

VL/CIL/MoEFCC/25-26/Oct 25 to Mar 26/01

Date: 26th May 2026

To
Deputy Director General of Forests (C)
Ministry of Environment, Forest and Climate Change,
Integrated Regional Office, Gandhi Nagar,
A-Wing – 407 & 409, Aranya Bhawan,
Near CH-3 Circle, Sector-10A,
Gandhi Nagar – 382010

Sub: Six-monthly progressive Environmental Compliance Report from Oct 2025 – Mar 2026 for integrated developments in CB/OS-2 offshore block and onshore facilities in the Gulf of Khambhat, Gujarat.

References:

1. J-11011/55/2000-IA II, dated 21st November 2000 and amended J-11011/55/2000 IA-II, dated 22nd December 2000- Drilling of exploration/appraisal wells (CB-OS/2) in the Gulf of Khambhat
2. J-11011/21/2001-IA. II, dated 06/07/2001 and amended J-11011/21/2001-IA II, dated 07/08/2001- Integrated Development of CB/OS-2 block (Phase I) in the Gulf of Khambhat
3. J-16011/12/2003-IA-III, dated 10th November 2003- Drilling of Exploratory/ Appraisal Wells (CB/OS-2) in the Gulf of Khambhat
4. J11-14/2004-IA-III, dated 04.08.2005- Development of Oil production in the CB/OS-2 Block, Gulf of Khambhat, Gujarat
5. J11-32/2005-IA-III, dated 04.08.2005- Oil and Gas development in Transition Zone of CB/OS-2 Block in Gulf of Khambhat, Gujarat
6. ENV-102004-41-P, dated 2nd December 2005- CRZ Clearance for Oil Production in the Block CB-OS-2, Gulf of Khambhat by the Cairn Energy India Private Limited.
7. J-11011/109/2005-I.A.II (I), dated. 25.01.2006- Development of Oil production in the CB/OS-2 Block off-shore area in Gulf of Khambhat, Gujarat
8. WLP/13/32/A/29/5-17/2005-06, fax dated 11th February 2006- Proposed oil and development in Transition zone of CB/OS-2 Block in Gulf of Khambhat, Gujarat
9. J-11011/20/2005 - IA II (I), dated 03.04.2006- Oil and Gas development in Transition Zone of CB/OS-2 Block in Gulf of Khambhat, Gujarat.

Sir/Madam,

Please find the enclosed herewith the status reports on the progressive compliance to the conditions enlisted in the above referred Environmental Clearance accorded by MoEF&CC with respect to the exploration, developments and production in CB/OS-2 offshore Block and the onshore facilities at the Gulf of Khambhat, Gujarat for the period October 2025 – March 2026.

Thanking you,

Yours faithfully,


Arun Sunag
Installation Manager
Cairn Oil & Gas, Vedanta Limited



Enc.: Environment Clearance Compliance Report, Oct'25-Mar'26.

Copy to:

1. In-charge Zonal Office Vadodara- West Zone, Central Pollution Control Board
2. Unit Head, Gujarat Pollution Control Board, Gandhinagar
3. Regional Officer, Gujarat Pollution Control Board, Surat.

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CIN: L13209MH1965PLC291394

Sensitivity: Internal (C3)

COMPLIANCE STATUS OF CONDITIONS OF MOEF&CC DURING ENVIRONMENTAL CLEARANCE OF THE PROJECT

Name of the Project: Drilling of exploratory/appraisal wells (CB-OS/2) in the Gulf of Khambhat

Clearance Letter No: J-11011/55/2000-IA II dated 21st November 2000
 J-11011/55/2000 IA-II dated 22nd December 2000

Period of Compliance Report: Progressive EC Compliance Reporting period is October 2025- March 2026

The average production details for the reporting period: The details are as follows:

In total three offshore Platforms installed with 29 numbers of wells drilled. The facility has obtained Environmental Clearance to produce up to 25,000 BOPD crude and 150 MMSCFD-- natural gas.

S. No		Units	Average production per day
1	Crude Production	BOPD	2975
2	Associated Gas Production	MMSCMD	0.81

All the conditions mentioned in this EC are being complied. Refer below for the point wise compliance details:

S. No.	EC Condition	Compliance Status
A.	Specific Conditions	
1	The schedule of commencement of drilling operation should be intimated at least one month in advance to the Wildlife Warden having jurisdiction over the nearest coastal area so as to enable him to monitor its impact, if any, as on the wildlife.	Agree to Comply The intimation will be sent to Wildlife Warden as and when drilling activity will be carried out.
2	Approval from DG Shipping under Merchant Shipping Act prior to commencement of the drilling operations should be obtained.	Agree to Comply DG shipping and MoD clearance shall be obtained as and when the drilling carried out. The exact location will be intimated to the Director General of Shipping, Mumbai, at least 30 days in advance, and all directions issued to ensure the safety of navigation will be strictly followed.
3	Only water-based drilling fluid/mud should be used for the drilling operation. As reflected in the EMP, the drilling fluid should be reused/recycled. There will be no discharge of drilling fluid/mud/cuttings into sea. The entire drill cuttings/mud will be disposed off onshore in a secured landfill site approved by GPCB.	Only water-based drilling fluid/mud is used for the drilling operation. Drilling fluid/mud/cuttings are disposed offshore as per GSR 546(E) Guidelines of EPA. No drilling activities have been carried out during reporting period.
4	In case the commercial viability of the project is established, the company will prepare a detailed plan for development of oil and gas fields in CB-OS/2 in the Gulf of Khambhat and obtain fresh clearance from Ministry	Since the commercial viability of gas production was established in the Project, NOC and separate production EC were obtained from GPCB and MOEF&CC respectively for development project in the Block.
5	Adequate infrastructural facilities should be provided near the offshore installations, so that booms, skimmers and chemical dispersants could be deployed immediately in case of oil leakage from the installations. Efforts should be made to curtail the oil slick within 500 m of the installation and accordingly, action plan and facilities to check the oil slick beyond 500 m should be provided.	Complied. Oil Spill Response and Contingency Plan has been prepared as per the NOS-DCP guidelines. booms and skimmers/ chemical dispersants are provided near installations during emergency as per photographs attached in Annexure –5 .

S. No.	EC Condition	Compliance Status
A.	Specific Conditions	
6	Even though the proposed site is not part of National Park or wildlife sanctuary, it is seen that degraded mangrove forests, coral reefs and some avifauna exists in the region. No drilling well should be located in such mangrove location. Also the company should submit a plan/scheme for mangrove regeneration/compensatory development in consultation with the local Forest/Wildlife office	A Memorandum of Understanding (MoU) was signed on 9th August 2012 between Cairn (hereinafter referred to as Vedanta Ltd (Cairn Oil & Gas)) and the Gujarat Ecology Commission, appointing the latter as the implementing agency for the "Restoration, Plantation and Conservation of 50 hectares of mangroves at Karanj Village, Olpad Taluka, Surat District." Subsequently, an MoU was signed with the Gujarat Forest Department on 20th October 2022 for the development of 60 hectares of mangroves in the Surat coastal region, with a ten-year schedule for plantation and protection activities. Another MoU was signed with the Gujarat Forest Department on 9th November 2023 to develop an additional 130 hectares of mangroves in the same region, also over a ten-year period. Refer Annexure – 4 for details.
7	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA/EMP report as well as the recommendations of the public hearing panel.	Complied. The environmental protection measures and safeguards recommended in EIA-EMP & Quantity Risk assessment (QRA) are being implemented. Please Refer below Point-Wise Compliance to EMP. Refer Annexure – 6 for point wise compliance to the EMP.
B.	General Conditions	
i.	The project authority must strictly adhere to the stipulations made by the Central Government as part of the international conventions and Merchant Shipping Act	Complied. Stipulations made by the Central Government and Merchant Shipping Act are being adhered to as per the following: 1. The Merchant Shipping Act. 1958, as amended & applicable. 2. MARPOL 1973/1978 as amended & applicable.
ii.	The project authorities must strictly adhere to the stipulations made by the Gujarat State Pollution Control Board	Being complied. The stipulations and norms prescribed by GPCB are followed. Compliance reports are being submitted regularly to GPCB regarding the Consent and Authorization conditions.
iii.	No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Agreed to comply. Company hereby assured that no activities being carried out without obtaining the prior EC.
iv.	The project must strictly adhere to the regulations made by MARPOL convention 1973/78 for setting limits for discharges from offshore oil/gas exploration and production activities	Complied.
v.	The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and	Noted and being complied with the requirements.

S. No.	EC Condition	Compliance Status
A.	Specific Conditions	
	Import of Hazardous Chemicals Rules, 1989 as amended on 3 rd October 1994. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc, must be obtained where ever applicable.	Unit is not a major accident hazard unit as regulation, however emergency response plan is in place. All the prior approval were obtained, and licences are in place as per applicable regulations.
vi.	The project authorities must comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management & Handling) Rules, 1989 wherever applicable. Authorisation from the State Pollution Control Board must be obtained for collection/treatment/storage/disposal of hazardous wastes.	Complied. The Facility has obtained Hazardous Waste Authorization from GPCB and conditions are being complied with.
vii.	The overall noise levels in and around the rig area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz, 75 dBA (day time) and 70 dBA (night time).	Complied. Monthly Noise monitoring (both day and nighttime) is carried out in the plant area to ensure compliance. Reports are attached as per Annexure-01 .
viii.	A separate environment management cell equipped with full-fledged laboratory facilities must be set up to carry out the environment monitoring functions.	Complied. Dedicated environmental expertise support is available both at the site and at Corporate office. The site has established laboratory to monitor the key parameters of STP, ETP and noise. However, for the detailed and regular monitoring, the third-party laboratory accredited by NABL and MoEF&CC has been hired to carry out the environmental monitoring requirements at the facilities and offshore.
ix.	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the MOEF as well as the state government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purpose.	Complied. Annual budgetary provisions are made for the environmental related expenses such as ETP & STP operation & maintenance, greenbelt development & maintenance, environmental monitoring, hazardous waste disposal, environmental audits etc. An amount of INR 5375818 was spent towards environment and related expenses during the reporting period.
x.	The implementation of the project vis-à-vis environmental action plans will be monitored by Ministry's regional office at Bhopal, State Pollution Control Board and Central Pollution Control Board. A six-monthly compliance status report should be submitted to the monitoring agencies.	Complied. Six monthly EC compliance report is submitted regularly.
xi	The project proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letters are available with the State Pollution Control Board/Committee and may also be seen at Website of	Environmental clearance of the project was advertised in the newspapers as per the MOEF guidelines and copies of the same were also submitted.

S. No.	EC Condition	Compliance Status
A.	Specific Conditions	
	the MOEF at http://WWW.envfor.nic.in . This should be advertised in at least two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned	

Sub: Compliance to the conditions of Environmental Clearance by MoEF

Period of reporting: Progressive EC Compliance Reporting period is April 2025 to September 2025

Ref: letter no . : J-11011/55/2000-IA II dated 21st November 2000

J-11011/55/2000 IA-II dated 22nd December 2000 **on dispensation for disposal of drill cuttings**

S. No.	Condition	Remarks
1	The water-based muds must have low toxicity (i.e 96 LC50 value > 30,000 ppm). The project authority should ensure that only low toxicity chemical additives shall be used for preparation of drilling fluids.	Noted for compliance. No drilling activities have been carried out during reporting period.
2	The disposal point should be atleast 5 Km away from the shoreline and ecologically sensitive areas.	Noted for compliance. No drilling activities have been carried out during reporting period.
3	At disposal point, the sea bed currents should have a minimum velocity of 60 Cm/second sea depth of 50 m minimum must be available for proper dilution and dispersion.	Noted for compliance. No drilling activities have been carried out during reporting period.
4	The drill cuttings should be discharged intermittently to avoid turbidity and reduction in transmittance.	Noted for compliance. No drilling activities have been carried out during reporting period.
5	Company should submit well-wise data on the quantity of water-based muds/cuttings used/generated along the slurry volume and properties.	Noted for compliance. No drilling activities have been carried out during reporting period.
6	Company should monitor the sea surface water quality in terms of oil content around the well and submit reports to the Ministry on a monthly basis during the period of drilling operations.	Noted for compliance. No drilling activities have been carried out during reporting period.

COMPLIANCE STATUS OF CONDITIONS OF MOEF&CC DURING ENVIRONMENTAL CLEARANCE OF THE PROJECT

Name of the Project: Integrated Development of CB/OS-2 block (Phase I) in the Gulf of Khambhat

Clearance Letter No: J-11011/21/2001-IA. II, Dated 06/07/2001
 J-11011/21/2001-IA II, Dated 07/08/2001

Period of Compliance Report: Progressive EC Compliance Reporting period is October 2025 - March 2026.

The average production details for the reporting period: The details are as follows:

In total three offshore Platforms installed with 29 numbers of wells drilled. The facility has obtained Environmental Clearance to produce up to 25,000 BOPD and 150 MMSCFD.

S. No		Units	Average production per day
1	Crude Production	BoPD	2975
2	Associated Gas Production	MMSCMD	0.81

All the conditions mentioned in this EC are being complied. Refer below for the point wise compliance details:

S. No.	EC Condition	Compliance Status
A.	Specific Condition	
1.	The schedule for commencement of the drilling operations should be intimated at least one month in advance to the wildlife warden having jurisdiction over the nearest coastal area so as to enable him to monitor its impact, if any, on the wild-life.	Agree to Comply. The intimation will be sent to Wildlife Warden one month in advance, as and when drilling activity will be carried out.
2.	Approval from DG Shipping under the Merchant Shipping Act prior to commencement of the drilling operations should be obtained. At least 30 days prior to the commencement of drilling, the exact location should be intimated to the Director General Shipping, Mumbai and Company should abide by any direction he may issue regarding ensuring the safety of navigation in the area.	Agree to Comply DG shipping and MoD clearance shall be obtained as and when the drilling carried out. The exact location will be intimated to the Director General of Shipping, Mumbai, at least 30 days in advance, and all directions issued to ensure the safety of navigation will be strictly followed.
3.	Only water-based drilling fluids/mud should be used for the drilling operation, Ministry hereby grants provisional permission for one year for disposal of the residual water based drilling fluids and drill cuttings after proper washing subject to the following conditions: <ul style="list-style-type: none"> – The water based muds must have low toxicity (i.e. 96 Hr LC-50 value > 30,000 ppm). The project authority should ensure – that only low toxicity chemical additives shall be used for preparation of drilling fluids. – The disposal point should be located at least 5 KM away from the shoreline and ecologically sensitive areas. – At the disposal point, the seabed currents should have a minimum velocity of 60cm/sec and sea depth of 50 meter minimum must be available for proper dilution and dispersion. – The drill cuttings should be discharged intermittently to avoid turbidity and reduction in transmittance. – Company should submit well-wise data on the quantity of water-based muds/cuttings used/generated along 	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.

S. No.	EC Condition	Compliance Status
A.	Specific Condition	
	<p>with slurry volume and properties (particle size distribution etc.)</p> <p>– Company should monitor the sea surface water quality in terms of oil content around the well and submit reports to the ministry on a monthly basis during the period of drilling operations.</p>	
4.	The company should monitor the heavy metal concentration in the marine fish species before taking up the exploratory drilling activities	Complied. Heavy metal concentration is monitored in the marine fish. Refer Annexure 8 for the report.
5.	Even though the proposed site is not part of any National Park or Wildlife Sanctuary, it is seen that degraded mangrove forests exists in the region. The company should submit a plan/ scheme for mangrove regeneration/ compensatory development in consultation with the local forest/ wildlife office.	A Memorandum of Understanding (MoU) was signed on 9th August 2012 between Cairn (hereinafter referred to as Vedanta Ltd (Cairn Oil & Gas)) and the Gujarat Ecology Commission, appointing the latter as the implementing agency for the "Restoration, Plantation and Conservation of 50 hectares of mangroves at Karanj Village, Olpad Taluka, Surat District." Subsequently, an MoU was signed with the Gujarat Forest Department on 20th October 2022 for the development of 60 hectares of mangroves in the Surat coastal region, with a ten-year schedule for plantation and protection activities. Another MoU was signed with the Gujarat Forest Department on 9th November 2023 to develop an additional 130 hectares of mangroves in the same region, also over a ten-year period. Refer to Annexure – 4 for further details.
6.	Adequate infrastructure facilities should be provided near the offshore installations so that booms, skimmers, chemical dispersant could be deployed immediately in case of oil leakage from the installations. Efforts should be made to curtail the oil slick within 500 meters of the installation and accordingly, action plan and facilities to check the oil slick beyond 500 meters should be provided.	Complied. Oil Spill Response and Contingency Plan has been prepared as per the NOS-DCP guidelines. booms and skimmers/ chemical dispersants are provided near installations during emergency as per photographs attached in Annexure –5 .
7.	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA/EMP/Risk analysis report as well as the recommendations of the Public Hearing panel.	Complied. The environmental protection measures and safeguards recommended in EIA-EMP & Quantity Risk assessment (QRA) are being implemented. Please Refer below Point-Wise Compliance to EMP. Refer Annexure – 6 for point wise compliance to the EMP.
B.	General Conditions	
i	The project authority must strictly adhere to the stipulations made by the Central Government as part of any international convention(s) or Merchant Shipping Act.	Complied. Stipulations made by the Central Government and Merchant Shipping Act are adhered to. Merchant Shipping Act are being adhered to as per the following: 1. The Merchant Shipping Act. 1958, as amended & applicable.

S. No.	EC Condition	Compliance Status
A.	Specific Condition	
		2. MARPOL 1973/1978 as amended & applicable.
S. No.	General Condition	Compliance Status
ii	The project authorities must strictly adhere to the stipulations made by the Gujarat Pollution Control Board and the State Government	Being complied. The stipulations and norms prescribed by GPCB are being complied with. Environment monitoring reports are regularly submitted to GPCB.
iii	No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference should be made to the ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any	Noted and no activities presently being carried out without any EC requirements. Amendments/ fresh environmental clearances are periodically obtained from MoEF&CC for future expansion and modification projects as per the requirements. TOR to CTE 82328 is obtained and is valid up to 12/05/2032.
iv	The project must strictly adhere to the regulations made by MARPOL convention 1973/1978 for setting limits, for discharges from offshore oil/gas exploration and production activities	Being complied. MV offshore monarch is deputed as Production Support Vessel at offshore. This Vessel complies to the requirements of the MARPOL convention.
v	The project authorities must strictly comply with the rules and regulations under Manufacture Storage and Import of Hazardous Chemicals Rules, 1989 as amended on 3 rd October, 1994. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained wherever applicable.	Noted and being complied with the requirements. Unit is not a major accident hazard unit as regulation, however for emergency, all the prior approvals were obtained and licences are in place as per applicable regulations..
vi	The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Waste (Management & Handling) Rules, 1989 wherever applicable. Authorisation from the State Pollution Control Board must be obtained for collection/treatment/disposal of hazardous wastes.	Noted for compliance. CCA No. AWH 137463 obtained and is valid up to 30/06/2028.
vii	The overall noise levels in and around the rig area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures, etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EP Rules, 1989 viz. 75 dBA (night time)	Noted for compliance. Please refer Annexure-1 for the detailed noise monitoring reports on site.
viii	A separate environment management cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	Complied Dedicated environmental expertise support is available both at the facilities and at corporate office. The site has established laboratory to monitor the key parameters of STP, ETP and noise.

S. No.	EC Condition	Compliance Status
A.	Specific Condition	
		However, for detailed and regular monitoring, a third-party laboratory accredited by NABL and MoEF&CC has been hired to carry out the environmental monitoring requirements of the facility and offshore every month.
ix	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment & Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purpose.	Complied. Annual budgetary provisions are made for the environmental related expenses such as ETP & STP operation & maintenance, greenbelt development & maintenance, environmental monitoring, hazardous waste disposal, environmental audits etc. An amount of INR 5375818 was spent towards environment and related expenses during the reporting period.
x	The implementation of project vis-à-vis environmental action plans will be monitored by Ministry's Regional Office at Bhopal, State Pollution Control Board/Central Pollution Control Board. A six-monthly compliance status report should be submitted to the monitoring agencies.	Complied. Six monthly EC compliance report is submitted regularly.
xi	The project proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/Committee and may also be seen at website of the Ministry of Environment & Forests at http://www.envfor.nic.in . This should be advertised in at least two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned.	Environmental clearance of the project was advertised in the newspapers as per the MOEF guidelines and copies of the same were also submitted.

SIX-MONTHLY REPORT OF PROGRESSIVE COMPLIANCE TO ENVIRONMENTAL CLEARANCE CONDITION

Name of the Project: Drilling of Exploratory/ Appraisal Wells (CB/OS-2) in the Gulf of Khambhat

Clearance Letter No: J-16011/12/2003-IA-III dated 10th November, 2003

Period of Compliance Report: Progressive EC Compliance Reporting period is October 2025 – March 2026.

Project activity during reporting period: No drilling activities were carried out during the reporting period of compliance report.

The average production details for the reporting period: The details are as follows:

In total three offshore Platforms installed with 29 numbers of wells drilled. The facility has obtained Environmental Clearance to produce up to 25,000 BOPD and 150 MMSCM.

S. No		Units	Average production per day
1	Crude Production	BoPD	2975
2	Associated Gas Production	MMSCMD	0.81

All the conditions mentioned in this EC are being complied. Refer below for the point wise compliance details:

S. No.	EC Condition	Compliance Status
A.	Specific Conditions	
1.	The Schedule for commencement of the drilling operation should be intimated at least one month in advance to the Wildlife Warden/Member Secretary, Gujarat Coastal Zone Management Authority and the Coast Guards having jurisdiction over the nearest coastal areas so as to enable them to monitor its impact, if any, on the wildlife and the coastal waters/coastal zone.	Agree to Comply The intimation will be sent to Wildlife Warden as and when drilling activity will be carried out.
2.	Approval from DG Shipping under the Merchant Shipping Act prior to commencement of the drilling operations should be obtained.	Agree to Comply DG shipping and MoD clearance shall be obtained as and when the drilling is carried out. The exact location will be intimated to the Director General of Shipping, Mumbai, at least 30 days in advance, and all directions issued to ensure the safety of navigation will be strictly followed.
3.	Use of diesel base mud is prohibited. Only water-based drilling fluids / mud should be used for drilling operation. As reflected in the EMP the drilling fluid should be recycled to a maximum extent. There should be no discharge of drilling fluid / mud / cuttings into sea. The unusable drilling fluid and entire drill cuttings should be disposed off onshore in a well-designed pit-lined with impervious liner. The disposal pit should be provided with leakage collection system. Design details of the waste disposal pit, capping of disposal pit should be approved by the Gujarat Pollution Control Board. The waste pit after it is filled up should be covered with impervious liner over which, a thick layer of native soil with proper slope should be provided	Noted for compliance. Water-based drilling fluid is used during drilling. Drilling fluid/mud/cuttings are disposed offshore as per GSR 546(E) Guidelines of EPA. No drilling activities have been carried out during reporting period.
4.	The chemical additives used for preparation of drilling fluid (DF) should have low toxicity i.e., 96 hr LC50 > 30,000 mg/1 as per mysid toxicity test conducted on locally available sensitive sea species. The chemicals used (mainly organic constituent) should be bio-degradable.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
5.	Barite used in preparation of DF should not contain Hg>1mg/kg and Cd>3g/kg	Noted and complied No drilling activities have been carried out during reporting period. Refer Attachment 8 for offshore monitoring reports.

S. No.	EC Condition	Compliance Status
6.	Drilling waste-water including drill cuttings generated from each well from any recognized laboratory for its characteristics and results should be submitted to Ministry of Environment & Forests / CPCB / Gujarat Pollution Control Board periodically	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
7.	The Company should get analyzed the drill cuttings generated from each well from any recognized laboratory for its characteristics and results should be submitted to Ministry of Environment & Forests / CPCB / Gujrat Pollution Control Board periodically.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
8.	The used Oil generated from drill site should be collected and sold to registered recyclers having environmentally sound management facility.	The used oil generated is re-processed with crude within the terminal.
9.	In case environmentally acceptable methods for disposal of drill waste such as (a) injection to a formation through casing annulus, if conditions allow (b) Land farming at suitable location (c) Bio-remediation (d) Incinerator or (e) Solidification should be considered in that case company should submit proposal to Gujarat Pollution Control Board / Ministry of Environment & Forests for approval.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
10.	In case the commercial viability of the project is established the company will prepare a detailed plan for development of oil and gas fields in CB/OS-2 in the gulf of Khambhat and obtain fresh clearance from the Ministry.	Since the commercial viability of gas production was established in the Project, NOC and separate production EC were obtained from GPCB and MOEF&CC respectively for development project in the Block.
11.	Adequate Infrastructure facilities should be provided near the offshore installations so that booms, skimmer, chemical dispersants could be deployed immediately in case of oil leakage from installation. Appropriate Oil Spill Management Plan should be drawn and efforts should be made to curtail the oil slick within 500m of the installation and accordingly action plan and facilities to check the oil slick beyond 500m should be provided	Complied. Oil Spill Response and Contingency Plan has been prepared as per the NOS-DCP guidelines. booms and skimmers/ chemical dispersants are provided near installations during emergency as per photographs attached in Annexure -5 .
12.	No drilling well should be located in Mangrove Area.	Noted for compliance. No drilling activities have been carried out during reporting period.
13.	It shall be ensured that during movement of man and material no obstruction of mangroves is carried out.	Noted for compliance. No drilling activities have been carried out during reporting period.
14.	No ground water shall be tapped for the project.	Complied. The water requirement is sourced from GIDC supply.
15.	The Solid Waste generated during the drilling process and from the equipment should be disposed of safely in consultation with Gujarat State Pollution Control Board.	Noted for compliance. Drilling Waste is disposed offshore as per GSR 546(E) Guidelines of EPA. No drilling activities have been carried out during reporting period.
16.	No landfill site should be located in coastal Regulation zone area. The solid waste generated during the drilling process and from the equipment should be disposed of safely in consultation with Gujarat State Pollution Board.	Noted for compliance. No drilling activities have been carried out during reporting period.
17.	No Camp sites for labours should be set up in Coastal Regulation Zone area. The toilets to be constructed in coastal regulation zone areas should have septic tank and soak pit.	Noted for compliance.

S. No.	EC Condition	Compliance Status
18.	The Waste-water generated from the project shall be treated and disposed of as per the norms laid down by Gujarat State Pollution Control Board.	<p>Noted for compliance.</p> <p>Sewage generated from the terminal activities is treated through the aeration process in the STP installed within the onshore terminal. The treated sewage is used for the greenbelt development activities within the onshore area and thus no discharge is carried out beyond the terminal premises.</p> <p>The produced water separated from the hydrocarbon well fluids is treated through onshore ETP installed within the terminal area. The treated effluent after meeting the marine discharge standards as prescribed by GPCB is discharged into sea through marine outfall located about 500 m from Low Tide Level (as recommended by NIO after carrying out the study).</p> <p>Periodic environmental monitoring is being carried out for the treated sewage and the treated effluents. Refer Annexure 1 for monitoring details.</p>
19.	Oil blow-out preventing device to be provided against to be checked and prevented.	<p>Complied with.</p> <p>Blow out valves are installed in the producing wells.</p>
20.	Hydrocarbon leak due to loss of containment to be checked and prevented.	The crude oil storage tanks are provided with the adequate bunds to contain any leakage. These tanks and bunds are continuously monitored to check for any leakages.
21.	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA / EMP / DMP report.	<p>Complied.</p> <p>The environmental protection measures and safeguards recommended in EIA-EMP & Quantity Risk assessment (QRA) are being implemented.</p> <p>Please Refer below Point-Wise Compliance to EMP. Refer Annexure – 6 for point wise compliance to the EMP.</p>
B.	General Conditions:	
i.	The Project authority must strictly adhere to the stipulation made by the central government as part of any International Convention(s) or Merchant Shipping Act.	<p>Complied.</p> <p>Stipulations made by the Central Government and Merchant Shipping Act are adhered to. Merchant Shipping Act are being adhered to as per the following:</p> <ol style="list-style-type: none"> 1. The Merchant Shipping Act. 1958, as amended & applicable. 2. MARPOL 1973/1978 as amended & applicable.
ii.	The Project authorities must strictly adhere to the stipulations made by the Gujarat State Pollution Control Board and the State Government	<p>Being complied.</p> <p>All the conditions mentioned in the CCA (Consolidated Consent Authorization) is being complied and periodic reports are being submitted to the Gujarat State Pollution Control Board.</p>
iii.	No further expansion or modification in the plant should be carried out without prior approval of Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance a fresh reference should be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any	Noted for compliance and no activities being carried out without obtaining the necessary approvals.
iv.	The project must strictly adhere to regulations made by MARPOL convention 1973/1978 for setting limits, for discharges from offshore oil/gas exploration and production activities	Complied

S. No.	EC Condition	Compliance Status
v.	The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended on 3 rd October 1994. Prior approvals from Chief Inspector of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained wherever applicable	Noted and being complied with the requirements. Unit is not a major accident hazard unit as regulation, however during emergency, all the prior approval are obtained and licenses are in place as per applicable regulations.
vi	The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of Hazardous wastes in accordance with the Hazardous Wastes (Management and Handling) Rules, 1989/2003 wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/disposal of hazardous wastes.	Being complied. The Facility has obtained Hazardous Waste Authorization from GPCB and conditions are being complied.
vii	The overall noise level in and around the rig area should be kept well within the standards (85 dBA) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise level should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dBA (day time) and 70 dBA (night time)	Noted for compliance No drilling activities have been carried out during reporting period.
viii	A separate environmental management cell equipped with full fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	Dedicated environmental expertise support is available both at the facilities and at corporate office. The site has established laboratory to monitor the key parameters of STP, ETP and noise. However, for the detailed and regular monitoring, third-party laboratory accredited by NABL and MoEF&CC has been hired to carry out the environmental monitoring requirements of the facilities and offshore.
ix.	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purpose	Complied. Annual budgetary provisions are made for the environmental related expenses such as ETP & STP operation & maintenance, greenbelt development & maintenance, environmental monitoring, hazardous waste disposal, environmental audits etc. An amount of INR 5375818 was spent towards environment and related expenses during the reporting period.
x.	The implementation of the project vis-à-vis environmental action plans will be monitored by Ministry's Regional Office at Bhopal/State Pollution Control board/Central Pollution Control Board. A six-monthly compliance status report should be submitted to the monitoring agencies.	Being complied. Six monthly EC compliance report is submitted regularly.
xi.	The Project Proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry and Forests at http://www.envfor.nic.in . This should be advertised within seven days from the date of issue of clearance letter in at least two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned.	A public notice informing the grant of EC by MOEF for the off-shore oil development in CB/OS-2 Block, Gulf of Khambhat and availability of its copies was published in the following newspapers: 1. Indian Express (English) dt 26-08-2005 2. Gujarat Mitra (Gujarati) - dt 26-08-2005

SIX-MONTHLY REPORT OF PROGRESSIVE COMPLIANCE TO ENVIRONMENTAL CLEARANCE CONDITION

Name of the Project: Development of Oil production in the CB/OS-2 Block, Gulf of Khambhat, Gujarat

Clearance Letter No: J11-14/2004-IA-III dated 04.08.2005

Period of Compliance Report: Progressive EC Compliance Reporting period is October 2025- March 2026.

Project activity during reporting period: No drilling activities were carried out during the reporting period of compliance report.

The average production details for the reporting period: The details are as follows:

In total three offshore Platforms installed with 29 numbers of wells drilled. The facility has obtained Environmental Clearance to produce up to 25,000 BOPD and 150 MMSCFD.

S. No		Units	Average production per day
1	Crude Production	BOPD	2975
2	Associated Gas Production	MMSCMD	0.81

All the conditions mentioned in this EC are being complied. Refer below for the point wise compliance details:

S. No.	EC Condition	Compliance Status
	Specific Conditions	
i.	All the conditions stipulated by the Forests and Environment Department, Government of Gujarat vide their letters NO.ENV-102000-41-P, dated 8.7.2004 should be strictly implemented.	Complied.
ii.	All the conditions stipulated by the Gujarat Pollution Control Board vide their letter No. PC/NOC/SRT-1392/5064, dated 3.6.2004 should be strictly implemented.	Complied.
iii.	The Schedule for commencement of the drilling operation should be intimated at least one month in advance to the Wildlife Warden/ Member Secretary, Gujarat Coastal Zone Management Authority and the Coast Guards having jurisdiction over the nearest coastal area so as to enable them to monitor its impact, if any, on the wildlife and the coastal waters/ coastal zone.	Agree to Comply The intimation will be sent to Wildlife Warden as and when drilling activity will be carried out.
iv.	Approval from DG Shipping under the Merchant Shipping Act prior to commencement of the drilling operations should be obtained.	Noted for the compliance. However, no drilling activity was carried out during the reporting period.
v.	Use of diesel base mud is prohibited. Only water based drilling fluids / mud should be used for the drilling operation. As reflected in the BMP the drilling fluid should be recycled to a maximum extent. There should be no discharge of drilling fluid / mud / cuttings into sea. The unusable drilling fluid and entire drill cuttings should be disposed off onshore in a well designed pit lined with impervious liner. The disposal pit should be provided with leakage collection system. Design details of the waste disposal pit, capping of disposal pit should be approved by the Gujarat Pollution Control Board. The waste pit after it is filled up should be covered with impervious liner over which, a thick layer of native soil with proper slope should be provided.	Noted for compliance. However, no drilling activity was carried out during the reporting period.
vi.	The chemical additives used for preparation of drilling fluid (DF) should have low toxicity i.e., 96	Noted for compliance. However, no drilling activity was carried out during the

S. No.	EC Condition	Compliance Status
	hr LC50 > 30,000 mg/1 as per mysid toxicity test conducted on locally available sensitive sea species. The chemicals used (mainly organic constituent) should be bio-degradable	reporting period.
vii.	Barite used in preparation of DF should not contain Hg >1 mg/ kg and Cd>3mg/ kg	Noted for compliance. However, no drilling activity was carried out during the reporting period.
viii.	Drilling waste water including drill cuttings wash water should be collected in the disposal pit, evaporated and treated and should comply with notified standards for onshore disposal.	Noted for compliance. However, no drilling activity was carried out during the reporting period.
ix.	The company should get analyzed the drill cuttings generated from each well from any recognized laboratory for its characteristics and results should be submitted to Ministry of Environment & Forests/CPCB/Gujarat Pollution Control Board periodically.	Noted for compliance. However, no drilling activity was carried out during the reporting period.
x.	The used oil generated from drill site should be collected and sold to registered recyclers having environmentally sound management facility	Noted for compliance No drilling activity has taken place in the reporting period under the scope of this EC
xi.	In case, environmentally acceptable methods for disposal of drill waste such as (a) injection to a formation through casing annulus, if conditions allow (b) land farming at suitable location (c) bio-remediation (d) incinerator or (e) solidification should be considered, in that case company should submit proposal to Gujarat Pollution Control Board/ Ministry of Environment & Forests for approval	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
xii.	In case the commercial viability of the project is established, the company will prepare a detailed plan for development of oil and gas fields in CB-OS/2 in the Gulf of Khambhat and obtain fresh clearance from the Ministry	Agreed to comply. Company hereby assured that no activities being carried out without obtaining the prior EC.
xiii.	Adequate infrastructure facilities should be provided near the off-shore installations so that booms, skimmers, chemical dispersants could be deployed immediately in case of oil leakage from the installation. Appropriate Oil Spill Management Plan should be drawn and efforts should be made to curtail the oil slick within 500 meters of the installation and accordingly, action plan and facilities to check the oil slick beyond 500 meters should be provided.	Complied. Oil Spill Response and Contingency Plan has been prepared as per the NOS-DCP guidelines. booms and skimmers/ chemical dispersants are provided near installations during emergency as per photographs attached in Annexure –5 .
xiv.	No drilling wells or facilities other than those permitted under the Coastal Regulation Zone Notification, 1991 should be located in mangrove area	Noted for compliance.
xv.	It shall be ensured that during movement of man and material no destruction of mangroves is carried out	Noted for compliance.
xvi.	No groundwater should be tapped for the project in Coastal Regulation Zone areas	Complied. The water requirement is fulfilled through rain-water harvesting on the terminal and GIDC supply.

S. No.	EC Condition	Compliance Status
xvii.	The solid waste generated during the drilling process and from the equipment should be disposed of safely in consultation with Gujarat State Pollution Control Board	Noted for compliance. However, no drilling activity was carried out during the reporting period.
xviii.	No landfill site should be located in Coastal Regulation Zone area. The solid waste generated from the drill cutting, solar evaporated drilling mud sediments should be disposed off in Gujarat Enviro Protection and Infrastructure Limited (GEPIL) hazardous waste facility located at Gabheri Taluk Choryasi, Surat	Noted for compliance. However, no drilling activity was carried out during the reporting period.
xix.	No camp sites for labours should be set up in Coastal Regulation Zone area. The toilets to be constructed in Coastal Regulation Zone areas should have septic tank and soak pit	Complied
xx.	The waste water generated from the project shall be treated and disposed off as per the norms laid down by Gujarat State Pollution Control Board	Complied. Sewage generated from the terminal activities is treated through the aeration process in the STP installed within the onshore terminal. The treated sewage is used for the greenbelt development activities within the onshore area and thus no discharge is carried out beyond the terminal premises. The produced water separated from the hydrocarbon well fluids is treated through onshore ETP installed within the terminal area. The treated effluent after meeting the marine discharge standards as prescribed by GPCB is discharged into sea through marine outfall located about 500 m from Low Tide Level (as recommended by NIO after carrying out the study). Periodic environmental monitoring is being carried out for the treated sewage and the treated effluents. Refer Annexure- 1 for environmental monitoring details.
xxi.	Oil blow out preventing device should be provided against the hazard of oil blow out	Complied with. Blow out valves are installed in the producing wells.
xxii.	Hydrocarbon leak due to loss of containment to be checked and prevented	The crude oil storage tanks are provided with adequate bunds to contain any leakage. These tanks and bunds are continuously monitored to check for any leakages.
xxiii.	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA/ EMP/ DMP report	Complied. The environmental protection measures and safeguards recommended in EIA-EMP & Quantity Risk assessment (QRA) are being implemented. Please Refer below Point-Wise Compliance to EMP. Refer Annexure – 6 for point wise compliance to the EMP
General Conditions:		
i.	The Project authority must strictly adhere to the stipulations made by the Central Government as part of any International Convention(s) or Merchant Shipping Act	Complied. Stipulations made by the Central Government and Merchant Shipping Act are adhered to. Merchant Shipping Act are being adhered to as per the following: 1. The Merchant Shipping Act. 1958, as amended & applicable. 2. 2. MARPOL 1973/1978 as amended & applicable.
ii.	The project authorities must strictly adhere to the stipulations made by the Gujarat State Pollution Control Board and the State Government.	Being complied. All the conditions mentioned in the CCA (Consolidated Consent Authorization) is being complied and periodic reports are being submitted to the Gujarat State Pollution Control Board.

S. No.	EC Condition	Compliance Status
iii.	No further expansion or modifications in the plant should be carried out without prior approval of the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Noted for the compliance and no activities being carried out without obtaining the necessary approvals.
iv.	The project must strictly adhere to the regulations made by MARPOL convention 1973/1978 for setting limits, for discharges from offshore oil/ gas exploration and production activities	Being complied
v	The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended on 3rd October 1994. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained wherever applicable.	Noted and being complied with the requirements. Unit is not a major accident hazard unit as regulation, however for emergency, all the prior approval were obtained and licenses are in place as per applicable regulations.
vi	The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management & Handling) Rules, 1989/2003 wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/ treatment/ storage/ disposal of hazardous wastes	Being complied. The Facility has obtained Hazardous Waste Authorization from GPCB and conditions are being complied.
vii	The overall noise level in and around the rig area should be kept well within the standards (85 dB(A)) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dB(A) (daytime) and 70 dB(A) (nighttime)	Being Complied No rig operation during the reporting period
viii	A separate environmental management cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions	Complied Dedicated environmental support is available at site and at corporate office. The site has established laboratory to monitor the key parameters of STP, ETP and noise. However, third-party laboratory accredited by NABL and MoEF & CC, has been hired to carry out environmental monitoring every month as per Environment monitoring plan
ix	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment & Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purpose	Complied. Annual budgetary provisions are made for the environmental related expenses such as ETP & STP operation & maintenance, greenbelt development & maintenance, environmental monitoring, hazardous waste disposal, environmental audits etc. An amount of INR 5375818 was spent towards environment and related expenses during the reporting period.

S. No.	EC Condition	Compliance Status
x	The implementation of the project vis-a-vis environmental action plans will be monitored by Ministry's Regional Office at Bhopal/State Pollution Control Board/ Central Pollution Control Board. A six-monthly compliance status report should be submitted to the monitoring agencies	Being complied. Six monthly EC compliance report is submitted regularly.
xi	The Project Proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/Committee and may also be seen at Website of the Ministry and Forests at http://www.envfor.nic.in . This should be advertised within seven days from the date of issue of the clearance letter in at least two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned.	A public notice informing the grant of EC by MOEF for the off-shore oil development in CB/OS-2 Block, Gulf of Khambhat and availability of its copies was published in the following newspapers: 1. Indian Express (English) dt 26-08-2005 2. Gujarat Mitra (Gujarati) - dt 26-08-2005

COMPLIANCE STATUS OF CONDITIONS OF MOEF&CC DURING CRZ CLEARANCE OF THE PROJECT

Name of the Project: Oil and Gas development in Transition Zone of CB/OS-2 Block in Gulf of Khambhat, Gujarat

Clearance Letter No: J11-32/2005-IA-III dated 04.08.2005

Period of Compliance Report: Progressive CRZ Compliance Reporting period is October 2025- March 2026.

Project activity during reporting period: No additional facilities installed and no drilling activities under the scope of this EC were undertaken during the reporting period of compliance report.

The well under the scope of this EC was abandoned and therefore there was no production in the reporting period.

All the conditions mentioned in this CRZ clearance are being complied. Refer below for the point wise compliance details:

S. No	CRZ condition	Compliance status
	A. Specific Conditions	
(i)	All the conditions stipulated by the Forest and Environment Department, Government of Gujarat vide their letters No. ENV -10-2004-85-P, dated 23.2.2005 should be strictly implemented.	Being complied.
(ii)	All the conditions stipulated by the Gujarat Pollution Control Board vide their letter No. PC/NOC/SRT-1392/1414/16263, dated 3.6.2004 should be strictly implemented.	Being complied.
(iii)	Extensive mangroves development should be taken up in identified area with Forest Department	A Memorandum of Understanding (MoU) was signed on 9th August 2012 between Cairn (hereinafter referred to as Vedanta Ltd (Cairn Oil & Gas)) and the Gujarat Ecology Commission, appointing the latter as the implementing agency for the "Restoration, Plantation and Conservation of 50 hectares of mangroves at Karanj Village, Olpad Taluka, Surat District." Subsequently, an MoU was signed with the Gujarat Forest Department on 20th October 2022 for the development of 60 hectares of mangroves in the Surat coastal region, with a ten-year schedule for plantation and protection activities. Another MoU was signed with the Gujarat Forest Department on 9th November 2023 to develop an additional 130 hectares of mangroves in the same region, also over a ten-year period. Refer Annexure – 4 for details.
(iv)	Necessary arrangements should be made to provide drinking water to the local public since the area has water scarcity problem	Water supply arrangements have been provided to Suvali village with a capital investment of Rs. 10 lakhs. Under the project Jeevan Amrit, we have installed ATW unit at Suvali RO plant so that people from the village can get drinking water 24x7 through ATW card.
(v)	No chemicals or products should be stored within the Coastal Regulation Zone area other than those permissible under the Coastal Regulation Zone Notification, 1991	Being complied. Chemicals are stored in Chemical storage yard which is not present in the CRZ area.
(vi)	No effluent discharge/ waste disposal should be done in CRZ area	Being complied. Effluents are not discharged in the CRZ area. Sewage generated from the terminal activities is treated through the aeration process in the STP installed within the onshore terminal. The treated sewage is used for the greenbelt development activities within the onshore area and thus no discharge is carried out beyond the terminal premises. The produced water separated from the hydrocarbon well fluids is treated through onshore ETP installed within the terminal area. The treated effluent after meeting the marine discharge standards as prescribed by GPCB is discharged into sea through marine outfall located about 500 m from Low Tide Level (as

S. No	CRZ condition	Compliance status
		recommended by NIO after carrying out the study). Periodic environmental monitoring is being carried out for the treated sewage and the treated effluents. Refer the Annexure - 1 for the details.
(vii)	The schedule for commencement of the drilling operation should be intimated at least one month in advance to the Wildlife Warden/ Member Secretary, Gujarat Coastal Zone Management Authority and the Coast Guards having jurisdiction over the nearest coastal area so as to enable them to monitor its impact, if any, on the wild life and the coastal waters/ coastal zone.	Noted and Compliance. No drilling activities under the scope of this CRZ Clearance were undertaken during the reporting period. However, all the stipulated conditions are being complied with and CIL shall continue to comply during any drilling activities in the future.
(viii)	Approval from DG Shipping under the Merchant Shipping Act prior to commencement of the drilling operations should be obtained	Noted for compliance. However, no drilling activities under the scope of this CRZ Clearance were undertaken during the reporting period.
(ix)	Use of diesel base mud is prohibited. Only water based drilling fluids / mud should be used for the drilling operation. As reflected in the BMP the drilling fluid should be recycled to a maximum extent. There should be no discharge of drilling fluid/ mud/ cuttings into the sea. The unusable drilling fluid and entire drill cuttings should be disposed off onshore in a well designed pit lined with impervious liner. The disposal pit should be provided with leakage collection system. Design details of the waste disposal pit, capping of disposal pit should be approved by the Gujarat Pollution Control Board. The waste pit after it is filled up should be covered with impervious line over which, a thick layer of native soil with proper slope should be provided.	Noted for compliance. The drilling is managed as per the requirements specified in the GSR 546 (E) and as per the Gujarat Pollution Control Board requirements. However, no drilling activities under the scope of this CRZ Clearance were undertaken during the reporting period.
(x)	The chemical additives used for preparation of drilling fluid (DF) should have low toxicity i.e., 96 hr LC50 > 30,000 MG/L as per mysid toxicity test conducted on locally available sensitive sea species. The chemicals used (mainly organic constituent) should be bio-degradable	Noted for compliance. However, no drilling activities under the scope of this CRZ Clearance were undertaken during the reporting period.
(xi)	Barite used in preparation of DF should not contain Hg>1mg/kg and Cd>3mg/kg.	Noted for compliance. However, no drilling activities under the scope of this CRZ Clearance were undertaken during the reporting period.
(xii)	Drilling wastewater including drill cuttings wash water should be collected in the disposed pit, evaporated and treated and should comply with notified standards for onshore disposal.	Noted for compliance. However, no drilling activities under the scope of this CRZ Clearance were undertaken during the reporting period.
(xiii)	The company should get analyzed the drill cuttings generated from each well from any recognized laboratory for its characteristics and results should be submitted to Ministry of Environment and Forests/ CPCB/ Gujarat Pollution Control Board periodically.	Noted for compliance. However, no drilling activities under the scope of this CRZ Clearance were undertaken during the reporting period.
(xiv)	The used oil generated from drill site should be collected and sold to registered recyclers having environmentally sound management facility	The used oil generated from the process equipment's are being reprocessed with crude at the onshore terminal.
(xv)	In case, environmentally acceptable methods for disposal of drill waste such as (a) injection to	Noted for compliance No drilling activities under the scope of this CRZ clearance were

S. No	CRZ condition	Compliance status
	a formation through caring annulus, if conditions allow (b) land farming at suitable location (c) bioremediation (d) incinerator or (e) solidification should be considered, in that case company should submit proposal to Gujarat Pollution Control Board/ Ministry of Environment & Forests for approval	undertaken during the reporting period
(xvi)	In case the commercial viability of the project is established, the company will prepare a detailed plan for development of oil and gas fields in CB-OS/2 in the Gulf of Khambhat and obtain fresh clearance from the Ministry	Vedanta Ltd. (Cairn Oil & Gas) has established commerciality of project and this EC is for the production of crude oil and gas.
(xvii)	Adequate infrastructure facilities should be provided near the off-shore installations so that booms, skimmers, chemicals dispersants could be deployed immediately in case of oil leakage from the installation. Appropriate Oil Spill Management Plan should be drawn and efforts should be made to curtail the oil slick within 500 meters of the installation and accordingly, action plan and facilities to check the oil slick beyond 500 meters should be provided.	Complied. Oil Spill Response and Contingency Plan has been prepared as per the NOS-DCP guidelines. booms and skimmers/ chemical dispersants are provided near installations during emergency as per photographs attached in Annexure -5 .
(xviii)	No drilling well should be located in mangrove area	Noted for compliance No drilling activities under the scope of this CRZ clearance were undertaken during the reporting period
(xix)	It shall be ensured that during movement of man and material no destruction of mangroves is carried out	Noted for compliance No drilling activities under the scope of this CRZ clearance were undertaken during the reporting period
(xx)	No groundwater should be tapped for the project	Complied. The water requirement is sourced from GIDC and rain-water harvesting facility at the terminal.
(xxi)	The solid waste generated during the drilling process and from the equipment should be disposed of safely in consultation with Gujarat state Pollution Control Board	Noted for compliance No drilling activities under the scope of this CRZ clearance were undertaken during the reporting period
(xxii)	No landfill site should be located in Coastal Regulation Zone area. The solid waste generated from the drill cutting, solar evaporated drilling mud sediments should be disposed off in Gujarat Enviro Protection and Infrastructure Limited (GEPIL) hazardous waste facility located at Gabheri Taluk Choryasi, Surat	Noted for compliance No drilling activities under the scope of this CRZ clearance were undertaken during the reporting period
(xxiii)	No camp sites for labours should be set up in Coastal Regulation Zone area. The toilets to be constructed in Coastal Regulation Zone areas should have septic tank and soak pit	Noted for compliance No drilling activities under the scope of this CRZ clearance were undertaken during the reporting period
(xxiv)	The waste water generated from the project shall be treated and disposed off as per the norms laid down by Gujarat State Pollution Control Board	Complied. Sewage generated from the terminal activities is treated through the aeration process in the STP installed within the onshore terminal. The treated sewage is used for the greenbelt development activities within the onshore area and thus no discharge is carried out beyond the terminal premises. The produced water separated from the hydrocarbon well fluids is treated through onshore ETP installed within the terminal area. The treated effluent after meeting the marine discharge standards as prescribed by GPCB is discharged into sea through marine outfall located about 500 m from Low Tide Level (as recommended by NIO after carrying out the study).

S. No	CRZ condition	Compliance status
		Periodic environmental monitoring is being carried out for the treated sewage and the treated effluents. Refer the Annexure 1 for the monitoring details.
(xxv)	Oil blow out preventing device should be provided against the hazard of oil blow out	Blow out Preventers (BOP) is an integral part of drilling machine and Vedanta Ltd. (Cairn Oil & Gas) ensures that BOP is in place during drilling operations
(xxvi)	Hydrocarbon leak due to loss of containment to be checked and prevented	The crude oil storage tanks are provided with adequate bunds to contain any leakage. These tanks and bunds are continuously monitored to check for any leakages.
(xxvii)	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA/EMP/DMP reports	Complied. The environmental protection measures and safeguards recommended in EIA-EMP & Quantity Risk assessment (QRA) are being implemented. Please Refer below Point-Wise Compliance to EMP. Refer Annexure – 6 for point wise compliance to the EMP.
(xxviii)	No activities should be carried out in the forest area without obtaining forest clearance from the Forest Department	Noted for compliance.
	General Conditions	
(i)	The Project authority must strictly adhere to the stipulations made by the Central Government as part of any International Convention(s) or Merchant Shipping Act	Complied. Stipulations made by the Central Government and Merchant Shipping Act are adhered to. Merchant Shipping Act are being adhered to as per the following: 1. The Merchant Shipping Act. 1958, as amended & applicable. 2. 2 MARPOL 1973/1978 as amended & applicable.
(ii)	The project authorities must strictly adhere to the stipulations made by the Gujarat State Pollution Control Board and the State Government	Being complied. All the conditions mentioned in the CCA (Consolidated Consent Authorization) is being complied and periodic reports are being submitted to the Gujarat State Pollution Control Board.
(iii)	No further expansion or modification in the plant should be carried out without prior approval of the Ministry of Environment & Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Noted for the compliance and no activities being carried out without obtaining the necessary approvals.
(iv)	The project must strictly adhere to the regulations made by MARPOL convention 1973/1978 for setting limits, for discharges from offshore oil/gas exploration and production activities.	Complied
(v)	The project authorities must strictly comply with the Rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended on 3 rd October 1994. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained wherever applicable.	Noted and being complied with the requirements. Unit is not a major accident hazard unit as regulation, however for emergency, all the prior approvals were obtained, and licenses are in place as per applicable regulations.
(vi)	The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management & Handling) Rules, 1989/2003	Being complied. The authorization for the Hazardous Waste Handling and Management has already been obtained from the GPCB and the management of wastes is being undertaken accordingly.

S. No	CRZ condition	Compliance status
	wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/treatment/storage/disposal of hazardous wastes.	
(vii)	The overall noise level in and around the rig area should be kept well within the standards (85 dB(A)) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPS Rules, 1989 viz. 75 db(A) (day time) and 70 dB(A) (night time).	Complied No rig operation during the reporting period.
(viii)	A separate environmental management cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	Complied. Dedicated environmental support is available at site and at Corporate office. The site has established laboratory to monitor the key parameters of STP, ETP and noise. Also, third party laboratory accredited by NABL and MoEF & CC has been hired to carry out the environmental monitoring as per Environment monitoring plan.
(ix)	The project authorities will provide adequate funds both recurring and non-recurring to implement the conditions stipulated by the Ministry of Environment & Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purpose.	Complied Annual budgetary provisions are made for the environmental related expenses such as ETP & STP operation & maintenance, greenbelt development & maintenance, environmental monitoring, hazardous waste disposal, environmental audits etc. An amount of INR 5375818 was spent towards environment and related expenses during the reporting period.
(x)	The implementation of the project vis-à-vis environmental action plans will be monitored by Ministry's Regional Office at Bhopal / State Pollution Control Board/Central Pollution Control Board. A six monthly compliance status report should be submitted to the monitoring agencies.	Noted and being complied. Six monthly compliance report is being submitted regularly.
(xi)	The Project Proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the state pollution control Board/Committee and may also be seen at Website of the Ministry and Forests at http://www.envfor.nic.in . This should be advertised within seven days from the date of issue of the clearance letter in at least two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned.	A public notice informing the grant of EC by MOEF for the off-shore oil development in CB/OS-2 Block, Gulf of Khambhat and availability of its copies was published in the following newspapers: 1) Indian Express (English) dt 26-08-2005 2) Gujarat Mitra (Gujarati) - dt 26-08-2005
(xii)	The Ministry may revoke or suspend the clearance, if implementation of any of the above conditions is not satisfactory	Noted.
(xiii)	The Ministry reserves the right to stipulate additional conditions if found necessary. The company will implement these conditions in a time bound manner.	Noted.

2.0 SIX-MONTHLY REPORT OF PROGRESSIVE COMPLIANCE TO CRZ CLEARANCE CONDITION

Name of the Project: CRZ Clearance for Oil Production in the Block CB-OS-2, Gulf of Khambhat by the Cairn Energy India Private Limited.

Clearance Letter No: ENV-102004-41-P dated 2nd December 2005

Period of Compliance Report: Progressive EC Compliance Reporting period is October 2025 – March 2026.

Project activity during reporting period: No drilling activities were carried out during the reporting period of compliance report.

The average production details for the reporting period: The details are as follows:

In total three offshore Platforms installed with 29 numbers of wells drilled. The facility has obtained Environmental Clearance to produce up to 25,000 BOPD and 150 MMSCM.

S. No		Units	Average production per day
1	Crude Production	BoPD	2975
2	Associated Gas Production	MMSCMD	0.81

All the conditions mentioned in this CRZ Clearance are being complied. Refer below for the point wise compliance details:

S. No.	CRZ Condition	Compliance Status
Specific Conditions		
1.	The Cairn Energy India Private Limited (CEIPL) shall strictly comply with the CRZ Notification, 1991 as amended from time to time.	Being complied.
2.	The CEIPL shall obtain separate recommendation from this Department for their phase II to V activities after obtaining the NOC from the Gujarat Maritime Board for their proposed oil development activities	Being complied.
3.	The project proponents shall prepare and submit the comprehensive EIA and Risk Assessment reports and shall implement all the suggestions / recommendations given in the said reports.	EIA and QRA studies are conducted periodically based on the project approval requirements. The recommendations and EMP are being implemented.
4.	The CEIPL shall contribute for any common study or facilities to be proposed by this department for the Gulf of Khambhat or for the Hazira region.	Company will support studies and/or facilities proposed in the Hazira region by Forests and Environment Department, Government of Gujarat.
5.	The CEIPL shall not tap the groundwater in any case	Complied. No ground water is tapped. Water is sourced from rain-water harvesting facility or from GIDC.
6.	The CEIPL shall implement all the suggestions / recommendations given by their consultant viz. ERM in their Environment Impact Assessment report.	Noted and being complied with.
7.	No activity shall be carried out in the forest-land or in the areas having mangroves or in the area which are ecologically sensitive and important	Noted and being complied with.
8.	The CEIPL shall bear the cost of the external agency that may be appointed by this department for carrying out supervision and/or monitoring of the construction and / or operation activities.	Complied. Company will bear the cost related to monitoring of the construction and / or operation activities proposed by Forests and Environment Department, Government of Gujarat.

S. No.	CRZ Condition	Compliance Status
9.	All necessary precautions shall be taken by the CEIPL to ensure that there is no change in the hydrology due to proposed activities.	The hydrocarbon wells are deep offshore wells beyond 1000 m depth. The hydrocarbon is abstracted from the confined zone and thus there will no change in the hydrology.
	General Conditions:	
10.	The construction camps shall be located outside the CRZ area.	Noted and no construction camps will be set up in the CRZ area.
11.	The CEIPL shall ensure that the drilling/construction labours are provided with the necessary amenities, including fuel, water supply and sanitation to ensure that there is no negative impact on the existing environmental condition of the region	Noted for compliance. However, no drilling activity was carried out during the reporting period.
12.	It shall be ensured by the CEIPL that there will be no disposal of sullage and sewage generated from construction camps, surface run-off from construction sites, and oil and grease spillage from construction equipment into the sea or the CRZ area.	Noted for compliance. However, no drilling activity was carried out during the reporting period.
13.	The site shall be restored to its original condition once the operation is completed, and all debris / waste shall be removed and disposed off at the site authorized for the said purpose in consultation with the Gujarat Pollution Control Board.	Noted for the compliance. The entire drilling will be carried out in the offshore area only, thus restoration may not be applicable till the operation phase is completed.
14	The project proponents shall carry out mangrove plantation in the region in consultation with the forest department and shall also develop and implement the greenbelt development plan.	A Memorandum of Understanding (MoU) was signed on 9th August 2012 between Cairn (hereinafter referred to as Vedanta Ltd (Cairn Oil & Gas)) and the Gujarat Ecology Commission, appointing the latter as the implementing agency for the "Restoration, Plantation and Conservation of 50 hectares of mangroves at Karanj Village, Olpad Taluka, Surat District." Subsequently, an MoU was signed with the Gujarat Forest Department on 20th October 2022 for the development of 60 hectares of mangroves in the Surat coastal region, with a ten-year schedule for plantation and protection activities. Another MoU was signed with the Gujarat Forest Department on 9th November 2023 to develop an additional 130 hectares of mangroves in the same region, also over a ten-year period. Refer Annexure – 4 for details.
15.	The project proponents shall implement the socio-economic upliftment program in consultation with the District Collector / DDO.	Cairn perseveres for holistic development of local community by focusing on all segments of the households across five thematic areas: Health, Water, Sanitation, Education, Sustainable livelihood (farm and vocational skill) as well as renewable energy. Refer Annexure – 2 for the CSR related programs.
16.	No activity shall be carried out before obtaining all necessary clearances under various acts/rules from different Govt. department / agencies	Noted for compliance and no activities being carried out without obtaining the necessary approvals.
17.	The CEIPL shall contribute financially in consultation with this Department to support the National Green Corps Scheme being implemented in Gujarat by the GEER	Noted for Compliance.

S. No.	CRZ Condition	Compliance Status
	Foundation	
18.	The project proponents shall have to comply with any other condition as may be stipulated by this department from time to time.	Noted for Compliance.
19.	The CEPIL shall strictly adhere to the undertakings submitted to this Department and mentioned herein above.	Noted for Compliance.
	Others	
1.	To implement all the suggestions and recommendations given by the consultant in their EIA and Risk Assessment reports	EMP is being implemented as part of the EIA study report. Refer Annexure 6 .
2.	To bear the cost of the external agency to be appointed by the Forests and Environment Department, GOG, for supervision/ monitoring of the proposed activities.	Noted for compliance
3.	To carryout Comprehensive Environmental Impact Assessment and Risk Assessment reports.	Continuous onshore environmental monitoring is being carried out for the onshore facilities and seasonal offshore monitoring is being carried out to determine the environmental attributes. The environmental protection and risk mitigation measures and safeguards recommended in the various studies including HAZOP (Hazard and Operability), HAZID (Hazard Identification) and COMAH (Control of Major Accident Hazards) are implemented during the project and operation stages. Recommendations mentioned in the Risk Assessment and Disaster Management Plan is followed and practiced through periodic drills.
4.	To participate financially and technically in Vessel Traffic Management System that may be proposed by the Gujarat Maritime Board or any other institute for the Gulf of Khambhat	Noted for compliance.
5.	To take a lead and provide necessary support and assistance for development of the mutual aid system with other major players in the Hazira region and for the Gulf of Khambhat for mitigating risk and disaster management in the Hazira region	Noted for compliance.
6.	The ground water shall not be tapped to meet with the water requirements during Construction and operational stages.	Complied. No ground water is tapped.
7.	The construction labour shall be provided with adequate amenities including the water Supply, sanitation and fuel to ensure that they do not ruin the existing environment.	Noted and complied
8.	The camps of the construction labour shall be located outside the CRZ areas and no waste including the construction debris shall be disposed off in the sea / creek or into the CRZ area	Noted and complied
9.	The socio-economic upliftment programme shall be implemented in consultation with the District Collector / District Development Officer.	Cairn perseveres for holistic development of local community by focusing on all segments of the households across five thematic areas: Health, Water, Sanitation, Education, Sustainable livelihood (farm and vocational skill) as well as renewable energy. Refer Annexure – 2 for the CSR related programs.

S. No.	CRZ Condition	Compliance Status
10.	The greenbelt development programme shall be implemented in consultation with the Forests Department	Suvali terminal is around 82.32 Acres and out of this, greenbelt cover is 36.25% of total facilities area, which is around 29.83 Acres. Refer Annexure – 3 for details.
11.	To support financially the National Green Corps Scheme being implemented by the GEER Foundation in Gujarat in consultation with the Forests and Environment Department	Noted for compliance.
12.	You are further directed to furnish us the six-monthly compliance reports with respect to the conditions stipulated by the MOEF. GOI, as well as the above-mentioned conditions stipulated by this Department in the months of January and July of every year, without fail.	Complied. Six monthly EC compliance report is submitted regularly.

COMPLIANCE STATUS OF CONDITIONS OF MOEF&CC DURING ENVIRONMENTAL CLEARANCE OF THE PROJECT

Name of the Project: Development of Oil production in the CB/OS-2 Block off-shore area in Gulf of Khambhat, Gujarat

Clearance Letter No: J-11011/109/2005-I.A.II (I), dtd. 25.01.2006

Period of Compliance Report: Progressive EC Compliance Reporting period is October 2025 – March 2026.

The average production details for the reporting period: The details are as follows:

In total three offshore Platforms installed with 29 numbers of wells drilled. The facility has obtained Environmental Clearance to produce up to 25,000 BOPD and 150 MMSCM.

S. No		Units	Average production per day
1	Crude Production	BoPD	2975
2	Associated Gas Production	MMSCMD	0.81

All the conditions mentioned in this EC are being complied. Refer below for the point wise compliance details:

S. No.	EC Condition	Compliance Status
A.	Specific Conditions	
i.	The international 'Good Practices' adopted by the petroleum industry, viz. International Norms to safeguard marine biodiversity would be implemented by M/s. CEIPL and monitored by the Indian Coast Guard to safeguard the marine biodiversity as per the decision conveyed by the Ministry of Environment & Forests vide its D.O. letter No.J-11011/90/2002-IA..II (I) dated 30 th September, 2005 to the Ministry of Petroleum and Natural Gas. The expenditure towards monitoring by Indian Coast Guard shall be borne by M/s CEIPL	Complied. Although there is no effluent discharge offshore, Cairn is implementing and practicing best oil & gas upstream sector specific international and national standards and guidelines. Cairn is periodically carrying out the monitoring of the marine water quality, marine sediment quality, biota and fish tissues and no negative impact is observed as per report.
ii.	M/s CEIPL shall get the monitoring done regarding the impact of developmental activities on the marine environment through National Institute of Oceanography or National Institute of Ocean Technology or any other reputed organization and submit periodical reports to the Ministry, and Chief Wild life Warden and GSPCB.	Complied. Marine offshore seasonal environmental monitoring is carried out periodically through NABL accredited laboratories. Reports are being regularly submitted to MoEFCC ,GPCB. Refer Annexure 8 for offshore monitoring details.
iii.	The schedule for commencement for the drilling operation shall be intimated at least one month in advance to the Wildlife Warden having jurisdiction over the nearest coastal area so as to enable him to monitor its impact, if any, on the wildlife.	Agree to Comply The intimation will be sent to Wildlife Warden as and when drilling activity will be carried out.
iv.	Approval from DG Shipping/ Ministry of Defense under the Merchant Shipping Act prior to commencement of the drilling operations shall be obtained. At least, 30 days prior to the commencement of drilling, the exact location should be intimated to the Director General of Shipping, Mumbai and the company should abide by any direction he may issue regarding ensuring the safety of navigation in the area.	Agree to Comply DG shipping and MoD clearance shall be obtained as and when the drilling carried out. The exact location will be intimated to the Director General of Shipping, Mumbai, at least 30 days in advance, and all directions issued to ensure the safety of navigation will be strictly followed.
v.	M/s CEIPL shall ensure that the oil spill contingency plan is in place and no oil spill takes place during mobilization, drilling and operations and there shall not be any damage to mangrove/coastal ecosystem	Complied. Oil Spill Response and Contingency Plan has been prepared as per the NOS-DCP guidelines and approval is obtained from ICG. Platform is more than 15 km away from the shore hence no negative impact is envisaged due to drilling or operational activity. Oil Spill Response and Contingency Plan has

S. No.	EC Condition	Compliance Status
		been prepared as per the NOS-DCP guidelines. Refer Annexure – 5 for the details.
vi.	The schedule for commencement of the drilling operation shall be intimated at least one month in advance to the Wildlife Warden having jurisdiction over the nearest coastal area so as to enable him to monitor its impact, if any, on the wild life.	Agree to Comply. The intimation will be sent to Wildlife Warden one month in advance, as and when drilling activity will be carried out.
vi.	Disposal of Drill Cuttings (DC) and Drilling Fluids (DF) for offshore installations:	Noted for compliance. However, no drilling activity was carried out during the reporting period.
(a)	Use of diesel base mud is prohibited. Only Water Base Mud (WBM) is permitted for offshore drilling. If the operator intends to use low toxicity Oil Based Mud (OBM) or synthetic base mud (SBM) to mitigate specific whole problems in the formation, it should be intimated to the Ministry and Gujarat State Pollution Control Board. The low toxicity OBM should have aromatic content < 1%.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(b)	The toxicity of chemical additives used in the DF (WBM or OBM or SBM) should be biodegradable (mainly organic constituents) and should have toxicity of 96 hr LC 50 value >30,000 mg/1 as per mysid toxicity or toxicity test conducted on locally available sensitive sea species.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(c)	Hexavalent Chromium compound shall not be used in DF. Alternate chemical in place of chrome lignosulfonate should be used in DF. In case, chrome compound is used, the DF/DC should not be disposed offshore.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(d)	Bulk discharge of DF in offshore is prohibited except in emergency situations.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(e)	WBM/OBM should be recycled to a maximum extent. Unusable portion of OBM should not be discharged into sea and shall be brought to onshore for treatment and disposal in an impervious waste disposal pit.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(f)	Thoroughly washed DC separated from WBM/SBM and unusable portion of WBM/ SBM having toxicity of 96 hr LC 50>30,000 mg/1 shall be discharged off-shore into sea intermittently, at an average rate of 50 bbl/hr/well from a platform so as to have proper dilution and dispersion without any adverse impact on marine environment. WBM/ SBM should be recycled to the maximum extent.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(g)	Drill cuttings of any composition should not be discharged in sensitive areas notified by Ministry of Environment and Forests.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(h)	In case of specific hole problem, use of OBM will be restricted with zero discharge of DC. Zero discharge would include re-injection of the DC into a suitable formation or to bring to shore for proper disposal. In such a case, use of OBM for re-injection should be recorded and made available to the Ministry and Gujarat State Pollution Control Board. Such low toxic OBM having aromatic	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.

S. No.	EC Condition	Compliance Status
	content less than 1% should be made available at the installation.	
(i)	In case, DC is associated with high oil content from hydrocarbon bearing formation, then disposal of DC should not have oil content >10 gm/kg.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(j)	The DC wash water should be treated to confirm limits notified under the Environment (Protection) Act, 1986 before disposal into sea. The treated effluent should be monitored regularly.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(k)	Discharge of DC from the installation located within 5 km. away from shore should ensure that there is no adverse impact on marine eco-system and on the shore. If, adverse impact is observed, then the company has to bring the DC onshore for disposal in an impervious waste disposal pit.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(l)	The Company should get analyzed the drill cuttings generated from each well from any recognized laboratory for its characteristics and results be submitted to MoEF/CPCB/SPCB periodically.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(m)	M/s CEIPL are required to record daily discharge of DC and DF to offshore and also to monitor daily the effluent quality, and submit the compliance report once in every six months to MoEF.	Agree to Comply with GSR 546 (e). Last Six-monthly compliance reports have been submitted to MoEFCC. Dated 27 th Nov 2024. No drilling activity was carried out during the reporting period.
(n)	Company should monitor the sea surface water quality in terms of oil content around the well and submit reports to the Ministry on a monthly basis during the period of drilling operations.	Complied Marine Environment monitoring is being carried out for Sea surface water analysis. Refer Annexure 8 .
(o)	The DC wash water should be treated to conform to limits notified under the Environment (Protection) Act, 1986, before disposal into sea. The treated effluent should be monitored regularly.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(p)	Barite used in preparation of DF shall not contain Hg>1 mg/kg & Cd> 3 mg/kg.	Agree to Comply with GSR 546 (e). No drilling activity was carried out during the reporting period.
(q)	If any, environment friendly technology emerges for substitution of DF and disposal technology, it may be brought to the notice of MoEF and regulatory agencies. If the operator desires to adopt such environment friendly technology prior approval from MoEF shall be taken.	Agree to Comply. No such environment friendly technology utilized during drilling period.
(r)	The Company shall monitor the petroleum hydrocarbons and heavy metals concentration in the marine fish species regularly and submit report to the Ministry.	Complied. Petroleum Hydrocarbon and heavy metals conc in marine fish is monitored, Refer Annexure 8 .
viii.	Treated wastewater (produced water or formation water or sanitary sewage) should comply with the marine disposal standards (for oil & Gas at <40 mg/1) notified under the Environment (Protection) Act, 1986.	Complied. Sewage generated from the terminal activities is treated through the aeration process in the STP installed within the onshore terminal. The treated sewage is used for the greenbelt development activities within the onshore area and thus no

S. No.	EC Condition	Compliance Status
		<p>discharge is carried out beyond the terminal premises.</p> <p>The produced water separated from the hydrocarbon well fluids is treated through onshore ETP installed within the terminal area. The treated effluent after meeting the marine discharge standards as prescribed by GPCB is discharged into sea through marine outfall located as recommended by NIO after carrying out the study.</p> <p>Periodic environmental monitoring is being carried out for the treated sewage and the treated effluent. Refer Annexure - 1 for the details.</p>
ix.	Requisite infrastructure facilities should be provided near the offshore installations so that booms and skimmers/ chemical dispersants could be deployed immediately in case of oil leakage from the installations. Efforts should be made to curtail the oil slick within 500 meters of the installation and accordingly, action plan and facilities to check the oil slick beyond 500 meters should be provided.	<p>Complied.</p> <p>Oil Spill Response and Contingency Plan has been prepared as per the NOS-DCP guidelines. booms and skimmers/ chemical dispersants are provided near installations during emergency as per photographs attached in Annexure -5.</p>
x.	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA/EMP/risk assessment report as well as the recommendations of the public hearing panel	<p>Complied.</p> <p>The environmental protection measures and safeguards recommended in EIA-EMP & Quantity Risk assessment (QRA) are being implemented. Please Refer below Point-Wise Compliance to EMP.</p> <p>Refer Annexure – 6 for point wise compliance to the EMP.</p>
xi.	The used oil generated from drill site shall be collected and sold to the registered re-processors having environmental sound facility	<p>Complied.</p> <p>The used oil generated from the process equipment are being internally re-processed along with the crude oil.</p>
xii.	M/s. CEIPL shall facilitate to set up a monitoring unit at the headquarters of State Wildlife Organization. The user agency shall also provide adequate infrastructure facilities to the visiting scientists and monitoring agency near their onshore/ offshore installations off and along the Gujarat Coast	<p>Complied.</p> <p>Company have provided adequate infrastructure facilities to the visiting scientists and monitoring agency at onshore terminal.</p>
xiii.	M/s. CEIPL shall comply with the specific and general conditions stipulated by the Ministry's environmental clearance letter under Coastal Regulation Zone (CRZ) Notification dated 4 th August, 2005.	<p>Complied.</p> <p>Compliance report for specific and general conditions stipulated under EC & CRZ clearance are regularly submitted.</p>
xiv.	M/s. CEIPL shall strictly comply with all the recommendations of the Chief Wildlife Warden, Gujarat regarding impact of the project on marine environment communicated vide letter no. WLP/12/32/A/1618/20/2005-06 dated 26.09.2005.	<p>Complied.</p> <p>Cairn is implementing and practicing oil & gas upstream sector specific international and national standards and guidelines.</p> <p>Cairn is periodically carrying out the monitoring of the marine water quality, marine sediment quality, biota and fish tissues.</p> <p>Efforts are made to protect Marine biodiversity against any contamination.</p>
	General Conditions	
i.	The project authority must strictly adhere to the	Complied.

S. No.	EC Condition	Compliance Status
	stipulations made by the Central Government as part of an International Convention(s) or Merchant Shipping Act	Stipulations made by the Central Government and Merchant Shipping Act are being adhered to as per the following: 1. The Merchant Shipping Act. 1958, as amended & applicable. 2. MARPOL 1973/1978 as amended & applicable
ii.	The project authority must strictly adhere to the stipulations made by the Gujarat State Pollution Control Board and the State Govt.	Being complied. The stipulations and norms prescribed by GPCB are followed. Compliance reports are being submitted regularly to GPCB regarding the Consent and Authorization conditions.
iii.	No further expansion should be carried out without prior approval of the Ministry of Environment and Forests. In case of deviations or alterations in the project proposal from those submitted to this Ministry for clearance, a fresh reference should be made to the Ministry to assess the adequacy of conditions imposed and to add additional environmental protection measures required, if any.	Agreed to comply. Company hereby assured that no activities being carried out without obtaining the prior EC.
iv.	The project authorities must strictly comply with the rules and regulations under Manufacture, Storage and Import of Hazardous Chemicals Rules, 1989 as amended on 3 rd October, 1994 and 6 th January, 2000. Prior approvals from Chief Inspectorate of Factories, Chief Controller of Explosives, Fire Safety Inspectorate etc. must be obtained wherever applicable.	Complied. Unit is not a major accident hazard unit as regulation, however during emergency, all the prior approvals were obtained and licenses are in place as per applicable regulations.
v.	The project authorities must strictly comply with the rules and regulations with regard to handling and disposal of hazardous wastes in accordance with the Hazardous Wastes (Management & Handling) Rules, 1989 as amended in 2003, wherever applicable. Authorization from the State Pollution Control Board must be obtained for collections/ treatment/ storage/disposal of hazardous wastes.	Complied. The Facility has obtained Hazardous Waste Authorization from GPCB and conditions are being complied regularly.PI. refer annual return of solid waste as per attached Annexure-10
vi.	The overall noise levels in and around the rig area should be kept well within the standards (85 dB(A) by providing noise control measures including acoustic hoods, silencers, enclosures etc. on all sources of noise generation. The ambient noise levels should conform to the standards prescribed under EPA Rules, 1989 viz. 75 dB(A) (day time) and 70 dB(A) (night time).	Complied . Monthly Noise monitoring (both day and night time) is carried out in the plant area to ensure compliance. Reports are attached as per Annexure-01 .
vii.	A separate environmental management cell equipped with full-fledged laboratory facilities must be set up to carry out the environmental management and monitoring functions.	Complied . Dedicated environmental expertise support is available both at the site and at Corporate office. The site has established laboratory to monitor the key parameters of STP, ETP and noise. However, for the detailed and regular monitoring, the third-party laboratory accredited by NABL and MoEF&CC has been hired to carry out the environmental monitoring requirements at the facilities and offshore.
viii.	The project authorities shall earmark an amount of Rs. 3.50 Crores during phase-I and Rs. 20.00 Crores during Phase- H, ID, IV and V as mentioned in Question No. XDC of the Questionnaire towards implementation of	Complied . Annual budgetary provisions are made for the environmental related expenses such as ETP & STP operation & maintenance, greenbelt

S. No.	EC Condition	Compliance Status
	<p>specific conditions stipulated by the Ministry of Environment and Forests as well as the State Government along with the implementation schedule for all the conditions stipulated herein. The funds so provided should not be diverted for any other purpose.</p>	<p>development & maintenance, environmental monitoring, hazardous waste disposal, environmental audits etc. An amount of INR 5375818 was spent towards environment and related expenses during the reporting period.</p>
ix.	<p>The implementation of the project vis-a-vis environmental action plans will be monitored by Ministry's Regional Office at Bhopal/ State Pollution Control Board/ Central Pollution Control Board. A six monthly compliance status report should be submitted to the monitoring agencies.</p>	<p>Complied. Six monthly EC compliance report is submitted regularly.</p>
x.	<p>The Project Proponent should inform the public that the project has been accorded environmental clearance by the Ministry and copies of the clearance letter are available with the State Pollution Control Board/ Committee and may also be seen at Website of the Ministry of Environment and Forests at http://envfor.nic.in. This should be advertised within seven days from the date of issue of the clearance letter at least in two local newspapers that are widely circulated in the region of which one shall be in the vernacular language of the locality concerned and a copy of the same should be forwarded to the Regional office.</p>	<p>A public notice informing the grant of EC by MOEF for the offshore oil development in CB/OS-2 Block, Gulf of Khambhat and availability of its copies was published in the following newspapers and copy was submitted to Ministry's Regional Office:</p> <ol style="list-style-type: none"> 1. Indian Express (English) - dtd. 06-03-2006 2. Gujarat Mitra (Gujarati) - dtd. 04-03-2006

SIX-MONTHLY REPORT OF PROGRESSIVE COMPLIANCE TO CHIEF WILDLIFE WARDEN RECOMMENDATIONS

Name of the Project: Proposed oil and development in Transition zone of CB/OS-2 Block in Gulf of Khambhat, Gujarat

Wildlife Clearance Letter No: WLP/13/32/A/29/5-17/2005-06, fax dated 11th February 2006

Period of Compliance Report: Progressive EC Compliance Reporting period is October 2025 – March 2026.

Project activity during reporting period: No additional facilities installed and no drilling activities under the scope of this EC were undertaken during the reporting period of compliance report.

The well under the scope of this EC was abandoned and therefore there was no production in the reporting period.

All the conditions mentioned in this clearance are being complied with. Refer below for the point wise compliance details:

S. No.	Condition	Compliance Status
Specific Conditions		
i.	The flaring of gas should be done in such a period of the day when the movement of the coastal birds are at minimum. This would probably be between 12.00 pm to 13.00 pm (15.00 Hrs.) or in early hour before sunrise.	No excess gas flaring is carried out. All the separated gas is being exported through the gas grid pipeline. Only operational flare is being carried out at Suvali Terminal. This flare is continuous and only minimum amount of the gas flaring is being carried out as per the safe operational philosophy of the Terminal.
ii.	Except Flaring, leakage of gas or liquid or oil waste or drilling waste should be prevented at all cost.	Being complied. The Suvali terminal is being monitored through various gas detection system continuously, so in case of emergency any such leakages can be immediately controlled. The crude oil is stored inside the bund to contain any such leakages. Drill cutting waste are appropriately disposed as per the requirements specified in the GSR 546 (E). Periodic fugitive emission leakage detection study is carried out.
iii.	No Synthetic based mud generated during drilling shall be disposed in sea. The waste residual muds and drill cuttings shall be disposed in GPCB approved landfill sites only and no case in the sea water.	The drilling is managed as per the requirements specified in the GSR 546 (E) and as per the Gujarat Pollution Control Board requirements.
iv.	Green belt of mangroves should be created in the possible areas of the project and green belt along the pipeline with other species should be created by the company	A Memorandum of Understanding (MoU) was signed on 9th August 2012 between Cairn (hereinafter referred to as Vedanta Ltd (Cairn Oil & Gas)) and the Gujarat Ecology Commission, appointing the latter as the implementing agency for the "Restoration, Plantation and Conservation of 50 hectares of mangroves at Karanj Village, Olpad Taluka, Surat District." Subsequently, an MoU was signed with the Gujarat Forest Department on 20th October 2022 for the development of 60 hectares of mangroves in the Surat coastal region, with a ten-year schedule for plantation and protection activities. Another MoU was signed with the Gujarat Forest Department on 9th November 2023 to develop an additional 130 hectares of mangroves in the same region, also over a ten-year period. Refer Annexure – 4 for details.
v.	After phase-I, the provision as per EIA should be maintained and in no case flaring of gas may be permitted.	No excess gas flaring is carried out. Only operational flare is being carried out at Suvali Terminal.

S. No.	Condition	Compliance Status
vi.	The company should have a Watch tower from where they should observe the congregation of the bird and if the congregation is large in numbers the flaring if possible be avoided for that period/days or make some arrangements to keep the bird away from the area.	No excess gas flaring is carried out. Only operational flare is being carried out at Suvali Terminal.
vii.	The monitoring regime be developed for air and water quality and reports be submitted to concerned officials including the Chief Wildlife Warden of the state at a decided frequency. Minimum two monitoring per year for overall environmental impact should be done. This may be reviewed by a committee of experts.	Complied Regular monitoring by third-party laboratory accredited by NABL and MoEF&CC is being carried out, refer Annexure -1 for trends in Environmental Monitoring Report.
viii.	It is informed by the company during presentation to the committee that drilling Waste and lubricant shall be brought on land and disposed using suitable Mechanism, thereby causing no pollution in the sea. The same may be strictly observed and enforced.	Noted for compliance. However, no drilling activity was carried out during the reporting period.
ix.	While company shall undertake all efforts to ensure safe development and production free from any spillage and pollution of the site, it shall faithfully report any spillage accidental or otherwise and take remedial measure as prescribed immediately.	Oil Spill Response and Contingency Plan has been prepared as per the NOS-DCP guidelines. Refer Annexure – 5 for the details.
x.	The company shall have an elaborate environment audit mechanism and reports of same shall be made available to the concerned officials of Government including the Chief Wildlife Warden	The company has established Environmental management System in place as per ISO 14001: 2015. Also environmental audit is carried out periodically by 3 rd Party institution / Consultant nominated by Gujarat Pollution Control Board.
xi.	Officials of state forest department including those specially designated by the Chief Wildlife Warden depending on exigencies shall be allowed to inspect the Project activities and project area and the company shall facilitate such inspections.	Noted for Compliance
xii.	The company shall abide by any additional conditions that may be prescribed by the Chief Wildlife Warden and/or by the State Government in the interest of conservation of flora and fauna in the region.	Noted for Compliance

COMPLIANCE STATUS OF CONDITIONS OF MOEF&CC DURING ENVIRONMENTAL CLEARANCE OF THE PROJECT

Name of the Project: Oil and Gas development in Transition Zone of CB/OS-2 Block in Gulf of Khambhat, Gujarat

Clearance Letter No: J-11011/20/2005 - IA II (I) dated 03.04.2006

Period of Compliance Report: Progressive EC Compliance Reporting period is October 2025 – March 2026.

Project activity during reporting period: No additional facilities installed and no drilling activities under the scope of this EC were undertaken during the reporting period of compliance report.

The well under the scope of this EC was abandoned and therefore there was no production in the reporting period.

All the conditions mentioned in this EC are being complied. Refer below for the point wise compliance details:

S. No.	EC Conditions	Compliance status
A.	Specific Conditions	
i.	The company shall comply with the guidelines for disposal of solid waste, drill cutting and drilling fluids for onshore drilling operation notified vide GSR.546 (E) dated 30 th August, 2005.	Noted for compliance. However, no drilling activity was carried out during the reporting period.
ii.	Drilling wastewater including drill cuttings wash water shall be collected in disposal pit lined with HDPE lining evaporated or treated and shall comply with the notified standards for on-shore disposal.	Noted for compliance. However, no drilling activity was carried out during the reporting period.
iii.	Effluent generated from Group Gathering Station (GGS) and other sources shall be treated to conform to standards under E (P) Act, 1986 and subsequent amendments.	Complied. The produced water separated from the hydrocarbon well fluids is treated through onshore ETP installed within the terminal area. The treated effluent after meeting the marine discharge standards as prescribed by GPCB is discharged into sea through marine outfall located about 500 m from Low Tide Level (as recommended by NIO after carrying out the study). Periodic environmental monitoring is being carried out for the treated sewage and the treated effluents. Refer Annexure -1 for the details.
iv.	The company shall not draw ground water to meet the water requirement	Complied. The water requirement is sourced from GIDC supply or rainwater harvesting facility at the terminal.
v	The Company shall take necessary measures to prevent fire hazards, containing oil spill and soil Remediation as needed. At place of ground flaring, the overhead flaring stack with knockout drums shall be installed to minimize gaseous emissions during Flaring	All storage tanks and process vessels have been installed with SIL (In simple terms, SIL is Safety Integrity Level, which is a measurement of performance required for a safety instrumented function) rated instrument systems including high, high-high and low, low-low alarms for information to DCS (Digital Control System) panel engineers for immediate intervention. Also, the process systems are installed with Emergency Shut Down Devices (ESDs)/valves to isolate the supply during any leaks and prevent spills. Oil spill contingency plan is prepared and implemented at sites. Secondary containment has been provided at all hydrocarbon storage areas in accordance with OISD standards. The process vessels have been provided with kerbs to contain accidental spills. Full-fledged 24x7 oil spill response team is stationed providing coverage to the operation, backed up fire services team consisting of trained professionals. Firefighting measures include hydrant system, foam

S. No.	EC Conditions	Compliance status
A.	Specific Conditions	
		<p>system, portable fire extinguishers, water spray systems, fireproof electrical fittings, and fire and gas detection systems. In addition, fire tenders are available.</p> <p>Control Room and process locations have been provided with a fire and gas detection system along with the fire extinguishing system. OISD Standards have been complied with the design and installation of both passive and active Fire protection system.</p> <p>The vertical stack of 30 m height is provided at the Suvali terminal, and they are connected to the knockout drums for effective separation of vapor-liquid.</p>
vi	The Company shall take necessary measures to reduce noise levels such as proper casing at the drill site and meet DG set norms notified by the MOEF. Height of all the stacks/ vents shall be provided as per the CPCB guidelines.	DG sets are provided with acoustic enclosures in accordance with E(P) Rules and effective stack height.
vii	After well testing at each drilling site, all installations, equipment and debris shall be removed and site shall be restored to the near original condition by re-vegetation with appropriate plant species	<p>The entire drilling as per this EC permission was carried out in the offshore area only, thus restoration and re-vegetation after well testing are not applicable.</p> <p>No drilling activity was carried out during the reporting period.</p>
viii	The company shall ensure that natural drainage channels are avoided or drainage channels are rerouted to ensure unhindered flow of rain/flood water, wherever necessary adequate erosion control measures will be provided	<p>The Suvali terminal have separate paved drainage for storm water collection and this drainage is connected to the rainwater recharge pit within the terminal premises.</p> <p>Enough green cover has been developed to prevent soil erosion.</p>
ix	The design, material of construction, assembly, inspection, testing and safety aspects of operation and maintenance of oil and gas facilities and pipeline and transporting the natural gas shall be governed by ASME/ANSI B31.8/B31.4 and OISD 141 standard.	Relevant standards and codes such as ASME/ANSI/OISD/BIS are followed in all aspects of design, construction, commissioning, operation and maintenance of the oil and gas facilities.
x.	Annual safety audit shall be carried out for the initial three years by an independent agency and report submitted to this Ministry for ensuring the strict compliance of safety regulations on operation and maintenance of facilities	<p>HSE Management System in place (certified to the ISO 14001 & 45001 standards). Mock drills have been conducted regularly.</p> <p>OISD (Oil Industry safety Directorate) also carried out the compliance audit with respect to OISD safety standards periodically and the recommendations are implemented and communicated to OISD.</p>
xi.	The project authorities shall provide 3 layer polythene coating to prevent contamination of sub soil	The pipelines have been provided with 3 layers of polythene coating to prevent contamination of soil
xii	The project authorities shall patrol and inspect the pipeline regularly for detection of faults as per OISD guidelines and continuous monitoring of pipeline operation by adopting non-destructive method(s) of testing as envisaged in the EMP.	<p>Regular patrolling is being carried out.</p> <p>Corrosion inhibitor injection has also been injected in inter-field pipelines as required to minimize/prevent corrosion.</p>
xiii	The project authorities shall plant a minimum of 10 trees for every tree cut along the pipeline route in consultation with the local DFO(s). The company shall develop a social forestry program to benefit the project affected local people in consultation with the local DFO (s). The	Noted for compliance.

S. No.	EC Conditions	Compliance status
A.	Specific Conditions	
	company shall develop a social forestry program to benefit the project affected local people in consultation with the local DFO/ village panchayat/ NGO.	
xiv.	The fire water facilities at the terminals must be designed as per OISD-117 guidelines. However, for fighting prolonged fires, the company should firm up a plan for assured water supply from nearby ground water source/ surface water supply from nearby ground water source/surface water source. This must be Complied before commissioning the project.	Complied. The fire protection and fighting system have been implemented in compliance with the OISD requirements. There are two Fire water ponds in case of emergency water supply for firefighting.
xv.	All the conditions stipulated vide letter no. WLP/13/32/A/2315-17/2005-06 dated 10.02.2006 from the Addl. Principal Chief Conservator of Forest, Wildlife, Gujarat State, Gandhi Nagar shall be strictly implemented.	Being complied.
xvi.	The International 'Good Practices' adopted by the petroleum industry viz. international norms to safeguard the Coastal and Marine biodiversity would be implemented by M/s. CEIL.	Cairn has implemented and practiced the oil & gas sector specific international and national standards and guidelines and shall adhere to this in future.
xvii	The flare system shall be designed as per good oil field practices and Oil Industry Safety Directorate (OISD) guidelines. The stack height shall be provided as per the regulatory requirements and emissions from stacks will meet the MOEF/ CPCB guidelines	Complied. Elevated flare height of 30 m has been provided. The ground level concentrations (GLC) are monitored periodically through ambient air monitoring. Refer Annexure – 1 for environmental monitoring details.
xviii	The project proponent shall also comply with the environmental protection measures and safeguards recommended in the EIA/ EMP/ risk analysis report as well as the recommendations of the public hearing panel	Complied. The environmental protection measures and safeguards recommended in EIA-EMP & Quantity Risk assessment (QRA) are being implemented. Please Refer below Point-Wise Compliance to EMP. Refer Annexure – 6 for point wise compliance to the EMP.

ANNEXURE NO. 01

Environmental Monitoring Report – CB/OS-2
(For the Period October 2025 – March 2026)

Environmental Monitoring for Ambient air, Gaseous emissions, Wastewater and Noise is carried out monthly and the same is submitted to GPCB every month.

All parameters are under the standards as prescribed by GPCB and no deviations were observed.

Ambient Air Quality Monitoring Results in Suvali- Onshore Terminal

Seven locations were selected around the Plant site for monthly Environmental monitoring. The locations are approved by GPCB. The graphical interpretation of the results is provided below.

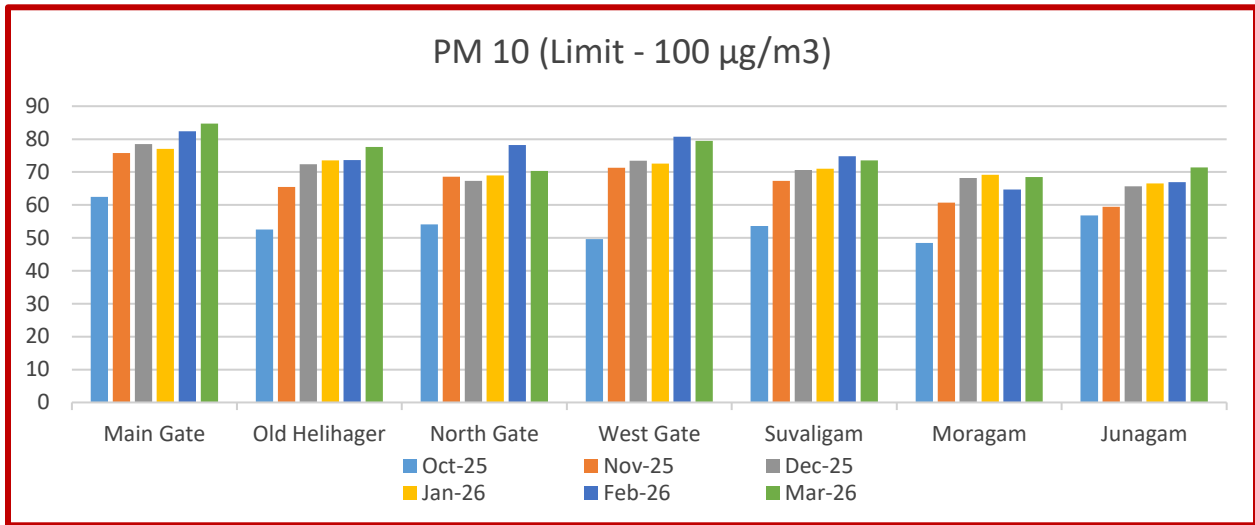


Figure 1: Graphical representation of average trend of PM₁₀ in block area

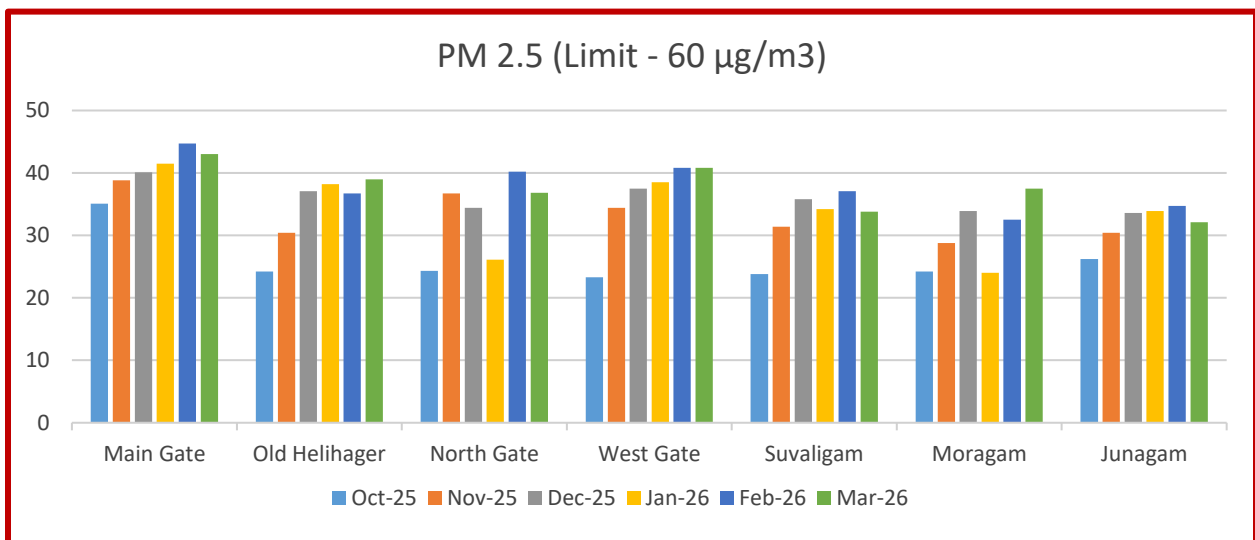


Figure 2: Graphical representation of average trend of PM_{2.5} in block area

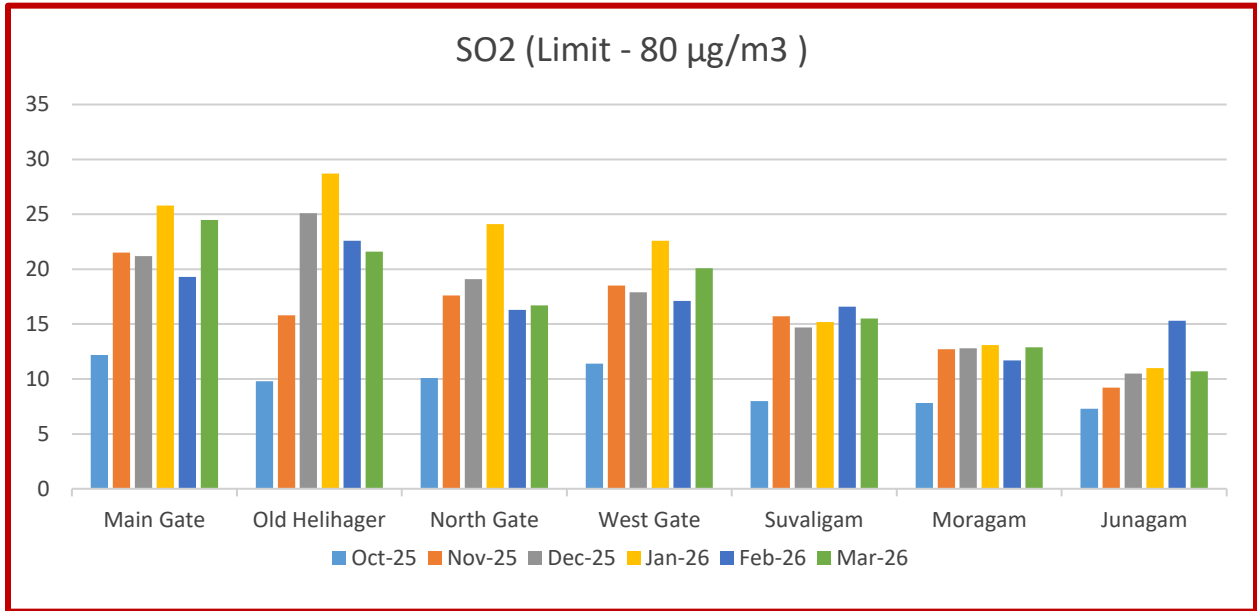


Figure 3: Graphical representation of average trend of SO₂ in block area

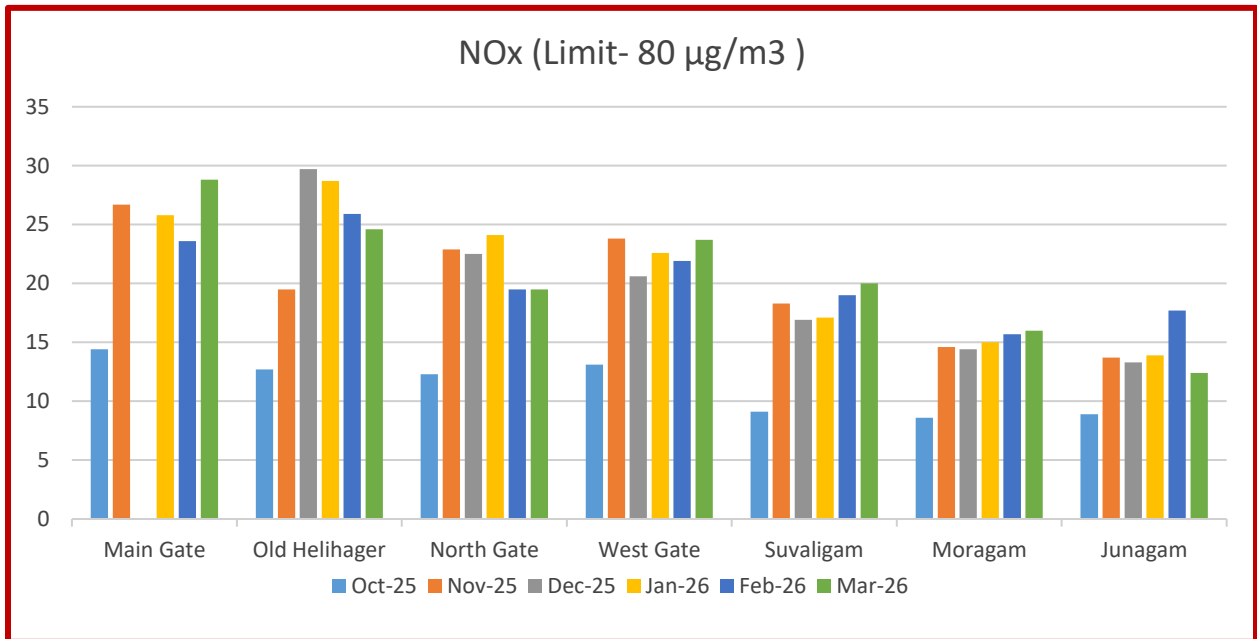


Figure 4: Graphical representation of average trend of NO_x in block area

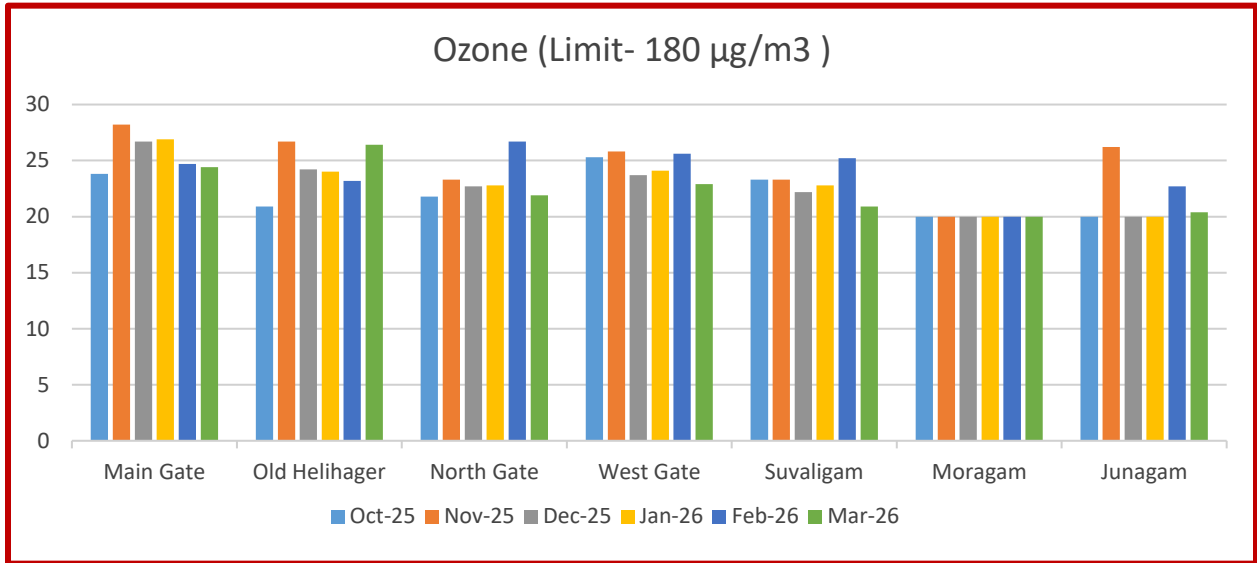


Figure 5: Graphical representation of average trend of O₃ in block area

Ambient Noise Quality Monitoring Results in Suvali Onshore Terminal

Four locations were selected around the Plant site for monthly noise monitoring. The locations are approved by GPCB. The graphical interpretation of the results is provided below.

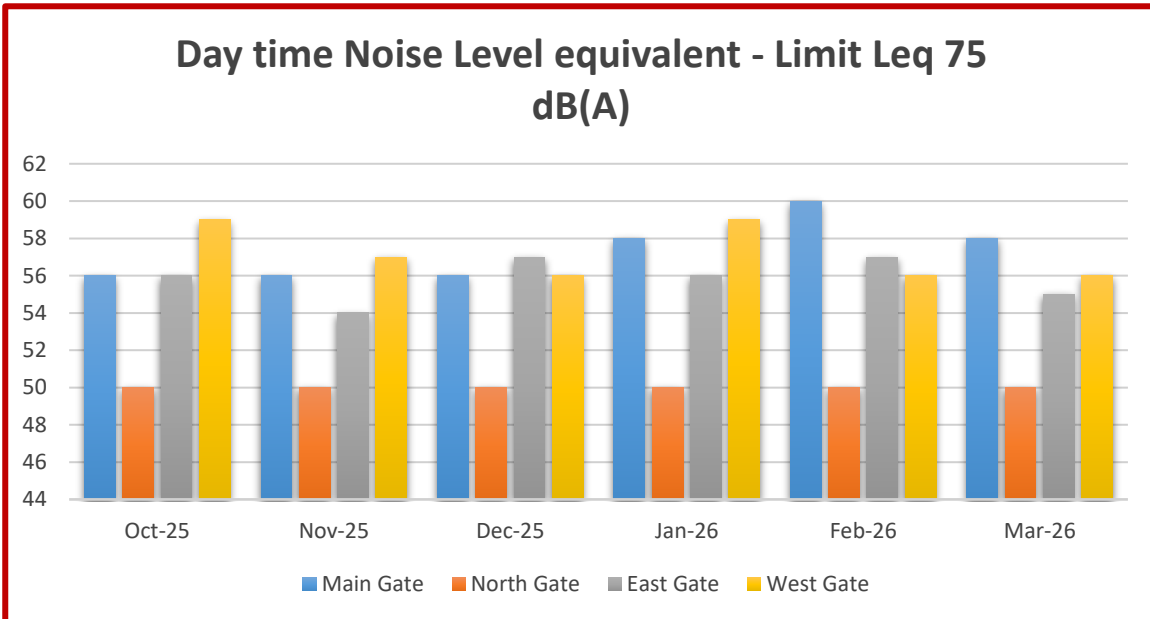


Figure 6: Graphical representation of trend of Noise Level in Leq dB(A) in the Day Time

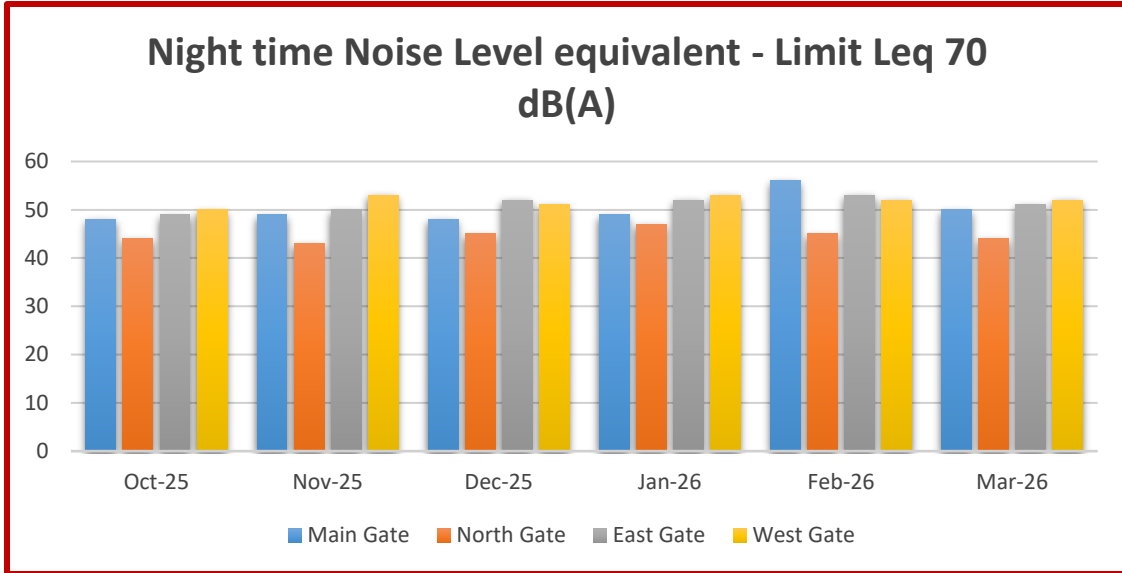


Figure 7: Graphical representation of trend of Noise Level in Leq dB(A) in the Night-time

Stack Monitoring Results in Suvali Onshore & offshore Terminal

Stack Monitoring was carried out for stacks attached to the exhaust of 12 equipment. This equipment are Hot Oil Heater (New and Old), Booster Compressor (BCP), Gas Turbine Compressor (GTC), Gas Turbine Generator (GTG), Tri ethylene Glycol absorbers (TEG) , Diesel Generators, Offshore platforms Dg and GLC.

(Graphical representation of average emission monitoring results during the reporting period (i.e. Oct'25 - Mar 26) is as follows:

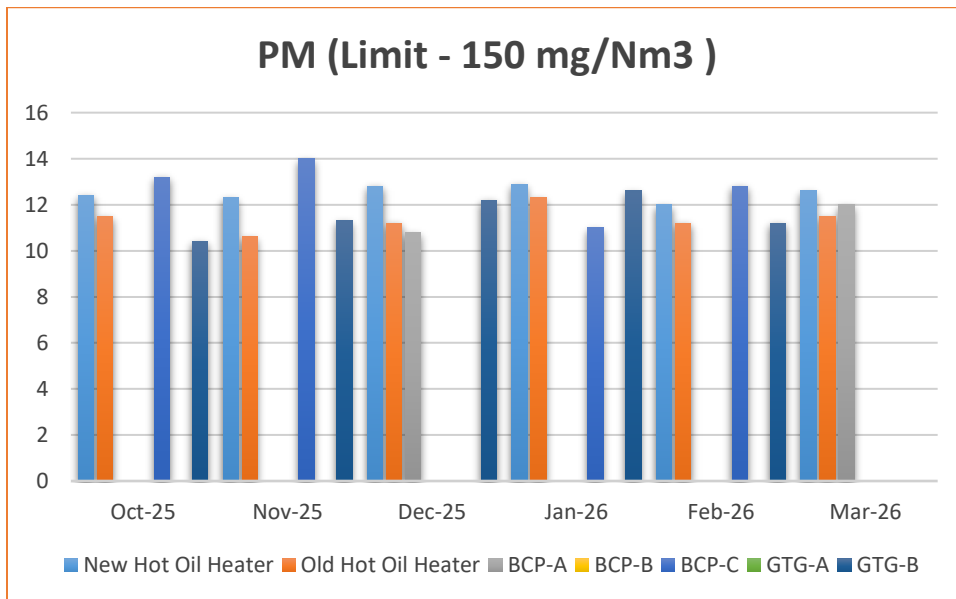


Figure 8: Graphical representation of average emission of Particulate Matter (PM 10) in mg/Nm³

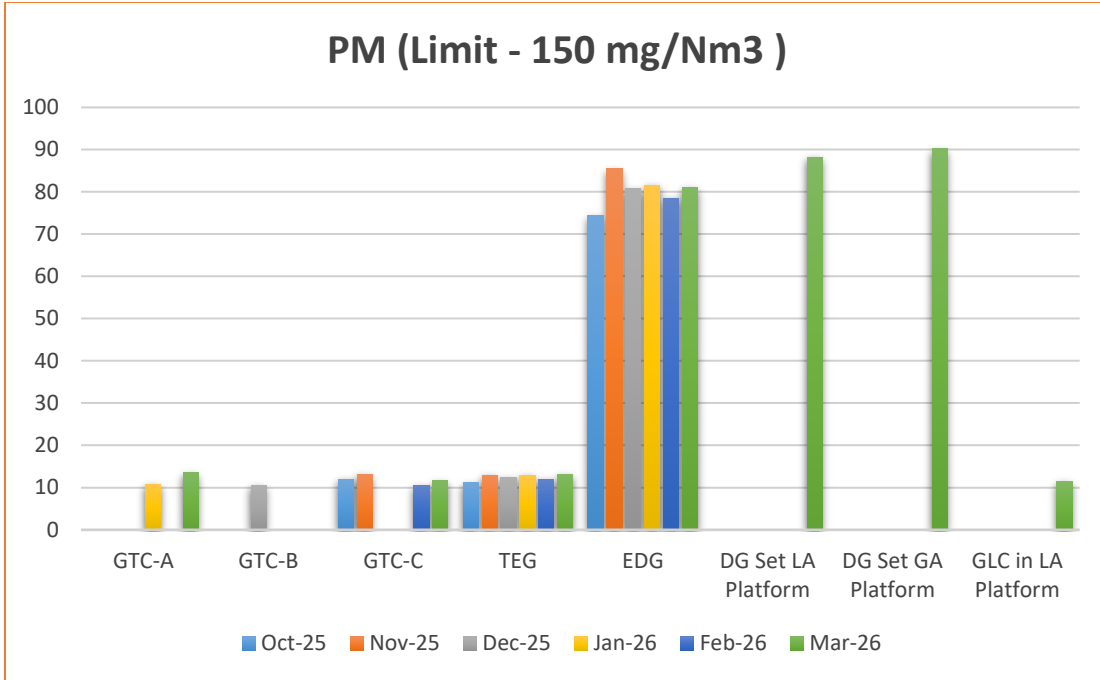


Figure 9: Graphical representation of average emission of Particulate Matter (PM₁₀) in mg/Nm³

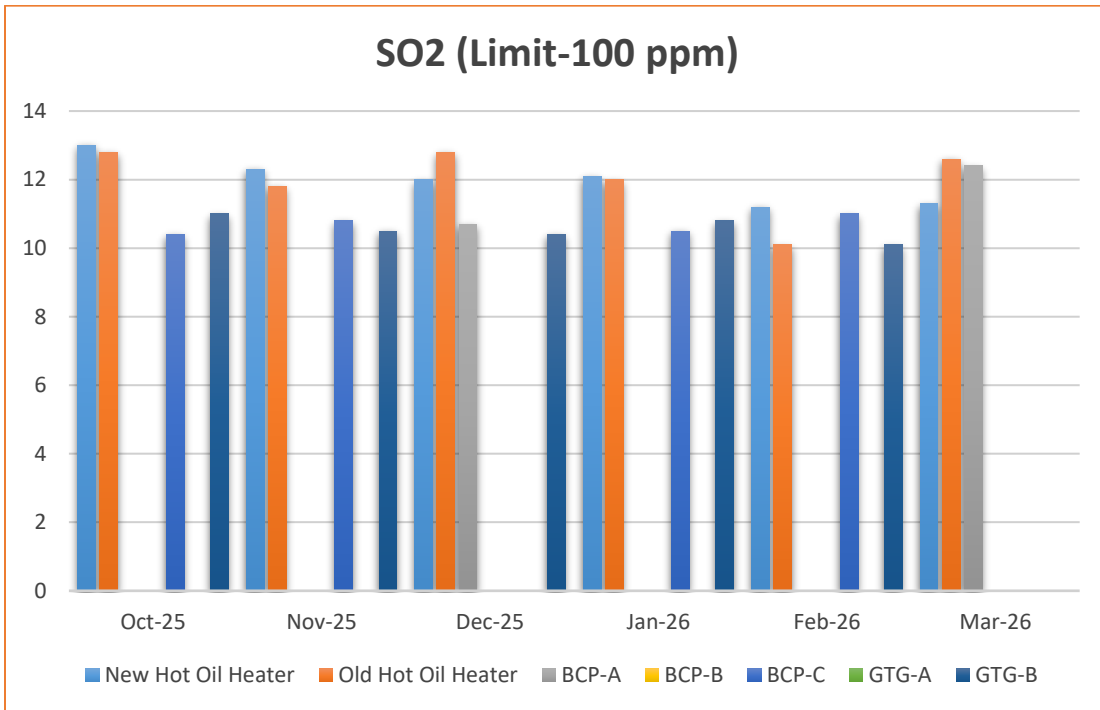


Figure 10: Graphical representation of average emission of Sulphur Di-oxides (SO₂) in mg/Nm³

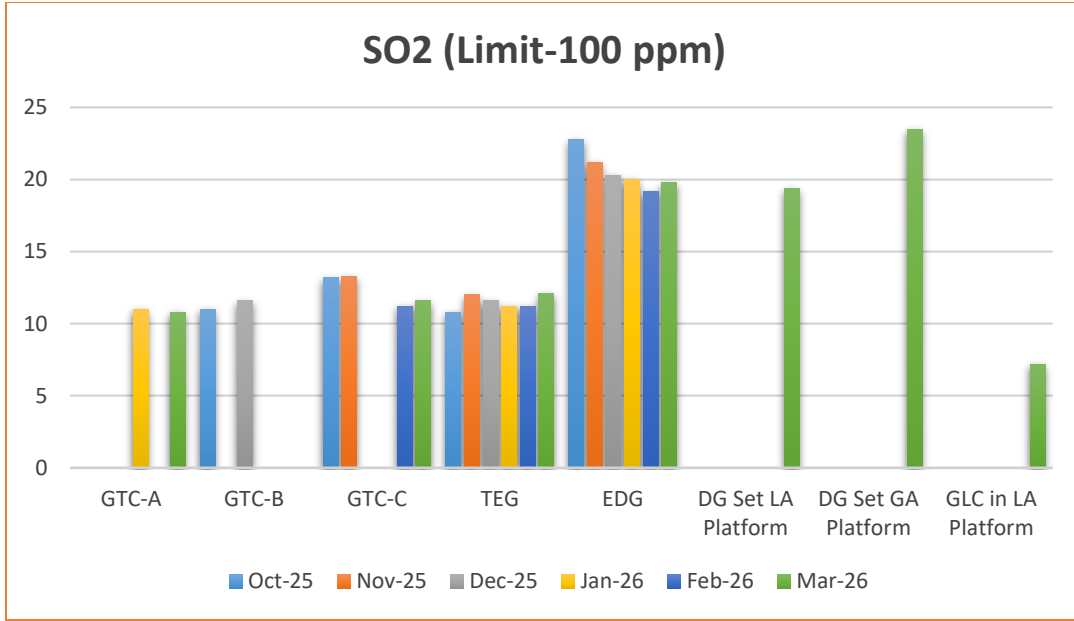


Figure 11: Graphical representation of average of Sulphur Di-oxides (SO₂) in mg/Nm³

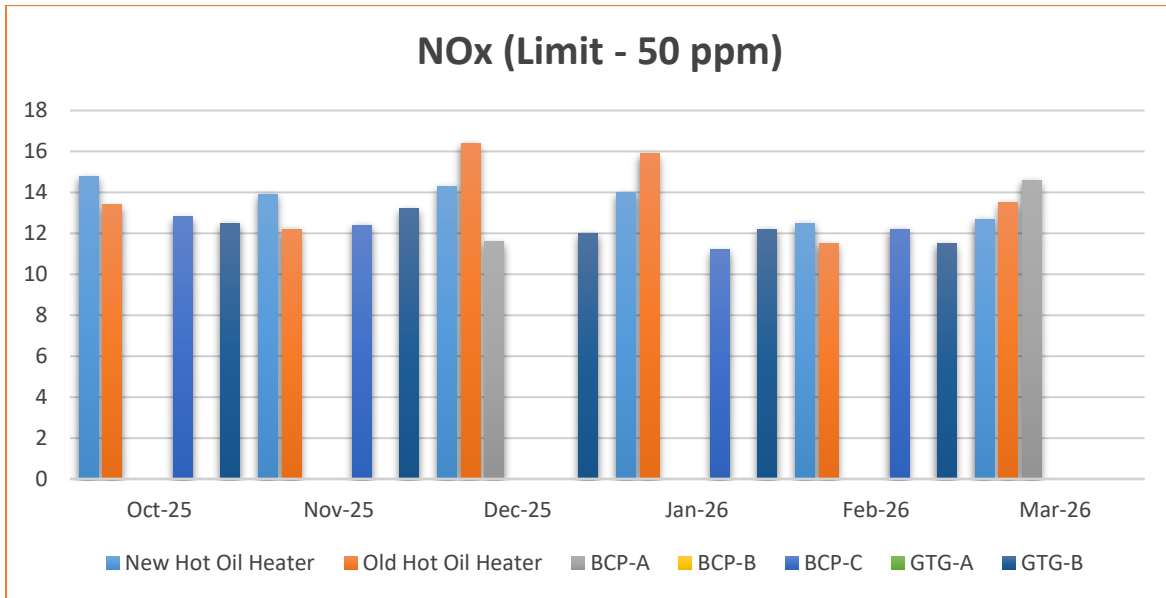


Figure 12: Graphical representation of average emission of Oxides of Nitrogen (NO_x) in mg/Nm³

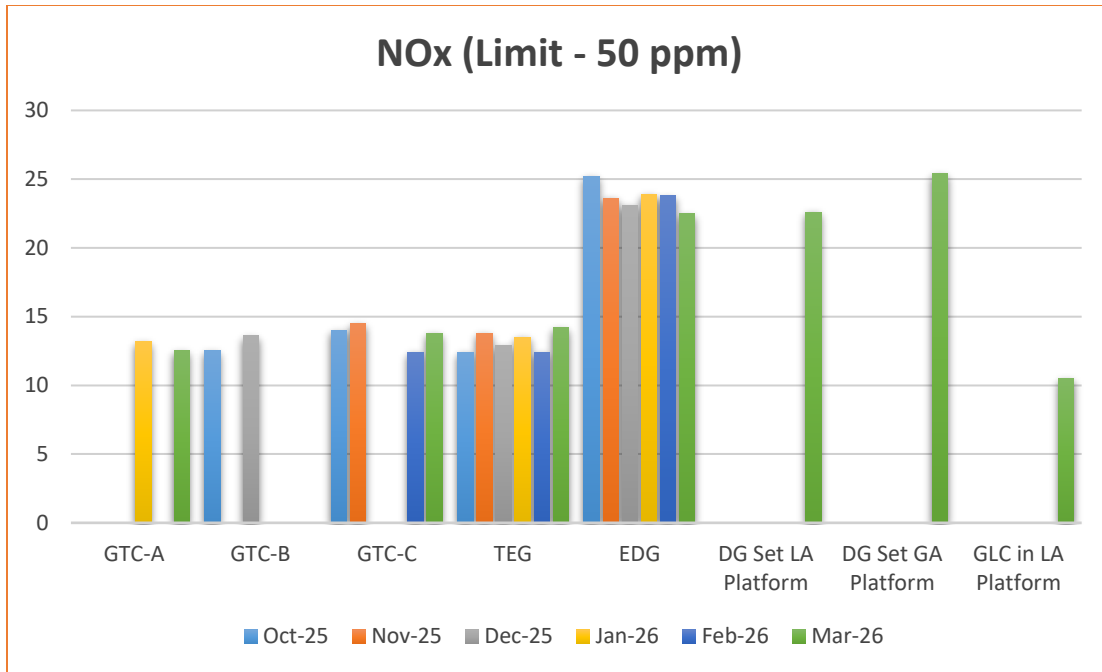


Figure 13: Graphical representation of average emission of Oxides of Nitrogen (NOx) in mg/Nm³

Effluent Quality Monitoring Results in Suvali Onshore Terminal

The ETP of 1920 KL per day capacity is installed to treat the produced water separated from the well fluids. The ETP has primary and secondary treatment system. Primary treatment removes the oil and suspended solids and the Secondary treatment has aeration process (Sequencing Batch Reactor) to remove the organic load from the effluent. The final treated wastewater meets the marine discharge standards specified by Gujarat Pollution Control Board and is discharged into sea through marine outfall located about 500 m from Low Tide Level (as recommended by NIO after carrying out the study).

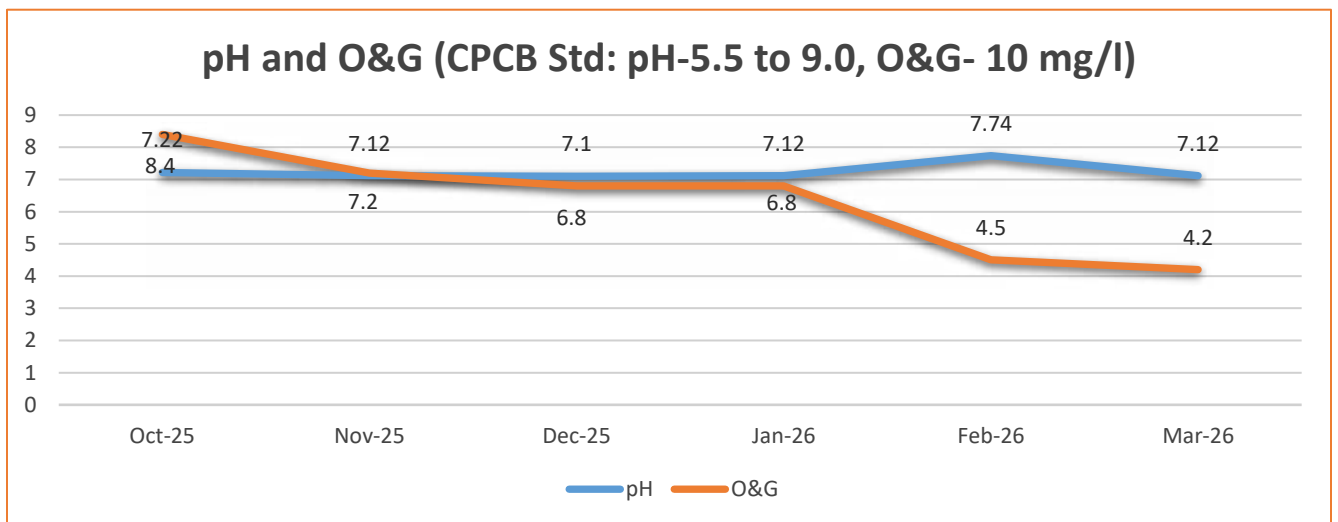


Figure 14: Graphical representation of pH and O&G of Treated Effluent

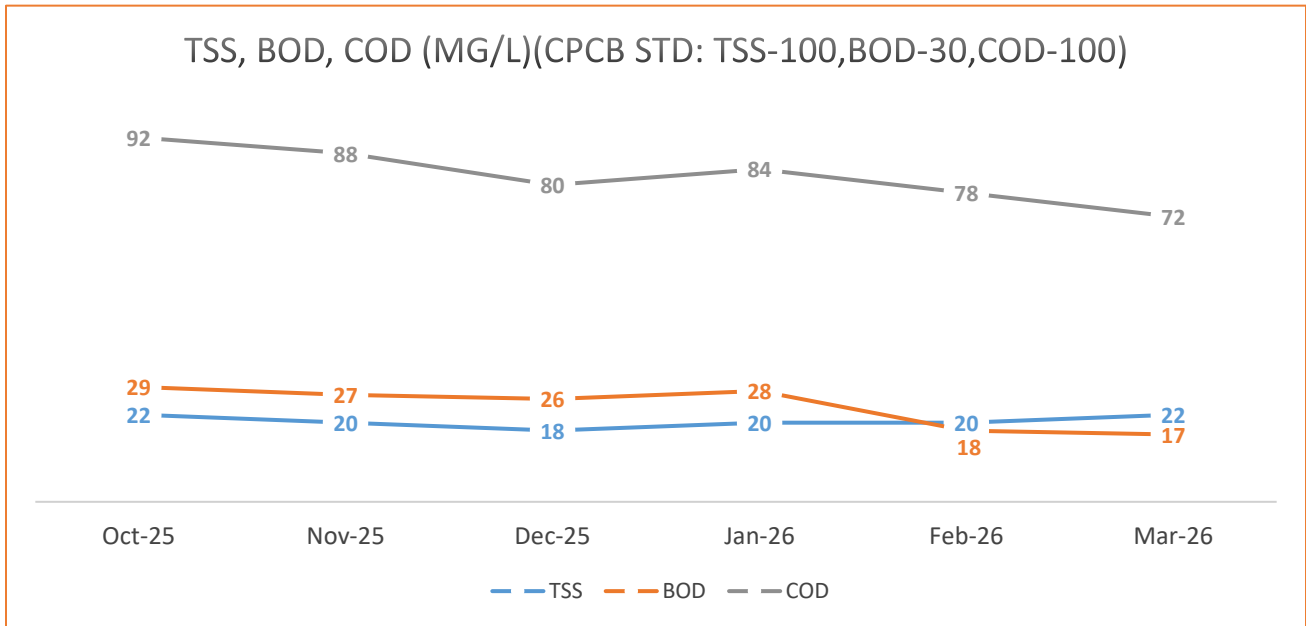


Figure 15: Graphical representation of TSS, BOD and COD of Treated Effluent

Sewage Quality Monitoring Results in Suvali Onshore Terminal

The STP of 30 KLD capacity is installed to treat the sewage generated from the Suvali Terminal. The STP has extended aeration treatment process. The treated sewage after disinfection is being discharged to the terminal for greenbelt development.

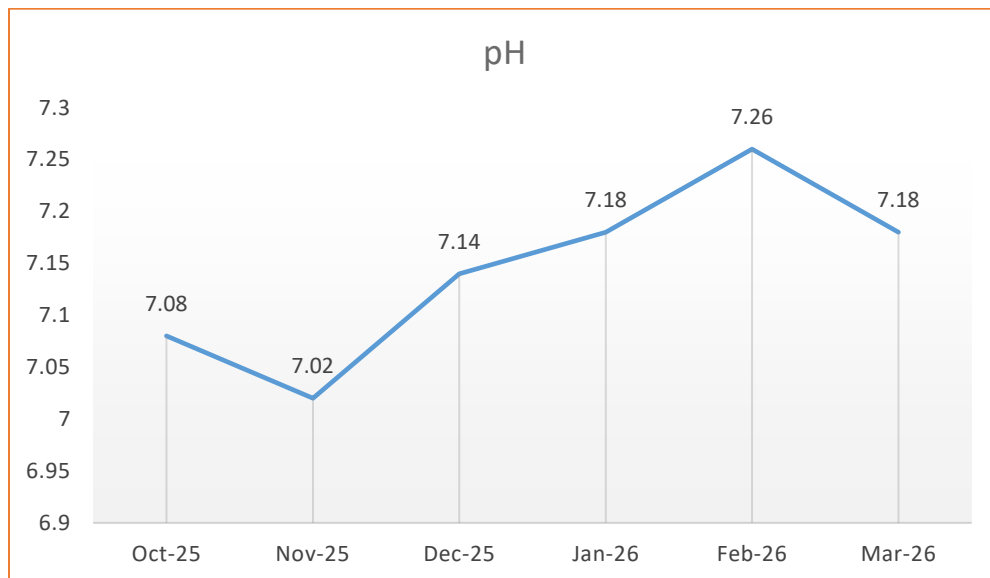


Figure 16: Graphical representation of pH of Treated Sewage

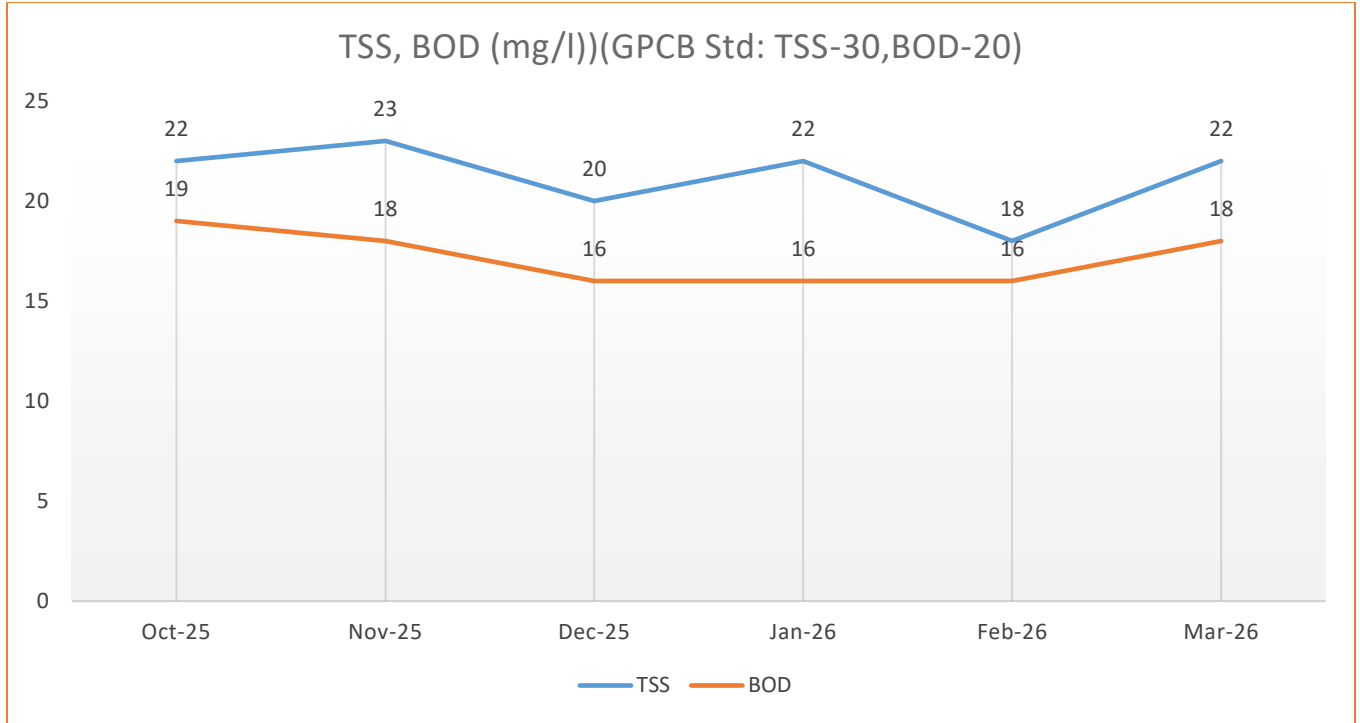


Figure 17: Graphical representation of TSS and BOD of Treated Sewage

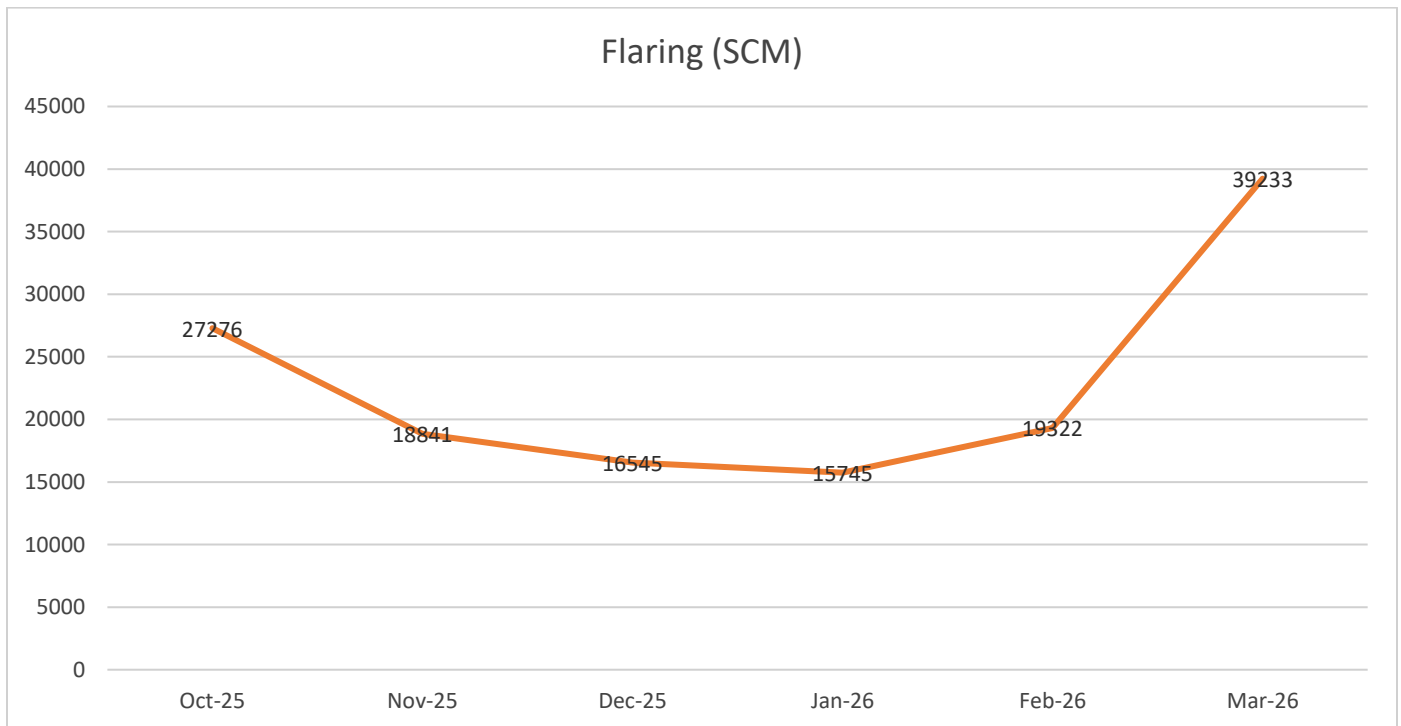


Figure 18: Trend analysis of gaseous flaring

➤ **Source Noise Quality Monitoring Results in Suvali Offshore Platform**

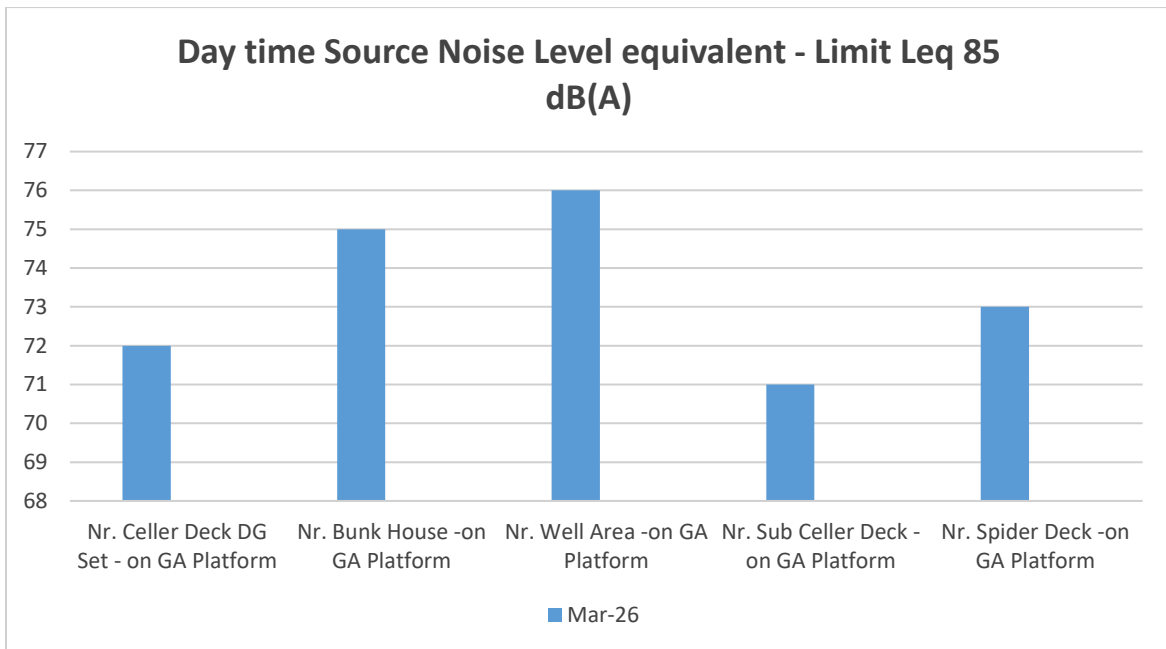
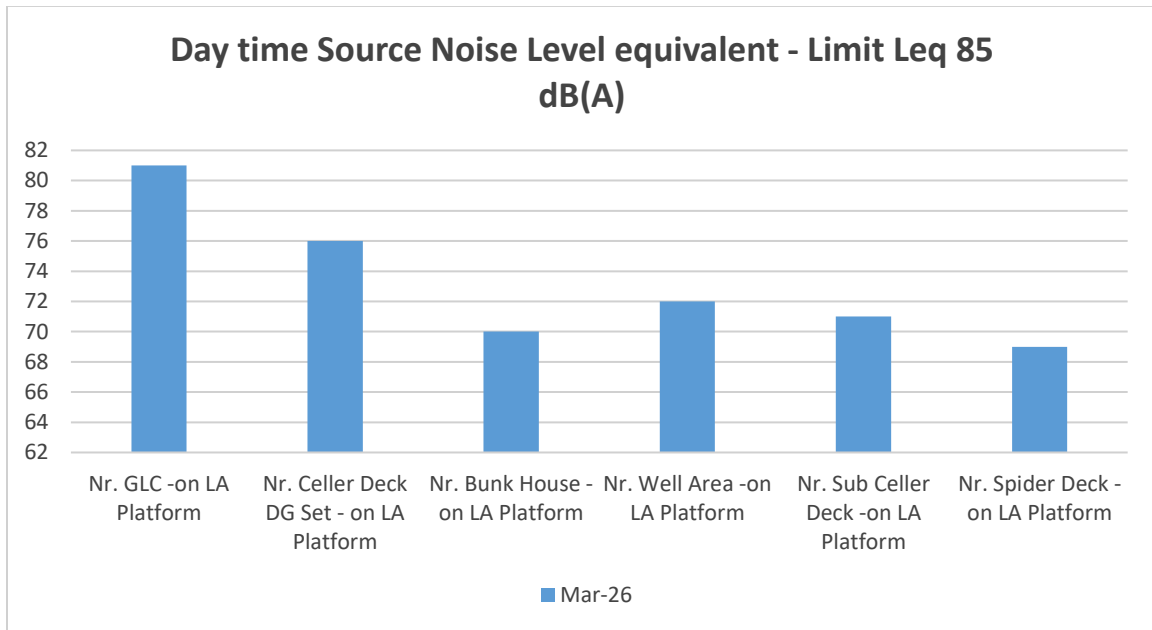


Figure 19: Graphical representation of trend of Noise Level in Leq dB(A) in the Day-time

Monthly Report Summary (September 2025 – March 2026)

Project: Micro Level Intervention (MLI) – OALP WC

NGO Partner: CEDRA

1. PHC Health Support

PHC Health Supporters continued providing essential healthcare services to the community across the reporting period, benefiting a total of **11,044 patients**.

- September 2025: 1,836 patients supported
- October 2025: 1,059 patients supported
- November 2025: 1,375 patients supported
- December 2025: 1,450 patients supported
- January 2026: 1445 patients supported
- February 2026: 1261 patients supported
- March 2026: 1060 patients supported

2. Key Highlights**September 2025 to December 2025:**

Regular PHC support services were provided to the community ensuring access to basic healthcare. Focus remained on consistent patient outreach and treatment at PHC level.

January 2026:

Along with PHC services, Republic Day was celebrated at Suvali and Junagam schools with 572 participants.

Activities included student scholarships (cycles and watches), girl child felicitation, and cultural programs.

February 2026:

Support provided for renovation of water storage tank at Suvali PHC for Guppy fish breeding to control mosquitoes.

Work included civil repair, tiles fixing, and plumbing with partial cost contribution from PHC.

March 2026:

PHC services continued benefiting 1060 patients during the month.

Focus remained on sustained healthcare delivery and community support.



ANNEXURE NO. 03
Greenbelt Development in Suvali Onshore Terminal

Greenbelt Development in Suvali Onshore Terminal

Cairn Oil and Gas, a vertical of Vedanta Limited is one of the largest explorations and production companies in India, contributing to around 25 per cent of India's domestic crude oil production. The company is committed to conducting all its business activities in a socially responsible, ethical and environmentally friendly manner while continuously working towards improving the Human Development Index (HDI) in its operational areas in Rajasthan, Gujarat, and Andhra Pradesh.

The 33.3 ha onshore processing facility at Suvali Terminal handles natural gas and crude oil from the Lakshmi and Gauri fields. Within the terminal, a green belt spans 12.07 ha, accounting for approximately 36.25% of the total area. In addition to on-site greening, broader ecological initiatives have been undertaken. In 2012, an MoU was signed with the Gujarat Ecology Commission for the restoration, plantation, and conservation of mangroves over 50 ha at Karanj Village, Olpad Taluka, Surat district. Further commitments include MoUs with the Gujarat Forest Division—one signed on 20th October 2022 for the development and protection of 60 ha of mangroves along the Surat coastal region, and another on 9th November 2023 for an additional 130 ha of mangrove conservation in the same region.

Flora and Fauna

The Suvali processing terminal is known to be mostly dominated with exotic ornamental, plant species such as Scarlet cordia (*Cordia alliodora*) and African tulip (*Spathodea camponulata*). Some native plant species were also recorded from this area such as Neem (*Azadirachta indica*) and Scholar Tree (*Alstonia scholaris*) (BMP, 2017). During the biodiversity assessment conducted in the terminal, 32 tree species, 11 shrub species and 20 herb species were documented from within the terminal (BMP, 2017). The terminal has a well maintained garden area with well grown avenue plant species present. The plantation activity is carried out as a part of the greenbelt development. The area in the Phase II is left natural and has very few operations in place. Where the helipad is, there is very sparse vegetation present in this phase and is mainly grassland habitat. Seasonal waterbodies are formed in this area after monsoon due to water logging, which is then host to a number of avian fauna (BMP, 2017).

During the biodiversity assessment conducted in the Suvali terminal (BMP, 2017), 23 birds, 2 mammals, 1 reptile and 2 butterfly species were encountered. Winter migrant barn swallow and common snipe were seen in Suvali terminal. Greater spotted eagle was observed over the plant area.

Canopy Density

Canopy density was calculated for the plantations developed within the Suvali Terminal. Forest cover is broadly classified in 4 classes, namely very dense forest, moderately dense forest, open forest and scrub. The classification of the cover into dense and open forests is based on internationally adopted norms of classification (FSI, 2018). According to FSI, the classes are defined as below.

Table 1: Classification Scheme for Canopy Cover

Very dense Forest	All Lands with tree cover of canopy density of 70% and above
Moderately dense forest	All lands with tree cover of canopy density between 40% and 70% above
Open forest	All lands with tree cover of canopy density between 10% and 40%
Scrub	All forest lands with poor tree growth mainly of small or stunted trees having canopy density less than 10 percent

While collecting ecological data, data was collected using spherical densimeter from the Suvali Terminal and the canopy density calculated. The calculation of canopy density resulted in the canopy density of 40.6% of plantation within the Suvali terminal, which is considered to be of the moderate density class as per FSI (FSI, 2018).

Table 2: List of Recorded Tree Species in Suvali Terminal

S.No	Scientific Name	Common Name
1	<i>Acacia auriculiformis</i>	Earleaf Acacia
2	<i>Acacia nilotica</i>	Desi Babool
3	<i>Ailanthus excelsa</i>	Mahanimb
4	<i>Alstonia scholaris</i>	Devil's tree
5	<i>Annona squamosa</i>	Sitafal
6	<i>Azadirachta indica</i>	Neem
7	<i>Bauhinia variegata</i>	Kachnar
8	<i>Callistemon viminalis</i>	Weeping bottlebrush
9	<i>Cassia fistula</i>	Amaltas
10	<i>Casuarina equisetifolia</i>	Whistling Pine
11	<i>Citrus limon</i>	Lemon
12	<i>Cocos nucifera</i>	Coconut
13	<i>Conocarpus erectus</i>	Button Mangrove
14	<i>Cordia sebestena</i>	Scarlet cordia
15	<i>Cycas revoluta</i>	Sago palm
16	<i>Delonix regia</i>	Gulmohor
17	<i>Eucalyptus globulus</i>	Southern blue gum
18	<i>Eythrina variegata</i>	Indian coral tree
19	<i>Ficus benghalensis</i>	Banyan
20	<i>Ficus racemose</i>	Cluster fig
21	<i>Ficus religiosa</i>	Peepal
22	<i>Ficus virens</i>	White Fig
23	<i>Grevillea robusta</i>	Silver oak
24	<i>Mangifera indica</i>	Mango
25	<i>Manikara zapota</i>	Noseberry
26	<i>Mimusops elengi</i>	Spanish cherry
27	<i>Morus alba</i>	White Mulberry
28	<i>Murraya koenigii</i>	Kadipatta
29	<i>Neolamarckia cadamba</i>	Kadamba

S.No	Scientific Name	Common Name
30	<i>Nyctanthes arboritis</i>	Har singar
31	<i>Peltophorum dubium</i>	Copperpod
32	<i>Peltophorum pterocarpum</i>	Yellow flametree
33	<i>Pithecellobium dulce</i>	Jangal Jalebi
34	<i>Platyclusus orientalis</i>	Oriental thuja
35	<i>Plumeria pudica</i>	Frangipani
36	<i>Plumeria rubra</i>	Common White Frangipani
37	<i>Polyalthia longifolia</i>	False Ashok
38	<i>Psidium guajava</i>	Guava
39	<i>Roystonea regia</i>	Royal palm
40	<i>Samanea saman</i>	Rain Tree
41	<i>Senna siamea</i>	Siamese Senna
42	<i>Spathodea campanulata</i>	African tulip tree
43	<i>Syzygium cumini</i>	Jamun
44	<i>Tamarindus indica</i>	Imli
45	<i>Tectona grandis</i>	Teak
46	<i>Terminalia catappa</i>	Indian almond
47	<i>Ziziphus jujuba</i>	Ber

Table 3: List of Recorded Shrub Species inside Suvali Terminal

S.No	Scientific Name	Common Name
1	<i>Bougainvillea glabra</i>	Paper Flower
2	<i>Cadaba fruticosa</i>	Cadaba
3	<i>Caesalpinia bonducella</i>	Gray nicker
4	<i>Calotropis gigantea</i>	Crown flower
5	<i>Calotropis procera</i>	Rubber bush
6	<i>Cascabela thevetia</i>	Yellow oleander
7	<i>Catharanthus roseus</i>	Periwinkle
8	<i>Dracaena fragrans</i>	Corn plant
9	<i>Dracaena spp.</i>	Dragontree
10	<i>Euphorbia caducifolia</i>	Leafless milk hedge
11	<i>Hibiscus rosa-sinensis</i>	Chinese hibiscus
12	<i>Ixora coccinea</i>	Jungle geranium
13	<i>Justicia adhatoda</i>	Malabar Nut
14	<i>Murraya paniculata</i>	Orange jessamine
15	<i>Nerium oleander</i>	Oleander
16	<i>Plumeria pudica</i>	White frangipani
17	<i>Tecoma stans</i>	Narrow leaf yellow bells



➤ Mangrove Plantation Photograph



ANNEXURE No. – 04

Mangrove Plantation Details – CB/OS-2

Mangrove Plantation Details

The CB/OS-2 offshore block is located in the Gulf of Khambhat, West Coast of India. The block extends from Ghogha to Mahuva on the western shore and Dandi to Delwara on the Eastern Shore of the Gulf. The block lies within Latitude 21°00'00" to 21°37'51" and Longitude 71°45'00" to 72°45'00". The retained area of the block is approximately 2642 km².

As per Environmental Clearance conditions, an MoU was signed on 9th August 2012 between Cairn Energy India Pvt. Ltd (herein after referred to as Vedanta Ltd (Cairn Oil & gas)) and Gujarat Ecology Commission to act as an implementing agency for and on behalf of Cairn to implement the project "Restoration, Plantation and Conservation of mangroves at Karanj Village of Olpad Taluka of Surat district". The Project period was 1st August 2012- 31st July 2013.

Another MoU was signed on 20th October 2022 with the Gujarat Forest Department for the development of 60Ha of mangroves at Surat coastal region. Another MoU was signed on 09th November 2023 with the Gujarat Forest Department for the development of 130Ha of mangroves at Surat coastal region.

Trees/Species were planted in the following manner:

Local Name	Botanical Name	Percentage
Cher	<i>Avicennia marina</i>	100%

The species were planted in Raised bed model and the number of them planted were 24000 seeds per hectare. Year wise/ Month wise Plantation Schedule of Activities were as follows:

Name of Model	Year	Financial Year	Month	Activities carried out
Raised Bed Model	Planting Year	2013-14	February to March	Preparation of bed, collection of seed, Alignment, seed sowing, Transportation of labour, etc.
	1 st Year	2014-15	March to August	Removal of algae & protection
			September to October	Protection of plantation & maintenance
			November to March	Casualty replacement

Cost of the project

Sl. No.	Budget Head	Total Amount (INR)
1	Mangrove Plantation (50Ha)	1000000
2	Baseline Survey	12500
3	Awareness Creation	25000
4	Administration (Salary, wage. Etc.)	125000
5	Documentation & Dissemination	10000
6	Travel & others	22500
	Total	1195000

Proposed Budget and Activity Schedule for the 60 Ha. Mangrove Plantation

Starting Year : November 2022

Mangrove Plantation Scheme- Surat Forest Department					
Sr. No.	Details	Unit	Rate	Quantity	Amount
Nursery – Starting					
1	Seed Collection	Per Hec	1600	60	96000
2	Soil filling in polythene bags	Per Hec	1884	60	113040
3	Preparation of beds	Per Hec	12400	60	744000
4	Seeding, Watering	Per Hec	5228	60	313680
5	Removal of Algae and weeds	Per Hec	6100	60	366000
					1632720
First Year					
1	Alignment Work	Per Hec	2480	60	148800
2	Sowing	Per Hec	5140	60	308400
3	Soil overturning	Per Hec	9315	60	558900
4	Protection	Per Month	10206	12	122472
5	Alae removal	Per Hec	6233	60	373980
6	Monitoring and boat rent	L.S.	Lumpsum	Lumpsum	100000
7	Public awareness program	Nos	50000	2	100000
					1712552
Second Year					
1	Casualty Nursery	Per Hec.	7975	60	478500
2	Sowing	Per Hec.	5654	60	339240
3	Soil overturning	Per Hec.	10246.5	60	614790
4	Seeding, Watering	Per Hec.	5750	60	345000
5	Protection	Per month	10206	12	122472
6	Algae removal	Per Hec	7167.95	60	430077
					2330079
Third Year					
1	Litter cleaning around the plant	Per Hec.	7884.7	60	473082
2	Protection	Per Month	10206	12	122472
					595554
Fourth Year					
1	Litter cleaning around the plant	Per Hec.	8673.17	60	520390.2
2	Protection	Per Month	10206	12	122472
					642862.2
Fifth Year					

1	Litter cleaning around the plant	Per Hec.	8673.17	60	520390.2
2	Protection	Per Month	10206	12	122472
					642862.2
Sixth Year					
1	Protection	Per Month	10206	12	122472
Seventh Year					
1	Protection	Per Month	10206	12	122472
Eighth Year					
1	Protection	Per Month	10206	12	122472
Ninth Year					
1	Protection	Per Month	10206	12	122472
Tenth Year					
1	Protection	Per Month	10206	12	122472
Fencing			35000	60	2100000
					Total – 10268989.4
					Cost/Hec- 171150



Glimpses from Mangrove Plantation Site

Proposed Budget and Activity Schedule for the 130 Ha. Mangrove Plantation

Starting Year: December 2023

Mangrove Plantation Scheme – Surat Forest Department					
S.No.	Details	Unit	Rate	Quantity	Amount
First Year					
1	Line Alignment	Per Ha	2,400	130	3,12,000
2	Seed Collection	Per Ha	1,600	130	2,08,000
3	Bed Preparation (1mX1mX30cm)	Per Ha	13,000	130	16,90,000
4	Seed Sowing	Per Ha	1,000	130	1,30,000
5	Plant Protection	Per Month	10,500	12	1,26,000
6	Algae Cleaning	Per Ha	3,000	130	3,90,000
7	Labour Expenses	Per Ha	3,000	130	3,90,000
					32,46,000
Second Year					
1	Casualty 20%	Per Tree	2.5	8,000	20,000
2	Plant Protection	Per Month	10,500	12	1,26,000
3	Algae Cleaning	Per Ha	3,000	130	3,90,000
					5,36,000
Third Year					
1	Casualty 20%	Per Tree	2.5	8,000	20,000
2	Sea Tide Litter Cleaning	Per Ha	3,000	130	3,90,000
3	Plant Protection	Per Month	11,500	12	1,38,000
					5,28,000
Fourth Year					
1	Sea Tide Litter Cleaning	Per Ha	3,000	130	3,90,000
2	Plant Protection	Per Month	11,500	12	1,38,000
					5,28,000
Fifth Year					
1	Sea Tide Litter Cleaning	Per Ha	3,000	130	3,90,000
2	Plant Protection	Per Month	13,000	12	1,56,000
					5,46,000
Sixth Year					
1	Plant Protection	Per Month	13,000	12	1,56,000
Seventh Year					
1	Plant Protection	Per Month	13,000	12	1,56,000
Eighth Year					
1	Plant Protection	Per Month	13,000	12	1,56,000
Ninth Year					
1	Plant Protection	Per Month	13,000	12	1,56,000
Tenth Year					
1	Plant Protection	Per Month	13,000	12	1,56,000
Demarcation of Plantation Area (Fencing)		Per Ha	35,000	130	45,50,000

	TOTAL	1,07,14,000
	Total Cost/Hectare	82,415



Glimpses from Mangrove Plantation Site

ANNEXURE NO 05

Oil Spill Contingency Plan – CB/OS-2 Operations

**OIL SPILL CONTINGENCY PLAN
VEDANTA LIMITED (CAIRN OIL & GAS)
CB/OS-2**

CBOS-2 OVERVIEW

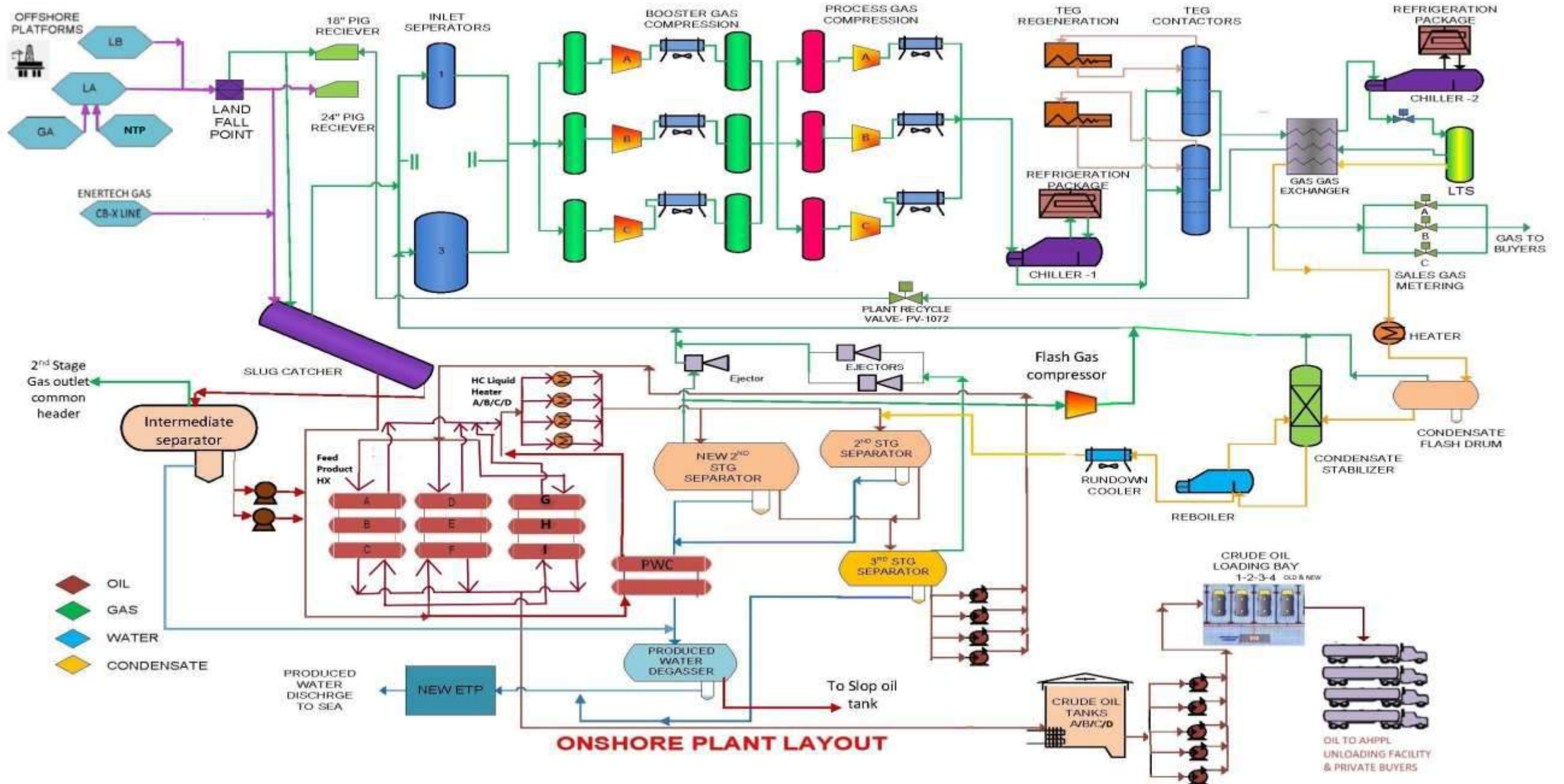


OFFSHORE PLATFORM

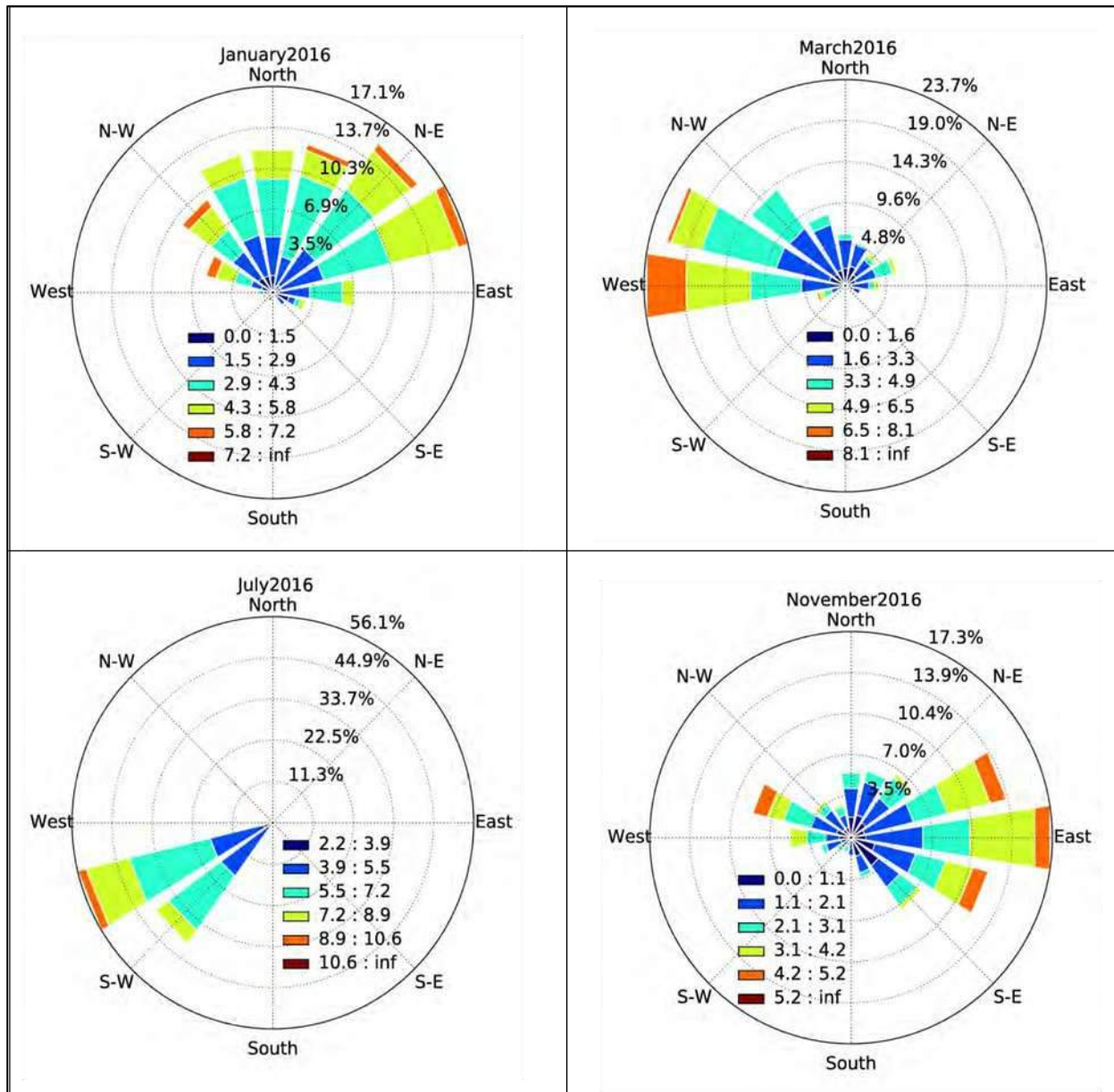


ONSHORE TERMINAL

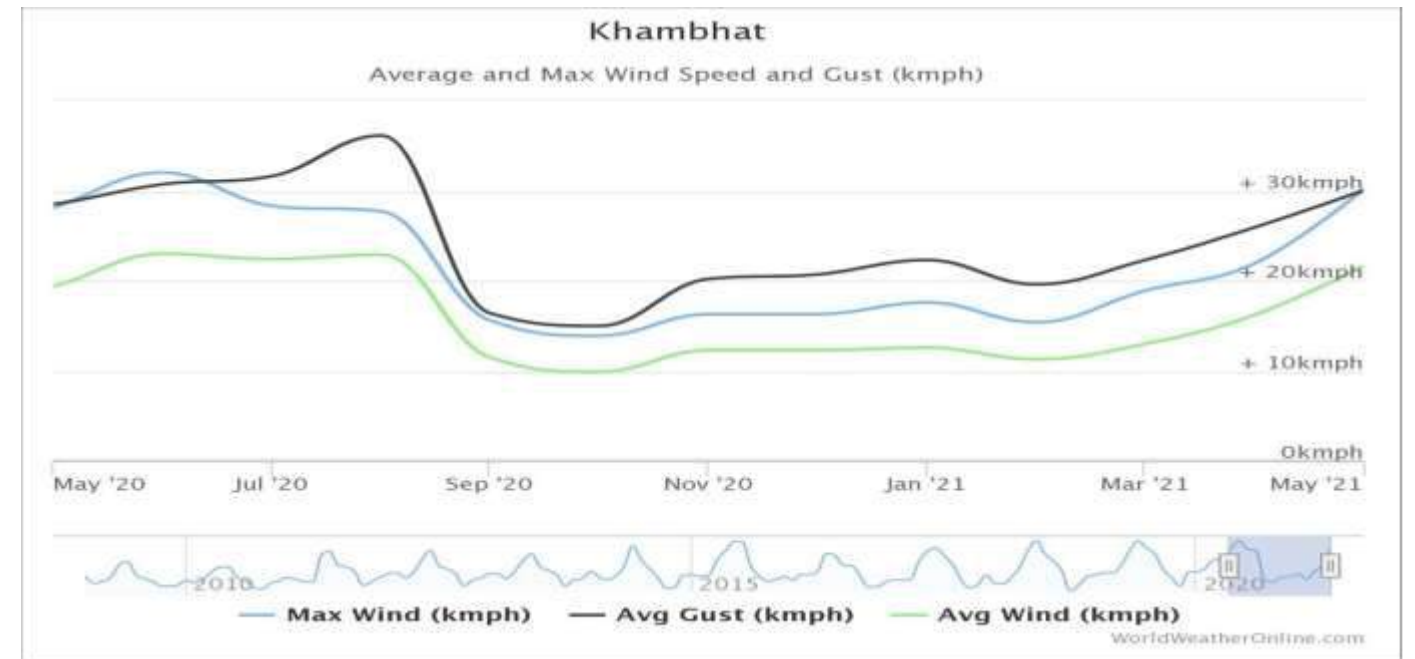
CBOS - 2 PROCESS OVERVIEW



Major Oil Spill Scenario	Proactive Mitigation Measures
Sub sea pipeline rupture	<ul style="list-style-type: none"> • Intelligent Pigging Survey (IPS) for the sub sea line to identify any internal defect • Annual Subsea Survey for Free Span and Rectification • Fit For the Purpose- FFP” certification done by Third party • Monthly routine check for Onshore Impressed Current Cathodic Protection (ICCP) • LAB check on periodic basis (Fe count, SRB Microbes count, Corrosion Inhibitor Residue Check) • Chemical dosing to reduce the internal corrosion
Leakage at wellhead	<ul style="list-style-type: none"> • Christmas Tree Integrity test • Two Barrier Policy • Well Integrity checks
Oil wells blow out during drilling	<ul style="list-style-type: none"> • Well Blow out Preventor • Drilling under hydrostatic balanced well
Oil Tanker Collapse	<ul style="list-style-type: none"> • Hose and SBM Integrity checks • Double Carcass hoses • Crude offtake operations during fair weather



Average wind rose diagram

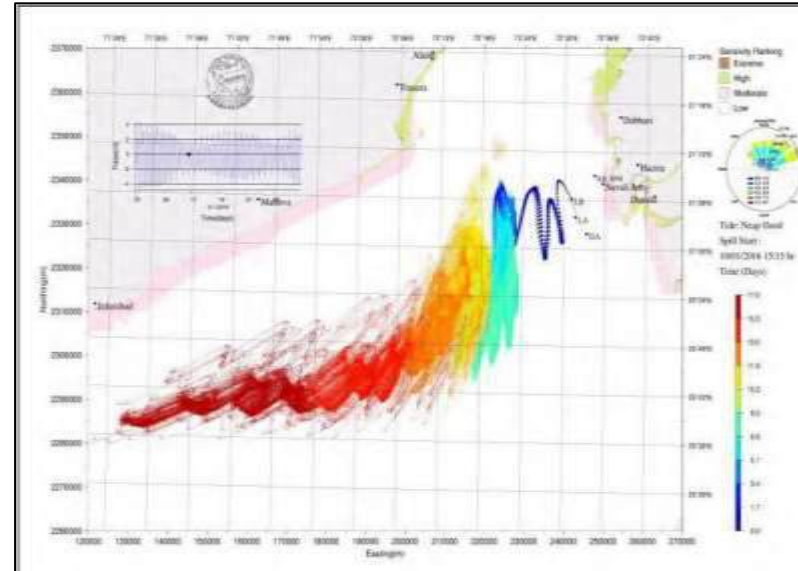


Month	Temp. (Deg.C)	Sea/Swell Ht (Mtr)	Current rate (Kts)	Wind Speed (Kts)
Jan : North –West Monsson	22.155	1 – 1.5	1 – 2	10 - 15
Mar : Pre - Monsoon	23.930	2 – 2.5	2 - 3	15 - 20
July : Monsoon	29.847	2 - 3	3 – 5	15 - 30
Nov : Post - Monsoon	27.983	1 – 1.5	1 – 2	5 - 15

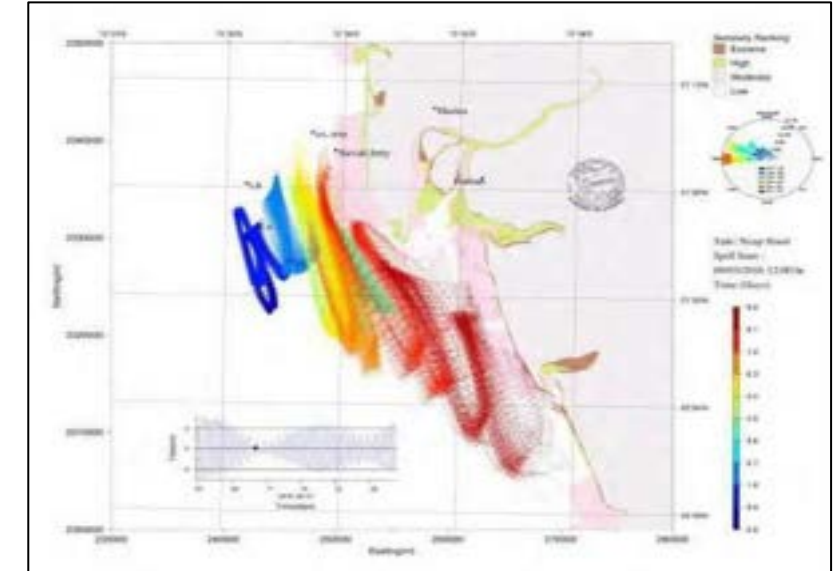
Note: Movement of oil on the sea surface: Oil will move at 100% of the current speed and approximately 3% of the wind speed.

OIL SPILL MODELLING STUDIES

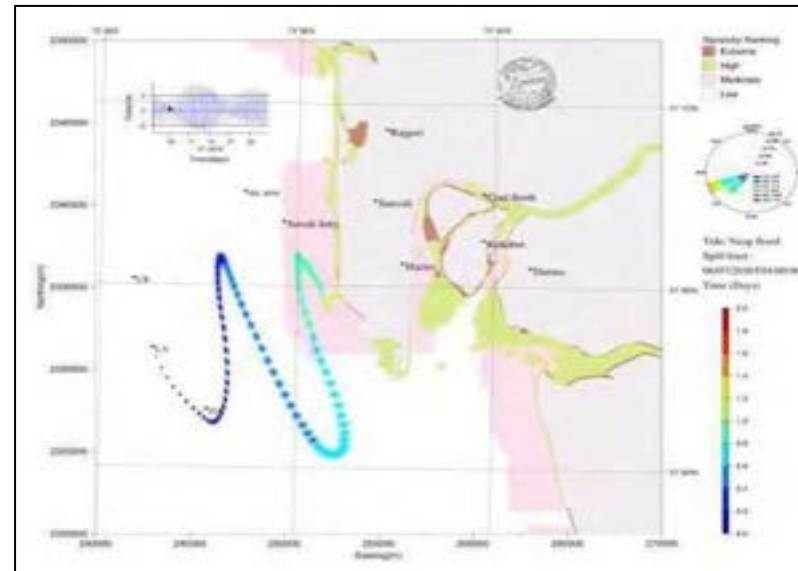
- Based on identified scenarios ,Oil Sill Modelling is conducted using dedicated software - Environ Software (P) Ltd
- Risk assessment carried out to identify potential oil spill scenarios.
- Crude oil weathering and dispersibility study was considered to provide necessary data
- Generation of data such as: tidal current, ocean current, local winds and others was gathered
- All possible scenarios during various seasons considered for modelling
- Year 2016 taken as baseline year



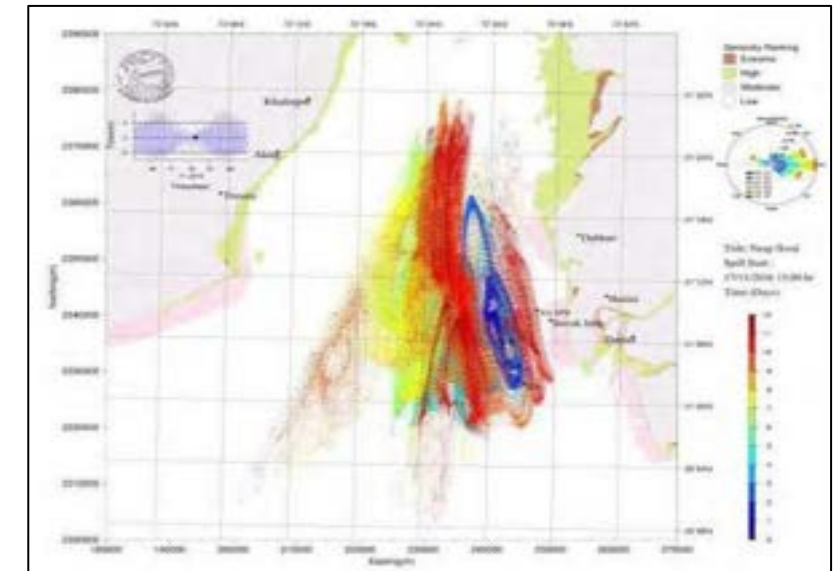
January



March



July



November

OIL SPILL RESPONSE STRATEGY

As we operate three offshore process platforms LA, LB, and GA handling crude oil production, we fall under **Risk Category 'A'** as outlined in the NOS-DCP guidelines.

Tier- I **up to 700 MT**

Operational spillages which can be dealt with using the resources immediately available at Cairn.

Tier – II **700 Ton to 10000 MT**

Medium sized spillages which exceed Cairn resources, and which require district and/or Regional assistance

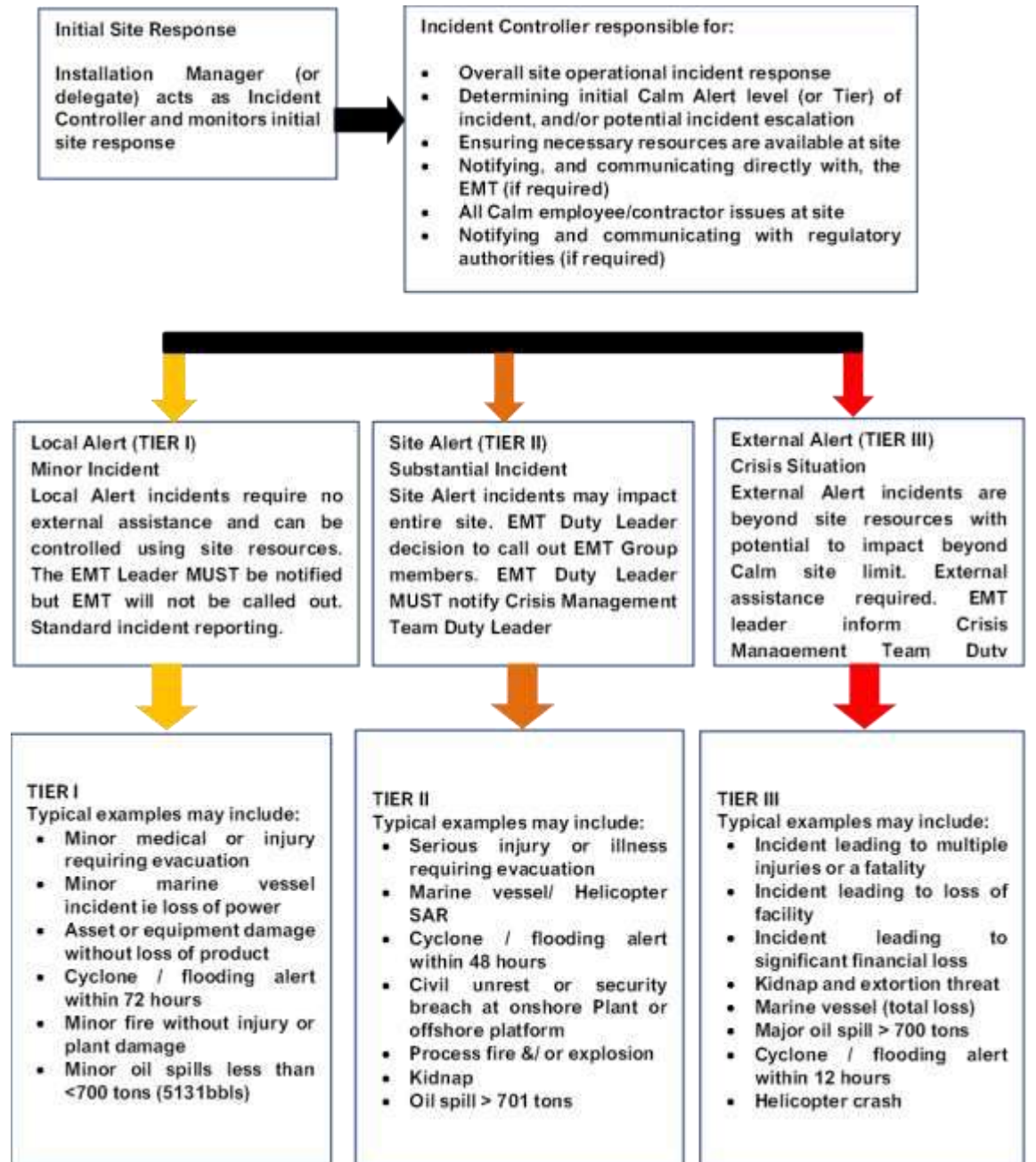
Tier – III **More than 10000 MT**

Large spillages which exceed the full resources of the district/region, and which may require National assistance and /or the implementation of the NOSDCP.

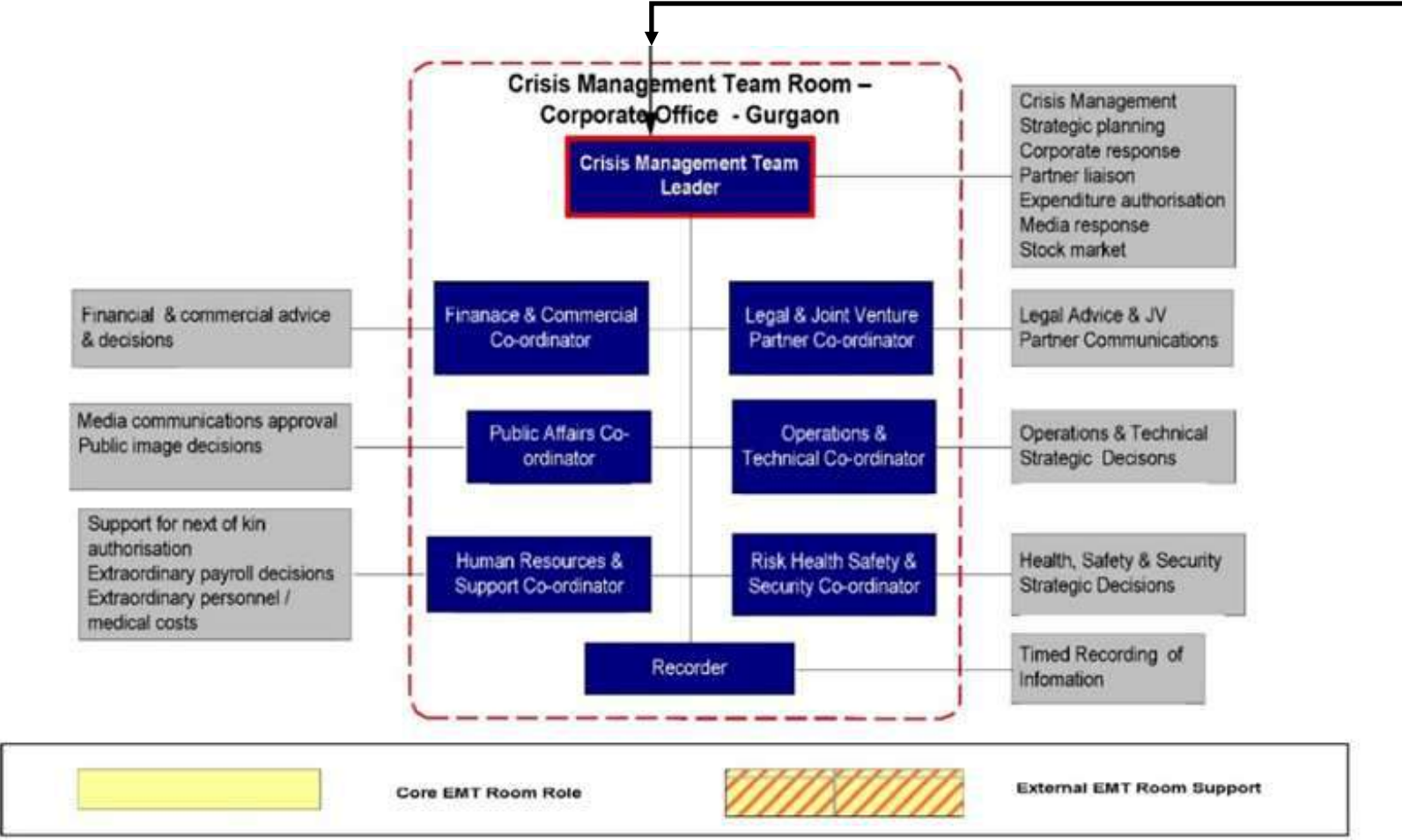
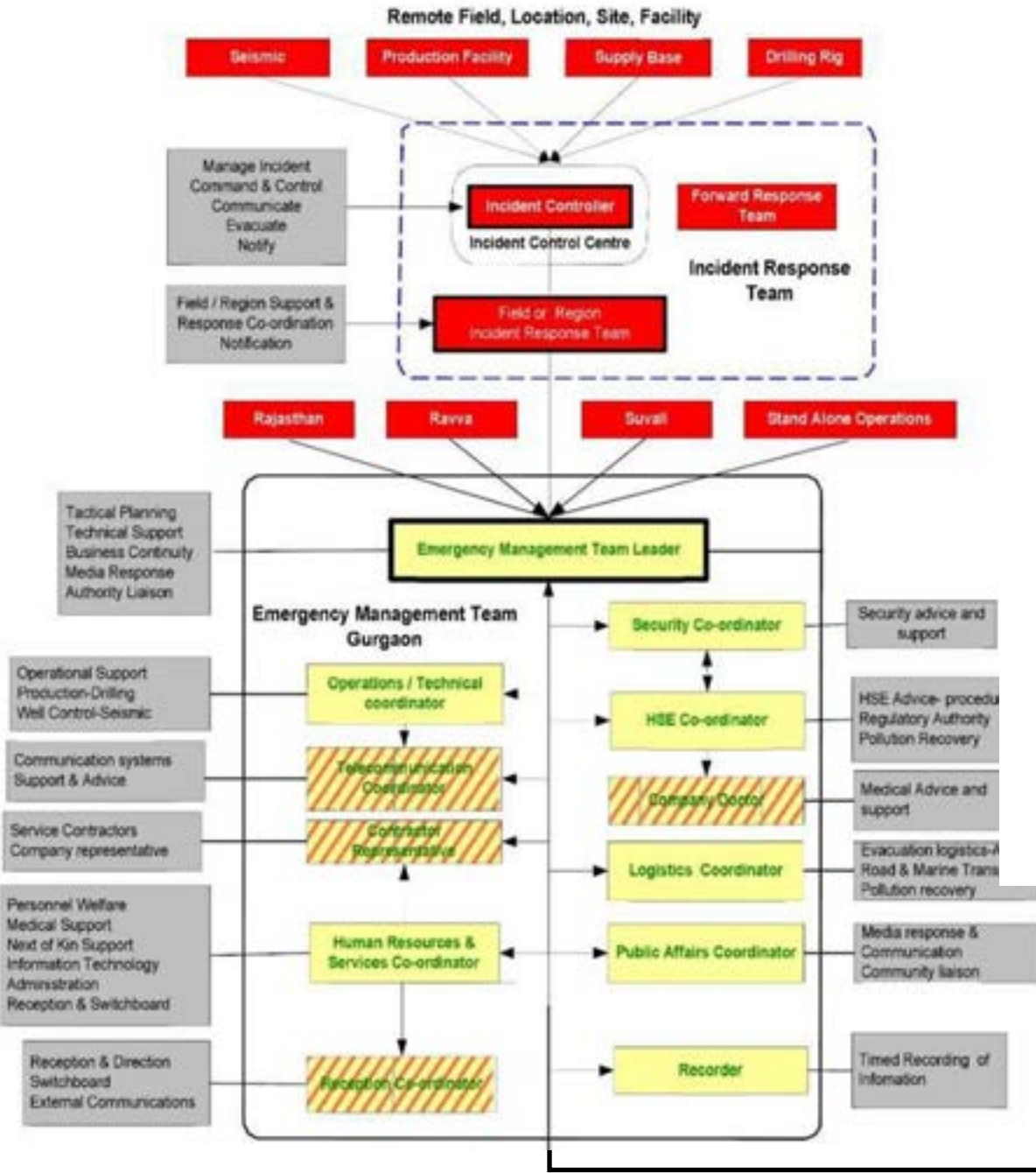
Mobilisation of OSR Equipment and IRT Personnel will roughly take 4-10 hours.

Response Equipment stored at Suvali will be mobilised and further deployment of OSR equipment on Coastline.

Dispersant Spraying will take less than 30 Mins to commence as Vessel is already in Operating area.



ROLES AND RESPONSIBILITIES





ROLES AND RESPONSIBILITIES

Incident
Controller

Installation Manger

Overall, in-charge including financial authorization. Responsible for Cairn tactical response to all emergency situations

HSE
Support

HSE In Charge

Health safety, environmental and security support, and response

Environmental
Manager

Environmental Engineer

Information related to environmental aspect of the region and possible impacts that may cause due to the oil spill.

Technical
Support

Field Manger
Production / Field
Manager
Maintenance

Operational and technical support and advice.

Offshore
Support

Offshore
Superintendent

Offshore related operational and maintenance support.

Community
Liaison

Administration
Manager

Communicating with various stakeholders including residents, fishermen etc.

Warehouse

Warehouse
Incharge

Necessary vessel and pollution response equipment from Adani Hazira Port, Surat.

Forward
Controller

Shift Production
Superintendent

Onshore support including the control room operations.

Fire
Chief

Fire Controller

Fire and related emergency situation handling.



ROLES AND RESPONSIBILITIES

HR Manger

HR In Charge

Human resources support for the affected staff members to interact with their families.

Scribe

Instrumentation Superintendent

Take overall stock of the situation and make note of the communications and support with the required information to Incident Controller.

Radio Officer

Radio Officer In charge

Managing the Helicopter and vessel related support including the coordination with Adani port and Surat Airport.

Security Manager

Security In charge

Office and operation related security support.

Medical Support

Duty Doctor

Medical related support that may arise.

Logistics Coordinator

Logistic Superintendent

Transport and logistics support as required including marine services.

Public Affairs

Head of Operations

Public affairs and media response

Muster point Controller

Access Control

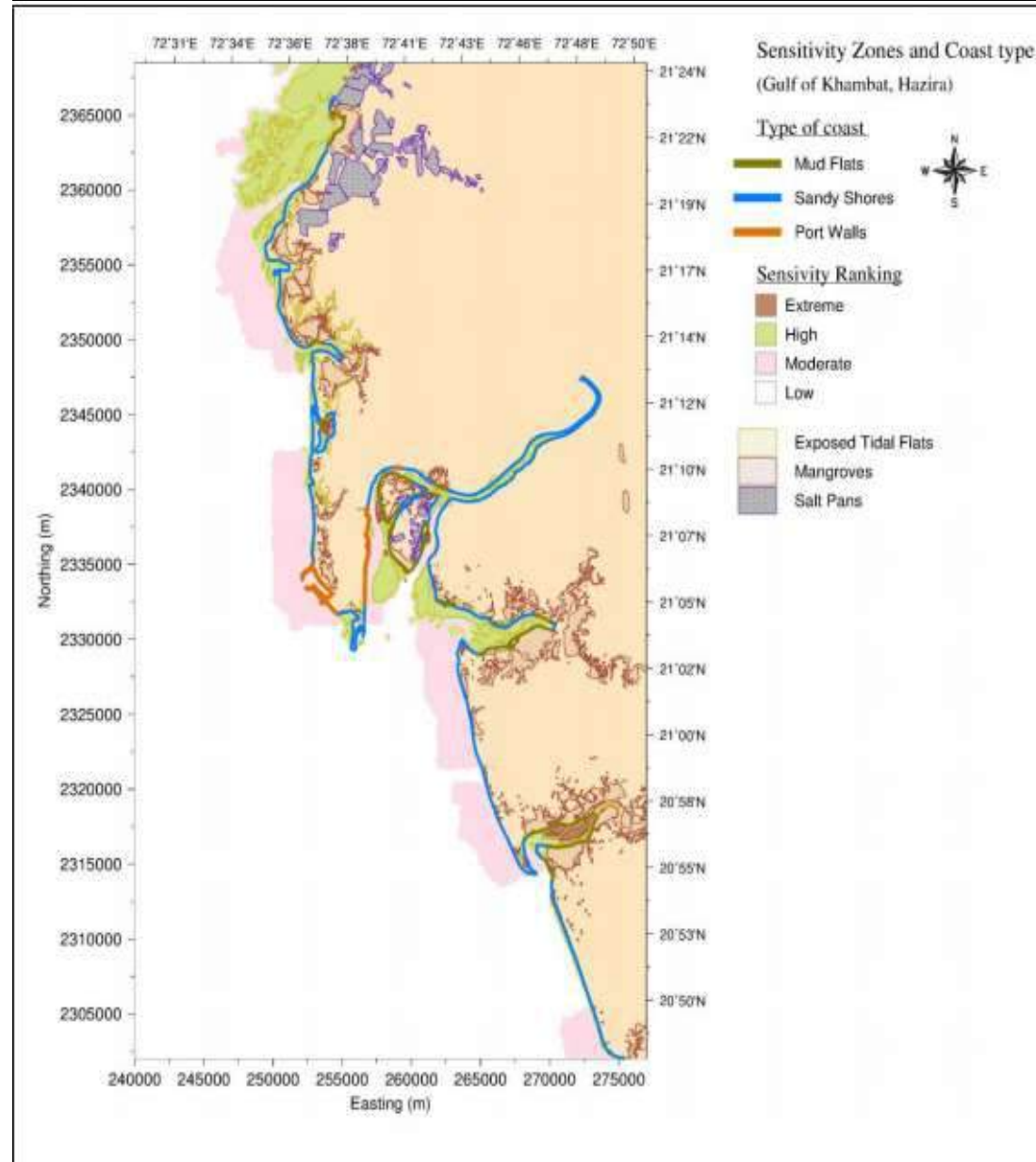
Taking the account of overall muster both in onshore and offshore. Coordination with the offshore team to understand the manpower deployment details.

First Aiders

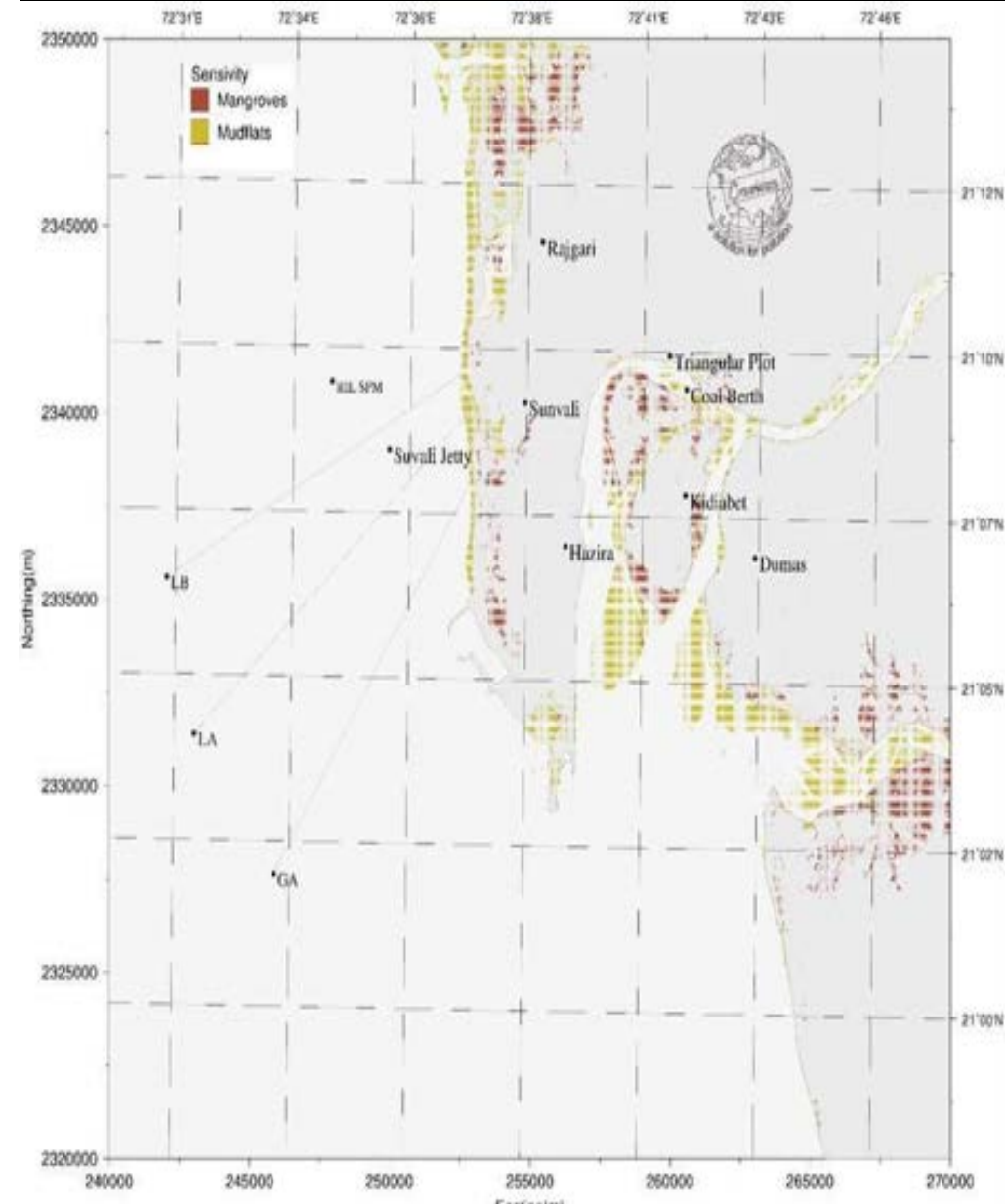
Trained Staff on Duty

Medic on duty should be ready with the Material safety Data Sheet (MSDS) and be ready to provide necessary support that may arise.

ENVIRONMENTAL SENSITIVITY DETAILS



SENSITIVITY ZONES & COAST TYPE



1

❑ Marine Environment:

- Potential impact on mangroves, mudflats, and marine life in the Gulf of Khambhat.
- Risk to fisheries and aquaculture zones due to potential spills

2

❑ Onshore Areas:

- Hazira Port and industrial facilities could be affected.
- Potential impact on beaches and coastal communities.

3

❑ Additional Considerations:

- Specific locations and extent of impact depend on spill scenario and prevailing conditions.
- Refer to sensitivity maps and environmental impact studies in the OSCP for detailed information.

4

❑ Nearby Communities:

- Potential impact on fishing villages and coastal communities reliant on marine resources.

5

❑ Preventative Measures:

- Regular inspections and maintenance of pipelines and platforms.
- Implementation of spill prevention and response plans, including regular drills and exercises.
- Community engagement and awareness programs to educate locals on spill response procedures and potential impacts.

MAINTENANCE AND TESTING OF OSR EQUIPMENT



Boom Reel



Boom Reel



Boom Reel



D22 powerpack



Air Blower



D9 Powerpack

OIL SPILL RESPONSE TRAINED MANPOWER

S/N	IMO LEVEL	Required	Available
1	IMO LEVEL 1	15	16
2	IMO LEVEL 2	05	05
3	IMO LEVEL 3	01	01
4	EQUIPMENT HANDLER	10	18



EQUIPMENT HANDLERS TRAINING AT SITE



MUTUAL AID AGREEMENT – OIL SPILL RESPONSE

Mutual Aid Agreement with Neighboring Industries to assist during Tier 2 Oil Spill is in place.

Company	Distance (NM)			Mobilization Time (Hrs.)		
	LA	LB	GA	LA	LB	GA
Reliance Hazira	12	14	9	2	2.5	2
Adani Hazira Port Limited	10.1	12.4	7.1	1.7	1.7	1.5
Sun Petro	12	14	9	2	2.2	2
Shell Hazira LNG Terminal	10	12	7	2.2	2.4	2

Agreement with OSRL – Singapore to assist in tackling Tier 3 Oil Spill Emergencies

Note: Sailing hours is Two to Four hours depending on current tide direction



GLIMPSE OF OIL SPILL MOCK DRILLS

Deployment of Oil Spill Boom in Sea



Rescue of Personnel



Deployment of Sorbent Boom



J-Formation of Containment Boom



Collection of Contaminated Sand



Use of Oil Spill Pad Rolls



JOINT INSPECTION BY INDIAN COAST GUARD & OISD

Briefing Session with OISD & Indian Coast Guard



JOINT INSPECTION BY INDIAN COAST GUARD & OISD

Deployment of Oil Spill Boom in Sea



Deployment of Weir Skimmer in Sea



J-Formation of Containment Boom



OSD Dispersant Spray Arms



Tele: +91 11 23115106
Email: dte-fe@indiancoastguard.nic.in

तटरक्षक मुख्यालय
Coast Guard Headquarters
National Stadium Complex
New Delhi 110 001

CNA/0720/Tier-1(OHA)

10 Mar 25

The Manager-HSE
Vedanta Limited (Cairn Oil & Gas)
Suvali-Hazira
Gujarat 394510

VETTING OF OIL SPILL CONTINGENCY PLAN (OSCP)
CAIRN OIL & GAS VEDANTA LTD.

1. Oil Spill Contingency Plan (OSCP) of Vedanta Limited (Cairn Oil & Gas) has been scrutinized by the Committee constituted for vetting of OSCPs of OHAs. The Committee has vetted OSCP with following recommendations:-
 - (a) Deficient PR Equipment as per Chairperson NOSDCP circular 04/2024 is to be procured.
 - (b) Requisite OPRC Level 1, 2 & 3 trained workforce is to be maintained.
 - (c) Quarterly mock drills and exercises are to be conducted i.a.w para 4.15 of NOSDCP.
2. In view of the above, OSCP of Vedanta Limited (Cairn Oil & Gas), Suvali-Hazira is vetted for a period of 05 years w.e.f. 10 Mar 25.
3. It is requested that the plan be reviewed periodically and kept updated. Further, the updated plan may be submitted for vetting i.a.w. NOSDCP by Jan 30.



(Kundan)
Commandant
Joint Director (FE)
for Director General

ANNEXURE NO 06

(Compliance to Environmental Management Plan)

Point-Wise Compliance to the Environmental Management Plan prepared in reference to **EC No. J-11011/109/2005-I.A.II(I)**

S.No	Issue	Phase of the proposed Oil development	Management Actions	Compliance Status
1	Accidental Oil spills, Chemical spills and gas releases	Development Planning	<p>Periodic audits to be conducted for planned operations, as well as changes in planning due to operational results to ensure that the</p> <ul style="list-style-type: none"> • project design (power generation equipment, flaring system) aim to minimize air emissions and comply with all legislative requirements • procurement and contractual agreements include considerations relating to equipment & vehicular emission norms. 	<p>Periodic Internal & external audit is carried out for continual improvement as per ISO requirement.</p> <p>HSE best practices, statutory obligations and company standards are part of all the contractual SOW and compliance being assured with.</p>
		Drilling Operations	<p>Regular monitoring of the air emissions from stacks attached to the power generation equipment in the MODU / FPSO will be carried out to ensure that</p> <ul style="list-style-type: none"> • the contractual drilling operations follow the principles of maintenance, optimization of fuel efficiency so that emissions from power generation equipment are minimized • emissions are released at a height sufficient enough to have minimum GLC's of air pollutants; 	<p>Complied.</p> <p>Stack height is provided as per relevant standards and Stack monitoring analysis is carried out. Refer Annexure 1.</p>
		Production Operations	<p>Regular Monitoring of the power generation equipment to be carried out to meet internationally accepted norms and low sulfur diesel be used as fuel for the power generation</p>	<p>Complied.</p> <p>Regular monitoring of the air emissions is carried out & reports are submitted to GPCB/MoEFCC as per attached Annexure- 01</p> <p>HSD is being used as fuel for power generation.</p>

Annexure – 06 – Compliance to Environmental Management Plan

			<p>Associated gas flared to be monitored and reported to ensure that cold venting of produced gas is totally avoided and flaring is minimized during the Production operations.</p> <p>Periodic audits to be carried out to ensure proper maintenance of flaring equipment and operations</p>	<p>Complied.</p> <p>Hot flare is provided at onshore terminal and minimum technical flaring of gas is only being done. Flared gas is measured every month since site has stringent Gas Flaring KPIs to ensure minimum flaring.</p>
			<p>Fugitive emissions from process equipment to be minimized by strictly following the maintenance procedures and masks to be provided to workers being exposed to such fugitive emissions. Regular monitoring of hazardous fugitive emissions should be carried out. Use of PPE to be monitored;</p>	<p>Complied.</p> <p>Fugitive emission monitoring is carried out and no major emission observed.</p> <p>Refer Annexure 9.</p>
2	Noise Emissions	Development Planning	<p>Periodic audits and noise monitoring should be conducted for planned operations, as well as changes in planning due to operational results to ensure that</p> <ul style="list-style-type: none"> • project design (noise generating equipment / involving moving machinery, flaring system) aim to minimise noise emissions • comply with all legislative requirements. • procurement and contractual agreements include considerations relating to equipment related noise emission abatement & mitigation measures. • Spatial & temporal planning of facilities is designed to ensure minimal noise disturbance to the 	<p>Complied.</p> <p>Monthly Noise monitoring (both day and night time) is carried out in the plant area to ensure compliance.</p> <p>Reports are attached as per Annexure-01</p>

			<p>nearby settlements. For example, location of DG sets in lower deck, to maintain adequate distance from living accommodation module.</p>	
		Drilling Operations	<ul style="list-style-type: none"> •Audits & inspection of noise producing equipment for proper maintenance and operational efficiency of noise abatement measures should be done to ensure minimal noise generation from rotary drilling equipment, & other major noise generating equipment by usage of silencers, rubber claddings and noise isolators wherever possible. •Earmuffs and ear plugs should be provided for maintaining good occupational health. 	<p>Complied.</p> <p>Audits & inspection of noise producing equipment for proper maintenance and operational efficiency of noise abatement measures is carried out regularly.</p> <p>Use of Ear protection is mandatory in the high noise area.</p>
		Production Operations	<p>To ensure minimal noise generation from power generating equipment, pumps, vehicular (incl. Helicopter) movements, flaring operation through preventive maintenance of equipment and machinery, flaring, operating</p>	<p>Complied .</p> <p>Monthly Noise monitoring (both day and night time) is carried out in the plant area to ensure compliance. Reports are attached as per Annexure- 01</p>

			conditions and noise level should be regularly monitored.	
3	Generation & disposal of liquid, solid wastes	Development Planning	Changes in project design due to operational results should be monitored and accordingly necessary changes in waste management design should be made to ensure appropriate handling of all the identified liquid, solid wastes and selection of treatment and disposal options followed by incorporation of required handling, treatment, storage and / or disposal systems in the project design	Complied. No Changes in project design is carried out.
		Drilling Operations	Recycling of mud should be maximized and proper washing of cuttings before disposal should be ensured so that offshore disposal meets the MoEF disposal criteria. For this, regular monitoring of the generated, discharged quantity as well as characteristics of the residual mud and drill cuttings should be done periodically.	Complied . Water based mud was recycled & DC will be washed properly before its disposal.
			Samples of drill cuttings & drilling mud should be tested for bio-toxicity & heavy metal concentration on a regular basis and records maintained. In case of exceedance, the drilling mud composition is to be modified	Complied. No drilling activity was carried out during the reporting period. Will be complied for our upcoming drilling activity.

		Water samples to be collected periodically from near the drilling rig and water samples tested for oil content;	Complied. Marine offshore seasonal environmental monitoring is carried out periodically through NABL accredited laboratories. Reports are being regularly submitted to MoEFCC ,GPCB.
		Offshore marine environment to be sampled for the various environmental attributes (water, sediment, benthos) at least once annually;	Complied. Marine offshore seasonal environmental monitoring is carried out periodically through NABL accredited laboratories. Reports are being regularly submitted to MoEFCC ,GPCB.
		A detailed Waste Management Plan taking into consideration, all the applicable regulations – especially those regulating waste characteristics and the final disposal norms / conditions should be prepared for each phase of development, based on the principles and guidelines presented in the EIA report. Accordingly, treatment / handling / disposal systems to be installed and operated during the drilling operations.	Complied. Waste Management Plan is in place covering all regulatory requirements. Waste disposal records are regularly submitted to GPCB.PI. refer Annexure-10
		Hazardous Wastes such as used engine oil / lubricating oil should be stored in contained area and sent onshore for disposal to GPCB approved recyclers or sent for permanent landfilling	Complied. The used oil generated from the process equipment are being blended along with the crude oil for further processing & sell.

		Production Operations	Source reduction as well as treatment of produced water for removal of oil and suspended solids should be ensured to meet the offshore disposal norms prescribed by the GPCB. Further, the existing outfall designed for disposal of liquid effluents to achieve maximum dispersion to be used for disposal of the treated produced water. Periodic Monitoring of marine outfall area should be done to study the impacts due to disposal of produced water.	Complied. Produced water is treated in the ETP facility before disposal. Monthly monitoring of the effluent is done to ensure GPCB norms. Existing outfall diffuser for treated effluent discharge is NIO approved. Reports are attached as per Annexure-01
4	Accidental Oil spills, Chemical spills and gas releases	Entire duration of Oil development	Safety systems to be installed (as a part of design) and safety procedures to be implemented for prevention & emergency response of accidental Oil spills, chemical spills and gas releases	Complied. Oil Spill Contingency Plan covering Offshore Spill and Shore Spill is available at site. Refer Annexure 05
			Detailed systems and procedures for prevention and control of accidental releases to be followed	Complied. Site has Emergency Response Plan in place. Refer Annexure 11
			Encourage culture to report near miss and investigate root causes and communicate lessons learned	Complied. Regular Awareness on Near Miss Reporting and sharing incidents conducted during monthly HSE Meeting and regular field interactions.
			Regular mock drills should be conducted to ensure emergency preparedness and regular safety training should be provided to the operational staff	Complied. Regular Mock Drill are conducted as per plan.
			Regular audits should be carried out to ensure complete avoidance of accidental spills/releases, emergency response preparedness	Complied. Regular Audits are carried out as per plan.

5	Impacts during installation of offshore structure	Initial and intermediate Production phases of the proposed Oil development	Project Assessment and Planning Controls to be utilized principally by adopting international codes & principles of practice during the process of erection of the relatively permanent structures – offshore well head platforms, sub-sea pipelines and the temporary offshore installations for drilling, processing of crude.	Complied. Planning Controls utilized principally by adopting international codes & principles of practice
			Approval from Gujarat maritime Board, & GPCB should be obtained on exact location of platform, anchoring of MOPU & FSO /FPSO	NOC obtained from GPCB & MOEF for production from offshore platforms.
6	Impacts due to presence of offshore infrastructure	Production Phase	Developments around the project area including fishing activities should be checked to ensure corrective actions required for control of events leading to impacts on safety and fishing due to the presence of offshore structures.	Complied. Site has deployed 24X7 Production Support vessel to monitor any unauthorized movement near offshore platforms.
			Regular liaison with the State Fisheries Commissionerate to be maintained to appraise CEIL's activities and their locations, so that CEIL ensures a considerable reduction in risk of fishery interactions	Complied. CEIL ensures a considerable reduction in risk of fishery interactions during its day to day operations.
7	Land and marine traffic management	Drilling and Production Phases.	Proper planning with respect to vehicular / marine vessel movements and traffic management should be ensured and Oil development program schedule & locations should be notified using established communication channels	Complied. Vessel movements are monitored through AIS. Site has Traffic Management plan in place.

Annexure – 06 – Compliance to Environmental Management Plan

			Tanker movements should be piloted by qualified captains familiar with the Gulf of Khambhat	Complied. No Such offshore tanker movement conducted w.r.t our operations.
			Offshore installations and marine vessels should have proper approved communication, navigational and warning systems. Periodic check should be ensured.	Complied. Radio Walkies and Landline Communication system provided on all offshore platforms.
8	Decommissioning		All protocols of the National, international and regional conventions /regulations (MOEF, IMO, E&P forum etc) should be strictly adhered.	Complied. No Site Decommissioning carried out during the reporting period
			Different decommissioning options should be developed, assessed and selected balancing the environmental factors, cost, technical feasibility, health and safety and public	Complied. No Site Decommissioning carried out during the reporting period
			Government should be informed about the cessation of production having proved the reservoir is no longer viable and for securely plugging wells below the surface	Agree to Comply as and when surrender the block. Regularly reporting is carriedout with DGMS/MoPNG for productions. plugging of wells carriedout securely.
			Government approval must be obtained to proceed with its recommended decommissioning option	Agreed to Comply. Necessary Government approval will be obtained before decommissioning.
			The parts of the structure removed to shore should be then re-used, recycled or disposed	Agreed to Comply. Company hereby agreed to re-used, recycled or disposed parts of the structure.



VL/CIL/20610/GPCB/FORM V/2025/06

Date: 17th June 2025

The Member Secretary,
Gujarat Pollution Control Board,
Paryavaran Bhavan,
Sector-10A,
Gandhinagar – 382 010.

Sir,

Sub: Submission of Annual Environment Statement (Form-V) for Development activities in CB/OS-2 Block in Surat district for the period April 2024 to March 2025

With reference to the subject cited above, please find enclosed herewith the Environment Statement for the financial year April 2024 to March 2025, in compliance with Condition No. 8.6 of the Consolidated Consent & Authorization (CC&A) issued by your esteemed office.

Thanking you,

Yours faithfully,



Samarth Kaji
Installation Manager - CB/OS-2

Copy to: The Regional Officer,
Gujarat Pollution Control Board,
Plot No.11-12/2,3
GIDC Pandesara
Surat – 394 221

VEDANTA LIMITED

Cairn Oil & Gas : Survey No 232 | Village – Sovali | Surat-Hazira Road | Surat - 394510, Gujarat, India
T +91-261 6711444 F +91-261 6711509, 10, 90 | www.cairnindia.com

Registered Office: Vedanta Limited, 1st Floor, 'C' wing, Unit 103, Corporate Avenue, Ahi Projects, Chakala, Andheri (East), Mumbai-400093, Maharashtra, India | T +91-22 664 34500 | F +91-22 664 34530 | www.vedantalimited.com

CIN: L13209MH1965PLC291394

FORM V
(See Rule 14)
ENVIRONMENTAL STATEMENT

ENVIRONMENTAL STATEMENT FOR THE FINANCIAL YEAR 2024-25

SUVALI ONSHORE TERMINAL
CB-OS 2 BLOCK HYDROCARBON FIELD
VILLAGE: SUVALI DIST: SURAT GUJARAT

PART - A

- | | |
|--|--|
| I. Name and address of the owner / occupier of the industry operation of process | Installation Manager – Suvali
M/s Vedanta Limited, Cairn Oil & Gas
Suvali Onshore Terminal Survey No. 232, Village
Suvali, Surat Hazira Road, Surat – 394510 |
| II. Industry category | Primary -- (STC Code)
Secondary -- (SIC Code) |
| III. Production capacity – Units | Suvali Onshore Terminal
Crude Oil Processing Capacity 12000 BoPD
Condensate: - 7200 M³/Month
Natural Gas- 150 MMSCFD |
| IV. Year of establishment | November 2002 |
| V. Date of the last environmental statement submitted | 16 th September 2024 |

PART - B

Water and Raw Material Consumption:

i) Water consumption m³/d

Purpose	Quantity in m ³ /d	Remarks
Domestic	32.21 m ³ /day	Water is sourced through GIDC Supply and used at administrative buildings, washrooms, etc.
Process/Industrial	41.77 m ³ /day	Water is sourced through GIDC Supply and used for industrial cleaning etc.
Total	90.65 m³/day	Refer Annexure-I for month-wise Consumption details

Name of products	Process water consumption per unit of product output	
	During the previous financial year	During the current financial year
Crude (SCM)	0.08 KL/SCM	0.15 KL/SCM
Natural Gas (SCM)	110.73KL/MMSCM	93.97 KL/MMSCM

(ii) Raw material consumption

Name of Raw Materials	Name of Products	Consumption of raw material per unit of output	
		During the previous financial year	During the current financial year
There are no raw materials involved in the production of Crude Oil. The well fluids consisting of oil, water and associated gas is extracted from the hydrocarbon subsurface reservoir and flows directly to the Suvali facility for phase separation and processing.		NA	NA

PART - C

POLLUTANTS	QUANTITY OF POLLUTANTS DISCHARGED (MASS/DAY)	CONCENTRATIONS OF POLLUTANTS IN DISCHARGES (MASS / VOLUME)			PERCENTAGE OF VARIATION FROM PRESCRIBED STANDARDS WITH REASONS	
		Parameter	Annual Avg(mg/l)	Prescribed Std.		
Treated Sewage Water	19.03 KLD	TSS (mg/l)	26.75	30	Within the specified limits of GPCB	
		BOD (mg/l)	15.08	20		
		Residual Cl	0.55	>0.5		
Treated Effluent	1122.94 KLD Refer Annexure-2 for Month-wise discharge quantity	Parameter	Annual Avg(mg/l)	Prescribed Std.	Within the specified limits of GPCB.	
		TSS (mg/l)	31	100		
		BOD (mg/l)	23.91	30		
		COD (mg/l)	79	100		
B) Air Emissions from Gas Turbines & DG Sets	Fuel Consumption: Avg Natural Gas consumed for running Gas Turbine Generators & Gas Turbine Compressor, Hot Oil Heater, TEG regenerators etc. = 82349.37 SCM/Day	Name of Source	Quantity of Pollutant (mg/NM ³)			The stack emissions are within the prescribed limits of GPCB.
			PM	SO ₂	NO _x	
		GTG	13.17	5.31	12.07	
		EDG	88.58	27.95	23.17	
		GTC	15.16	7.11	10.51	
		Booster Compressor	15.23	5.7	10.93	
		Hot Oil Heater	16.66	9.02	12.19	
		TEG Regenerator	15.45	7.81	8.96	
GPCB Limit	150	100	50			

**PART - D
HAZARDOUS WASTE**

(As specified under Hazardous & Other Wastes (Management, Handling and Transboundary Movement) Rules 2016)

Hazardous Waste	Total Quantity Generated					
	During the previous financial year			During the current financial year		
a) From Process	Sr. No.	Hazardous Waste Description	Generation Quantity (Kgs/ Liters)	Sr. No.	Hazardous Waste Description	Generation Quantity (Kgs/ Liters)
	1	Waste oil (5.2. Schedule I)	Nil	1	Waste oil (5.2. Schedule I)	27589
	2	Used Oil/ Spent Oil (5.1 Schedule I)	130	2	Used Oil/ Spent Oil (5.1 Schedule I)	Nil
	3	Filters, Liners containing Oil (3.3 Schedule I)	Nil	3	Filters, Liners containing Oil (3.3 Schedule I)	Nil
	4	Oily Soaked Cotton Rags (5.2 Schedule I)	Nil	4	Oily Soaked Cotton Rags (5.2 Schedule I)	Nil
	5	Discarded containers (33.3 Schedule I)	2400	5	Discarded containers (33.3 Schedule I)	Nil
	6	Spent Chemicals (32.1 Schedule I)	8,620	6	Spent Chemicals (32.1 Schedule I)	Nil
	7	Drill Cuttings (2.1 Schedule I)	Nil	7	Drill Cuttings (2.1 Schedule I)	Nil
	8	Drilling Fluid (2.3 Schedule I)	Nil	8	Drilling Fluid (2.3 Schedule I)	Nil
	9	Waste Hot Oil (5.2 Schedule I)	Nil	9	Waste Hot Oil (5.2 Schedule I)	Nil
	10	Expired paint (21.1 Schedule I)	Nil	10	Expired paint (21.1 Schedule I)	Nil
	11	Sludge Generated from ETP Operations	19310 Kgs	11	Sludge Generated from ETP Operations	44130 Kgs
(B) From pollution control facilities	Waste Disposal to Authorized Pre processor.			Waste Disposal to Authorized Pre processor.		
	1.	Sludge Generated from ETP Operations	19310 Kgs	1.	Sludge Generated from ETP Operations	44130 Kgs
(C) From Other sources	NIL			NIL		

PART - E

SOLID WASTE

Solid Waste	Total Quantity	
	During the previous financial year	During the current financial year

Solid Waste	Total Quantity	
	During the previous financial year	During the current financial year
(a) From process	Mentioned in other waste category	Refer Part D for Hazardous Waste and other solid waste mentioned below
(b) From Pollution control facility (STP Sludge)	The Bio-sludge generated is used as manure for greenbelt maintenance.	The Bio-sludge generated is used as manure for greenbelt maintenance.
(C) Other wastes from, Warehouse, Living quarters and plant housekeeping etc.,	950 Kg Non-Hazardous waste	2305 Kg Non-Hazardous waste
(1) Quantity recycled or re-utilized within the unit.	130 L Used Oil reprocessed within the terminal	27589 L Used Oil reprocessed within the terminal
(2) Sold (Waste paper, metal waste, plastic wastes, packaging material, wooden pallets, drinking water bottles etc. are handover to recyclers)	Nil	Nil
(3) Disposed	Segregated solid waste sold to scrap dealers through auction basis time to time.	Segregated solid waste sold to scrap dealers through auction basis time to time.

PART - F

Please specify the characterizations (in terms of composition and quantum) of Hazardous and non-hazardous wastes and indicate disposal practice adopted for both these categories of wastes.

Hazardous Waste: As per Hazardous Waste Authorization. Refer **Annexure-3** for details.

Non-hazardous waste: Domestic waste is generated from the operation and development facilities which mostly consist of bio-degradable organic matter and recyclable wastes. The recyclable waste is handed over to scrap vendor for further recycling process. Food waste is used for composting and manure is being used in green belt development.

PART - G

Impact of the pollution abatement measures taken on conservation of natural resource:

- Sewage Treatment Plant of capacity 30 KLD at Suvali Terminal is operational for the treatment of sewage water.
- Organic Waste Converter for the treatment and conversion of food waste into bio-manure is available.
- Water produced in crude extraction process is treated in Effluent Treatment plant and discharged into the sea as per GPCB Norms.
- The 33.3 ha onshore processing facility at Suvali Terminal handles natural gas and crude oil from the Lakshmi and Gauri fields. Within the terminal, a green belt spans 11.17 ha, accounting for approximately 33.54% of the total area.
- In addition to on-site greening, broader ecological initiatives have been undertaken. In 2012, an MoU was signed with the Gujarat Ecology Commission for the restoration, plantation, and

conservation of mangroves over 50 ha at Karanj Village, Olpad Taluka, Surat district. Further commitments include MoUs with the Gujarat Forest Division—one signed on 20th October 2022 for the development and protection of 60 ha of mangroves along the Surat coastal region, and another on 9th November 2023 for an additional 130 ha of mangrove conservation in the same region.

- More than 27,000 KL of water utilized in the plant has been collected from rainwater harvesting ponds built inside the terminal.

PART - H

Additional measures/investment proposal for environmental protection including abatement/prevention of pollution.

- Fuel control devices are a part of all equipment for fuel conservation.
- Solar panels are installed at the facility to contribute to the overall energy mix.
- Rainwater harvesting facility is built within the terminal to meet 40% of freshwater demand.
- Tree plantation is one of the initiatives taken up by the company regularly.
- All the detergents used at the terminal are bio friendly.
- Oil Spill Response Equipments are available with Organization as per NOSDCP requirements.
- Awareness sessions on environmental topics are conducted regularly for all employees and business partners.
- As part of CSR initiative, Cairn has developed a rainwater harvesting facility for the community.
- The company has stopped the use of Single-use plastic items at its premises and has been certified as **Single-Use Plastic Free Premises** by the Confederation of Indian Industry
- World Environment Day was celebrated on 5th June 2025 with active engagement from employees, business partners and communities.

Date: 17.06.2025

Installation Manager – Suvail
(Samarth Kaji)



ANNEXURE – 1

FRESH WATER CONSUMPTION IN KILOLITERS

FRESH WATER CONSUMPTION (FY 2024-25)							
Month	Service Water (Industrial), m3	Fire Water/RWH (Industrial) (m3)	Gardening Water (Agriculture), m3	Potable Water (Domestic), m3	Total Water Consumed in m3	Production in Th. Tons Production in Th. Tons	Sp. Water m3/Th. Tons
Apr-24	488	0	524	858	1870	29.07	64.32
May-24	727	0	633	954	2313	28.34	81.61
Jun-24	869	0	415	1088	2372	30.56	77.61
Jul-24	725	1035	515	859	3135	38.05	82.39
Aug-24	799	828	500	885	3012	36.54	82.44
Sep-24	929	855	531	1013	3328	35.88	92.74
Oct-24	1029	695	539	1009	3272	36.02	90.83
Nov-24	808	845	532	1027	3212	33.30	96.45
Dec-24	771	486	554	969	2780	36.74	75.66
Jan-25	852	76	426	1148	2502	37.10	67.43
Feb-25	813	589	407	943	2752	42.02	65.48
Mar-25	1012	17	506	1005	2540	45.18	56.22
Total	9822	5425	6083	11757	33087	429	933
Per day	26.91	14.86	16.67	32.21	90.65	1.17	2.56

ANNEXURE – 2

EFFLUENT WASTEWATER QUANTITY IN KILOLITRES

Months	Wastewater
	Treated Effluent (KL)
Apr-24	40841
May-24	40527
Jun-24	36416
Jul-24	36890
Aug-24	36706
Sep-24	42495
Oct-24	43272
Nov-24	25422
Dec-24	26192
Jan-25	27209
Feb-25	23478
Mar-25	30426
Total	409874

ANNEXURE – 3

HAZARDOUS WASTE (FROM PROCESS)

S. No	Hazardous Waste Description	Authorized Quantity	FY 24-25 Generation Quantity (Kgs/ Liters)	FY 24-25 Disposal Quantity (Kgs/ Liters)
1	ETP Waste (34.3 Schedule I)	600 MT/ Year	44.13	44.13
2	Waste oil (Tank bottom oil/ Sludge, oil emulsions) (5.2 Schedule I)	800 MT/Year	27.589	27.589
3	Used Oil/ Spent Oil (5.1 Schedule I)	40 MT/Year	0	0
4	Sludge Filters, Liners containing Oil (35.1 Schedule I)	15 MT/ Year	Nil	Nil
5	Oily Soaked Cotton Rags (Z-41 Schedule I)	6000 Kg/Year	Nil	Nil
6	Discarded containers (33.3 Schedule I)	30000 Kg/ year	Nil	Nil
7	Spent Chemicals (32.1 Schedule I)	40 MT/Year	Nil	Nil
8	Drill Cuttings (2.1 Schedule I)	800 MT/Well	Nil	Nil
9	Drilling Fluid (2.3 Schedule I)	440 MT/Well	Nil	Nil
10	Waste Hot Oil (5.2 Schedule I)	1000 Lit/Year	Nil	Nil
11	Expired paint (21.1 Schedule I)	600 Kg/Year	Nil	Nil

BIO-MEDICAL WASTE

S. No	Waste Description	Characteristics	Authorized Quantity	FY 24-25 Generation Quantity (Kgs)	FY 24-25 Disposal Quantity (Kgs)
1	Yellow Category	Toxic	10 Kg/ Month	19.277	19.277
2	Red Category	Toxic	1 Kg/Month	3.856	3.856
3	White Category	Toxic	10 Kg/Month	1.095	1.095
4	Blue Category	Toxic	1 Kg/Month	0.005	0.005

Marine Offshore **Study Report**

Pre Monsoon: March 2026



Project Proponent

M/s. Vedanta Limited

(Div.: Cairn Oil & Gas), Suvali, Hazira

Sub-Contractor

M/s. Asian Energy Services Ltd.

Study Carried Out by

M/s. Ecosystem Resource Management Pvt. Ltd., Surat

TABLE OF CONTENTS

Sr. No.	Description	Page No.
0	MEMBERS ASSOCIATED WITH THE REPORT	1
1	INTRODUCTION	2
2	SCOPE AND OBJECTIVE	3
3	SAMPLING LOCATIONS, METHODOLOGY OF SAMPLING & ANALYTICAL PROCEDURES	4
A	MARINE WATER	4
3.1	SAMPLING LOCATIONS DETAILS	4
3.2	SAMPLING METHODOLOGY FOR MARINE WATER	5
3.3	METHODOLOGY AND RESULTS FOR PHYSICO-CHEMICAL ANALYSIS	6
3.4	SUMMARY AND INTERPRETATION OF MARINE WATER	12
B	MARINE WATER QUALITY NEAR DISCHARGE POINT	16
3.5	GENERAL DISCUSSION AND INTERPRETATION	18
4	SEDIMENT	18
4.1	SAMPLING METHODOLOGY FOR SEDIMENT AND RESULTS OF ANALYSIS	18
4.2	SUMMARY AND INTERPRETATION	19
5	MARINE ECOLOGY AND BIODIVERSITY	20
5.1	PHYTOPLANKTON	20
5.1.1	METHODOLOGY FOR SAMPLING OF PHYTOPLANKTON	20
5.1.2	METHODOLOGY FOR TESTING OF PIGMENT ANALYSIS AND PHYTOPLANKTON	20
5.1.3	SUMMARY AND INTERPRETATION OF PIGMENT ANALYSIS	21
5.1.4	RESULT OF CELL COUNT, TOTAL GENERA AND MAJOR GENERA - PHYTOPLANKTON	22
5.1.5	DIVERSITY INDEX OF PHYTOPLANKTON	33
5.1.6	SUMMARY AND INTERPRETATION	33
5.2	ZOOPLANKTON	33
5.2.1	METHODOLOGY FOR SAMPLING OF ZOOPLANKTON	33
5.2.2	METHODOLOGY FOR TESTING OF ZOOPLANKTON	34
5.2.3	RESULT OF CELL COUNT, TOTAL GENERA AND MAJOR GENERA - ZOOPLANKTON	34
5.2.4	DIVERSITY INDEX OF ZOOPLANKTON	38
5.2.5	SUMMARY AND INTERPRETATION	38
6	BENTHOS	39
6.1	METHODOLOGY FOR SAMPLING OF SEDIMENT AND BENTHOS	39
6.2	METHODOLOGY FOR TESTING OF BENTHOS	39
6.3	RESULTS OF BENTHOS	39
6.4	SUMMARY AND INTERPRETATION	42
7	FISH SURVEY	42
7.1	QUALITATIVE DATA OF FISHES	42
7.2	FISH TISSUE ANALYSIS	44
7.3	SUMMARY AND INTERPRETATION	44

LIST OF TABLES

Table 2.1: Scope of Work

Table 3.1: Sampling locations with its coordinates

Table 3.2A: Marine Water Analysis

Table 3.2B: Marine Water Analysis

Table 3.3: Summary of Temperature

Table 3.4: Summary of pH

Table 3.5: Summary of Salinity

Table 3.6: Summary of DO

Table 3.7: Summary of Phosphate

Table 3.8: Sampling locations with its coordinates near discharge point

Table 3.9: Analysis of Marine Water near discharge point

Table 4.1: Sediment Analysis

Table 5.1: Pigment Analysis

Table 5.2: Result of cell count, Total genera and Major genera – Phytoplankton Location: LB – 500 m E

Table 5.3: Result of cell count, Total genera and Major genera – Phytoplankton Location: LB – 500 m W

Table 5.4: Result of cell count, Total genera and Major genera - Phytoplankton Location: LB – 1000 m W

Table 5.5: Result of cell count, Total genera and Major genera - Phytoplankton Location: LA – 500 m E

Table 5.6: Result of cell count, Total genera and Major genera - Phytoplankton Location: LA – 500 m W

Table 5.7: Result of cell count, Total genera and Major genera - Phytoplankton Location: LA –1000 m W

Table 5.8: Result of cell count, Total genera and Major genera - Phytoplankton Location: GA – 500 m E

Table 5.9: Result of cell count, Total genera and Major genera - Phytoplankton Location: GA– 500 m W

Table 5.10: Result of cell count, Total genera and Major genera - Phytoplankton Location: GA – 1000 m W

Table 5.11: Result of cell count, Total genera and Major genera - Phytoplankton Location: LB TO GA

Table 5.12: Result of cell count, Total genera and Major genera - Phytoplankton Location: L A TO GA

Table 5.13: Diversity indices of phytoplankton

Table 5.14 Result of cell count, Total genera and Major genera – Zooplankton Location: LB – 500 m E

Table 5.15: Result of cell count, Total genera and Major genera – Zooplankton Location: LB – 500 m W

Table 5.16: Result of cell count, Total genera and Major genera – Zooplankton Location: LB – 1000 m W

Table 5.17: Result of cell count, Total genera and Major genera – Zooplankton Location: LA – 500 m E

Table 5.18: Result of cell count, Total genera and Major genera – Zooplankton Location: LA – 500 m W

Table 5.19: Result of cell count, Total genera and Major genera – Zooplankton Location: LA – 1000 m W

Table 5.20: Result of cell count, Total genera and Major genera – Zooplankton Location: GA – 500 m E

Table 5.21: Result of cell count, Total genera and Major genera – Zooplankton Location: GA – 500 m W

Table 5.22: Result of cell count, Total genera and Major genera – Zooplankton Location: GA – 1000 m W

Table 5.23: Result of cell count, Total genera and Major genera – Zooplankton Location: LB TO GA

Table 5.24: Result of cell count, Total genera and Major genera – Zooplankton Location: LA TO GA

Table 5.25: Diversity indices of Zooplankton

Table 6.1: Macrobenthos

Table 6.2: Meiobenthos

Table 7.1: Qualitative Fish Data

Table 7.2: Results of Fish Tissue Analysis

LIST OF FIGURES

Figure 3.1: Map showing the sampling locations

Figure 3.2: Photographs of Marine Sampling

Figure 3.3: Map showing the sampling locations near discharge point

Figure 5.1: Photographs of Phytoplankton

Figure 5.2 Photographs of Zooplankton

Figure 6.2 Photographs of Benthos

Figure 7.1: Photographs taken during Fish catching

MEMBERS ASSOCIATED WITH THE REPORT

Project Proponent

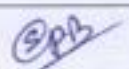
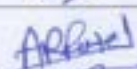

VEDANTA LIMITED-Cairn OIL & GAS OF THE LAKSHMI AND GAURI
OFFSHORE OIL & GAS FIELDS AT GULF OF CAMBAY IN GUJARAT

Team Leader

Mr. Sunilkumar Pandey

Team Members (ERM)

Environmental Monitoring & Data Collection	Team Leader – Sunil Kumar Pandey		
	Team Members	1.	Mr. Bhavesh Patel
	2.	Mr. Krishna Patel	
	3.	Mr. Axay Patel	
Sample Analysis	Biologist	1.	Mr. Sunilkumar Pandey
		2.	Mrs. Hetal Patel
		3.	Mrs. Shraddha Banker

Name		Signature
Prepared by	Shraddha Banker	
Reviewed by	Axay Patel	
Authorized by	Sunil Kumar Pandey	

1. INTRODUCTION:

Vedanta Limited Cairn oil and gas is the operator of the Lakshmi and Gauri offshore oil & gas fields, which are located on the west coast of India in the Gulf of Cambay in Gujarat state. The aforementioned fields are covered in block CB/OS-2 in Cambay offshore Basin.

The existing facilities within the offshore block include Lakshmi fields (LA & LB platforms) and Gauri fields-GA platform; sub-sea pipeline connecting to Suvali Onshore terminal.

Vedanta limited- Cairn Oil & Gas awarded the work of marine study to Ecosystem Resource Management Pvt. Ltd., Surat. Ecosystem Resource Management Pvt. Ltd., Surat is leading consultant in the field of Environmental services, its own full-fledged laboratory to carry out sampling and analysis of Environmental samples. This laboratory is accredited with NABL for chemical and biological scope for sampling and testing for different environmental matrices. It is also recognized by CPCB for the testing of chemical and biological parameters.

2. SCOPE AND OBJECTIVE:

Marine samples were collected in the month of March, 2026 and the scope of study is presented in Table no.2.1.

Table 2.1: Scope of work

Attribute	Sub-attribute	Sampling criteria	
		Specification	Number of locations
Water quality (Physical)	Atmospheric Temperature, Water Temperature, TSS, Turbidity, pH, Salinity	Surface, mid-depth and bottom samples (-13m)	11 locations in 10- 30m water depths
Water quality (Chemical)	Oil & Grease, Dissolved Oxygen (DO), Biochemical Demand (BOD), Hydrocarbons, Inorganic Phosphates, Total Phosphorous, Nitrite Nitrogen, Nitrate Nitrogen, Ammonia Nitrogen, Silicate, Heavy metals (Cadmium, Barium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Zinc, Cobalt) and phenols	Location: 11 locations in a grid pattern covering 3 platforms and marine outfall point	
Biological Characteristics	Chlorophyll-a, Zooplankton, Phytoplankton (biomass and classification up to groups), diversity index. Macro-Benthos (biomass and classification up to groups), diversity index.	Total 11 locations	11 stations for plankton, chlorophyll-a and macro-benthos
Sediment quality	Texture/ grain size, organic carbon, Sulphur, phosphorus, mineral oil, Total Petroleum Hydrocarbons (TPH) and Heavy Metals (aluminum, barium, chromium, manganese, iron, cobalt, nickel, copper, zinc, lead, cadmium and mercury).	Total 11 locations Location: 11 locations in a grid pattern covering the 3 platforms and marine outfall point.	11 locations
Fish tissues	Petroleum Hydrocarbons and Heavy metals (Cadmium, Barium, Chromium, Copper, Iron, Lead, Manganese, Mercury, Nickel, Zinc) in fish tissues	Total 6 locations on 3 varieties of fish. One tissue in each fish.	3 varieties of fish at 4 locations
Wastewater	pH, Temperature, Oil & Grease, Suspended Solids, BOD, COD, Ammonical Nitrogen, Arsenic (as As), Mercury (as Hg), Lead (as Pb), Hexavalent chromium, Total chromium, Copper (as Cu), Zinc (as Zn), Nickel (as Ni), Cyanide (as CN), Fluoride (as F), Sulphide and Phenolic compounds	Total 3 locations in and around the marine outfall point	Three locations Covering top, middle and bottom of the water depths during low tide and high tide.

3. SAMPLING LOCATIONS, METHODOLOGY OF SAMPLING & ANALYTICAL PROCEDURES

A. MARINE WATER

3.1 Sampling Locations Details

Before starting the sampling locations were decided as per its suitability & approachability via tugboat. Samples were collected from 11 locations as per the map shown in figure no. 3.1. and locations are also described in table no.3.1.

Figure No. 3.1 Map showing the sampling locations

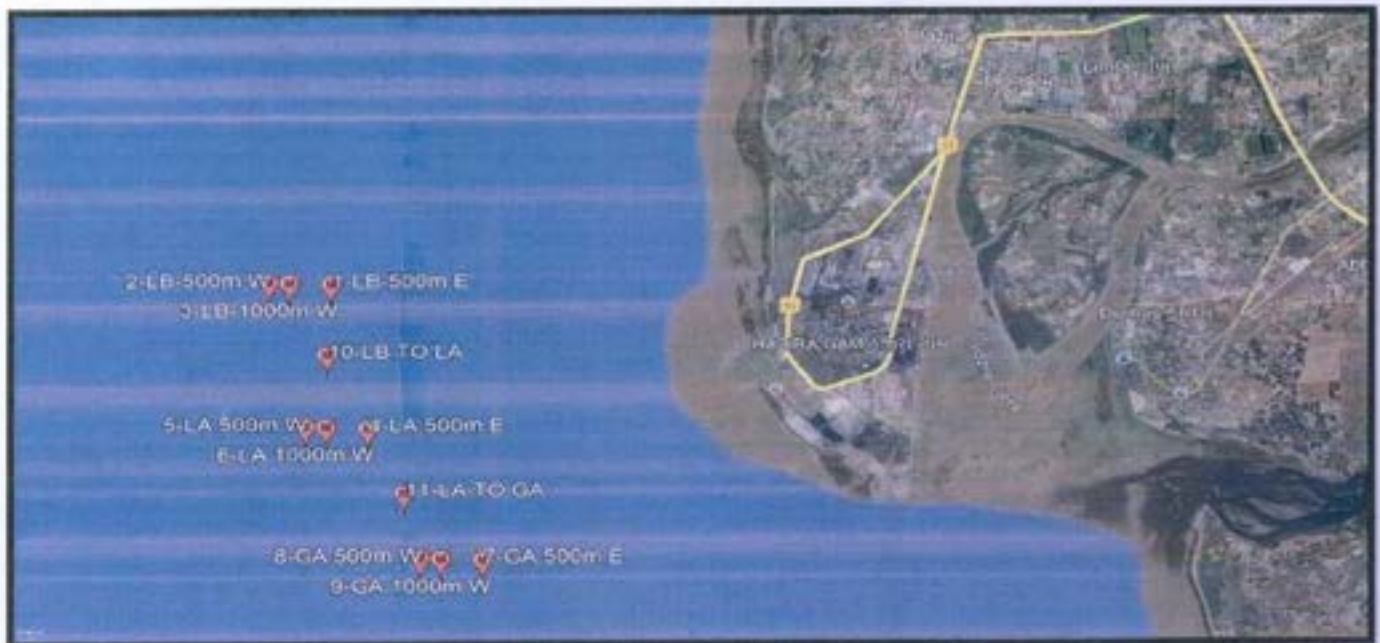


Table No.3.1 - Sampling locations with its coordinates.

Sr. No.	Water depth (m)	Location code.	Geographical Coordinates	
			Latitude	Longitude
1	7	LB – 500 m E	21° 6'12.25"N	72°31'18.86"E
2	16	LB – 500 m W	21° 6'12.25"N	72°30'44.20"E
3	17	LB – 1000 m W	21° 6'12.25"N	72°30'26.94"E
4	10	LA – 500 m E	21° 3'56.25"N	72°31'54.81"E
5	19	LA – 500 m W	21° 3'56.25"N	72°31'20.13"E
6	21	LA – 1000 m W	21° 3'56.25"N	72°31'02.81"E
7	26	GA – 500 m E	21° 1'55.23"N	72°33'34.55"E
8	15	GA – 500 m W	21° 1'55.23"N	72°32'59.84"E
9	19.2	GA – 1000 m W	21° 1'55.23"N	72°32'42.56"E
10	16	LB TO LA	21° 5'04.66"N	72°31'18.28"E
11	14	LA TO GA	21° 2'55.88"N	72°32'27.17"E

3.2 Sampling Methodology for Marine Water

Grab Marine water samples were collected from the surface (<0.5m), Middle (mid of the depth) and bottom (0.5m above bottom layer) of the predetermined locations with the help of Depth (Niskin) sampler. The Niskin bottle sampler is a cylindrical sampler closed with water-tight stoppers on both ends. The stoppers are connected through an elastic band that runs through inside of the sample collection cylinder. The stoppers can be pulled out and locked to the outside of the cylinder, leaving both pipe openings unobstructed. After the sampler has been placed at the pre-determined sampling depth, the lock on the stoppers can be triggered to release, causing the stoppers to close. Trigger the closing mechanism and retrieve the sampler. The collected samples were bifurcated into different containers as per the preservation technique defined for various parameters as per APHA 24th edition 2023.

Preservation was done onsite. DO, Temperature and pH were measured onsite. Samples were packed and labelled appropriately and brought to the laboratory in ice box. Glass bottle sampler was used for the sampling of Oil & Grease and DO.

Sampling photographs are presented in figure no.3.2



Figure No.3.2 Photographs of Marine Sampling

3.3 Methodology and Results for Physico-Chemical Analysis

All the analysis was carried out as per the standard method for the examination of Water & Waste water APHA 24th Edition 2023 and IS 3025. Method detail summary is described as under:

1. Temperature

Calibrated thermometer was used for the onsite measurement of temperature and results were based on the rise of mercury up to the point and recorded in field data sheet.

(Reference of test method: IS 3025 (Part 09) – 1984)

2. pH

pH analysis was carried out with the help of pH meter after attaining the temperature of laboratory just after receiving the sample at the laboratory. Before doing the measurement of pH, Calibration of instrument was done using pH buffer of 7.0, 4.0 and 9.0. After each measurement electrode was washed with distilled water and wiped. After the calibration, standard was checked.

(Reference method: IS 3025 (Part 11) –2022)

3. TSS

The non-filterable residue is determined by passing the sample through a weighed filter and drying the filter at 103°C-105°C in an oven. The increase in the filter weight represents Total Suspended Solids (TSS).

(Reference method: IS 3025 (Part 17): 2022)

4. Salinity as NaCl:

Salinity meter was calibrated before measurement. Salinity was measured by bringing the sample in contact with the electrode.

5. Total Hardness

This method depends on ability of ethylene diamine tetra acetic acid (C₁₀H₁₆O₈N₂) or its disodium salt to form stable complexes with calcium and magnesium ions. When the dye Eriochrome Black T (EBT) (C₂₀H₁₃N₃O₇S) is added to a solution containing calcium and magnesium ions at pH 10.0 a wine red complex is formed. This solution is titrated with standard solution of disodium salt of EDTA, which extracts calcium and magnesium from the dye complex and the dye is changed back to its original blue colour. Eriochrome Black T is used to indicate the end-point for the titration of calcium and magnesium together.

(Reference method: IS: 3025 (Part -21): 2009, Reaffirmed 2019)

6. Calcium as Ca

Take an aliquot of water sample, maximum 50 ml, in a beaker or conical flask. Add 1 N sodium hydroxide solution up to pH 12 to 13. Add approximately 0.1 to 0.2 gm Murexide as an indicator. Titrate with 0.01 M standard EDTA solution. End Point is red to violet.

(Reference method: IS 3025 (Part 40) – 1991)

7. Magnesium as Mg

First of all, total hardness was measured then calcium hardness was measured. Calcium hardness value was subtracted from total hardness value to find out the magnesium hardness. For the determination of magnesium ion, magnesium hardness was multiplied by the 0.243.

(Reference method: IS 3025 (Part 46) – 1991)

8. Total Alkalinity

Alkalinity of water is the capacity of the water to accept protons. It may be defined as the quantitative capacity of an aqueous medium to react with hydrogen ions to pH 8.3 (phenolphthalein alkalinity) then to pH 3.7 total alkalinity or methyl orange alkalinity. Suitable aliquot of the sample is taken in conical flask where 2 to 5 drops of phenolphthalein indicator is added, if it turns pink then titrate against 0.02 N H_2SO_4 till the colour disappears after this methyl orange indicator is added and titrated in the similar way till the colour changes from yellowish to pinkish.

(Reference method was IS: 3025 (Part – 23) – 1986/ Reaffirmed 2019)

9. Sulphate as SO_4

Sulphate ion (SO_4) is precipitated in an acetic acid medium with barium chloride ($BaCl_2$) so as to form barium sulphate ($BaSO_4$) crystals of uniform size. Light absorbance of the $BaSO_4$ suspension is measured by a photometer and the SO_4 concentration is determined by comparison with a standard curve.

(Reference method: APHA 24th Edition - 2023, Part – 4000, Section – 4500 SO_4 -2 E, (Turbidity Method))

10. Total Petroleum Hydrocarbon (TPH)

A liquid liquid extraction chromatographic method was adopted to analyse the TPH.

Reference method was APHA 23rd Edition, Section: 6440 B

11. Phenolic Compound

Most steam distillable phenols react with 4-aminoantipyrine at pH 7.9 ± 0.1 in the presence of potassium ferricyanide to form a coloured antipyrine dye. This absorbance is measured at 500 nm. This method is recommended for concentrations more than 1 mg/l phenol which does not require chloroform extraction technique.

(Reference method was IS 3025 (Part 43/Section 1):2022 (4- Aminoantipyrine method without Chloroform Extraction))

12. Total Phosphorus as PO_4

100 ml of sample was taken and its pH was adjusted with dilute HCl. 4 ml ammonium molybdate reagent and 0.5 ml stannous chloride was added. After 10 minutes and before 12 minutes' colour intensity was measured spectrophotometrically at 690 nm.

(Reference method: IS 3025(Part 31) :1988)

13. Silica as SiO_2

Suitable aliquote of sample was taken and the volume of sample was made up 50 ml with distilled water, where 1 ml 1+1 HCl solution was added and mix thoroughly. Then after 2 ml Ammonium molybdate reagent was added and mix by inverting at least six times and let stand for 5 to 10 min. 2 ml oxalic acid was added and absorbance was measured on spectrophotometer at the wavelength of 410 nm just after 2 minutes but before 15 min.

Reference method was APHA 23rd Edition, Section: 4500 SiO_2 – C (Molybdosilicate Method).

14. DO

Do measurement was done onsite by adopting Azide modification method. DO was collected with the help of DO sampler and the sample was transferred in DO Bottle after taking care that no air bubbles

can enter the DO bottle. The sample was kept for few minutes so that it is stabilized. 1ml of $MnSO_4$ followed by 1 ml Alkali Azide reagent was added in the bottle with the help of pipette inserting the tip below the surface. Brown precipitate arises and it was dissolved with the help of 1ml H_2SO_4 . The precipitates were dissolved. Known volume of sample is taken in another BOD bottle for titration against 0.025 N $Na_2S_2O_3$ solution using starch as an indicator. End point was noted after disappearance of blue colour.

(Reference method: IS 3025 (Part 38) :1989)

15. BOD (3 Days at 27°C)

The biochemical oxygen demand (BOD) test is based on mainly bio-assay procedure which measures the dissolved oxygen consumed by micro-organisms while assimilating and oxidizing the organic matter under aerobic conditions. The standard test condition includes incubating the sample in an air tight bottle, in dark at a specified temperature for specific time.

(Reference method: IS: 3025(Part 44), 1993/Reaffirmed 2019)

16. Ammonia as NH_3-N

Ammonia produces a yellowish- brown coloured compound when reacted with Nessler reagent (K_2HgI_4 or $2KI + HgI_2$) provided the sample is clarified properly. Pre-treatment with $ZnSO_4$ and $NaOH$ precipitates Ca, Fe, Mg, and sulphide, which form turbidity and apparent colour. Addition of EDTA or Rochelle salt solution (before Nessler Reagent) Prevents precipitation of Chlorine and calcium in presence of alkaline Nessler's reagent.

(Reference method: IS 3025 (Part 34) -1988/Reaffirmed 2019 (Nesslerization Method))

17. Heavy Metals (Fe, Zn, Mn, Pb, Cd, Ni, Cr, Cu, Co)

Different standards were prepared using the CRM. Respective hollow cathode lamp was used to determine the respective metal concentration with the help of Atomic Absorption spectrophotometer. Reference method was APHA 23rd Edition, Section: 3111 B

18. Oil and Grease

Dissolved or emulsified oil and grease is extracted from water by intimate contact with hexane and estimation is made gravimetrically. Organic solvents sometimes form emulsions that are difficult to break. This method provides ways of handling such emulsions. Recovery of solvents is also mentioned.

Reference method was IS: 3025 (Part 39)-2021, (Partition Gravimetric Method)

Table 3.2A Marine Water Analysis

No	Parameters	Unit	LB – 500 m E			LB – 500 m W			LB – 1000 m W			LA – 500 m E			LA – 500 m W		
			S	M	B	S	M	B	S	M	B	S	M	B	S	M	B
1	Electrical Conductivity	mS/cm	36.38	36.49	36.67	36.53	36.52	36.44	36.12	36.17	36.21	36.64	36.71	36.74	36.63	36.73	36.77
2	Atmospheric Temperature	°c	32.5			32.0			32.0			32.0			32.5		
3	Water Temperature	°c	28.0	27.5	27.0	28.5	28.0	28.0	29.5	29.0	29.0	28.5	28.0	28.0	28.5	28.0	28.0
4	TSS	mg/l	29	27	30	31	29	32	30	28	32	30	29	31	31	30	32
5	Turbidity	NTU	72	70	68	70	68	67	70	68	67	68	66	64	68	66	62
6	pH	-	7.84	7.82	7.8	7.86	7.84	7.81	7.88	7.86	7.85	8.02	8	7.98	8.12	7.88	7.8
7	Salinity	ppt	31.5	31.9	32.1	30.8	31.4	31.8	32.6	32.9	33.0	33.1	33.3	33.6	31.9	32.5	32.8
8	DO	mg/l	5.5	5.3	5.2	5.4	5.2	5.1	5.4	5.3	5.2	5.4	5.2	5	5.5	5	5.1
9	BOD	mg/l	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
10	Total Petroleum Hydrocarbon	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
11	Oil & Grease	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
12	Inorganic Phosphates	mg/l	0.12	0.14	0.15	0.14	0.15	0.16	0.12	0.12	0.14	0.14	0.15	0.16	0.12	0.14	0.15
13	Total Phosphorous	mg/l	0.16	0.17	0.18	0.17	0.18	0.19	0.18	0.16	0.19	0.2	0.19	0.21	0.19	0.21	0.2
14	Nitrite Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
15	Nitrate Nitrogen	mg/l	3.2	3.0	2.8	3	2.9	2.7	3	3	2.8	2.8	2.7	2.5	3	2.8	2.6
16	Ammonia Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
17	Sulphates	mg/l	1250	1254	1260	1252	1255	1256	1240	1250	1254	1260	1262	1266	1262	1262	1266
18	Silicate	mg/l	12	14	15	11	12	14	14	15	16	12	14	16	14	15	17
19	Cadmium as Cd	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Barium as Ba	mg/l	0.021	0.019	0.025	0.018	0.021	0.024	0.020	0.012	0.020	0.025	0.024	0.019	0.015	0.018	0.017

21	Chromium as Cr	mg/l	0.02	0.02	0.03	0.02	0.03	0.04	0.02	0.03	0.03	0.02	0.02	0.03	0.01	0.02	0.03
22	Copper as Cu	mg/l	<0.05	0.058	<0.05	<0.05	<0.05	0.072	0.076	<0.05	0.056	0.071	<0.05	<0.05	0.066	<0.05	<0.05
23	Iron as Fe	mg/l	0.12	0.14	0.15	0.11	0.12	0.14	0.1	0.12	0.12	0.09	0.1	0.12	0.1	0.12	0.14
24	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Mercury as Hg	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
27	Nickel as Ni	mg/l	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
28	Zinc as Zn	mg/l	0.075	0.150	0.075	0.070	0.120	0.062	0.160	0.110	0.062	0.071	0.067	0.170	0.078	0.150	0.080
29	Cobalt as Co	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
30	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

Table 3.2B Marine Water Analysis

No	Parameters	Unit	LA – 1000 m W			GA – 500 m E			GA – 500 m W			GA – 1000 m W			LB TO LA			LA TO GA		
			S	M	B	S	M	B	S	M	B	S	M	B	S	M	B	S	M	B
1	Electrical Conductivity	mS/cm	36.66	36.71	36.78	36.37	36.41	36.47	36.78	36.67	36.61	36.78	36.81	36.88	37.25	37.36	37.48	36.95	37.07	37.14
2	Atmospheric Temperature	oc	32.0			32.5			32.5			32.0			32.0			32.0		
3	Water Temperature	oc	28.5	28.0	28.0	29.0	28.5	28.5	28.0	27.5	27.5	28.0	27.5	27.0	28.0	27.5	27.5	28.0	28.0	27.5
4	TSS	mg/l	30	29	31	30	28	33	31	29	32	29	27	32	31	30	33	31	30	32
5	Turbidity	NTU	72	70	68	78	76	75	72	70	68	76	72	74	82	70	69	75	74	72
6	pH	-	8.18	8.02	7.89	8.06	8.03	7.9	8.18	8.08	8.01	8.2	7.98	7.88	8.14	7.9	7.82	8.12	8.0	7.86
7	Salinity	ppt	31.3	31.6	31.8	32.5	32.8	32.9	30.6	31.1	31.5	32.6	32.9	33.2	32.1	32.7	33.0	32.6	33.1	33.5
8	DO	mg/l	5.6	5.4	5.2	5.2	5.0	4.9	5.3	5.2	5.1	5.0	4.9	4.7	5.4	5.2	5.1	5.4	5.2	5.0
9	BOD	mg/l	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2	<2
10	Total Petroleum Hydrocarbon	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1

11	Oil & Grease	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
12	Inorganic Phosphates	mg/l	0.16	0.18	0.19	0.12	0.14	0.16	0.2	0.23	0.24	0.19	0.2	0.22	0.18	0.2	0.21	0.2	0.23	0.24
13	Total Phosphorous	mg/l	0.2	0.21	0.23	0.18	0.2	0.22	0.24	0.26	0.27	0.26	0.28	0.3	0.25	0.26	0.27	0.28	0.29	0.3
14	Nitrite Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
15	Nitrate Nitrogen	mg/l	2.6	2.4	2.2	2.8	2.7	2.6	3.0	2.8	2.7	3.0	2.9	2.8	3.4	3.2	3.0	3.1	3.0	2.8
16	Ammonia Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
17	Sulphates	mg/l	1260	1262	1270	1250	1254	1258	1258	1260	1262	1264	1268	1270	1280	1284	1288	1270	1274	1276
18	Silicate	mg/l	16	17	18	15	16	18	16	17	18	18	19	20	17	18	19	18	20	21
19	Cadmium as Cd	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
20	Barium as Ba	mg/l	0.017	0.021	0.012	0.023	0.016	0.029	0.018	0.025	0.019	0.032	0.031	0.023	0.015	0.014	0.017	0.015	0.014	0.018
21	Chromium as Cr	mg/l	0.02	0.03	0.03	0.02	0.03	0.04	0.03	0.03	0.04	0.02	0.03	0.04	0.01	0.02	0.03	0.02	0.03	0.03
22	Copper as Cu	mg/l	0.091	0.058	<0.05	0.081	0.067	<0.05	0.038	<0.05	0.068	0.071	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05	<0.05
23	Iron as Fe	mg/l	0.09	0.11	0.02	0.1	0.12	0.14	0.10	0.11	0.12	0.12	0.14	0.15	0.09	0.10	0.12	0.09	0.10	0.12
24	Lead as Pb	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Manganese as Mn	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Mercury as Hg	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
27	Nickel as Ni	mg/l	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
28	Zinc as Zn	mg/l	0.081	0.180	0.081	0.071	0.190	0.072	0.075	0.170	0.160	0.120	0.140	0.180	0.150	0.067	0.085	0.180	0.072	0.15
29	Cobalt as Co	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
30	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

3.4 Summary and Interpretation

1. Temperature:

Temperature is an important parameter that influences chemical processes such as adsorption, emulsification, flocculation and dissolution, during these chemical reactions, energy is released and the temperature of water body changes. These changes directly or indirectly impact on aquatic life. Water temperature also plays an important role in regulating the species distribution and their composition because of activity of aquatic life is associated with these phenomena. Generally, the temperature of uncontaminated water remains slightly low. Higher temperature than ambient air temperature indicates towards the contamination and above said reactions.

During the observation, it was found that temperature of the stated study zones is varied in a narrow range in accordance with ambient air quality temperature. Minimum Maximum and Average value are tabulated in following **Table. 3.3**

Locations	Minimum Temperature (°C)	Maximum Temperature (°C)	Average Temperature (°C)
LB – 500 m E	27.0	28.0	27.5
LB – 500 m W	28.0	28.5	28.3
LB – 1000 m W	29.0	29.5	29.3
LA – 500 m E	28.0	28.5	28.3
LA – 500 m W	28.0	28.5	28.3
LA – 1000 m W	28.0	28.5	28.3
GA – 500 m E	28.5	29.0	28.8
GA – 500 m W	27.5	28.0	27.8
GA – 1000 m W	27.0	28.0	27.5
LB TO LA	27.5	28.0	27.8
LA TO GA	27.5	28.0	27.8

General Discussion on Available Data:

Ambient temperature was recorded in the range 32.0°C to 32.5°C and marine water temperature was recorded 27°C to 29°C. Marine water temperature is below the ambient temperature. The temperature variation is in narrow range.

Interpretation:

Based on above data and general discussion, it is interpreted that there is no exothermic reaction occurring in the studied location and the environmental condition is favorable for the growth of marine life by regulating its metabolic activities.

2. pH

pH is the measure of hydrogen ion activity in any solvent. The basic principle of the pH measurement is the determination of activity of hydrogen ions by potentiometric measurement. The principle system that regulates pH in sea water is the Carbonate consisting of CO₂, H₂CO₃, HCO₃ and CO₃, salt content and alkalinity due to Borates. Generally, the pH of sea water changes in a limited variation from 7.8 to 8.3. Data obtained during the survey are summarized under the **Table No. 3.4**

Locations	Minimum pH (pH units)	Maximum pH (pH units)	Average pH (pH units)
LB – 500 m E	7.80	7.84	7.82
LB – 500 m W	7.81	7.86	7.83
LB – 1000 m W	7.85	7.88	7.86
LA – 500 m E	7.98	8.12	8.05
LA – 500 m W	7.80	8.12	7.96
LA – 1000 m W	7.89	8.18	8.03
GA – 500 m E	7.90	8.06	7.98
GA – 500 m W	8.00	8.18	8.09
GA – 1000 m W	7.88	8.20	8.04
LB TO LA	7.82	8.14	7.98
LA TO GA	7.86	8.12	7.99

General Discussion on Available Data:

pH also plays the role in dissociation of weak acids and bases which enhance the toxicity of some contaminants such as HCN and H₂S etc. Changes in equilibrium of ionic species may change NH₃ to NH₄ which can enhance the toxicity at higher pH. High pH may be a cause to associate the metallic compounds in water, SS and changes in pH of sediment. pH variation in water bodies is in very narrow range. pH has been recorded in the range 8.0 to 8.3 which can be considered quite good.

Summary and Interpretation:

During the pH analysis average pH was recorded in the range of 7.82 to 8.09. This indicates that pH is varying in narrow range. pH values are in the desired range of pH i.e. 7.8 to 8.3 and it indicates that there is neither the effect due to release of anthropogenic discharges nor any degree of dissociation of weak acids and bases enhancing the toxicity.

3. Salinity

Salinity is the saltiness or amount of salt dissolved in a marine water body. This is usually expressed in ppt. Concentration of salinity depends on evaporation and precipitation altogether with the addition of fresh water. Salinity is an important factor in determining many aspects of the chemistry of natural waters and of biological processes within it, and is a thermodynamic state variable that, along with temperature and pressure, governs physical characteristics like the density and heat capacity of the water.

Biological organisms adapt to the salinity of water in that area and a variation in salinity can be harmful to the bio diversity in that area. Generally, the marine water salinity is considered to be around 32 to 35.5 and varies from season to season.

Data obtained during the survey are summarized under the **Table No. 3.5**

Locations	Minimum Salinity (ppt)	Maximum Salinity (ppt)	Average Salinity (ppt)
LB – 500 m E	31.5	32.1	31.8
LB – 500 m W	30.8	31.8	31.3
LB – 1000 m W	32.6	33.0	32.8
LA – 500 m E	33.1	33.6	33.4

LA – 500 m W	31.9	32.8	32.4
LA – 1000 m W	31.3	31.8	31.6
GA – 500 m E	32.5	32.9	32.7
GA – 500 m W	30.6	31.5	31.1
GA – 1000 m W	32.6	33.2	32.9
LB TO LA	32.1	33.0	32.6
LA TO GA	32.6	33.5	33.1

General Discussion on Available Data:

Average salinity varies from 31.1 to 33.4 which is in the expected range i.e. from 32 to 35 ppt.

Summary and Interpretation:

Salinity varies from 30.6 to 33.6 ppt. Presence of salinity in surface, middle and bottom are almost following the similar trend. It shows that mixing capacity of water is sufficient due to high current of water. Data of salinity are within the desired range and it shows towards the natural property of marine water body.

4. Dissolved Oxygen (DO)

DO measures are vital for maintaining aerobic conditions in water bodies to maintain the respiratory demand of aquatic life. Generally, DO is the characteristic of the water body which indicate towards the probability of organic matter in water as well as dissolution of salt in water. Temperature is also one of the factors which affect the level of DO in water body. The minimum requirement of DO in water for the survival of many of aquatic life is more than 2mg/L and some specific organisms cannot survive under DO level of 4mg/L.

Data obtained during the survey are summarized under the **Table No. 3.6**

Locations	Minimum DO (mg/L)	Maximum DO (mg/L)	Average DO (mg/L)
LB – 500 m E	5.2	5.5	5.3
LB – 500 m W	5.1	5.4	5.2
LB – 1000 m W	5.2	5.4	5.3
LA – 500 m E	5.0	5.4	5.2
LA – 500 m W	5.0	5.5	5.2
LA – 1000 m W	5.2	5.6	5.4
GA – 500 m E	4.9	5.2	5.0
GA – 500 m W	5.1	5.3	5.2
GA – 1000 m W	4.7	5.0	4.8
LB TO LA	5.1	5.4	5.2
LA TO GA	5.0	5.4	5.2

General Discussion on Available Data:

DO also helps in degrading the organic matter and reducing the BOD. Higher DO level of DO facilitates better metabolic activity of aquatic life thereby increase in reproduction of aquatic life.

Summary and Interpretation:

During the analysis it was found that average DO is varying from 4.8 to 5.4 mg/L which is quite good for the survival of aquatic life. This DO can be considered on higher side which means there is very less probability of organic contamination in water and less BOD.

4. Inorganic Phosphate as PO₄

Phosphate covers under the nonmetallic parameter but it acts as nutrient for phytoplanktons. Excess concentration of phosphorus may create the eutrophication in water body. Concentration up to 0.01 mg/L phosphorus is considered acceptable but greater than this value considered excessive.

Data obtained during the survey are summarized under the **Table No 3.7**

Locations	Minimum Phosphate (mg/L)	Maximum Phosphate (mg/L)	Average Phosphate (mg/L)
LB – 500 m E	0.12	0.15	0.13
LB – 500 m W	0.15	0.16	0.15
LB – 1000 m W	0.12	0.14	0.13
LA – 500 m E	0.14	0.16	0.15
LA – 500 m W	0.12	0.15	0.13
LA – 1000 m W	0.16	0.19	0.17
GA – 500 m E	0.12	0.16	0.14
GA – 500 m W	0.20	0.24	0.22
GA – 1000 m W	0.19	0.22	0.20
LB TO LA	0.18	0.21	0.19
LA TO GA	0.20	0.24	0.22

General Discussion on Available Data:

Phosphorus is an important parameter with respect to nutritional requirement of plant.

Excess phosphorus may contribute in creating the eutrophic condition in marine water body. Excess phytoplankton and weeds growth may cause death and decay of the same as a result BOD may increase in water body and DO level may reduce.

Summary and Interpretation:

During the survey phosphorus content was found in the range of 0.12 mg/L to 0.24 mg/L and the average concentration from 0.13 to 0.22 mg/L. The content of phosphorus can be considered slightly higher side.

5. Total Petroleum Hydrocarbon

The hydrocarbons are also produced by microbes and they come in water body in trace amounts. Several TPH are discharged by the industries and they also come during the transportation of crude oil and its products due to leakage. Prominent land based sources are domestic, industrial effluent and atmospheric fall out of fuel combustion products condensed vapors. TPH consists of several Hydrocarbons. They are saturated, Unsaturated, aliphatic, one ring, poly aromatic, fused aromatic, alicyclic or naphthenic hydrocarbons having a wide range of boiling points. After reaching in marine environment, PHC is processed through several weathering process and it gets distributed in water column. These PHCs are

absorbed on suspended particles and settles down as sediment.

General Discussion on Available Data:

Total Petroleum hydrocarbon may create toxicity after reaching in water body PHC is processed through several weathering process and gets distributed in water column.

Summary & Interpretation

During the survey, the concentration of TPH was recorded below the detection limit.

6. Heavy Metals:

Analysis has been also conducted for heavy metal parameters and they have been found below the detection range, which indicate that there is not any contamination of heavy metals in marine water body.

B. Marine Water Quality Near Discharge Point

Marine water samples have been collected from 3 different locations during low tide and high tide to assess the variation in marine water characteristics. All the samples have been collected from surface, middle and bottom. Sampling and analysis methodology has been adopted as per the techniques described for marine water sampling.

Marine sampling locations near discharge point are presented in figure no.3.3 and Table no.3.8. Results are presented in Table no.3.9

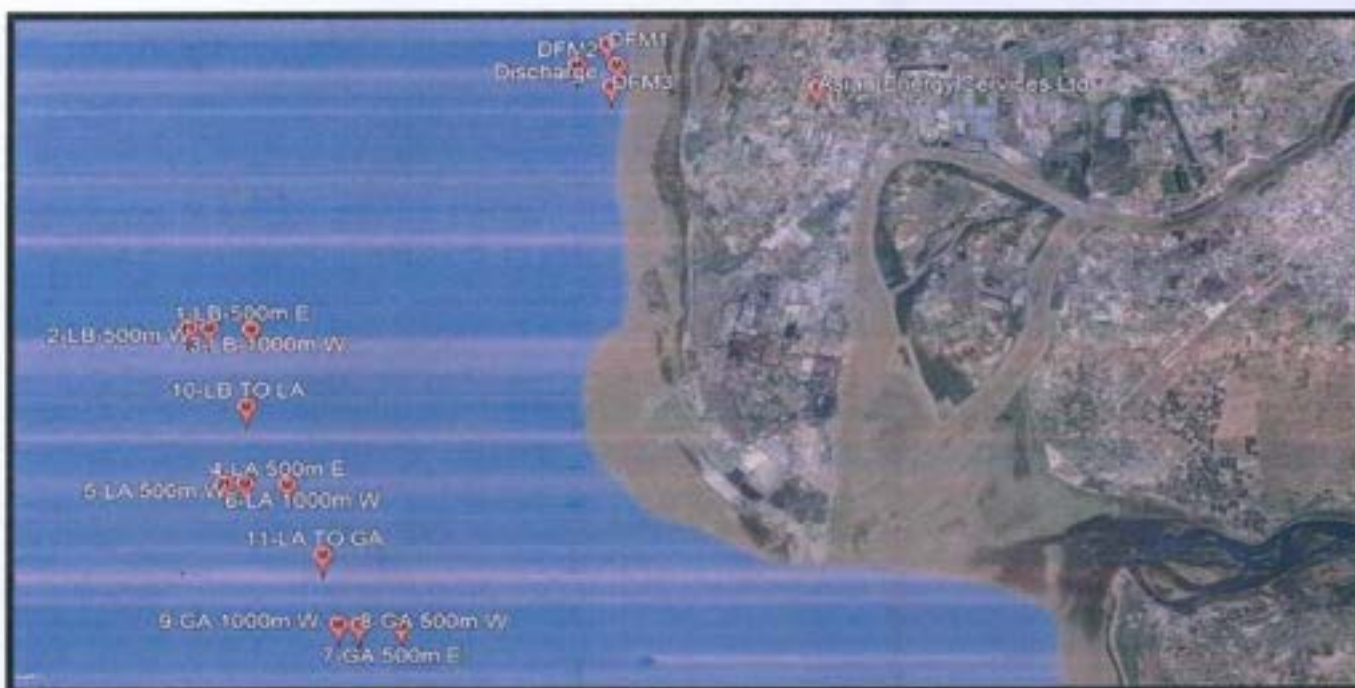


Figure No. 3.3 Map showing the sampling locations near discharge point

Table No. 3.8- Sampling locations with its coordinates near discharge point

Locations	Latitude	Longitude
DFM1	21°10'34.75"N	72°36'5.28"E
DFM2	21°10'14.80"N	72°35'40.36"E
DFM3	21° 9'57.64"N	72°36'9.87"E

Table 3.9 Analysis of Marine Water near discharge point.

Sr. No	Parameters	Unit	DFM1		DFM2		DFM3	
			HT	LT	HT	LT	HT	LT
1	Electrical Conductivity	mS/cm	34.89	34.2	35.17	34.83	35.61	35.11
2	Atmospheric Temperature	°C	32.0		32.0		33.0	
3	Water Temperature	°C	28.0	28.0	28.5	28.0	27.5	27.5
4	TSS	mg/l	38	32	34	32	34	36
5	Turbidity	NTU	62	58	60	54	64	60
6	pH	-	7.88	8.02	7.78	7.96	8.04	8.11
7	Salinity	ppt	32.5	31.8	33.1	32.6	31.8	30.4
8	DO	mg/l	5.1	4.9	5.0	4.6	4.9	4.7
9	BOD	mg/l	<2	<2	<2	<2	<2	<2
10	Hydrocarbon	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
11	Inorganic Phosphates	mg/l	0.142	0.131	0.187	0.174	0.212	0.194
12	Total Phosphorous	mg/l	0.23	0.21	0.29	0.23	0.26	0.25
13	Nitrite Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
14	Nitrate Nitrogen	mg/l	1.7	1.3	1.5	1.2	1.4	1.1
15	Ammonia Nitrogen	mg/l	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
16	Sulphates	mg/l	1170	1120	1210	1160	1250	1190
17	Silicate	mg/l	12	14	16	14	15	12
18	Cadmium	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
19	Barium	mg/l	0.011	0.014	0.019	0.021	0.016	0.012
20	Chromium	mg/l	0.02	0.03	0.03	0.03	0.02	0.02
21	Copper	mg/l	<0.05	<0.05	<0.05	<0.05	0.059	<0.05
22	Iron	mg/l	0.118	0.104	0.126	0.112	0.114	0.097
23	Lead	mg/l	<0.01	<0.01	0.02	0.01	0.02	<0.01
24	Manganese	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
25	Mercury	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
26	Nickel	mg/l	<0.3	<0.3	<0.3	<0.3	<0.3	<0.3
27	Zinc	mg/l	0.062	0.076	0.110	0.098	0.114	0.096
28	Cobalt	mg/l	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
29	Phenolic Compounds	mg/l	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

3.5 General discussion and Interpretation

1. **pH (7.88 to 8.11):** The pH range indicates that pH is almost near to the results of marine water sample collected from other marine locations, it indicates that there is no impact on pH of marine water body due to effluent discharge.
2. **Salinity (30.4 ppt to 33.1 ppt):** The salinity values fall within the range of 30.4 ppt to 33.1 ppt which are quite similar to marine water sample collected from other marine locations.
3. **TSS (Total Suspended Solids) – 32 mg/L to 36 mg/L:** The TSS levels are slightly higher compared to other locations, which might suggest some local turbidity or sedimentation, potentially due to nearby discharge point.
4. **DO (Dissolved Oxygen) – 4.6 mg/L to 5.1 mg/L:** Dissolved oxygen values are slightly lower side compare to other marine locations, this impact may be due to industrial discharge. Reported DO level is Quite sufficient for aquatic life survival.
5. There is no observed impact on Biochemical Oxygen Demand (BOD) (<2.0) and phosphorus levels. This suggests that the discharge might not be introducing significant organic material or nutrients, which would otherwise increase BOD or phosphorus in the water.

Based on above discussion and comparison of data with the results of other marine water locations, it is interpreted that impact on marine water body near discharge point is not more than its self-purification capacity as waste water is discharge through the closed- loop. Results are also showing that water dispersion is being happened in adequate way. DO and BOD data are following the trend of uncontaminated sea water characteristics. It also states that there is no marine life threat due to disposal of effluent through closed loop pipeline. There was no evidence of death and decay of marine life neither near platforms nor around the discharge point during the survey. No cold or hot flaring was seen during the survey. Results of oil and Grease are almost nil as they have been reported as below detection limit.

4. SEDIMENT

4.1 Sampling Methodology for Sediment and Results of Analysis

Sediment sampling was carried out with the help of Van Veen Grab sediment sampler. Sampling was conducted for 11 nos. of locations. 50% Sample quantity was passed through a series of sieves for the purpose to separate out macro benthos. Organisms retained on upper sieves were separated with the help of forceps and spatula and transferred in dish for identification purpose.

Remaining 50% unsieved sample was brought for the sediment analysis of texture class (sand, silt, clay), nutrient parameter and heavy metal parameters. Analysis for texture class was carried out as per methods manual, soil testing in India, Dept. of Agriculture and Cooperation and heavy metal analysis was carried out as per USEPA (Digestion) & testing using AAS as per APHA 24th Edition 2023. Phosphorus analysis was carried out as per Methods manual, soil testing in India, Dept. of Agriculture and Cooperation and organic carbon as per IS 2720 (Part 22) section 1. Test Report is presented in Table 4.1

Table 4.1 Sediment Analysis

No	Parameter	Unit	LB- 500 m E	LB- 500 m W	LB- 1000 m W	LA- 500 m E	LA- 500 m W	LA- 1000 m W	GA- 500 m E	GA- 500 m W	GA- 1000 m W	LB TO LA	LA TO GA
1	Organic Carbon (OC)	%	0.38	0.50	0.42	0.46	0.51	0.44	0.38	0.37	0.38	0.42	0.45
2	Phosphorus	mg/kg	125.4	136.5	119.8	130.6	150.5	145.2	123.5	126.9	137.9	142.3	135.6
3	Zinc (as Zn)	mg/kg	35.2	38.6	41.2	39.5	40.7	33.5	38.70	42.5	41.7	43.7	40.5
4	Copper (as Cu)	mg/kg	21.4	22.5	20.8	23.4	25	26.3	24.70	22.8	22.4	26.7	24.8
5	Manganese (as Mn)	mg/kg	4.20	3.88	3.95	4.36	4.56	5.05	4.12	3.87	5.02	4.87	3.82
6	Cobalt (as Co)	mg/kg	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0	<1.0
7	Lead (as Pb)	mg/kg	8.6	10.2	14.2	13.2	7.8	8.1	11.70	12.1	13.1	14.3	11.1
8	Cadmium (as Cd)	mg/kg	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5	<5
9	Nickel (as Ni)	mg/kg	12.4	11.5	13.2	10.5	11.7	12.2	13.5	11.8	12.4	13.7	10.5
10	Mercury (as Hg)	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
11	Sulphur	%	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
12	T.Chromium (as Cr+6)	mg/kg	25.06	22.35	25.62	30.15	20.04	20.15	26.79	18.88	24.76	20.26	27.52
13	Iron (as Fe)	%	1.13	1.02	1.12	1.00	1.19	1.11	1.08	1.18	1.05	0.99	1.09
14	Barium	mg/kg	23.7	20.8	25.3	28.4	20.7	18.2	21.5	23.4	25.1	20.8	25.7
15	Total Petroleum Hydrocarbon	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
16	Mineral Oil	mg/kg	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1	<0.1
17	Total Aluminium (as Al)	%	0.81	0.74	0.80	0.79	0.80	0.77	0.70	0.83	0.70	0.74	0.82
18	Particle Size												
A	Sand	%	52.0	50.7	49.9	56.8	48.5	54.2	55.1	50.3	54.5	57.3	52.4
B	Silt	%	21.8	23.5	26.5	23.9	26.4	20.2	22.3	26.0	24.8	18.1	22.3
C	Clay	%	26.2	25.8	23.6	19.3	25.1	25.6	22.6	23.7	20.7	24.6	25.3

4.2 Summary and Interpretation

Zinc was recorded in the range from 33.5 to 43.7 mg/kg with minimum at location SD6 and maximum at SD10. Mercury was found below the detection limit. It indicates that the bottom of the studied locations is

not impacted due to any oil leakage. Other heavy metals have been recorded almost in their natural range for sandy clay soils.

Phosphorus content has been recorded in the range 119.8 to 150.5 mg/kg. This can be considered very high as it is >60.0 mg/kg. This may cause eutrophication in water body. Texture class of studied locations is sandy clay loam.

Concentration of Total Petroleum Hydrocarbon (TPH) has been found below detectable limits (BDL) for all locations. It also indicates that there is no oil contamination.

Total organic carbon has been found in the range 0.37% to 0.51%. This can be considered low to moderate range in sediment as per Agriculture department of India. There is no evidence of oil deposition on sediment as results of TPH is below detection limit.

5. MARINE ECOLOGY AND BIODIVERSITY

The biological parameters considered in the present study are abundance of phytoplankton, abundance of zooplankton and macrobenthic population. Phytoplankton and zooplankton reflect the productivity of a water column at primary and secondary levels. Benthic organisms being associated with the seabed, provide information regarding the integrated effects of stress due to disturbances, if any, and hence are good indicators of early warning of potential damage.

5.1 PHYTOPLAKTON

5.1.1 Methodology for Sampling of Phytoplankton

Phytoplankton samples were collected using phytoplankton net. Known volume of water sample was passed through the phytoplankton net (55 mesh size) and collected in 100 ml measuring cylinder attached to the net and this sample was transferred in polyethylene bottle after washing the sides of net with distilled water. Onsite preservation was done with Lugol's solution at the rate 0.3 ml/100 ml. Sample was stored in dark condition. Sample was labeled with necessary details and brought to the laboratory for testing.

5.1.2 Methodology for Testing of Pigment Analysis and Phytoplankton

Pigments: A known volume of water was filtered through a 0.45µm membrane filter paper and extracted in 90% acetone overnight at 5°C in dark. For the estimation of chlorophyll a and phaeophytin, the extinction of the acetone extract was measured at 665 and 750 nm using a spectrophotometer before and after treatment with dilute acid respectively.

Population: Samples for cell count were preserved in lugol – Iodine solution. Enumeration and identification of planktons were done under a microscope and using Sedgewick - Rafter slide. The total number of Phytoplankton present in 1 liter of water sample was calculated using the following formula.

$$N = n.v.1000 / V$$

Where,

N = Total number in L

n = Average number of Phytoplankton cell in 1 ml of sample

v = volume of Phytoplankton concentrates in ml

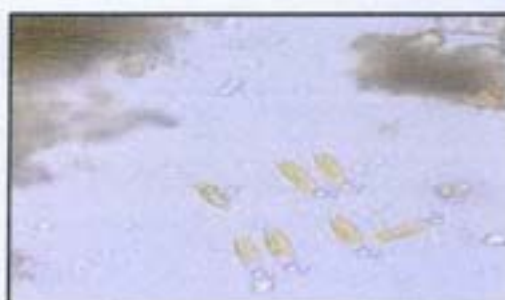
V = Total water filtered in L



Oscillatoria



Ceratium sp.



Diatoms

Figure No. 5.1 Photographs of Phytoplanktons

Table 5.1 Pigment Analysis

Sr. No	Location Code	Chlorophyll – a, mg/m ³	Pheophytin mg/m ³
1	LB – 500 m E	0.71	0.11
2	LB – 500 m W	0.89	0.22
3	LB – 1000 m W	0.92	0.21
4	LA – 500 m E	1.22	0.45
5	LA – 500 m W	0.89	0.14
6	LA – 1000 m W	0.71	0.11
7	GA – 500 m E	0.89	0.34
8	GA – 500 m W	0.97	0.28
9	GA – 1000 m W	0.78	0.21
10	LB TO LA	0.53	0.18
11	LA TO GA	1.08	0.54

5.1.3 Summary and Interpretation of Pigment Analysis

Chlorophyll – a was recorded in the range of 0.71 to 1.22 mg/m³ with minimum at location LB – 500 m E and LA – 1000 m W and maximum at location LA – 500 m E. Pheophytin was also measured and it was recorded in the range of 0.11 to 0.54 mg/m³ with minimum at locations LB – 500 m E and LA – 1000 m W and maximum at Location LA TO GA.

5.1.4 Result of cell count, Total genera and Major genera - Phytoplankton

Table 5.2 Location: LB – 500 m E

Sr. No.	Cell Count No. /L	Total Genera	Major Genera Observed	Total Species	Percentage Composition (%)
Bacillariophyceae					
1	80	9	<i>Planktoniella sp.</i>	12	5.56
2	120		<i>Coscinodiscus sp.</i>		8.33
3	150		<i>Nitzschia sp.</i>		10.42
4	60		<i>Biddulphia sp.</i>		4.17
5	190		<i>Chaetoceros sp.</i>		13.19
6	70		<i>Navicula sp.</i>		4.86
7	240		<i>Skeletonema sp.</i>		16.67
8	100		<i>Thalassionema sp.</i>		6.94
	1010				70.14
Chlorophyceae					
9	30	3	<i>Pediastrum sp.</i>	4	2.08
10	20		<i>Chlamydomonas sp.</i>		1.39
	50				3.47
Dinophyceae					
11	100	4	<i>Ceratium sp.</i>	6	6.94
12	70		<i>Peridinium sp.</i>		4.86
13	60		<i>Prorocentrum sp.</i>		4.17
	230				15.97
Cyanophyceae					
14	90	2	<i>Oscillatoria sp.</i>	3	6.25
15	60		<i>Trichodesmium sp.</i>		4.17
	150				10.42
Total	1440	18		25	100

Table 5.3 Location: LB – 500 m W

Sr. No.	Cell Count No. /L	Total Genera	Major Genera Observed	Total Species	Percentage Compoition (%)
Bacillariophyceae					
1	110	11	<i>Planktoniella sp.</i>	14	6.92
2	210		<i>Coscinodiscus sp.</i>		13.21
3	180		<i>Nitzschia sp.</i>		11.32
4	80		<i>Biddulphia sp.</i>		5.03
5	190		<i>Chaetoceros sp.</i>		11.95
6	140		<i>Navicula sp.</i>		8.81
7	150		<i>Skeletonema sp.</i>		9.43
8	70		<i>Thalassionema sp.</i>		4.40
	1130				71.07
Chlorophyceae					
9	40	3	<i>Pediastrum sp.</i>	4	2.52
10	50		<i>Chlamydomonas sp</i>		3.14
	90				5.66
Dinophyceae					
11	100	4	<i>Ceratium sp.</i>	6	6.29
12	90		<i>Peridinium sp.</i>		5.66
13	50		<i>Prorocentrum sp.</i>		3.14
	240				15.09
Cyanophyceae					
14	80	2	<i>Oscillatoria sp.</i>	2	5.03
15	50		<i>Trichodesmium sp.</i>		3.14
	130				8.18
Total	1590	20		26	100

Table 5.4 Location: LB – 1000 m W

Sr. No.	Cell Count No. /L	Total Genera	Major Genera Observed	Total Species	Percentage Composition (%)
Bacillariophyceae					
1	40	8	<i>Planktoniella sp.</i>	11	3.48
2	120		<i>Coscinodiscus sp.</i>		10.43
3	280		<i>Nitzschia sp.</i>		24.35
4	0		<i>Biddulphia sp.</i>		0.00
5	140		<i>Chaetoceros sp.</i>		12.17
6	170		<i>Navicula sp.</i>		14.78
7	100		<i>Skeletonema sp.</i>		8.70
8	0		<i>Thalassionema sp.</i>		0.00
	850				73.91
Chlorophyceae					
9	0	1	<i>Pediastrum sp.</i>	2	0.00
10	30		<i>Chlamydomonas sp.</i>		2.61
	30				2.61
Dinophyceae					
11	120	2	<i>Ceratium sp.</i>	3	10.43
12	40		<i>Peridinium sp.</i>		3.48
13	0		<i>Prorocentrum sp.</i>		0.00
	160				13.91
Cyanophyceae					
14	60	2	<i>Oscillatoria sp.</i>	3	5.22
15	50		<i>Trichodesmium sp.</i>		4.35
	110				9.57
Total	1150	13		19	100

Table 5.5 Location: LA – 500 m E

Sr. No.	Cell Count No. /L	Total Genera	Major Genera Observed	Total Species	Percentage Composition (%)
Bacillariophyceae					
1	70	10	<i>Planktoniella sp.</i>	13	3.83
2	180		<i>Coscinodiscus sp.</i>		9.84
3	160		<i>Nitzschia sp.</i>		8.74
4	40		<i>Biddulphia sp.</i>		2.19
5	260		<i>Chaetoceros sp.</i>		14.21
6	170		<i>Navicula sp.</i>		9.29
7	180		<i>Skeletonema sp.</i>		9.84
8	90		<i>Thalassionema sp.</i>		4.92
	1150				62.84
Chlorophyceae					
9	70	3	<i>Pediastrum sp.</i>	3	3.83
10	40		<i>Chlamydomonas sp.</i>		2.19
	110				6.01
Dinophyceae					
11	120	3	<i>Ceratium sp.</i>	4	6.56
12	30		<i>Peridinium sp.</i>		1.64
13	60		<i>Prorocentrum sp.</i>		3.28
	210				11.48
Cyanophyceae					
14	190	2	<i>Oscillatoria sp.</i>	2	10.38
15	170		<i>Trichodesmium sp.</i>		9.29
	360				19.67
Total	1830	18		22	100

Table 5.6 Location: LA – 500 m W

Sr. No.	Cell Count No./L	Total Genera	Major Genera Observed	Total Species	Percentage Composition (%)
Bacillariophyceae					
1	90	9	<i>Planktoniella sp.</i>	13	5.42
2	230		<i>Coscinodiscus sp.</i>		13.86
3	190		<i>Nitzschia sp.</i>		11.45
4	30		<i>Biddulphia sp.</i>		1.81
5	120		<i>Chaetoceros sp.</i>		7.23
6	190		<i>Navicula sp.</i>		11.45
7	150		<i>Skeletonema sp.</i>		9.04
8	90		<i>Thalassionema sp.</i>		5.42
	1090				
Chlorophyceae					
9	30	3	<i>Pediastrum sp.</i>	4	1.81
10	50		<i>Chlamydomonas sp.</i>		3.01
	80				
Dinophyceae					
11	100	4	<i>Ceratium sp.</i>	4	6.02
12	140		<i>Peridinium sp.</i>		8.43
13	70		<i>Prorocentrum sp.</i>		4.22
	310				
Cyanophyceae					
14	70	3	<i>Oscillatoria sp.</i>	3	4.22
15	100		<i>Trichodesmium sp.</i>		6.63
	180				
Total	1660	19		24	100

Table 5.7 Location: LA – 1000 m W

Sr. No.	Cell Count No. /L	Total Genera	Major Genera Observed	Total Species	Percentage Composition (%)
Bacillariophyceae					
1	90	11	<i>Planktoniella sp.</i>	13	7.20
2	110		<i>Coscinodiscus sp.</i>		8.80
3	80		<i>Nitzschia sp.</i>		16.80
4	60		<i>Biddulphia sp.</i>		0.00
5	190		<i>Chaetoceros sp.</i>		11.20
6	110		<i>Navicula sp.</i>		19.20
7	40		<i>Skeletonema sp.</i>		8.00
8	100		<i>Thalassionema sp.</i>		2.40
	920				73.60
Chlorophyceae					
9	20	3	<i>Pediastrum sp.</i>	4	1.60
10	20		<i>Chlamydomonas sp.</i>		1.60
	40				3.20
Dinophyceae					
11	90	5	<i>Ceratium sp.</i>	5	4.88
12	40		<i>Peridinium sp.</i>		3.25
13	60		<i>Prorocentrum sp.</i>		4.88
	190				15.20
Cyanophyceae					
14	80	3	<i>Oscillatoria sp.</i>	4	5.60
15	60		<i>Trichodesmium sp.</i>		2.40
	100				8.00
Total	1250	22		26	100

Table 5.8 Location: GA – 500 m E

Sr. No.	Cell Count No. /L	Total Genera	Major Genera Observed	Total Species	Percentage Composition (%)
Bacillariophyceae					
1	80	11	<i>Planktoniella sp.</i>	13	5.41
2	200		<i>Coscinodiscus sp.</i>		13.51
3	140		<i>Nitzschia sp.</i>		9.46
4	80		<i>Biddulphia sp.</i>		5.41
5	190		<i>Chaetoceros sp.</i>		12.84
6	70		<i>Navicula sp.</i>		4.73
7	260		<i>Skeletonema sp.</i>		17.57
8	50		<i>Thalassionema sp.</i>		3.38
	1070				72.30
Chlorophyceae					
9	30	3	<i>Pediastrum sp.</i>	3	2.03
10	20		<i>Chlamydomonas sp.</i>		1.35
	50				3.38
Dinophyceae					
11	110	4	<i>Ceratium sp.</i>	4	7.43
12	50		<i>Peridinium sp.</i>		3.38
13	60		<i>Prorocentrum sp.</i>		4.05
	220				14.86
Cyanophyceae					
14	100	2	<i>Oscillatoria sp.</i>	3	6.76
15	40		<i>Trichodesmium sp.</i>		2.70
	140				9.46
Total	1480	20		23	100

Table 5.9 Location: GA – 500 m W

Sr. No.	Cell Count No. /L	Total Genera	Major Genera Observed	Total Species	Percentage Composition (%)
Bacillariophyceae					
1	100	10	<i>Planktoniella sp.</i>	13	7.75
2	250		<i>Coscinodiscus sp.</i>		19.38
3	110		<i>Nitzschia sp.</i>		8.53
4	60		<i>Biddulphia sp.</i>		4.65
5	120		<i>Chaetoceros sp.</i>		9.30
6	70		<i>Navicula sp.</i>		5.43
7	140		<i>Skeletonema sp.</i>		10.85
8	40		<i>Thalassionema sp.</i>		3.10
	890				68.99
Chlorophyceae					
9	40	1	<i>Pediastrum sp.</i>	2	3.10
10	0		<i>Chlamydomonas sp.</i>		0.00
	40				3.10
Dinophyceae					
11	160	3	<i>Ceratium sp.</i>	3	12.40
12	50		<i>Peridinium sp.</i>		3.88
13	30		<i>Prorocentrum sp.</i>		2.33
	240				18.60
Cyanophyceae					
14	50	2	<i>Oscillatoria sp.</i>	2	3.88
15	70		<i>Trichodesmium sp.</i>		5.43
	120				9.30
Total	1290	16		20	100

Table 5.10 Location: GA – 1000 m W

Sr. No.	Cell Count No. /L	Total Genera	Major Genera Observed	Total Species	Percentage Composition (%)
Bacillariophyceae					
1	30	9	<i>Planktoniella sp.</i>	13	2.75
2	80		<i>Coscinodiscus sp.</i>		7.34
3	250		<i>Nitzschia sp.</i>		22.94
4	50		<i>Biddulphia sp.</i>		4.59
5	120		<i>Chaetoceros sp.</i>		11.01
6	210		<i>Navicula sp.</i>		19.27
7	80		<i>Skeletonema sp.</i>		7.34
8	40		<i>Thalassionema sp.</i>		3.67
	860				
Chlorophyceae					
9	0	1	<i>Pediastrum sp.</i>	2	0.00
10	40		<i>Chlamydomonas sp.</i>		3.67
	40			3.67	
Dinophyceae					
11	90	3	<i>Ceratium sp.</i>	4	8.26
12	30		<i>Peridinium sp.</i>		2.75
13	0		<i>Prorocentrum sp.</i>		0.00
	120			11.01	
Cyanophyceae					
14	70	1	<i>Oscillatoria sp.</i>	2	6.42
15	0		<i>Trichodesmium sp.</i>		0.00
	70			6.42	
Total	1090	14		21	100

Table 5.11 Location: LB TO LA

Sr. No.	Cell Count No. /L	Total Genera	Major Genera Observed	Total Species	Percentage Composition (%)
Bacillariophyceae					
1	60	9	<i>Planktoniella sp.</i>	11	4.51
2	240		<i>Coscinodiscus sp.</i>		18.05
3	100		<i>Nitzschia sp.</i>		7.52
4	60		<i>Biddulphia sp.</i>		4.51
5	180		<i>Chaetoceros sp.</i>		13.53
6	130		<i>Navicula sp.</i>		9.77
7	100		<i>Skeletonema sp.</i>		7.52
8	80		<i>Thalassionema sp.</i>		6.02
	950				
Chlorophyceae					
9	0	2	<i>Pediastrum sp.</i>	3	0.00
10	30		<i>Chlamydomonas sp.</i>		2.26
	30				2.26
Dinophyceae					
11	120	4	<i>Ceratium sp.</i>	5	9.02
12	50		<i>Peridinium sp.</i>		3.76
13	40		<i>Prorocentrum sp.</i>		3.01
	210				
Cyanophyceae					
14	90	2	<i>Oscillatoria sp.</i>	3	6.77
15	50		<i>Trichodesmium sp.</i>		3.76
	140				10.53
Total	1330	17		22	100

Table 5.12 Location: LA TO GA

Sr. No.	Cell Count No. /L	Total Genera	Major Genera Observed	Total Species	Percentage Composition (%)
Bacillariophyceae					
1	80	10	<i>Planktoniella sp.</i>	14	6.72
2	100		<i>Coscinodiscus sp.</i>		8.40
3	190		<i>Nitzschia sp.</i>		15.97
4	0		<i>Biddulphia sp.</i>		0.00
5	130		<i>Chaetoceros sp.</i>		10.92
6	190		<i>Navicula sp.</i>		15.97
7	90		<i>Skeletonema sp.</i>		7.56
8	50		<i>Thalassionema sp.</i>		4.20
	830				69.75
Chlorophyceae					
9	40	3	<i>Pediastrum sp.</i>	3	3.36
10	30		<i>Chlamydomonas sp.</i>		2.52
	70				5.88
Dinophyceae					
11	50	3	<i>Ceratium sp.</i>	3	4.20
12	80		<i>Peridinium sp.</i>		6.72
13	50		<i>Prorocentrum sp.</i>		4.20
	180				15.13
Cyanophyceae					
14	60	2	<i>Oscillatoria sp.</i>	3	5.04
15	50		<i>Trichodesmium sp.</i>		4.20
	110				9.24
Total	1190	18		23	100

5.1.5 Diversity Index of Phytoplankton

Shannon's indices are used for measuring the biological diversity which was developed from the information theory. Simpson's index measures the probability that two specimens were picked at random in a community belong to the different species.

Index calculation has been done using the online omni index calculator and results are presented in table 5.13.

Table 5.13 Diversity indices of phytoplankton

Location Code	S (Total species)	N (total individuals)	D (Simpson's index)	H (Shannon's Diversity (H) Index)
LB – 500 m E	26	1590	0.92	2.58
LB – 500 m W	25	1440	0.91	2.53
LB – 1000 m W	19	1150	0.86	2.18
LA – 500 m E	22	1830	0.90	2.42
LA – 500 m W	24	1660	0.91	2.55
LA – 1000 m W	26	1250	0.90	2.45
GA – 500 m E	23	1480	0.90	2.46
GA – 500 m W	20	1290	0.89	2.32
GA – 1000 m W	21	1090	0.86	2.20
LB TO LA	22	1330	0.90	2.39
LA TO GA	23	1190	0.90	2.36

5.1.6 Summary and Interpretation

Minimum 19 species at Location LB – 1000 m W and maximum 26 species at location LB – 500 m E and Location LA – 1000 m W were identified. There is small variation of species distribution from one Location to other Location. Shannon Index and Simpson's index has also been calculated. As per Shannon's Index value is 2.20 to 2.58 which shows towards the clean water to mild pollution and Simpson's index is near 1.0, it also indicates towards the very mild pollution. Based on above summary report it is interpreted that marine environment quality can be considered satisfactory.

5.2 ZOOPLANKTON

5.2.1 Methodology for Sampling of Zooplankton

Zooplankton samples were collected using 8 mesh size Zooplankton net. Approximately 10 to 20 liters of water sample were passed through the net and collected in 100 ml measuring cylinder attached to the net and this sample was transferred in polyethylene bottle after washing the sides of net with distilled water. Onsite preservation was done with 5% buffered formalin. 0.04% Rose Bengal stain was used in turbid samples for differentiating the animals and detrital material. Sample was labelled with necessary details and brought to the laboratory for testing.

5.2.2 Methodology for Testing of Zooplankton

Volume was obtained by displacement method. A portion of the sample was analyzed under a microscope for the faunal composition and population count.

The total number of zooplankton present in 1 liter of water sample was calculated using the following formula.

$$N = n.v.1000 / V$$

Where,

N = Total number in L

n = Average number of Zooplankton cell in 1 ml of sample

v = volume of Zooplankton concentrates in ml

V = Total water filtered in L



Tintinnids



Copepod

Figure No. 5.2 Photographs of Zooplankton

5.2.3 Result of cell count, Total genera and Major genera - Zooplankton

Table 5.14 Location: LB – 500 m E

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	6	4100	31.08
2	Polychaetes	5	2500	18.95
3	Chaetognaths	4	900	6.82
4	Lamellibranchs	3	400	3.03
5	Tintinnids	4	1000	7.58
6	Ostracoda	2	200	1.52
7	Nauplius	5	2900	21.99
8	Oikopleura	2	900	6.82
9	Fish Eggs	1	90	0.68
10	Fish Larvae	2	200	1.52
Total		34	13190	100

Table 5.15 Location: LB – 500 m W

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	5	4400	37.93
2	Polychaetes	4	1800	15.52
3	Chaetognaths	2	700	6.03
4	Lamellibranchs	1	600	5.17
5	Tintinnids	3	500	4.31
6	Ostracoda	3	300	2.59
7	Nauplius	5	2100	18.10
8	Oikopleura	4	800	6.90
9	Fish Eggs	1	200	1.72
10	Fish Larvae	1	200	1.72
Total		29	11600	100

Table 5.16 Location: LB – 1000 m W

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	6	3400	28.10
2	Polychaetes	4	2100	17.36
3	Chaetognaths	3	1300	10.74
4	Lamellibranchs	2	700	5.79
5	Tintinnids	3	1200	9.92
6	Ostracoda	1	600	4.96
7	Nauplius	3	2000	16.53
8	Oikopleura	2	700	5.79
9	Fish Eggs	3	100	0.83
10	Fish Larvae	0	0	0.00
Total		27	12100	100

Table 5.17 Location: LA – 500 m E

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	5	2600	25.00
2	Polychaetes	3	1500	14.42
3	Chaetognaths	2	1000	9.62
4	Lamellibranchs	1	400	3.85
5	Tintinnids	3	800	7.69
6	Ostracoda	2	700	6.73
7	Nauplius	3	2300	22.12
8	Oikopleura	1	400	3.85
9	Fish Eggs	2	600	5.77
10	Fish Larvae	1	100	0.96
Total		23	10400	100

Table 5.18 Location: LA – 500 m W

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	4	2500	24.80
2	Polychaetes	3	1600	15.87
3	Chaetognaths	2	900	8.93
4	Lamellibranchs	2	1000	9.92
5	Tintinnids	4	1100	10.91
6	Ostracoda	2	400	3.97
7	Nauplius	5	2100	20.83
8	Oikopleura	1	400	3.97
9	Fish Eggs	1	80	0.79
10	Fish Larvae	0	0	0.00
Total		24	10080	100

Table 5.19 Location: LA – 1000 m W

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	4	2200	23.91
2	Polychaetes	2	900	9.78
3	Chaetognaths	3	1400	15.22
4	Lamellibranchs	2	300	3.26
5	Tintinnids	4	1200	13.04
6	Ostracoda	1	500	5.43
7	Nauplius	4	2400	26.09
8	Oikopleura	1	300	3.26
9	Fish Eggs	0	0	0.00
10	Fish Larvae	0	0	0.00
Total		21	9200	100

Table 5.20 Location: GA – 500 m E

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	5	1800	21.43
2	Polychaetes	3	1200	14.29
3	Chaetognaths	2	700	8.33
4	Lamellibranchs	2	900	10.71
5	Tintinnids	3	1300	15.48
6	Ostracoda	2	600	7.14
7	Nauplius	4	1400	16.67
8	Oikopleura	2	400	4.76
9	Fish Eggs	0	0	0.00
10	Fish Larvae	1	100	1.19
Total		24	8400	100

Table 5.21 Location: GA – 500 m W

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	6	2700	24.55
2	Polychaetes	3	900	8.18
3	Chaetognaths	3	800	7.27
4	Lamellibranchs	1	500	4.55
5	Tintinnids	2	1200	10.91
6	Ostracoda	2	1100	10.00
7	Nauplius	3	2900	26.36
8	Oikopleura	1	700	6.36
9	Fish Eggs	1	100	0.91
10	Fish Larvae	1	100	0.91
Total		23	11000	100

Table 5.22 Location: GA – 1000 m W

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	7	3500	28.93
2	Polychaetes	4	1600	13.22
3	Chaetognaths	3	1200	9.92
4	Lamellibranchs	2	600	4.96
5	Tintinnids	3	1100	9.09
6	Ostracoda	2	700	5.79
7	Nauplius	5	2400	19.83
8	Oikopleura	2	800	6.61
9	Fish Eggs	0	0	0.00
10	Fish Larvae	1	200	1.65
Total		29	12100	100

Table 5.23 Location: LB TO LA

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	4	1800	19.15
2	Polychaetes	3	1500	15.96
3	Chaetognaths	1	800	8.51
4	Lamellibranchs	3	1100	11.70
5	Tintinnids	2	400	4.26
6	Ostracoda	2	600	6.38
7	Nauplius	5	2400	25.53
8	Oikopleura	2	500	5.32
9	Fish Eggs	1	200	2.13
10	Fish Larvae	2	100	1.06
Total		25	9400	100

Table 5.24 Location: LA TO GA

Sr. No.	Groups/Phylum	Total genera	Population No./L	Percentage (%) Composition
1	Copepoda	6	3700	28.03
2	Polychaetes	5	2400	18.18
3	Chaetognaths	2	900	6.82
4	Lamellibranchs	3	1600	12.12
5	Tintinnids	3	1100	8.33
6	Ostracoda	1	500	3.79
7	Nauplius	5	2100	15.91
8	Oikopleura	2	700	5.30
9	Fish Eggs	1	200	1.52
10	Fish Larvae	0	0	0.00
Total		28	13200	100

5.2.4 Diversity Index of Zooplankton

Shannon's indices are used for measuring the biological diversity which was developed from the information theory. Simpson's index measures the probability that two specimens were picked at random in a community belong to the different species.

Index calculation has been done using the online omni index calculator and results are presented in Table no. 5.25.

Table 5.25 Diversity indices of Zooplankton

Location Code	S (Total species)	N (total individuals)	D (Simpson's index)	H (Shannon's Diversity (H) Index)
LB – 500 m E	34	13190	0.81	1.89
LB – 500 m W	29	11600	0.79	1.80
LB – 1000 m W	27	12100	0.83	2.02
LA – 500 m E	23	10400	0.84	2.07
LA – 500 m W	24	10080	0.84	2.03
LA – 1000 m W	21	9200	0.82	1.97
GA – 500 m E	24	8400	0.85	2.10
GA – 500 m W	23	11000	0.83	1.99
GA – 1000 m W	29	12100	0.82	1.94
LB TO LA	25	9400	0.82	1.96
LA TO GA	28	13200	0.81	1.91

5.2.5 Summary and Interpretation

Total 34 species were identified during the testing and maximum zooplankton species was identified at location LB – 500 m E and minimum at LA – 1000 m W with a variation of 9200 No/L to 13200 No/L. Shannon Index and Simpson's index has also been calculated. As per Shannon's Index value is

1.80 to 2.10 which shows towards the clean water to mild pollution and Simpson's index is near 1.0, it also indicates towards the very mild pollution. Based on above summary report it is interpreted that marine environment quality can be considered satisfactory.

6 BENTHOS

6.1 Methodology for Sampling for Sediment and Benthos

Ekman Grab benthic sampler was used for the collection of benthos sample as well as sediment samples. The sample collected by sampler was transferred into polyethylene bags and preserved with rose Bengal containing formalin.

6.2 Methodology for Testing of Benthos

The sediment was sieved through a 0.5 mm mesh sieve and animals retained were preserved in 5 % buffered formaldehyde. Total population was estimated as number of animals in 1 m² area and biomass is expressed on wet weight basis (g/m²)

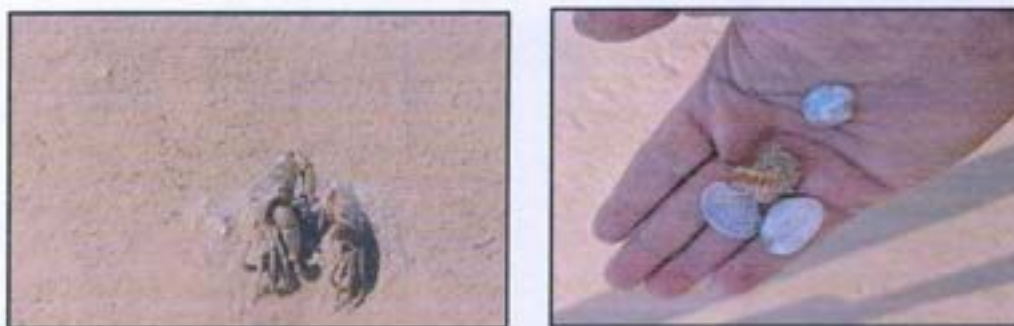


Figure No. 6.2 Photographs of Benthos

6.3 Results of Benthos

Table 6.1 Macrobenthos

Station Detail	Groups Detail	Population (no./m ²)	No. of species	Total Population density	Biomass (g/m ²)	Simpson's Index (1-D)	Shannon Weiner Index H'
LB – 500 m E	Nematodes	18	6	83	1.79	0.743	1.37
	Bivalvia	22					
	Gastropods	17					
	Polychaetes	26					
LB – 500 m W	Nematodes	19	7	94	2.12	0.735	1.34
	Bivalvia	31					
	Gastropods	15					
	Polychaetes	29					
	Nematodes	18	5	83	1.88	0.738	1.35

LB – 1000 m W	Bivalvia	23					
	Gastropods	15					
	Polychaetes	27					
LA – 500 m E	Nematodes	11	6	72	1.93	0.734	1.34
	Bivalvia	26					
	Gastropods	14					
	Polychaetes	21					
LA – 500 m W	Nematodes	12	5	85	1.72	0.742	1.36
	Bivalvia	23					
	Gastropods	22					
	Polychaetes	28					
LA – 1000 m W	Nematodes	18	5	84	1.95	0.741	1.36
	Bivalvia	28					
	Gastropods	17					
	Polychaetes	21					
GA – 500 m E	Nematodes	27	6	92	2.04	0.745	1.37
	Bivalvia	23					
	Gastropods	19					
	Polychaetes	23					
GA – 500 m W	Nematodes	21	5	80	1.83	0.730	1.33
	Bivalvia	19					
	Gastropods	13					
	Polychaetes	27					
GA – 1000 m W	Nematodes	19	5	81	1.99	0.735	1.34
	Bivalvia	24					
	Gastropods	12					
	Polychaetes	26					
LB TO LA	Nematodes	28	6	87	1.89	0.742	1.36
	Bivalvia	21					
	Gastropods	16					
	Polychaetes	22					
LA TO GA	Nematodes	16	5	79	1.67	0.732	1.33
	Bivalvia	26					
	Gastropods	12					
	Polychaetes	25					

Table 6.2 Meiobenthos

Station Detail	Groups Detail	Population (no./m ²)	Total Population density	Biomass (g/m ²)
LB – 500 m E	Nematodes	28	96	1.95
	Ostracods	15		
	Formaniferans	27		
	Polychaetes	26		
LB – 500 m W	Nematodes	32	85	1.85
	Ostracods	13		
	Formaniferans	21		
	Polychaetes	19		
LB – 1000 m W	Nematodes	37	90	1.98
	Ostracods	12		
	Formaniferans	18		
	Polychaetes	23		
LA – 500 m E	Nematodes	31	84	1.82
	Ostracods	11		
	Formaniferans	13		
	Polychaetes	29		
LA – 500 m W	Nematodes	23	81	1.66
	Ostracods	12		
	Formaniferans	17		
	Polychaetes	29		
LA – 1000 m W	Nematodes	28	83	1.78
	Ostracods	16		
	Formaniferans	13		
	Polychaetes	26		
GA – 500 m E	Nematodes	31	91	1.94
	Ostracods	14		
	Formaniferans	17		
	Polychaetes	29		
GA – 500 m W	Nematodes	17	65	1.62
	Ostracods	9		
	Formaniferans	21		
	Polychaetes	18		
GA – 1000 m W	Nematodes	31	81	1.73
	Ostracods	9		

	Formaniferans	17		
	Polychaetes	24		
LB TO LA	Nematodes	35	69	1.59
	Ostracods	12		
	Formaniferans	19		
	Polychaetes	3		
LA TO GA	Nematodes	22	70	1.83
	Ostracods	7		
	Formaniferans	13		
	Polychaetes	28		

6.4 Summary and Interpretation

Macrobenthos

Total population density was found maximum 96 no/m² at location LB – 500 m W and minimum 72 no/m² at location LA – 500 m E. There is small variation of species distribution from one Location to other Location. Biomass was observed in the range of 1.67 to 2.12 g/m². Shannon Index and Simpson's index has also been calculated. As per Shannon's Index value is 1.33 to 1.37 which shows towards the mild pollution and Simpson's index is near 1.0.

Meiobenthos

Total population density was found maximum 104no/m² at location LB – 500 m E and minimum 65 no/m² at location GA – 500 m W. Biomass was observed in the range of 1.59 to 1.98 g/m².

7 Fish survey

7.1 Qualitative Data of Fishes

During fish survey, survey team contacted to local fishermen for collecting the qualitative data of fish – catch in nearby area. All the data have been collected after interviewing with local fishermen and qualitative fish data are presented in Table no.7.1 and photographs are presented in Figure no. 7.1



White Pomfret



Catfish



shrimp

Figure 7.1 Photographs taken during Fish catching

Table No. 7.1 Qualitative Fish Data

S. No	Scientific Name	Common Name	IUCN Status
Marine Fishes			
1	<i>Pampus argenteus</i>	White Promfet	VU
2	<i>Parastromateus niger</i>	Black Promfet	LC
3	<i>Harpadon nehereus</i>	Bombay Duck	NT
4	<i>Polynemidae</i>	Threadfin	LC
5	<i>Epinephelus itajara</i>	Jewfish	VU
6	<i>Tenualosa ilisha</i>	Hilsa	LC
7	<i>Coilia dussumieri</i>	Coilia	LC
8	<i>Selachimorpha</i>	Shark	NA
9	<i>Mugil cephalus</i>	Mullet	LC
10	<i>Siluriformes</i>	Catfish	NA
11	<i>Anguilliformes</i>	Eel	NA
12	<i>Oligoplites saurus</i>	Leather Jacket	LC
13	<i>Scomberomorus commerson</i>	Seer Fish	NT
14	<i>Eleutheronema tetradactylum</i>	Indian Salmon	EN
15	<i>Trachipteridae</i>	Ribon Fish	NA
16	<i>Barbonymus gonionotus</i>	Silver Barb	LC
17	<i>Perca</i>	Perch	LC
18	<i>Caridea</i>	Shrimp	NA
19	<i>Dendrobranchiata</i>	Prawns	NA
20	<i>Panulirus homarus</i>	Lobsters	LC
21	<i>Brachyura</i>	Crabs	NA
22	<i>Leveillula taurica</i>	Levta	NA
23	<i>Sepia officinalis</i>	Cuttlefish	LC
24	<i>Teuthida</i>	Squid	NA
25	<i>Thunnini</i>	Tuna	NA
26	<i>Carangoides</i>	Carranges	LC
27	<i>Rastrelliger kanagurta</i>	Mercrel	DD
28	<i>Botia rostrate</i>	Rani Fish	LC
29	<i>Solea solea</i>	Sole Fish	DD
30	<i>Sardinella longiceps*</i>	Indian oil sardine	LC

7.2 Fish Tissue Analysis

Procedure: Small short lived fishes were selected for fish tissue analysis as they are likely to accumulate mercury and other toxins. Large and long lived fishes were avoided which have higher concentration of mercury. Fishes were collected from the locations preferably Indian salmon, Hilsa and Indian oil sardine as per availability. These fishes were collected from the local fisherman who used to conduct fishing activity regularly around the near station LA, LB, GA, LB-LA and LA-GA and fishes caught in the net attached to the boat.

Table No. 7.2 Results of Fish Tissue Analysis

Metals	Unit	LB - 500 m E - LB - 1000 m W	LA - 500 m E - LA - 500 m W	LA - 500 m W - LA - 1000 m W	GA - 500 m E - GA - 500 m W	GA - 1000 m W	LB-LA	LA-GA
Cadmium	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Barium	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Chromium	mg/kg	0.31	0.37	0.42	0.33	0.49	0.35	0.41
Copper	mg/kg	2.17	2.29	2.56	2.82	2.71	2.88	2.82
Iron	mg/kg	0.29	0.23	0.27	0.19	0.26	0.33	0.38
Lead	mg/kg	0.13	0.18	0.08	0.14	0.16	0.09	0.08
Manganese	mg/kg	2.78	3.24	3.34	3.39	2.86	3.57	3.31
Mercury	mg/kg	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01	<0.01
Nickel	mg/kg	0.19	0.14	0.16	0.18	0.21	0.19	0.24
Zinc	mg/kg	0.25	0.28	0.33	0.38	0.31	0.29	0.34
TPH	mg/kg	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001	<0.001

7.3 Final Summary and Interpretation

During physico-chemical analysis, temperature of marine water was found quite below the ambient temperature, it indicates that there is no evidence of exothermic reaction and pH value were recorded >7.8 and <8.5 it shows that marine water possesses the natural characteristic w.r.t to pH. Salinity data are almost following the similar trend of marine data as per the data available (NIO).

Total petroleum hydrocarbon value was noted below the detection range (DL- 0.1mg/kg). As per Clarke and McLeod 1977, concentration 10-100 ppm is indicating that fishes are exposed with TPH.

Based on the above discussion it is concluded that currently fishes can be considered unexposed with petroleum hydrocarbon related compound.

Cadmium concentration has been recorded below detection limit (DL- 0.01 mg/kg) as per WHO cadmium concentration should not exceed 0.5 mg/kg. It is also within the desirable limit.

Lead value has been recorded in the range of 0.08 to 0.18 mg/kg and WHO limit is 2.0 mg/kg. It is within the limits.

Chromium value has been recorded in the range of 0.31 to 0.49mg/kg and WHO limit is 0.6 mg/kg. It is within the limits.

Zinc value has been recorded in the range of 0.25 to 0.38mg/kg and WHO limit is 30 mg/kg. It is within the limits.

Copper value has been recorded in the range of 2.17 to 2.88mg/kg and WHO limit is 3.0 mg/kg. It is within the limits.

Based on the above discussion and comparison study of the results with the above-discussed standards, it is concluded that water quality possesses the natural quality of marine water and there is no evidence of Oil spillage and deposition of toxic materials in fish tissue.



FUGITIVE EMISSION MONITORING STUDY REPORT FOR CH₄ & VOCs

RJ North & South, Midstream & Suvali Operations Assets

Contents

INTRODUCTION.....	3
ABOUT INDUSTRY	3
OBJECTIVE OF THE STUDY	4
FUGITIVE EMISSION STUDY – LEAK DETECTION AND REPAID (LDAR)	4
OPTICAL GAS IMAGING TECHNOLOGY & WORKING PRINCIPAL	6
GAS DETECTOR TYPES	7
STUDY COVERAGE AREA.....	8
STUDY METHODOLOGY	9
SAMPLING PROTOCOL	10
QUANTIFICATION APPROACH.....	12
RESULTS OF THE STUDY	13
CORRECTION FACTOR CALCULATION	14
CONCLUSION	14
SUGGESTIONS.....	15
ANNEXURE.....	16

INTRODUCTION

M/s Envigil Leak Detection Specialists (OPC) Pvt Ltd, Pune has been contracted by Vedanta owned Cairn Oil & Gas to conduct the fugitive emission/leak of Hydrocarbons (CH₄ & VOCs) monitoring & measurement study within the identified facilities as per OISD Guidelines 224 (based on US EPA Method 21 Guidelines).

ABOUT INDUSTRY

Vedanta Limited (Cairn Oil & Gas) is the largest independent oil and gas exploration and production company in India and the largest private sector producer of crude oil in India. Cairn Oil & Gas operates ~27% of India's domestic crude oil production and have interest in 58 hydrocarbon blocks across the country.

RJ-ON-90/1 Onshore Block

This block is spread in approx. 3111 sq. km. across Barmer and Jalore districts of western Rajasthan. The field have two processing terminals named as Mangala Processing Terminal and Raageshwari Gas Terminal for processing of crude oil and natural gas respectively. There are more than 60 hydrocarbon production well pads in the block.

Midstream

The Mangala Development Pipeline (MDP) is located in the Barmer and Jalore districts of Rajasthan and Banaskantha, Patan, Ahmedabad, Surendranagar, Rajkot and Jamnagar districts of Gujarat. The MDP consists of 670 km electrically heated 24” crude oil pipeline which starts at MPT, Rajasthan and ends at the marine tanker loading facility in the Arabian Sea along the Gujarat coast. Electric power for this heating is generated in thirty-nine (39) above ground installations (AGIs) located approximately 18 km apart from one another all along the crude oil pipeline using gas engine generators. Intermediate crude oil storage and export facility is located at Radhanpur in district Patan, Gujarat. RJ Crude oil is transported from the main pipeline at AGI-13A to Radhanpur terminal. Intermediate crude oil storage and pumping facility to IOCL is located in Gujarat at Viramgam, Ahmadabad district, Gujarat. AGI-32A and AGI-33 at Salaya, Jamnagar district, Gujarat consists of crude oil export facilities to the Reliance India Limited Refinery and Essar Oil Refinery respectively. The Bhogat terminal at Bhogat village, Jamnagar district, Gujarat approximately 80 km from Salaya and 8 km inland from the shore. The terminal consists of facilities for crude oil storage and export to the offshore marine tanker loading facility. Marine tanker loading facilities are located in the Arabian Sea approximately 6 km seaward from the landfall point of the crude oil pipeline, the landfall in turn is some 8 km from the Bhogat terminal. The marine facilities consist of a dual 24” heated and insulated pipeline from Bhogat to the marine facility and Single Point Mooring (SPM) for loading heated tankers.

Suvali CB/OS-2 Offshore Block

CB/SO-2 oil and gas field lies off Surat District of State of Gujarat, India, in the Gulf of Cambay. The block is held by a Joint Venture (JV) consortium of Vedanta Ltd, Oil and Natural Gas Corporation Ltd and Tata Petrodyne Ltd for developing and producing crude oil and gas. The offshore operation area is situated approximately 25 km southwest of Surat city along the eastern shoreline of Gulf of Khambhat. The CB/OS-2 field consists of three unmanned well-head platforms Lakshmi A (LA), Lakshmi B (LB) and Gauri A (GA). Onshore gas processing terminal is located at Suvali, in Surat District in Gujarat. The On-shore terminal spreads across 82 acres and produces around 10,000 BoPD.

OBJECTIVE OF THE STUDY

The objective of the study involves fugitive emissions leakage monitoring (identification of loss points/sources) and measurement (quantification of hydrocarbon loss) to calculate the correction factor to be applied for Scope-1 GHG volume at the oil & gas exploration, production and gas processing terminals for various locations of Vedanta Limited Cairn Oil and Gas (RJ North & South, Midstream & Suvali).

FUGITIVE EMISSION STUDY – LEAK DETECTION AND REPAID (LDAR)

Fugitive Emission Study - Leak Detection and Repair (LDAR) is a process that maintenance teams use to identify leaks in oil and gas facilities. The purpose of LDAR is to prevent major accidents, wasted resources leading to higher costs, and underperforming assets.

The volatile organic compounds (VOCs) and gases are emitted from different equipment sources which might include valves, flanges, and other connections, pumps, and compressors, pressure relief devices, process drains, open-ended valves, pump and compressor seal system degassing vents, accumulator vessel vents, agitator seals, and access door seals.

Emissions reductions from implementing an LDAR program potentially reduce product losses, increase safety for workers and operators, decrease exposure of the surrounding community, reduce emissions fees, and help facilities avoid enforcement actions.

Fugitive Emission Monitoring - LDAR Block Diagram

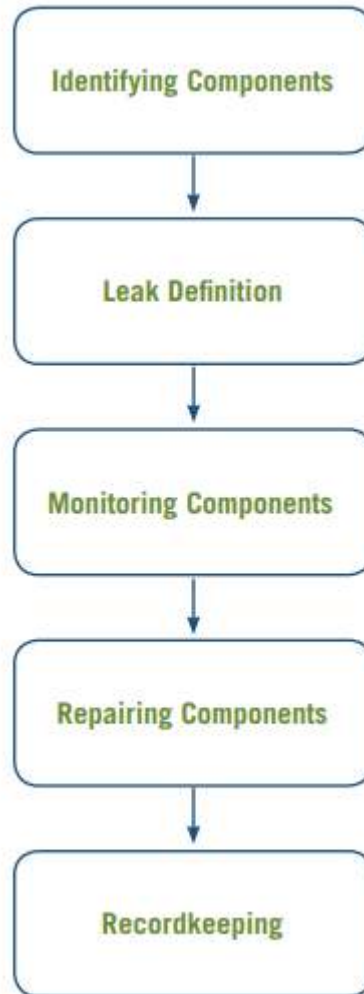


Figure 1

OPTICAL GAS IMAGING TECHNOLOGY & WORKING PRINCIPAL

Optical gas imaging is based on infrared sensing technology that can detect invisible industrial gases. All objects in nature with temperature above absolute zero (-273.15°C) emit infrared radiation. The intensity of infrared radiation depends on the target temperature. The infrared optical gas imaging thermal camera converts invisible infrared radiation into visible infrared images according to the temperature difference or radiation difference between the target and the background or between various parts of the target after absorbing infrared radiation at specific wavelengths.

The gas leak detection infrared detector with built-in narrowband filter only receives the infrared band near the gas infrared absorption peak and can convert the gas into visible infrared images through the radiation difference between the gas and the background.

The optical gas imaging camera can quickly detect the gas without temporarily stopping the production line, by identifying the infrared radiation difference between the gas and the background and visualizing the gas whether the leakage exists, and accurately locate the pinpoint leakage source.

The visual digital recordings are evidence of leak which can be analysed by teams for production loss, emission leak fix, maintenance and safety decisions.

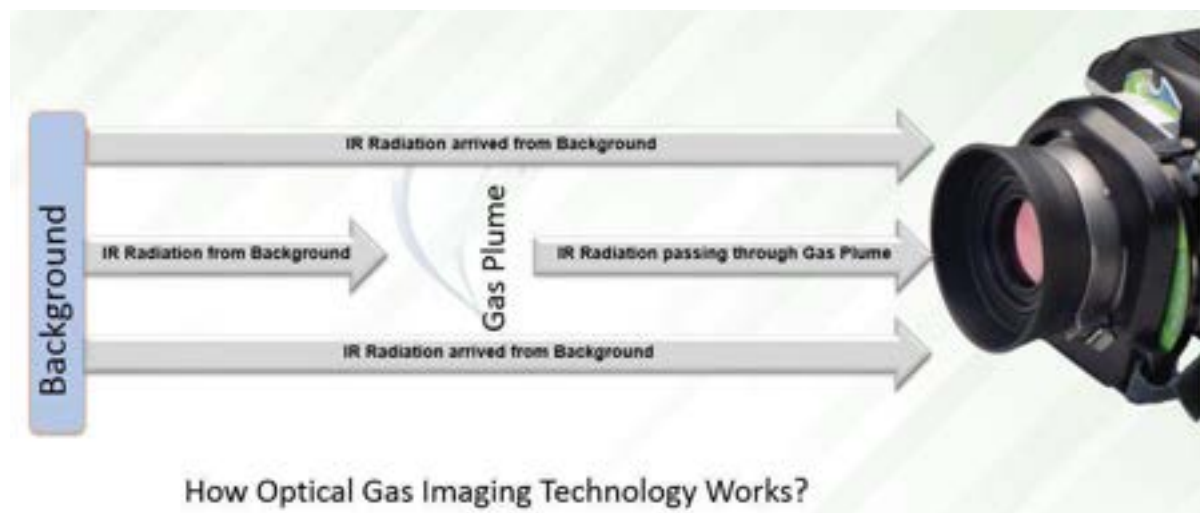


Figure 2

WORKING OF PHOTO IONISATION GAS DETECTOR (PID)

The PID is an efficient gas detector for many gases and vapours. PIDs produce instantaneous readings, operate continuously.

PIDs use a specially designed ultraviolet (UV) lamp to create high energy photons to irradiate and ionize the sample inside the analysis chamber. The analysis chamber is composed of two plates between which a difference of potential is applied. Upon production of ionized molecules, a current is created and recorded. The intensity of the current is a direct measure of the number of ionized molecules.

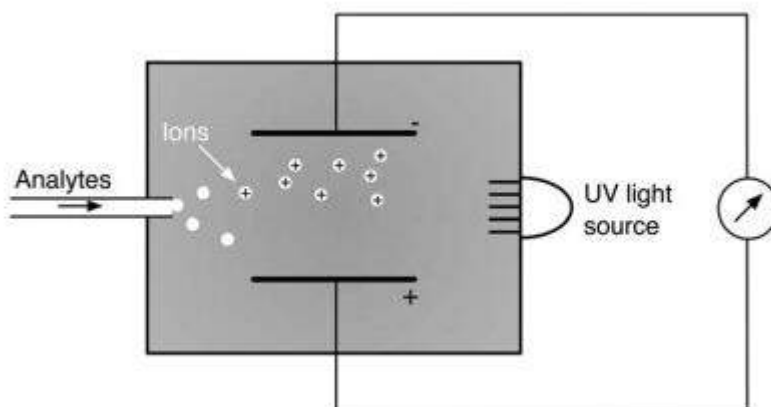




Figure 3

GAS DETECTOR TYPES

The gas detectors can be classified in a broad category as fixed detectors and portable detectors.

Difference Between Fixed Gas Detector and Portable Gas Detector

Sr No	Fixed Detectors	Portable Detectors
1.	The fixed gas detectors are installed permanently or temporarily in working areas.	The portable gas detectors are carried by staff person.
2.	The fixed gas detectors are useful to detect sudden leaks.	The portable gas detectors are useful to detect gradual leaks.
3.	The fixed gas detectors are used to detect presence of gas.	The portable gas detectors are used to detect gas emission leaks.
4.	The fixed gas detectors data is not used for monitoring or control of gas emission leaks.	The portable gas detectors are used to collect data for monitoring or control of gas emission leaks.

5.	The fixed gas detectors is a reactive approach to solve leak problems.	The portable gas detectors is a proactive approach to solve leak problems.
6.	<p style="text-align: center;">Fixed</p> 	<p style="text-align: center;">Portable</p> 

Annexure – 1: - For reference of Technical Specifications of equipment used.

STUDY COVERAGE AREA

As per the service order, the fugitive emission survey cum study has been carried out during 21st Feb to 4th Apr 2024, across the RJ North, RJ South, Midstream & Suvali assets. All the Processing Terminals (MPT, RGT/RDG & Suvali), Local Separation Facility Well Pads (NA-01, AWP08, BWP15& MWP12), Satellite Well Pads and identical sample well pads covered in the study area, the details of locations or facilities covered under study are as below: -

Table-1 Location of Study Area

Area	Location	Location Detail
RJ North	Mangla Processing Terminal (MPT)	GPA Area
		VRU Area
		Trains Area
		PLR Area
		Boiler Area
		Export Tank Area
	Mangla Well Pads	Trains Area
		MWP 2
		MWP 6
		MWP 8
		MWP 9
	Aishwarya Well Pads	MWP 12
		AWP 1
		AWP 2
		AWP 5
AWP 8		
NW 01		

	Bhagyam Well Pads	BWP 6
		BWP 12
		BWP 15
		NE 1
		NI 2
Midstream	Midstream	Viramgam Terminal
		Bhogat Terminal
		AGI 18
		AGI 26
RJ South	Rageshwari Terminal	Complete Processing Terminal
	Bridge Plant	
	RDG Plant	
	Gas Well Pads	Gas Well Pad 1
		Gas Well Pad 2
		Gas Well Pad 4
		Gas Well Pad 7
	Satellite Well Pad	Tukaram 1Z
		Raag oil 1
Suvali	Suvali	Lakshmi A
		Lakshmi B
		Processing Area

STUDY METHODOLOGY

Leak detection and Repair (LDAR) is a program implemented to comply with environmental regulations for reducing fugitive emission of targeted chemicals into the environment. Several standards such as National emission Standards for Hazardous Air Pollutants (NESHAP), Central Pollution Control Board (CPCB), New Source Performance Standard NSPS) etc require the monitoring of these fugitive emissions from the process equipment.

• Steps Undertaken During Fugitive Emission Monitoring

➤ Project Preparation

- Facility Layout study for Area/Subarea/Component/Equipment
- Layout Study covering review of P&ID.
- Identify geographical separation markers.
- Identifying Execution sequence

➤ Source Inventory

- Safety Training
- Project kick off meeting

- Site visit before monitoring
- Define Monitoring routes
- Prepare for monitoring

- **Unit Monitoring phase**
 - Prepare OGI Camera, CH₄ & VOC Detectors
 - Start Monitoring Program
 - Regular status reporting

- **First Repair Attempt**
 - Prepare tightening list
 - Guide team to leaking source
 - Leak attend
 - Re monitoring after repair attempt

- **Reporting**
 - Consolidation of all gathered data
 - Create Report
 - Detail list of all sources
 - Repair orders
 - Equipment overview as per EPA Source

SAMPLING PROTOCOL

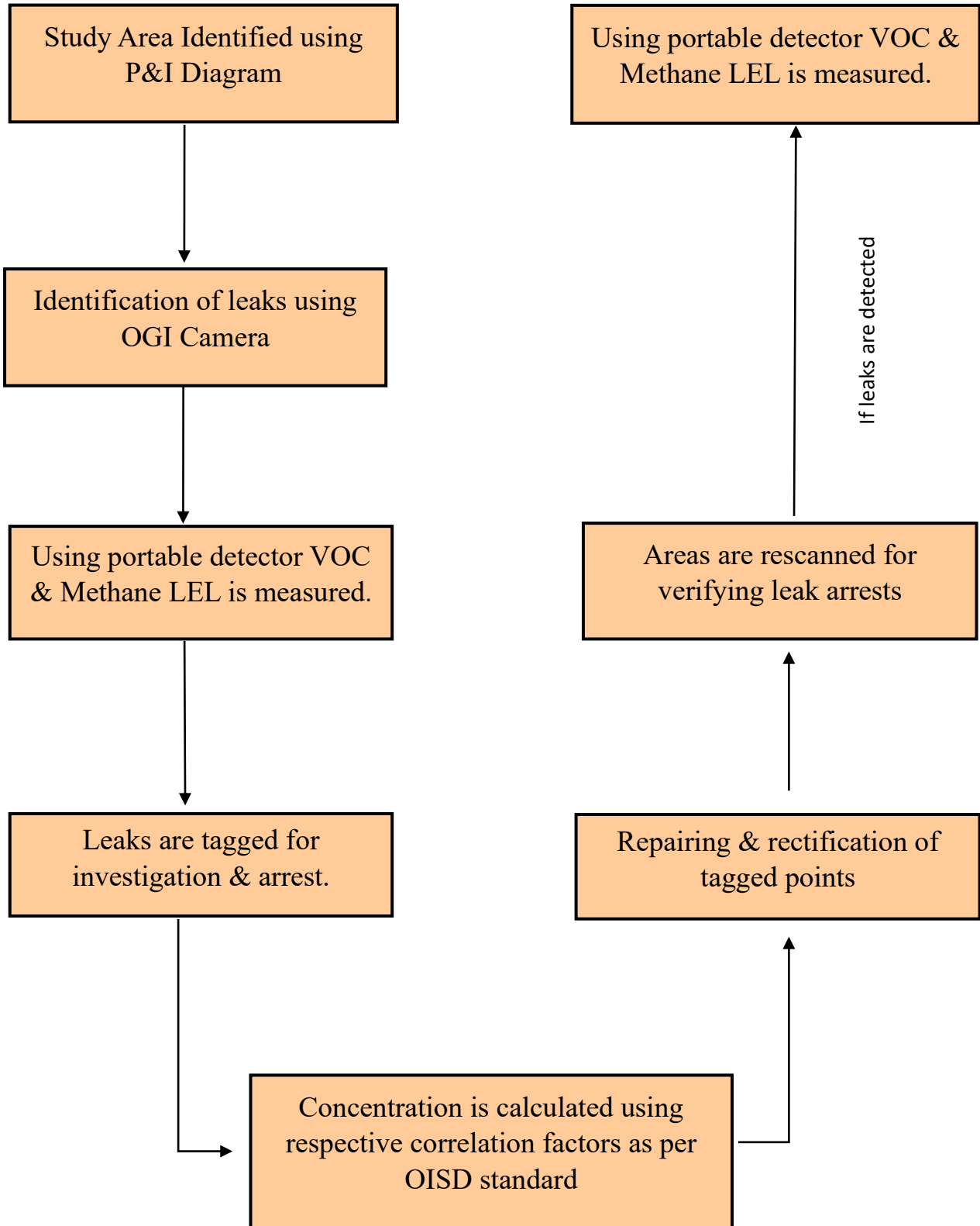
Initial screening: Screening test must be conducted initially and include:

- Type of affected source (e.g. pump, compressor, etc.)
- Site specific ID of each affected source.
- Date and Method 21 test
- Type of Method 21 detector
- Screening result in ppmv

• **Individual source Surveys**

Leak is identified using Optical Gas Imaging (OGI) Camera. Identified component/equipment leaking is tagged for further identification and leak PPM reading will be measured and recorded. The leak PPM reading will be taken with probe 1 cm away from the gas leak point source detected as per OGI. The maximum measured leak PPM reading will be recorded.

Methodology



QUANTIFICATION APPROACH

Based on industry experience, certain correlations have been developed for calculation of the emissions utilizing readings of the portable gas detector. These correlations depend on the services (such as vapour, light liquid) and the type of the component tested (e.g. flange, valve, compressor, pump).

Table-2 Correlation Factors

Component Type	Service	Correlation
Valve	Light liquid vap pr. > 0.3 kPa	$(3.84 \times 10^{-5}) \times (\text{ppmv})^{0.74}$
Valve	Gas/Vapour	$(9.81 \times 10^{-7}) \times (\text{ppmv})^{1.14}$
Valve	Hydrogen	$(1.77 \times 10^{-6}) \times (\text{ppmv})^{0.98}$
Pumps	Light Liquid	$(2.22 \times 10^{-4}) \times (\text{ppmv})^{0.77}$
Pumps	Heavy Liquid	$(3.13 \times 10^{-5}) \times (\text{ppmv})^{0.97}$
Compressors	Hydrocarbon	$(2.28 \times 10^{-4}) \times (\text{ppm})^{0.77}$
Compressors	Hydrogen	$(1.77 \times 10^{-6}) \times (\text{ppmv})^{0.98}$
Safety relief Valves	All	$(2.28 \times 10^{-4}) \times (\text{ppmv})^{0.77}$
Flanges	All	$(1.7 \times 10^{-5}) \times (\text{ppmv})^{0.82}$
Drains	All	$(1.43 \times 10^4) \times (\text{ppmv})^{1.02}$

#Reference

- US EPA Protocol for Equipment Leak Emission Estimate (EPA-453/R-95-017) published in November 1995.
- Table C-3 of Appendix C on Revision of Petroleum Industry Correlation and Emission Factors of US EPA Protocol on VOC

Sample Calculation for a Flange leak

Instrument Reading in ppmv = 10,000 ppmv

Calculation using correlation for flange leak: (from the above table)

$$\begin{aligned} \text{Emission, kg/hr/source} &= (1.7 \times 10^{-5}) \times (\text{measured in ppmv} \times \text{R.F.})^{0.82} \\ &= (1.7 \times 10^{-5}) \times (10,000 \times 1)^{0.82} \\ &= 0.0324 \text{ kg/hr} = 0.77 \text{ kg/day} \end{aligned}$$

Methane Gas LEL to PPM Conversion Sample Calculation

LEL - Lower Explosive Limit for Methane gas is 5%.

100% LEL = 5% methane = 50,000 ppm methane

Instrument Reading in LEL% = 35 %

Methane 100% LEL = 50000 ppm

$$\text{Methane 35 \% LEL} = \frac{(35 \% \times 50000 \text{ ppm})}{100 \%}$$

Methane 35 % LEL = 17500 ppm

RESULTS OF THE STUDY

Table-3 Results – Calculations of the HC (CH4 & VoCs) Losses – Before & After Study

S. No.	Facility Location	Total Emission <u>Before</u> Attending Leak (Tons/Year)		CO2 Equivalent <u>Before</u> Attending Leak (Tons/Year)	Total Emission <u>After</u> Attending Leak (Tons/Year)		CO2 Equivalent <u>After</u> Attending Leak (Tons/Year)
		CH4	VOC		CH4	VOC	
1.	MPT	92.02	0.85	2581.46	1.49	0.09	42.23
2.	MBA Well Pads	13.83	0.84	392.00	0.002	0.70	3.99
3.	RDG, RGT & Well Pads	26.01	1.30	735.87	6.07	0.006	170.1
4.	Viramgam & AGI	9.14	3.06	273.17	0.00	3.05	17.06
5.	Bhogat	8.28	1.29	239.35	0.03	1.24	7.89
6.	Suvali	105.79	1.19	2968.91	0.61	0.22	18.35
7.	Total	255.07	8.53	7190.76	8.34	5.32	259.62

Annexure 2: -Number of leaks/HC losses at different locations



In entire study area total 88 HC loss points were identified out of which 42 were classified as leak as per OISD 2024(7.0 – Table 1).

Annexure 3: -Leak Definition & classification as per OISD

However, the HC potential from 88 HC loss points in terms of Methane is 255.07 tons and VOC is 8.53 tons were found respectively. Most of the leaks are attended and rectified during the survey itself, same has been re-verified and found the residual CH4 emissions 8.34 tons and VOC emissions 5.32 tons. Some of the identified emission/leak points are part of the design and some will be attended in the upcoming coming shutdown. As Per OISD Leak definition (7.0 – Table 1) 42 leaks were identified with potential emission of 7014 tCO2 eq. 37 leaks with potential emission of 6836 tCO2 eq. are attended.

Table-4 – Classification of Identified Leak Points as per OISD- 224

	MPT	MBA	Bhogat	Viramgam & AGI	RGT	Suvali	Total	Leak potential (tCO2 eq.)
Leak No.	9	3	2	3	14	11	42	7014
Attended	9	3	2	3	9	11	37	6836

- 5 leaks of RGT Requires shutdown.

CORRECTION FACTOR CALCULATION

The correction factor is a coefficient value which can be used effectively to calculate estimated value of emissions based on the scope 1 emission.

Table-4 – Derived Correction factor based on Leak or Loss of HC Identified

Facility Name	Total CO2 Equivalent Scope 1 Emission (Tonnes)	Total CO2 Emission Before Fix (Tonnes)	% Correction Factor Before Fix
MBA	1276055	2973	0.23
Midstream	62381	513	0.82
RJ South	113690	736	0.65
Suvali	66645	2969	9.06
Ravva	111863	0.11	0.00
Total	1630633.7	7191.10	0.44

#Ravva Emissions as per Fugitive emission study of G Lens innovation Labs Pvt. Ltd.

CONCLUSION

This study has assessed (identify & quantify) the fugitive emissions associated with Cairn's Scope 1 emissions, revealing that total fugitive emissions amounted to 7190 tCO₂ eq., representing 0.44% of Cairn's total Scope 1 emissions. Following targeted leak detection and repair efforts, these emissions were significantly reduced to 259.65 tCO₂ eq., which is just 0.02% of the total Scope 1 emissions.

The reduction in fugitive emissions demonstrates the effectiveness of the measures implemented to address leaks and improve emission control. Despite these efforts, a residual level of fugitive emissions remains, underscoring the need for ongoing vigilance and maintenance to further minimize emissions.

Based on the analysis, it is recommended that Cairn incorporate a Correction Factor of 1% for Scope 1 emissions. Implementing this Correction Factor will provide a more comprehensive understanding of Cairn's total GHGs of Scope-1, enabling better strategic planning and reporting. By adopting this approach, Cairn can enhance its environmental performance and align more closely with industry best practices for emission management.

Overall, this study highlights both the progress made in reducing fugitive emissions and the importance of continuous improvement in fugitive emission control strategies. Future efforts should focus on further reducing fugitive emissions and refining measurement techniques to support Cairn's sustainability goals.

SUGGESTIONS

1. Every Emission leak is unique in nature and the fix needs to be based on different factors such as material type, leak source type (line, crack, gap, pin hole, threaded join), pressure, temperature. The method used to fix the emission leak needs to consider the various parameters for an effective fix.
2. Emission leak fix has to follow a planned approach with discussion and reasoning. For example – venting large amount of gas to take a line system offline for fixing a small leak may or may not be appropriate and need to be discussed.
3. The leak fix must be done appropriately using expertise in sealant knowledge and application skills, which should help to reduce the gas emission leak. The original equipment manufacturers guidance is also very important to get good fix results. The original equipment manufacturers may be able to suggest the right sealant and method to apply.

ANNEXURES

ANNEXURE 1

Technical Specifications - EyeCGas 2.0 Optical Gas Imaging



THERMAL IMAGER

THERMAL SENSITIVITY <10mK@ 25°C

OPTICS f/1.1; 18° with 30mm lens; Manual focus

DIGITAL ZOOM x2, x4, x8 and x16 (only for visible camera)

DIGITAL VIDEO CAMERA EMBEDDED, fixed focus, for situational awareness

COOLED DETECTOR TYPE Cooled High Sensitivity, 320 x 240 pixels

SPECTRAL RANGE 3 to 4.4µm

PHYSICAL CHARACTERISTICS

WEIGHT (WITH BATTERY AND LENS) 2.6kg (5.9 lbs)

SIZE IN (LXHXW) 9" x 4.3" x 5.1" (230 x 110 x 130) mm

ENVIRONMENTAL CONDITIONS

OPERATING TEMPERATURE RANGE -20°C to + 50°C

STORAGE TEMPERATURE RANGE -40°C to + 70°C

WATER AND DUST PROTECTION IP65

HAZARDOUS LOCATIONS INTRINSICALLY SAFE

CSA C22.2 No. 213-M1987, Non-Incentive Electrical Equipment for Use in Class

I, Division 2, ANSI/ISA-12.12.01 - Class I and II, Division 2, and Class III, ATEX

intrinsically safe for Zone 2 ratings as: Ex II 3 GD; Ex ic nA nC IIC T6 Gc; Ex ic tc IIIC

T85°C DC

COMMUNICATION INTERFACES

USB Data transfer, video streaming and video images file transfer

Wi-Fi 2.4 GHz for video streaming and file transfer

Bluetooth 4.2 with other devices: RMLD, TVA2020, LDAR software etc...

GPS Built in or external

Technical Specifications - Tiger XT VOC Detector



Minimum Resolution	10.6 eV: 1 ppb or 0.001 mg/m ³ ***
Detectable Range**	10.6 eV: 1 ppb up to 20,000 ppm***
Response Time	10.6 eV: T90 < 2 seconds
Accuracy***	10.6 eV: ± 5 % display reading or ± 1 digit***
Battery Life	Li-ion: life up to 24 hours, charge time 8 hours
Lamps	10.6 eV Krypton PID lamp (standard)
Calibration	2 point and 3-point calibration (via calibration kit accessory)
Flow Rate	≥ 220 ml/min (with blocked flow alarm)
Humidity	0-99% RH (non-condensing)
Protection	Designed to IP65
Weight & Dimensions	370 mm (H) x 91 mm (W) x 60 mm (D) 870g

Intrinsic Safety Certification Approvals

II 1G Ex ia IIC T4 Ga

Tamb = -25 °C ≤ Ta ≤ +45 °C (with lithium ion battery pack)

Tamb = -25 °C ≤ Ta ≤ +40 °C (with alkaline battery pack)

IECEX ITS 22.0025X ITS-I22ATEX35111X

ITS22UKEX0635X

3193491 conforms to UL Std. 913, 61010-1 & Certified to CAN/CSA Std. C22.2 No. 61010-1

Class 1 Division 1. Approval for Groups A, B, C & D, T4

Technical Specifications - Sensit Gold G2 (Natural Gas)



Natural Gas Resolution 0.1%

Range 5 to 100% Gas

Accuracy $\pm 5\%$

Dimensions 11.5 x 3 x 2.32" (29.2 x 7.6 x 5.9cm)

Weight 1.2lbs (544g)

Operational Temperature -4 to 104°F (-20 to 40°C)

Battery Life Alkaline: Approximately 18hrs continuous

Intrinsic Safety Certification Approvals

ATEX Cert. No. TRAC11ATEX21304X

Ex ib IIB T3

AEx ia IIB T3

IP54

ANNEXURE 2

NUMBER OF LEAK/EMISSION SOURCES AT VARIOUS SITES

S NO.	Facility	No. of leak Points	Leak Points Attended
1.	MPT	23	20
2.	MBA Well Pads	07	3
3.	RDG, RGT & Well Pads	16	11
4.	Viramgam and AGI	05	4
5.	Bhogat	07	4
6.	Suvali	30	27
7.	Total	88	69

ANNEXURE 3

7.0 A leak is defined as the detection of VOC concentration more than the values (in ppm) specified below at the emission source using a hydrocarbon analyser. For equipment leak emission estimates may be referred to:

Table – 1*

Component	General Hydrocarbon (ppm)	Benzene (ppm)
Pump/Compressor	5000	2000
Valves/Flanges	3000	1000
Other components	3000	1000

Fugitive Emission Study Field Photos





GPCB-FORM IV-2025-05

Date: 20th May 2025

To,

The Regional Officer,
Gujarat Pollution Control Board,
Plot No. 11-12/2,3
GIDC, Pandesara
Surat – 394 221.

Sir/Ma'am,

Sub: Submission of Form IV for Year 2024-25

Ref: CCA Order No. AWH – 137463, Consent Condition No. 7.15

With reference to the above, we are hereby submitting the Annual Return in **Form IV** under the **Hazardous and Other Wastes (Management and Transboundary Movement) Rules, 2016**, for the period **April 2024 to March 2025**, in compliance with **Condition No. 7.15** of the Consolidated Consent and Authorization (CCA) granted to us by GPCB.

Thanking you,

Yours faithfully,



Samarth Kaji
Installation Manager – CB/OS-2
Cairn Oil & Gas, Vedanta Limited

Enclosed:

1. Annual Hazardous Waste Return: April 2024 – March 2025

VEDANTA LIMITED

Cairn Oil & Gas : Survey No 232 | Village – Suvall | Surat-Hazira Road | Surat - 394510, Gujarat, India
T +91-261 6711444 F +91-261 6711500, 10, 90 | www.cairnindia.com

Registered Office: Vedanta Limited, 1st Floor, 'C' wing, Unit 103, Corporate Avenue, Atul Projects, Chakala, Andheri (East), Mumbai-400093,
Maharashtra, India | T +91-22 664 34500 | F +91-22 664 34530 | www.vedantalimited.com

CIN: L13209MH1905PLC291394

FORM 4

[See rules 6(5), 13(8), 16(6) and 20(2)]

FORM FOR FILING ANNUAL RETURNS[To be submitted by occupier/operator of disposal facility to State Pollution Control Board/ Pollution Control Committee by 30th June of every year for the proceeding period April to March]

1.	Name and address of the generator/operator of facility:	:	Vedanta Limited - Cairn Oil & Gas Suvali Onshore Terminal Survey No. 232, Village Suvali, Surat Hazira Road, Surat – 394510
2.	Authorization No. and Date of issue:	:	AWH 137463 Dated 03.10.2024 Valid till 30.06.2028
3.	Name of the authorized person and full address with telephone and fax number	:	Samarth Kaji Installation Manager – CB/OS-2 Onshore Terminal, Survey No. 232, Village Suvali Surat Hazira Road, Surat 394510, Gujarat Tele: 0261-6711400 Fax: 0261-6711509
4.	Production during the year (FY 2024-25)	:	A. Crude Oil: 2,14,895 SCM B. Natural Gas: 35,21,13,514.7 SCM
Part A: To be filled by Hazardous Waste Generators			
1.	Total Quantity of Waste generated Category wise	:	Hazardous Waste Generated during FY 2024-25. Refer to Annexure 1 Total Quantity generated= 71.719 MT
2.	Quantity Disposed (i) To disposal facility (ii) To recycler or co-processor or pre-processor (iii) others	:	Hazardous Waste disposed during FY 2024-25. Refer Annexure 1&2 (i) Common TSDF: Nil (ii) Recycler/ Co-Processor/ Pre-processor (M/s Achintyaa Enviro Solutions Pvt Ltd.): 44.13 MT (iii) Others- Re-processing inside the terminal: 27.589 MT Offshore disposal as per GSR 546(E) guidelines of EPA: Nil
3.	Quantity utilized in-house, if any	:	Used/Waste/lube Oil generated during maintenance activities is reprocessed through our internal processing and mixed with the product in a closed loop system.
4.	Quantity in storage at the end of the year	:	Nil
Part B: To be filled by Treatment, storage and disposal facility operators			
1.	Total quantity received	:	-Not Applicable-
2.	Quantity in stock at the beginning of the year	:	
3.	Quantity treated	:	
4.	Quantity disposed in landfills as such and after treatment	:	
5.	Quantity incinerated (if applicable)	:	
6.	Quantity processed other than specified above	:	
7.	Quantity in storage at the end of the year	:	

Part C. To be filled by recyclers or co-processors or other users		
1.	Quantity of waste received during the year (i) domestic sources (ii) imported (if applicable)	:
2.	Quantity in stock at the beginning of the year	:
3.	Quantity recycled or co-processed or used	:
4.	Quantity of products dispatched (wherever applicable)	:
5.	Quantity of waste generated	:
6.	Quantity of waste disposed	:
7.	Quantity re-exported (wherever applicable)]	:
8.	Quantity in storage at the end of the year	:

-Not Applicable-

Date: 20th May 2025
Place: Suvali, Surat



Signature:
Samarth Kaji
Installation Manager

Annexure- 1: Hazardous Waste Generation and Disposal Details FY 2024-25**Suvali Onshore Terminal**

S. No	Hazardous Waste Description	Authorized Quantity	Generation Quantity (MT)	Disposal Quantity (MT)	Remarks
1	ETP Waste (34.3 Schedule I)	600 MT/ Year	44.130	44.130	-
2	Waste oil (Tank bottom oil/ Sludge, oil emulsions) (5.2 Schedule I)	800 MT/Year	27.589	27.589	Reused or Reprocessed Within the Terminal
3	Used Oil/ Spent Oil (5.1 Schedule I)	40 MT/Year	Nil	Nil	
4	Sludge Filters, Liners containing Oil (35.1 Schedule I)	15 MT/ Year	Nil	Nil	
5	Oily Soaked Cotton Rags (Z-41 Schedule I)	6000 Kg/Year	Nil	Nil	
6	Discarded containers (33.3 Schedule I)	30000 Kg/ year	Nil	Nil	
7	Spent Chemicals (32.1 Schedule I)	40 MT/Year	Nil	Nil	
8	Drill Cuttings (2.1 Schedule I)	800 MT/Well	Nil	Nil	
9	Drilling Fluid (2.3 Schedule I)	440 MT/Well	Nil	Nil	
10	Waste Hot Oil (5.2 Schedule I)	1000 Lit/Year	Nil	Nil	
11	Expired paint (21.1 Schedule I)	600 Kg/Year	Nil	Nil	

ANNEXURE-2: HAZARDOUS WASTE DISPOSAL DETAILS FY 2024-25

SUVALI TERMINAL

S. No	Date	Manifest No.	Type of Waste	Disposed (MT)	Transporter Name	Vehicle Number
1	19/06/2024	2570057	ETP Sludge	6.050	Achintyaa Enviro Solutions Pvt Ltd	GJ15AT4583
2	10/01/2025	2792861	ETP Sludge	10.440	Achintyaa Enviro Solutions Pvt Ltd	GJ15AT4583
3	21/03/2025	2869452	ETP Sludge	8.620	Achintyaa Enviro Solutions Pvt Ltd	GJ15AT4583
4	24/03/2025	2872116	ETP Sludge	8.530	Achintyaa Enviro Solutions Pvt Ltd	GJ15AT4583
5	25/03/2025	2874009	ETP Sludge	10.490	Achintyaa Enviro Solutions Pvt Ltd	GJ15AT4583
				44.130		
1	30-01-2025	-	Waste/Used Oil	25.32	Reprocessed Within the Terminal	-
2	26-02-2025	-	Waste/Used Oil	0.069	Reprocessed Within the Terminal	-
3	25-03-2025	-	Waste/Used Oil	2.200	Reprocessed Within the Terminal	-
				27.589		






SUVALI INCIDENT RESPONSE PLAN					
Revision Number	29	Date of Issue	21 st May 2025	Next Review	20 th May 2026
Owner	HSE				
Application	CB/OS-2 Operations				
Classification	Internal				



VEDANTA LIMITED CAIRN OIL & GAS

CBOS-2 OPERATIONS

INCIDENT RESPONSE PLAN

Prepared by	Vijay Kansagara HSE Head, CBOS-2	
	Nikunj P / Amita B / Irfan F / Ravinder B Production Superintendent	
Reviewed by	Urvesh Shah Head Production, CBOS-2	
	Paresh Lad Head Maintenance, CBOS-2	
Approved by	Samarth Kaji Installation Manager, CBOS-2	
Document Number	PRO-LX-H-0004	

Document Change History

Rev	Date	Section	Nature of Change
A	22/09/2002	Entire Document	1st Draft – For Offshore Gas to SVL facilities
0.0	30/09/2002	Entire Document	For implementation
1.0	04/07/2004	Entire Document	Reviewed by SVL team
2.0	25/11/2005	Entire Document	Reviewed by SVL team
3.0	30/11/2007	Entire Document	Reviewed by SVL team
4.0	09/05/2009	Entire Document	To update in line with EMP released in corporate to include Radiation emergency response and ALHF augmentation project
5.0	09/04/2014	Entire Document	For best practice
6.0	15/04/2015	Section 7.2	Revision of Emergency Events and Procedures
7.0	25/10/2016	Entire Document	<ol style="list-style-type: none"> 1. Scenario Specific Checklist. 2. Review under Fire & Explosion at Offshore Platform (LA Platform) w.r.t Gas Lift Compressor. 3. Inclusion of Reliance under Mutual Aid Partner.
8.0	04/04/2017	Entire Document	<ol style="list-style-type: none"> 1. Exclusion of Emergency Plan for CBX Well Site. 2. Inclusion of Work at Height Rescue Plan.
9.0	12/06/2018	Entire Document	<ol style="list-style-type: none"> 1. Inclusion of Bursting of Pipeline scenario as per OMR 2017. 2. Inclusion of Mutual Aid Partner – M/s L&T Hazira.
10.0	12/07/2018	Section 9 – EMT Section 10 – CMT	1. Revision in EMT & CMT Structure as per Revised HSE Emergency Response Strategy.
11.0	26/10/2018	Section 12 – IRT Roles	1. Role of Security Manager included as per recommendation under Bomb Threat Tabletop conducted on 26 th Oct’18.
12.0	18/12/2018	Section 33 – Emergency Events Section 34 – Incident Reporting Section 35 – Media Statement	<ol style="list-style-type: none"> 1. Revision in List of Emergency Scenarios 2. Inclusion of Incident Reporting to the Indian Regulators. 3. Revision in Media Statement Format as per Cairn Emergency Preparedness Guide.
13.0	23/01/2019	Emergency Scenario – 33.1.10 Loss of Radioactive Source	Revision in Safety and Security Measures in case of Loss of Radioactive Source as per AERB Circular# AERB/RSD/WL/Circular/2019.
14.0	30/11/2019	Section 13 – Designated Muster Locations	Revision in Muster Location of On Duty PIC in silent hours.
15.0	16/01/2020	Section 13 – Designated Muster Locations	Revision in IC Role during night shift and weekly offs due to change in IM duty pattern.

Rev	Date	Section	Nature of Change
16.0	18/06/2020	Section 33.1.3 – Helicopter Missing Scenario Emergency Scenario – COVID 19 Pandemic	VSAP CAPA: Inclusion of Support from Mutual Aid Partner and Helicopter Operator for Search Operation. (GAT-2020-6242) Inclusion of COVID19 Pandemic Scenario
17.0	31/08/2020	Section 33.1.8 – Radioactive Material Spill	Mock Drill Recommendation: AERB Reporting Format for Loss of Radioactive Material.
18.0	01/06/2021	Section 12 – IRT Roles Section 2 – Purpose	IRT Logistics Coordinator Role to Manager Production Offshore & Offsite Reference of UNEP Guideline for Environment Emergency Response. Learning from West Coast Cyclone in May-2021 Fatality of Security Guard during lightning in Group Company
19.0	21/07/2021	Section 33	Typographical error in revision number corrected
20.0	01/05/2022	Section 20	Designated Muster Locations
21.0	16/06/2022	Section 31	CMT and EMT List Update
22.0	01/08/2022	Section 26.1.8 – Radioactive Material Spill	Inclusion of Offshore Resources in Emergency Scenario of Radioactive Source - Revision of Loss of Radioactive Source Mock Drill Recommendation
23.0	31/08/2022	Section 9.6 – Muster Section 33 – Emergency Events	Inclusion of special care for pregnant women employees during emergency. Inclusion of Section 26.4.3 Earthquake
24.0	25/11/2022	Section 26.2.8 – Tanker Collision leading to Oil Spill	Inclusion of Business Partner role in offsite Crude Tanker incident.
25.0	31/05/2023	Section 31.2 – Emergency Response Group Section 31.3 – Incident Response Team	Revision in IRT Team contact details
26.0	17/08/2023	Section 26.2.8 – Tanker Collision leading to Oil Spill	Inclusion of Gas Testing of Crude before commencing the transfer of crude from one tanker to another Inclusion of Revised Mutual Aid Agreement with M/s LnT Hazira.
27.0	31/03/2024	Section 32.3 – Emergency Services Section 23 – Roles and Responsibility Section 26.2.9 – Electric Shock Scenario	Revision in Indian Coast Guard Team contact details and inclusion of ODAG Contact Details Updation of IRT Alternative Roles Updation of Roles and Responsibilities of Control Room Engineer Inclusion of Electric Shock Scenario in Onshore Emergency Events

28.0	16/10/2024	<p>Section 19 – IRT Roles</p> <p>Section 20 – Designated Muster Location</p> <p>Section 32.1 – Emergency Response Group</p>	<p>Updation in Responsible Position of Logistic Support and Medical Support</p> <p>Updation in Alternate Responsible Position of Technical Support and Additional Fire and Rescue Support.</p> <p>Updation in personnel mustering at Muster Point#1 and Muster Point#5.</p> <p>Updation in list of Fire Warden and Alternate Fire Warden.</p> <p>Updation in Emergency Management Team</p> <p>Updation in Additional First Aiders and Additional Fire Fighting Team.</p>
29.0	21/05/2025	<p>Section 20 – Designated Muster Location</p> <p>Section 26.3.6 – Air Raid Warning</p> <p>Section 32.1 – Site Emergency Response Team</p> <p>Section 32.2 – Emergency Response Group</p>	<p>Updation in list of Fire Warden and Alternate Fire Warden.</p> <p>Inclusion of Air Raid Warning Scenario</p> <p>Updation in List of Site Emergency Response Team</p> <p>Updation in Emergency Management Team</p> <p>Updation in Additional First Aiders and Additional Fire Fighting Team.</p> <p>Inclusion of coordination with government bodies in event of offsite emergencies</p>

DOCUMENT CONTROL AND DISTRIBUTION LIST

This Incident Response Plan prepared for Cairn Oil & Gas Vedanta Limited CB/SO-2 Onshore Terminal and Offshore Platforms (Lakshmi Alpha, Lakshmi Bravo and Gauri Alpha) and is issued on the authority of the Installation Manager CB/OS-2. It is the responsibility of the Installation Manager CB/OS-2 to ensure that the document reflects the latest emergency response information and for ensuring that the whole document is reviewed at regular intervals not exceeding three years or when there is a change in the operating asset structure that has an impact on the contents.

A copy of this document will be issued to everyone in the distribution list. The original electronic version is also available in Documentum. Those with specific duties for dealing with an incident or emergency must ensure that they are aware of their responsibilities and duties as contained in this manual, and the way these procedures interface with the other support groups and organizations

Distribution List

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TABLE OF CONTENTS

1.	<i>INTRODUCTION Cairn Oil & Gas, CBOS-2 Asset is committed to properly manage any emergency, which can arise during its operations, to minimize the impact it may have upon personnel, the environment, property, the company's financial position and its reputation. The key to effective response to emergencies is having trained personnel and a pre-established organization on-call capable of mobilizing and responding to the extent required by different levels of emergency.</i>	8
2.	<i>PURPOSE</i>	8
3.	<i>SCOPE</i>	8
4.	<i>DESCRIPTION OF OPERATIONS</i>	9
5.	<i>EMERGENCY RESPONSE PHILOSOPHY</i>	10
6.	<i>EMERGENCY CLASSIFICATION</i>	10
7.	<i>CAIRN INCIDENT AND EMERGENCY MANAGEMENT ORGANIZATIONS</i>	12
8.	<i>ORGANIZATION SUPPORT LINKS</i>	14
9.	<i>MANAGEMENT & CONTROL OF EMERGENCIES</i>	15
10.	<i>MEDICAL FACILITIES AND SUPPORT</i>	17
11.	<i>EMERGENCY COMMUNICATIONS</i>	18
12.	<i>DRILLS AND EXERCISES</i>	19
13.	<i>ORGANISATION AND ARRANGEMENTS</i>	19
14.	<i>PREPARATION AND PLANNING</i>	20
15.	<i>SUFFICIENT COMPETENT PERSONNEL</i>	20
16.	<i>DETECTION OF INCIDENTS</i>	20
17.	<i>EXTERNAL SUPPORT</i>	20
18.	<i>EMERGENCY CONTACTS</i>	21
19.	<i>IRT ROLES:</i>	21
20.	<i>DESIGNATED MUSTER LOCATIONS</i>	22
21.	<i>INCIDENT CONTROL AND EMERGENCY RESPONSE CENTRES</i>	24
22.	<i>INCIDENT REPORTING AND NOTIFICATION</i>	25
23.	<i>ROLES AND RESPONSIBILITY</i>	29
24.	<i>SCENARIO SPECIFIC CHECKLIST</i>	40
25.	<i>EMERGENCY EVENTS FLOW CHARTS</i>	41
26.	<i>EMERGENCY EVENTS</i>	43
26.1	<i>Offshore Emergency Events</i>	44
26.2	<i>Onshore Emergency Events</i>	80
26.3	<i>Security Emergency Events</i>	116
26.4	<i>Natural Emergency Events</i>	132
26.3	<i>Social Unrest</i>	140
26.4	<i>COVID 19 Pandemic</i>	143
27	<i>Reporting of Incident</i>	144
27.2	<i>Reporting</i>	144
27.3	<i>Reporting within the Field</i>	144
28	<i>Reporting to Head office - Gurgaon the Field</i>	144
28.2	<i>Incident Report</i>	144
28.3	<i>Incident Situation Report Format (SITREP)</i>	145
28.4	<i>Medical Evacuation (Medevac) Report</i>	145
28.5	<i>Internal Distribution</i>	145
28.6	<i>Notification Period</i>	145
29	<i>Incident Reporting Forms</i>	148
29.1	<i>Media Statement</i>	148
29.2	<i>SITREP</i>	149
29.3	<i>OIL SPILL REPORTING FORM</i>	150
29.4	<i>Medevac Patient Details</i>	151
29.5	<i>Site Medical Causality Report</i>	153
29.6	<i>Fatality Report</i>	154
29.7	<i>Bomb Threat</i>	155

29.8	Telephone Call Record	156
29.9	Pollution Report.....	157
29.10	Government Incident Notification	158
29.11	Incident Response Log.....	159
30	Location Specific Information.....	160
30.1	Hospital or Sickbay Equipment List.....	160
30.2	Fire Fighting Facilities.....	160
31	Specifications of Rescue Tools & Equipment's.....	163
32	Emergency Contact Directory	165
32.1	Emergency Response Group.....	166
32.2	SITE INCIDENT RESPONSE TEAM	167
32.3	Emergency Services.....	168

1. INTRODUCTION

Cairn Oil & Gas, CBOS-2 Asset is committed to properly manage any emergency, which can arise during its operations, to minimize the impact it may have upon personnel, the environment, property, the company’s financial position and its reputation. The key to effective response to emergencies is having trained personnel and a pre-established organization on-call capable of mobilizing and responding to the extent required by different levels of emergency.

2. PURPOSE

This is a site-specific Incident Response Plan (IRP), the purpose of which is to provide guidance to personnel based at the site who are appointed as the Incident Response Team (IRT) on the actions to take in the event of an incident or emergency. It details the procedures to be followed by members of the IRT to ensure a prompt and efficient response, should an incident or emergency occur. The Incident Response Team will be formed from Field Managers, Supervisors and Personnel based at the site that will be always on call while on location. Personnel who form an IRT will be informed of their responsibilities and trained in their role.

If an incident or emergency develops the site IRT will be mobilized, and depending on circumstances at the time, resources from adjacent facilities will be called upon to aid. This Site Incident Response plan has been developed in line with UNEP Guideline for Environment Emergency Response.

3. SCOPE

The scope of this Incident Response Plan covers the following areas falling under Cairn Vedanta Limited – Suvali Terminal and would be henceforth referred as “**Site**” in subsequent paragraphs:

- LA, LB and GA Offshore Platforms (Applicable only to defined Cairn boundary)
- Sub Sea Pipelines (24” and 12” respectively)
- Landfall point area including 18” pipeline
- Suvali Onshore Terminal
- Associated Logistics Operations (Helicopter, Marine and Road Transport Operations)

Installation	Location
Suvali Onshore Terminal	21°10'13.346"N 072° 39'00.120"E
Gauri Alpha (GA) Platform	21°01'55.18"N 072° 33'17.20"E
Lakshmi Bravo (LB) Platform	21°06'12.39"N 072° 31'01.54"E.
Lakshmi Alpha (LB) Platform	21°03'56.30"N 072° 31'37.41"E



4. DESCRIPTION OF OPERATIONS

The Lakshmi Field Development consists of three unmanned well-head platforms Lakshmi A and Lakshmi B and platform Gauri A (GA). Onshore gas processing terminal is located near the coastal town of Suvali in the north-west Indian province of Gujarat. A 600 mm NB subsea pipeline connects the Lakshmi A platform to the onshore terminal, with a 300 mm nominal bore spur line from Lakshmi B tying in sub-sea. A 300mm NB pipe connects GA to LA and joins LA – Onshore Terminal pipeline at deck level. Untreated Oil & natural gas free- flows from the LA, LB and GA platforms to shore during all phases of operation. The 300 mm pipeline from GA-LA is 4.5 kilometres in length. Submarine section of pipeline is concrete weight coated, corrosion coated and buried 1 meter below the seabed. The line from LA is 600 mm nominal bore pipeline is approximately 36 kilometres in length. The submarine section of this pipeline (32 kilometres) is concrete weight coated and corrosion coated. Sections of this pipeline are trenched for stability purposes and the thickness of the weight coating varies depending on the raining internal and external conditions.

The onshore section of the 600 mm nominal bore is approximately 4 kilometres in length and is externally coated in order to mitigate corrosion. The onshore pipeline is buried at a depth of approximately 1500 mm (top-of-pipe).). The onshore section of 600 mm line is hot tapped for 450 mm line (loop line) near Land fall point which runs parallel to 600 mm line. The 450 mm line is provided with Pig launcher cum receiver at onshore terminal receiving end. The line was commissioned under loop line project to handle liquid slugs during pigging operation.



5. EMERGENCY RESPONSE PHILOSOPHY

In emergency situations, a pre-planned and organized approach is most effective in responding to emergencies. The formation of a trained Incident Response Team will increase the probability of preserving life, protecting the environment and property, and returning the situation to normal. Cairn's Emergency Response Philosophy provides "reasonable assurance that adequate measures can and will be taken in the event of an incident or emergency." This document sets forth emergency planning standards for site facilities required to comply with the philosophy and defines the organizations involved in emergency response.

The added feature of emergency planning provides that, even in the unlikely event of an incident or release to the environment staffed with competent individuals, organized into teams, with allocated and clearly defined roles and responsibilities and practiced in their roles.

NOTE

It is not intended for every prompt to be reacted to sequentially, or to be reacted to at all, only to be considered as pro-active suggestions, appropriate to the incident response required at the time.

CAUTION

Clear communications are always extremely important, with all personnel concerned assigned with role and responsibility in Suvali Incident Response Team.

6. EMERGENCY CLASSIFICATION

An emergency is any unplanned event which changes the operational state of the site or location and requires an IMMEDIATE RESPONSE to deal with it.

- It may involve injury or death of personnel.
- It may involve environmental damage.
- It may affect the operability of the site.
- It may affect surrounding areas and population
- It may affect the revenue generating ability of the Company

Cairn defines emergency situations in three tiers of severity, related to the scale of the incident and the capability of the organization to respond effectively.

Below picture shows the details of the tier levels and is based on the Cairn Risk Evaluation guidelines.

Emergency Level	Tier 1 Regional	Tier 2 Tactical	Tier 3 Strategic
Category	Minor Incident where site does not require external assistance and can control emergencies with local resources. Incident Controller must notify duty EMT Leader.	Substantial Incident Duty EMT Leader decision to call out EMT Task Force. Duty EMT Leader must notify duty CMT Leader.	Crisis situation appears likely. Duty CMT Leader decides to Call Out CMT Task Force. Duty CMT Leader must notify CEO.
Response	Incident Response Team	Emergency Response Team	Crisis Response Team
Health & Safety	Minor Injury case; Equipment Damage with loss of production; Minor Fire without injury or plant damage; Rescue of Trapped or injured person.	Fire or Explosion; Injury or Illness require evacuation; Traffic Accident requires external assistance; Marine Incident e.g., Vessel Collision	Incident leading to multiple injuries or fatality(s); Significant financial loss due to property damage; Total loss of Marine Vessel; Well Blowout incident leading to Media coverage; Major traffic Incident with multiple casualties
Environment	Minor Oil Spill < 700 Bbls.; Onsite Environment Exposure contained within Internal Efforts; Notification of Cyclone within 72 Hrs.	Oil Spill > 100 Tons but < 1000 Tons; Offshore Environment Exposure contained with Mutual Aid support; Flood or Cyclone warning Blue Alert (within 48 Hrs.)	1000T (7000 bbls.) effluent discharge / flaring beyond acceptable limits; Flood or Cyclone warning Yellow alert (within 12 Hrs.); Major Earthquake
Security	Minor Security breach; Theft from site; Local unrest.	Civil unrest or security breach; Major Criminal Activity	Terrorist Activities / Bomb Threat / Major Civil unrest

7. CAIRN INCIDENT AND EMERGENCY MANAGEMENT ORGANIZATIONS

The Company's emergency management procedure uses a three-tiered emergency management organization. These are:

At the first level there is the **Incident Response Teams (IRT)** based at CB/OS-2. There are Incident Response Teams based at all manned remote locations, sites or facilities who are responsible for:

- Management and control of localized incidents and emergencies
- Notifying and liaising with the duty Emergency Management Team Leader
- Notifying the ERT Leader
- The regional Emergency Response Teams role is to provide support to the entire field IRT's and act as the main link to the EMT.

An **Emergency Management Team (EMT)** based in the Company head office in Gurgaon, responsible for:

- Providing support, advice and off-location assistance to the remote location where a major incident is in progress
- Notifying next-of-kin, authorities, employees, contractors, national JVs etc.
- Notifying and liaison with Crisis Management Team
- Providing and coordinating specialist support
- Co-coordinating recovery from incident
- Obtaining clearances for and issuing release to national media

EMT members each have defined emergency roles and responsibilities with the appropriate knowledge and experience within that role. In the event of an incident or emergency the EMT leader will make a decision whether or not to mobilise the EMT. If the decision is taken to mobilise the EMT then all EMT duty personnel are required to proceed promptly to the Emergency Management Team Room and to implement actions in accordance with their role, responsibility and as directed by the duty EMT Leader.

The EMT core organization is comprised of the following roles and responsibilities:

1. **EMT Leader** – In overall charge. Responsible for Company's tactical response to all emergency situations.
2. **Human Resources & Services Co-ordinator** – Responsible for providing HR and Services advice and support.
3. **Logistics Co-ordinator** – Responsible for providing transport and logistics support as required.
4. **Operation and Technical Co-ordinator** – Responsible for providing operational and technical support and advice.
5. **HSE Co-ordinator** – Responsible for providing health, safety, environmental support, and response.
6. **Recorder** – Responsible for maintaining a timed log of key events and actions.
7. **Security Co-ordinator** – Responsible for providing security support advice and assisting others as required by EMT Leader

Activation of EMT

In the event of a remote location (any operational facility under Cairn management control with respect to Rava, Suvali or other Stand-Alone Operation) activating their Incident Response Team (IRT), the Incident Controller shall immediately notify (24 hours/day and 7 days/week) the duty Emergency Management Team (EMT) Leader.

Depending on where the emergency is, the Gurgaon Office Radio Operator will be the central point of contact for the initial incident notification. If notified of an incident or emergency the Gurgaon Radio Officer shall immediately notify the duty EMT Leader (Refer Emergency Contact details).

The Gurgaon Radio Operator will request the following information from the person reporting an incident or emergency situation:

- Caller's location and contact telephone number
- Nature of the Incident
- Local time of report

The Gurgaon Radio Operator will notify the duty EMT Leader that an Emergency has occurred along with the information provided above. Upon receiving notification of an incident or emergency, the duty EMT Leader must make immediate contact with the Location reporting the incident or emergency situation.

Emergency Management Team Room

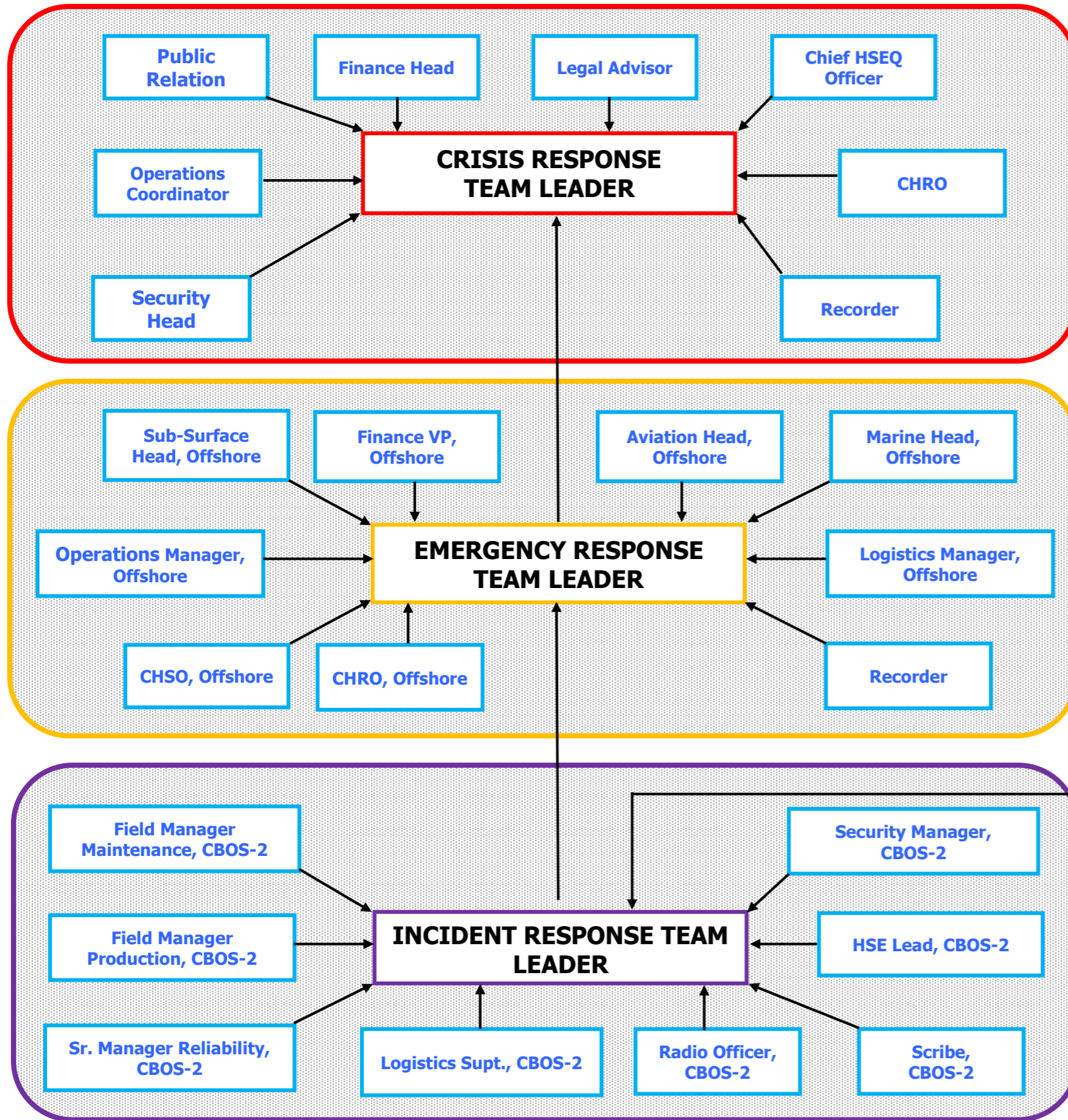
When the EMT is mobilised, the group members will normally meet in the designated Emergency Co-ordination Centre.

A Crisis Management Team (CMT) based in the Company head office in Gurgaon, responsible for:

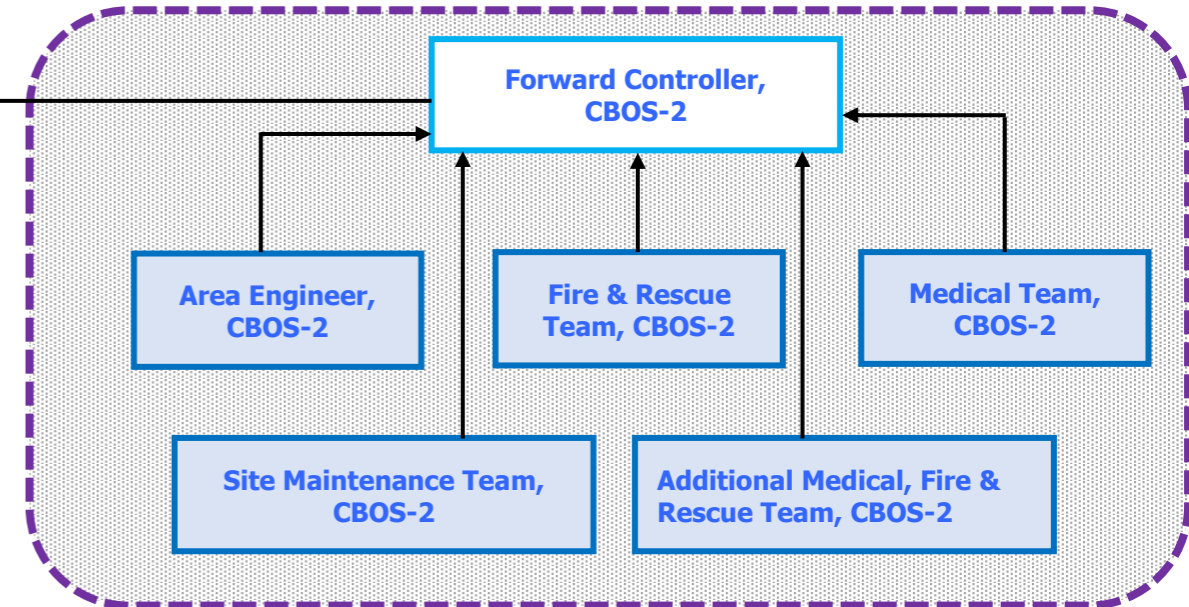
- Providing strategic response assistance, support and advice to the EMT
- Notifying international authorities, shareholders, JV partners, and financial institutions
- Coordinating and approving all media releases, issuing international media releases
- Authorizing extraordinary expenditure
- Deciding on the course of action in the event of civil unrest or war
- Coordinating response to kidnap and extortion demands
- Providing legal advice and response

This Incident Response Plan details the Incident Response Team's individual roles and responsibilities and provides guidance on how they should provide assistance to others in emergency or incident situations and address the issues arising out of such situations e.g., personnel, environmental, legal and financial.

8. ORGANIZATION SUPPORT LINKS



Emergency Level	Tier 1 Regional	Tier 2 Tactical	Tier 3 Strategic
Category	Minor Incident where site does not require external assistance and can control emergency with local resources. Incident Controller must notify duty EMT Leader.	Substantial Incident Duty EMT Leader decision to call out EMT Task Force. Duty EMT Leader must notify duty CMT Leader.	Crisis situation appears likely. Duty CMT Leader decide to Call Out CMT Task Force. Duty CMT Leader must notify CEO.
Response	Incident Response Team	Emergency Response Team	Crisis Response Team
Health & Safety	Minor Injury case; Equipment Damage with loss of production; Minor Fire without injury or plant damage; Rescue of Trapped or injured person.	Fire or Explosion; Injury or Illness require evacuation; Traffic Accident requires external assistance; Marine Incident e.g., Vessel Collision	Incident leading to multiple injuries or fatality(s); Significant loss financial loss due to property damage; Total loss of Marine Vessel; Well Blowout incident leading to Media coverage; Major traffic Incident with multiple casualties
Environment	Minor Oil Spill < 700 Bbls.; Onsite Environment Exposure contained within Internal Efforts; Notification of Cyclone within 72 Hrs.	Oil Spill > 100 Tons but < 1000 Tons; Offshore Environment Exposure contained with Mutual Aid support; Flood or Cyclone warning Blue Alert (within 48 Hrs.)	1000T (7000 bbls) effluent discharge / flaring beyond acceptable limits; Flood or Cyclone warning Yellow alert (within 12 Hrs.); Major Earthquake
Security	Minor Security breach; Theft from site; Local unrest.	Civil unrest or security breach; Major Criminal Activity	Terrorist Activities / Bomb Threat / Major Civil unrest



9. MANAGEMENT & CONTROL OF EMERGENCIES

9.1 General

The Incident Controller (or authorized deputy) shall assume command and control of any emergency occurring within the CB/OS-2 Onshore and Offshore Operations. All personnel based or visiting the site are to be briefed on the emergency procedures and advised of their responsibilities. Mitigation measures are available / deployed at CB/OS-2 to protect personnel, equipment and property from the effects of fire and explosion. The site Safety Induction covers the rules to be followed by Employees, Business Partners and visitors in case of an emergency.

9.2 Control

Control measures employed to limit or prevent the escalation of accidents, incidents and hazards include, but are not limited to:

- Remotely operated equipment such as ESD and blow-down systems, specific to the area.
- Fire and Gas detection systems at site.
- Tier-1 Oil Spill Response Equipment.
- Deployment of the Forward Response Team, if it is safe to do so, to proceed to the incident and manually operate equipment, e.g. isolation valves.
- Remote operation of equipment and co-ordination of the Forward Response Team is carried out by personnel located in the Incident Control Centre.
- Fixed and Portable Fire Fighting (State of the art Fire Tenders) equipment and fire team manning the fire station round the clock.

9.3 Emergency Siren

Site has installed Emergency Sirens suitably to cover whole area within cairn operational control along with Public Address System These sirens are inline with OISD 116 as below:

Sr. No.	Type of Emergency	Siren	Duration
1	Small Fire	No Siren	----
2	Level/Tier 1&2 Emergency Major Fire or Leak	Wailing Siren for Two Minutes	2 Minutes
3	Level/Tier 3 Emergency Disaster or Site Evacuation	Wailing Siren for Two Minutes + Gap 1 Minute + Wailing Siren for Two Minutes + Gap 1 Minute + Wailing Siren for Two Minutes	8 Minutes
4	All Clear	Straight Run for Two Minutes	2 Minutes
5	Test Siren	Straight Run for Two Minutes	2 Minutes

Sirens are tested on weekly basis and observation records are maintained by site Fire Team. A clear set of actions followed, including how to raise the alarm, by the person or persons becoming involved in or discovering an incident or emergency are provided as part of the induction process. The actions include a clear instruction on how to report an incident or emergency to the Incident Controller.

Whenever an emergency occurs it is vital that the alarm be raised immediately and that the appropriate persons are informed in order that immediate action is taken to account for everyone, contain the incident and recover the situation.

Following means can be used while raising an alarm:

- ✓ By Walkie Talkie
- ✓ By intercom to 2500 (Control Room) / 2450 (Radio Room)
- ✓ By paging system
- ✓ By pressing the Evacuation button in the control room
- ✓ By activating the Manual Alarm call points installed at strategic locations in the plant.

NOTE

Final decision lies with the Incident Controller on raising the alarm depending upon the type of the emergency.

9.4 ESCAPE

The CB/OS-2 facilities and other associated areas will have clearly marked primary and if required alternative escape routes. These are specified / explained in the site safety induction or demonstrated as part of the site induction process.

9.5 MUSTER

All personnel working or visiting CB/OS-2 facility shall be allocated a Muster Point which is clearly identified in the site safety induction process. On hearing the Emergency Alarm / notification, personnel shall report to their allocated muster point. If personnel are unable to get to their allocated muster point, they should report to the nearest alternative muster point and ensure that a communication of the same reaches his designated Muster Checker. Instructions are in place for Muster Checkers and those in charge of the Incident and Medical Response Teams to account for and report to the Muster Coordinator the status of the muster.

9.6 MUSTER (ACCOUNTING FOR PERSONNEL)

The method used for accounting of personnel is by use electronic based system-access control system where people's movements are tracked at gates and site registers or 'T' card system where people's movements are tracked. The site register and access card details will be maintained by the security team who will hold an up-to-date record of all those on the site. In the event of an incident at any of the site location, the register/database will be marked to show each person accounted for from the muster roll call. All non-emergency personnel shall report **on foot** to their nearest muster point on hearing the site alarm, unless instructed to do otherwise via radio announcement or agreed alternative method of communication.

In case of any Pregnant women employee at site, Admin Manager to ensure that they are stationed in ground floor of their office building nearer to their muster point as much as possible. Admin Manager to depute one escort for assisting them to safe location in case of emergency.

All personnel with emergency duties including the Incident Controller must ensure that they can safely gain access to their normal emergency response locations; if unable to do this, they should report to the nearest Muster Point, contact the Incident Control Centre or, failing this, advise the most senior member of staff and respond in accordance with the instructions given.

CAUTION

In case of a confirmed gas leak (no fire condition), no vehicles including emergency vehicles shall be utilized after the Site Alarm has been initiated, unless direct instructions are received from the Incident Controller or his designated team member.

9.7 EVACUATION

The Installation/Site Manager will decide to evacuate all the personnel at site following an incident, if he deems the site is becoming unsafe. This will be done in a controlled manner using all available means of evacuation.

9.8 MEDICAL EVACUATION

In the event of a medical evacuation being required, the site medical team shall immediately notify the Incident Controller of the need to evacuate a patient(s), the Incident Controller or their nominated deputy shall immediately inform the IRT Leader who will mobilize the IRT and ensure that the medical and logistical Support organizations are prepared and pressed into service. The site Medical Staff in consultation with the Incident Controller will determine the method of evacuation and location for treatment.

Note

For Medical Evacuation by Ambulance, it is Site Doctor's responsibility to ensure sufficient medication is available in the ambulance to cover the whole period of the journey.

9.9 SITE EVACUATION / ABANDONMENT

If the emergency continues to deteriorate, the procedure authorizes the Incident Controller, through a series of process to Abandon the facility.

Following are the probable scenarios where plant / Operation abandoning is required:

- ❖ Well blowout
- ❖ Major Hydrocarbon Leak
- ❖ Bomb Threat
- ❖ Terrorist Threat
- ❖ Natural Calamity – Earthquake, Cyclone, Flood Situation

Any other cases as the directive from the District / Central Govt.

10. MEDICAL FACILITIES AND SUPPORT

To ensure prompt response and minimize delays in the treatment and transportation of patients needing hospital care, medical facilities such as clinics or first response units such as mobile clinics or ambulances are available in CB/OS-2 Onshore Terminal Medical Centre. CB/OS-2 operations being

round the clock operations, the Installation Manager ensure that sufficient medical support is available to cover the period of the operation.

Medical Centre is equipped to handle all sorts of burn injuries and have a dedicated ward. Burn injury can be stabilized at Medical Centre.

Following are the facilities dedicated for burn injuries at the Operation Base Camp.

- Ward 1 Bed and medication.
- Decontamination room With Showers,
- Water gel blankets in the field.
- Advanced First aid sterilized dressing.
- Capability to shift to a better facility with advanced life support ambulance.

Following are the other facilities at the CB/OS-2 Onshore Terminal Medical Centre

- Medical staff manning round the clock by qualified Paramedics.
- Ward with 1 bed for IP stabilization
- Pharmacy
- Treatment room with dressing table and trolley.
- Suction machine
- BP Instrument
- Suture Tray
- Sterilized antiseptic dressing
- Stitching facility for all kind of injuries.
- Advanced Life Support Ambulance-ALSA.
- Treatment of all medical Ailment
- Medical storeroom
- Laboratory

11. EMERGENCY COMMUNICATIONS

Reliable communications equipment and support are available for use during an emergency. Site has dedicated Radio Room where all communications are bridged between Onshore & Offshore facilities.

Communication facilities available at site include the following:

- VHF / UHF radios
- HF Single Side band (SSB) facility in control room for interfacing with offshore operations.
- Voice Over Internet Protocol (VOIP) phones in all Sub-stations and other office buildings.
- Flameproof Mobile phones (designated places in the offshore / operations sites)
- Public Address and General Alarm (PAGA) System.
- Emergency siren.

Details of emergency numbers and contacts are found in IRP. During any incident, it is essential that the Communications Centre be manned by a competent radio operator, who is responsible for maintaining communications with all sections of the IRT and the EMT and for passing on information as required to the Incident Controller.

All personnel who are issued with communications equipment such as VHF Radios, mobile telephones must be competent in its use and familiar with emergency communications procedures such as usable channels, telephone and alternative systems and procedures if primary system fails to raise help.

Radio Communications for Routine operations are carried out via following channels:

Operations	Radio Channel
Onshore Operations	Channel 01
Offshore Operations	Channel 06

12. DRILLS AND EXERCISES

Details covering Drills and Exercises are provided in the annual HSE plan and are therefore not replicated in this document. The workforce will be practiced in reacting to any reasonably foreseeable event which could occur at the site.

13. ORGANISATION AND ARRANGEMENTS

13.1 ORGANISATION

To ensure that there is no conflict between an individual's site duties and any role allocated in the emergency organization, the Installation Manager must ensure that additional roles and responsibilities are clearly identified and can be performed without affecting or compromising either role.

13.2 ARRANGEMENTS

In all foreseeable circumstances, the prior arrangements are provided for the management of emergency or incident response. These arrangements will ensure, as far as is reasonably practicable, the safety of all persons involved or connected with them, prevent damage to equipment and the environment.

These arrangements include:

- Planning for emergencies.
- The prevention, detection, control and mitigation of incidents.
- Manual intervention.
- Informing all personnel of what their response to emergencies should be.
- Informing all personnel of hazardous conditions; their response and accounting for all personnel following an incident.
- Partial or full terminal evacuation.
- Firefighting and rescue.
- Co-ordination of the response and the co-operation of all those involved.
- External Support and response.

As part of the planning and consultation process, arrangements must be in place with the Cairn Gurgaon Emergency Management Team (EMT) so that they will respond promptly if additional logistical, medical, environmental, media or business continuity assistance is required.

14. PREPARATION AND PLANNING

Cairn Management have an obligation under various statutory regulations to identify, so far as is reasonably practicable, all hazards and their risks which could affect activities and personnel on or connected with the CB/OS-2 Operations and put in place control measures which will reduce these risks to 'As Low As Reasonably Practicable' (ALARP) levels. By recognizing and assessing these residual risks and what the potential results of incidents could be, adequate prior arrangements - preparation and planning - are be put in place so that if there is an incident, there will be an immediate and appropriate response. The overriding strategy, which is stated and implied by this plan, is that the preservation of life and the prevention of injury are of paramount importance.

15. SUFFICIENT COMPETENT PERSONNEL

Cairn Senior Management and their site managers have an obligation to ensure sufficient competent personnel are available to cover the roles identified in the site Incident Response organization. All personnel on site will be competent to respond, as appropriate, to emergencies. This can vary from responding to alarms and simple instructions and going to a muster station, to assessing complex situations, taking correct decisions and allocating tasks.

All personnel working in the facility shall receive appropriate instruction on how they will respond to emergencies. This is briefly covered in the site Safety Induction process as well.

Selections for positions where personnel will fulfill a critical role when responding to emergencies ensure that such duties are considered and that the personnel selected are suitable.

All IRT Members are subject to Emergency Management & Handling Training followed by annual refresher training on same.

16. DETECTION OF INCIDENTS

Incidents and potential incidents are detected primarily by either:

- Fire and Gas Detection System
- Automatic detection of process deviations or leaks
- Personnel at site

For personnel who come upon or suspect an incident or potential incident or are charged specifically to guard against an incident occurring (e.g., vessel entry watch or fire watch) through campaigns and special trainings, specific advice is given in the site Safety Induction training, in Procedures and in Permit to Work precautions. Personnel are educated about manually raising alarms - e.g., manual alarm call points, by telephoning or calling by radio the site Incident Control Centre (ICC).

17. EXTERNAL SUPPORT

The corporate Cairn's Crisis Management Plan provides details of the Cairn Crisis Management Team's activities in Support of the field response teams in such aspects as the involvement of external emergency services i.e., Police, public and media enquires etc.

18. EMERGENCY CONTACTS

It is the responsibility of the Incident Controller to ensure that an up-to-date list of all contacts and support services which may be required under incident and emergency situations is maintained and available in the Incident Control Centre (ICC). The format to be used, containing some of the essential contact positions and support services, is contained in Section 31 of this document.

19. IRT ROLES:

Following Positions identified for effectively managing emergencies. The Leader of the Incident Response Team is site Installation Manager (IM) or their nominated Deputy and Forward Response Team should be identified.

Rev. 28

Roles	Responsible Position	Alternate Responsible Position
Incident Controller	Installation Manager	Head Maintenance
Forward Controller	On Duty Production Supt.	*****
Control Panel	On Duty Production Engineer	*****
Operation Support	Head Production	Production Manager Offshore
Technical Support	Head Maintenance	Manager Instrumentation
HSE Support	HSE Manager	HSE Engineer
Logistics Support	Dy. Manager Prod & Logistics	Logistic Admin
Security Support	Security Manager	On Duty Security Officer
Medical Support	On Duty Paramedic	*****
Fire and Rescue Support	HSE Engineer	HSE Supervisor
Mutual Aid Support	Head Projects & Facility	Admin Manager
Muster Checker #1	HSE Manager	Head Projects & Facility
Muster Checker #2	Manager Mechanical	Lab Superintendent
Muster Checker #3	On Duty Security Officer	*****
Radio Room	On Duty Radio Officer	*****
Scribe	On Duty Instrument Engineer	*****
Additional Fire and Rescue Support	Mechanical Suptd.	Mechanical Sr. Engineer
Additional Medical Support	Electrical Superintendent	Electrical Engineer

NOTE:

One person may cover more than one role, provided the person is trained and deemed competent to carry out their designated role(s).

20. DESIGNATED MUSTER LOCATIONS

The sounding of the Suvali Plant Siren requires all persons to muster at the designated muster area in order to account for all persons on board and to allow Emergency Control Teams to be deployed. In the event of the siren being activated during General Shift hours (0830 – 1730 hrs.) personnel will muster according to the following table:

Rev. 28

SUVALI SITE PERSONNEL (General Shift 0830 -1730 Hrs.)					
Muster Point #1 Control Room	Muster Point #2 Fire Equipment Room	Muster Point #3 Near Main Gate	Muster Point #4 Near North Gate	Muster Point #5 LQ Shed	Muster Point #6 East Gate Security
INCIDENT RESPONSE TEAM	ADDITIONAL RESPONSE TEAM	OTHER PERSONNEL	PHASE II WORKING PERSONNEL	OTHER PERSONNEL	
Installation Manager	*Additional Fire Fighting Team	Security Manager	Aviation Crew	Employees stationed at Office Bunks, MVT building + LQ Personnel	ETP Supervisor + ETP Operators
Head Production	*Additional First Aiders Team	Security Supervisor	Phase II Security Guards		
On Duty Control Room Engineer	Lab Supt. (Muster Coordinator)	All other persons not included in Muster Point# 1, 2 & 4	All Personnel working in Phase II		
On Duty Radio Officer	Mechanical Suptd. (BP)				
Head HSE	Production Suptd. (BP)				
Head Maintenance	Electrical Sup., Electrical Engineer(BP)				
Sr. Manager AO & Reliability	Lab Technician				
Instrument Engineer	HSE Engineer				
Dy. Manager Prod & Logistics	Warehouse Incharge				
	Warehouse Associate				
	MHE Operators				

* Refer Section 32.2 for List of Additional Fire Fighting Team and Additional First Aiders Team.

To ensure complete mustering of Personnel as per above Muster Plan, Following FIRE WARDENS are identified to assist personnel for mustering at respective locations:

Rev. 28

Location	Fire Warden	Alternative Fire Warden
Mines Vocational Training (MVT) Centre	Abbas Ali (RTSO)	Dhiren (RTSO)
Office Bunks (Lakshmi / Gauri/ Asian Energy)	Vishnu Gopan	Aman Gaurav
Workshop Building	Hemraj Rathod	Niraj Naik
Control Room Building	Sanad Nambiar	Venkatesan A.S

SUVALI SITE PERSONNEL					
(Silent Hours – After Working Hours, Weekends, On Public Holidays)					
Muster Point #1 Control Room	Muster Point #2 Fire Equipment Room	Muster Point #3 Near Main Gate	Muster Point #4 Near Main Gate	Muster Point #5 LQ Shed	Muster Point #6 East Gate Security
INCIDENT RESPONSE TEAM	ADDITIONAL RESPONSE TEAM	OTHER PERSONNEL	PHASE II WORKING PERSONNEL	OTHER PERSONNEL	
#Duty Production In-charge PIC	NO MUSTERING	Security Supervisor	North Gate Security Guard	NO MUSTERING	ETP Supervisor + ETP Operators
On Duty Control Room Engineer		Person staying in LQ			
Duty Radio Officer		All other persons not included in Muster Point# 1, 2 & 4	All Personnel working in Phase II		
Duty Instrumentation Engineer (Muster Coordinator)					
Duty Electrical Engineer					
# On duty PIC shall act as Incident Controller until Installation Manager or appointed Deputy Manager reports to site. # On duty PIC shall decide either to be in field or be in IRT room, depending upon the type of Emergency. # Night duty Intrinsic (IS) phone with dedicated sim no. shall be kept with PIC to make the emergency communication over mobile phone. Rotational Production Shift Staff - Area Engineer, Operators and Fire Team remains 'On Scene'					

FIRE FIGHTING AND RESCUE TEAMS

Members of the Forward Response team (Fire Fighting and Rescue) must be trained in the use of all available equipment and will operate under the instructions of the Incident Controller and "guidance and control" of the Forward Controller.

21. INCIDENT CONTROL AND EMERGENCY RESPONSE CENTRES

The IRT will be headed by the Incident Controller (or appointed deputy) who has overall responsibility for the safety of all personnel on the site.

21.1 INCIDENT CONTROL CENTRE (ICC)

The Site Central Control Room Building housing the "Incident Control Centre" (ICC) shall be used by the Incident Controller and his team. The ICC will be permanently equipped with communications equipment, an information management system, a copy of this IRP document, drawings, technical and reference documents, procedures and contact lists and any other equipment required by the Incident Controller and team to manage an incident or Emergency situation. Alternative arrangement is set up at Security Manager Office near Main Gate to utilize it as Incident Control Centre in case, primary Incident Control Centre is not available due to emergency.

21.2 ALTERNATE INCIDENT CONTROL CENTRE (ICC)

In case of emergency at Central Control Room Building, Security CCTV Monitoring Building will be considered as alternative Incident Control Centre. Accordingly, Security CCTV Monitoring Building is equipped with following reference material:

- 1) Incident Response Plan and their Flowcharts for reference.
- 2) Wall Clock
- 3) Landline Phone
- 4) CCTV Screens
- 5) Site Layout
- 6) Radio Set and battery charging station
- 7) Site P&IDs
- 8) White Board
- 9) Emergency Power Back Up

21.3 INCIDENT CONTROL CENTRE – EQUIPMENT LIST

All site emergency response will be co-ordinated from site ICC. The following equipment is kept at the Suvali Terminal Site Incident Control Centre.

Items	Description
✓	Large location wall maps and blow-up photographs of CB/OS-2 Field activity sites
✓	1 x Copy of the Suvali Incident Response Plan
✓	1 x Copy of the Oil Spill Contingency Plan
✓	1 x Copy of any relevant CB/OS-2 Field Emergency Response Bridging Documents
✓	2 x Dedicated direct dial telephone lines or immediate vicinity access (minimum)
✓	1 x Dedicated speaker-phone – direct inside line from incident site
✓	2 x Dedicated fax machines; 1 x incoming, 1 x outgoing (minimum of 1 at least)
✓	Emergency power back-up
✓	1 x Location time clock
✓	White board(s)
✓	Computer with e-mail capability
✓	Close access to video recorder, television and AM/FM radio
✓	Close access to photocopy machine
✓	Site P & ID's and PFD's
✓	Spare copies of the current Contact Directory

22. INCIDENT REPORTING AND NOTIFICATION

22.1 INCIDENT REPORTING

All incidents and emergencies must be reported and investigated in order to establish what happened and the causes of the incident or emergency in order to introduce measures to prevent the incident or emergency occurring again. The incident reporting procedure is contained in the Cairn corporate document CIL/HSEQ/GDL/14/000003. Details of the reporting process/protocol and forms to use are contained in the Rajasthan Incident Response Plan.

Note: An initial Incident Notification Report must be compiled and submitted by the concerned Line Manager to the relevant Management Levels through Cairn Incident Management System (CIMS) within 24 Hrs.

22.2 INCIDENT NOTIFICATION

It is essential that in any Incident or Emergency situation, all the Emergency Organizations must be notified, that a situation has occurred or is in progress:

- The primary responsibility for notifying the relevant organizations is the site Incident Controller; he must firstly notify the Emergency Management Team Leader.

- If any incident or emergency situation occurs which is not specifically listed, the site Incident Controller must use his discretion with a view to notify the Emergency Management Team Leader in a timely fashion or as soon as reasonably practicable.

22.3 MEDIA COMMUNICATION

A Major Incident or Emergency will almost inevitably attract interest and attention from both national and international media. The Duty EMT Leader, in consultation with the duty Crisis Management Team Leader, is responsible for ensuring that the media strategy is decided, and actions taken, with timely and appropriate Media releases approved and issued. To achieve this, Public Affairs Coordinator must be supplied with relevant timely information on which to base media response. To avoid the release of potentially damaging or contradicting statements to the media, the CMT leader must be consulted to review all and any media statements prior to their release. The Public Affairs Coordinator is responsible for the preparation of media statements and their release once approval has been received from the CMT Leader.

The Initial or Media holding statement should be issued as soon as the facts of the incident or emergency are known. The format to be used for the initial media statement is given on the pre-printed forms provided in the EMT Room. The Media holding statement must be issued using company letter head paper.

Note: All media statements must be approved before release by CMT Leader and the Chief Executive Officer.

22.4 EMERGENCY RESPONSE PROCEDURES

There is no single procedure or process that if followed will ensure a successful outcome for those managing an incident or responding to an emergency, they are not a guarantee that the incident will be contained, controlled or prevented from escalation. These procedures can at best be a guide to the team managing the incident or emergency situation. The most effective method for ensuring a successful outcome is by training and practice by those charged with the responsibility of responding to and controlling incidents and emergencies. The Company requires that all Incident Controllers and staff at their sites, plants and field locations to become familiar with the content of these procedures and guides through frequent and regular exercises and drills. They are designed to be used in exercises and drills and for guidance in the event of an incident occurring. Checklists have also been produced, they are provided as an aide memoir for the Incident Controller and his team.

22.5 Document Custodian

As a minimum, this Plan will be reviewed in once in a year or whenever there is a need to strengthen the plan based on emergency drills or changes in plant operations or availability of additional resources.

Glossary of Terms

AO	Administration Officer
ASAP	As Soon As Possible
Bbl.	Barrel (measure of crude oil equal to 42 U.S. gallons)
BOPD	Barrels of Oil Per Day
CCR	Central Control Room
CPR	Cardio-Pulmonary Resuscitation
CAIRN	Vedanta Limited, Cairn Oil & Gas
CMT	Crisis Management Team
OSRL	Oil Spill Response Limited
EMERGENCY	(An emergency is any unplanned event which changes the operational state of the site or location and requires an IMMEDIATE RESPONSE to deal with it.)
EMT Room	Emergency Management Team Room (Gurgaon)
EMT	Emergency Management Team (Gurgaon)
EMT LEADER	Emergency Management Team Leader
EMP	Emergency Management Plan
IRT	Incident Response Team
ESD	Emergency Shut Down
ETA	Estimated Time of Arrival
FC	Forward Controller
HAZARD	(The potential to cause harm, including ill health or injury; damage to property, plant, production or the environment; production losses or increased liabilities.)
HF	High Frequency
HSE	Health Safety and Environment
IC	Incident Controller
ICC	Incident Control Centre
IM	Installation Manager
INCIDENT	(An event or a chain of events that has caused, or could have caused fatalities, injury, illness and/or damage to assets, the environment, or third parties.)
SIRP	Suvali Incident Response Plan
IRT	Incident Response Team
JV	Joint Venture
LQ	Living Quarters
MEDIVAC	Medical Evacuation
MRT	Medical Response Team
MSDS	Material Safety Data Sheet (Data sheet provided by suppliers of any dangerous substance which contain detailed information on its identification, composition, hazards, first aid measures, firefighting requirements, handling/storage, exposure controls, PPE requirements, physical/chemical properties and toxicological data)

NEAR MISS	(Any incident which could have resulted in injury to persons or damage to plant or equipment or harm to the environment, or any activity, which if allowed continuing, could have the potential to cause an incident.)
NOS-DCP	National Oil Spill Disaster Contingency Plan
OH&S	Occupational Health and Safety
ONGC	Oil and Natural Gas Corporation
OSCP	Oil Spill Contingency Plan (For this PLAN, refer to West Coast OSCP of Cairn Energy India Pty Ltd)
OSR	Oil Spill Response
PA	Public Affairs
P & IDs	Piping and Instrument Diagrams
P/F	Platform
PFDs	Process Flow Diagrams
PS	Production Superintendent
POB	Person On Board
PPE	Personal Protective Equipment
PSV	Production Support Vessel
QRA	Quantitative Risk Assessment
SAR	Search and Rescue
SIRP	Suvali Incident Response Plan
SITREP	Situation Report
SOP	Standard Operating Procedure
UHF	Ultra-High Frequency
VHF	Very High Frequency
VSAT	Very Small Aperture Transmission
POLREP	Pollution Report

23. ROLES AND RESPONSIBILITY

INCIDENT CONTROLLER

Role Purpose

- ✓ To protect life and limit damage to equipment, plant and the environment by taking effective action to control incidents.
- ✓ Manage and direct the response to an incident or emergency to ensure potential for escalation, the risk of injury to personnel and damage to the environment is minimized.
- ✓ Manage and co-ordinate the activities of the Incident Control Team and Forward Response Teams.
- ✓ Ensure that all essential notifications are implemented both onsite and offsite. Communicate with the EMT Duty manager, ER Team Leader, Construction Sites and External Emergency Services.

Person Assigned

Installation Manager

Operated from

Incident Control Centre

Key Responsibilities

- To manage the response to any and all incident or emergencies at the Site, Plant or Field Location including any emergency arises with respect to Cairn Cambay Offshore Facility.
- To Control the incident to prevent escalation and minimize risk to personnel.
- Notify and liaise with Emergency Response Team Leader.
- Direct and coordinating the activities of the Incident Control and Forward Response Teams.
- Ensuring sufficient trained and competent personnel are available to support the Incident Response Team.
- Ensuring the safety of all personnel working at the Site, Terminals or Field location.
- Evaluate and initiate immediate actions to contain and mitigate effects of the incident or emergency.
- Establish head count and potential whereabouts of any missing personnel and if necessary, prepare search, rescue, and recovery plan.
- Developing a plan of action to deal with the incident or emergency and communicating this plan to the response team leaders.
- Maintain focus on incident to minimize potential for escalation.
- Determine level and quality of local resources available to support Control and Forward Response Team.
- Monitor the situation & determine need for evacuation.
- Identifying, requesting and mobilizing of any additional resources required.
- Ensure emergency procedures are followed, incident log is maintained, check lists are followed and preparation of statutory reporting documents.
- Arranging Medical Evacuation support.
- Planning and preparation for relocation of any evacuated personnel.
- Arrange for and if necessary, participate in any investigation resulting from the incident or emergency.
- Ensuring appropriate action is taken to make the incident or emergency site safe before activities allowed to resume.

OPERATIONS SUPPORT

Role Purpose

- ✓ To protect life and limit damage to equipment, plant and the environment by taking effective action to control incidents.
- ✓ Manage and direct the response to an incident or emergency to ensure potential for escalation, the risk of injury to personnel and damage to the environment is minimized.
- ✓ Manage and co-ordinate the activities of the Incident Control Team and Forward Response Teams.
- ✓ Ensure that all essential notifications are implemented both on-site and offsite. Communicate with the EMT Duty manager, ER Team Leader, Construction Sites and External Emergency Services.

Person Assigned	Head Production
Operated from	Incident Control Centre

Key Responsibilities

- To manage the response to any and all incident or emergencies at the Site, Plant or Field Location including any emergency arises with respect to Cairn Cambay Offshore Facility.
- To Control the incident to prevent escalation and minimize risk to personnel.
- Notify and liaise with Incident Controller at site.
- Direct and coordinating the activities of the Incident Controller and Forward Response Team.
- Ensuring the safety of all personnel working at the Site, Terminals or Field location.
- Evaluate and initiate immediate actions to contain and mitigate effects of the incident or emergency.
- Developing a plan of action to deal with the incident or emergency and communicating this plan to the response team leaders.
- Maintain focus on incident to minimize potential for escalation.
- Determine level and quality of local resources available to support Incident Controller and Forward Response Team.
- Monitor the situation & determine need for evacuation.
- Identifying, requesting and mobilizing of any additional resources required.
- Ensure emergency procedures are followed, incident log is maintained, check lists are followed and preparation of statutory reporting documents.
- Arranging Medical Evacuation support.
- Planning and preparation for relocation of any evacuated personnel.
- Arrange for and if necessary, participate in any investigation resulting from the incident or emergency.
- Ensuring appropriate action is taken to make the incident or emergency site safe before activities allowed to resume.

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TECHNICAL SUPPORT (MAINTENANCE COORDINATOR)

Role Purpose

- ✓ Assist in the Management of the incident.
- ✓ Advise on process, plant and equipment status from the engineering point of view.
- ✓ Technical advisor to the Incident Controller and assist in prioritization of different risks and actions associated with plant.
- ✓ Clearly communicate to his team members the task required to be achieved, actions to be undertaken.

Person Assigned

Head Maintenance

Operated from

Incident Control Centre

Key Responsibilities

- Support the Incident Controller.
- Provide advice on plant and equipment from the engineering point of view.
- Advise on Engineering problems and solutions.
- Assume responsibility for task delegated by Incident Controller.
- Assist Incident Controller in the analysis of incident potential and preparation of response priorities.
- Assist in ensuring personnel involved in response operations have the personnel, material, equipment and supplies needed to carry out those operations in a safe, effective, and efficient manner.
- Work with HSE representative to develop an overall strategy to protect sensitive resources /areas from the engineering point of view.
- Give clear instructions to Technical Support Team from the engineering point of view via the Incident Controller.
- Advice (via Incident Controller) in performance of electrical, process and utility isolations as required.
- Ensuring use of non-sparking tools by mechanical team.

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CONTROL ROOM SHIFT ENGINEER

Role Purpose

- ✓ Assist in the Management of the incident.
- ✓ Update on process, plant and equipment status from the engineering point of view.
- ✓ Clearly communicate to his team members the task required to be achieved, actions to be undertaken.

Person Assigned

On Duty Control Room Engineer

Operated from

Incident Control Centre

Key Responsibilities

- To intimate the scenario immediately to the Incident Controller on receipt of emergency call.
- To manage the response to any and all incident or emergencies at the Site, Plant or Field Location as well as any emergency arises with respect to Cairn Offshore Cambay Facility.
- To Control the incident to prevent escalation and minimize risk to personnel and act as Incident Controller till resumes the charge.
- Coordinating the activities of the Incident Control and Forward Response Team.
- To take preventive steps to avoid escalation of the incident and initiate plant shutdown in case of requirement.
- Do the paging in case of emergency for communicating to all and stop all the work permits (by doing paging).
- Keep in touch with field engineer.
- Help incident controller in Identifying, requesting and mobilizing of any additional resources required.
- Ensure emergency procedures are followed, incident log is maintained, check lists are followed and preparation of statutory reporting documents.
- Ensuring appropriate action is taken to make the incident or emergency site safe before activities allowed to resume.
- Ensure that ETP Area Engineer/Operator reports to Fire Pump house to remain standby for pump operation in event of emergency. Additionally, they should close pumps manually when the emergency has taken care off.

Rev. 27

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FORWARD CONTROLLER

Role Purpose

- ✓ Acts on behalf of the Incident Controller as the person in charge of the incident location and coordinates front line response **as directed by the Incident Controller.**
- ✓ Reports the status of incident/emergency to the Incident Control Centre, organize firefighting response and the rescue of trapped or injured personnel.

Person Assigned

On Duty Production Superintendent

Operated from

Incident Location

Key Responsibilities

- To control and co-ordinate the incident scene activities including the Fire and Rescue effort, Medical Response and Security Teams at the scene of the incident or emergency
- To evaluate and initiate actions to mitigate the effect of the emergency and request any additional resources likely to be required
- To providing front line response to the incident.
- Establishing a Forward Control Point.
- The control and safety of all personnel at the scene or entering and leaving the incident scene.
- To Assess and report the on-scene incident status to the Control Centre. Detailing the scale of the incident, likely escalation and whether the incident can be contained.
- To report on effectiveness of passive and active firefighting protection, if applicable
- Assess the likely impact of the incident on any simultaneous operations, the local community or the environment.
- Directing the teams in rescuing of trapped/injured personnel.
- Ensuring the Incident Response Team is trained and competent in the methods of dealing with all identified incident and emergency situations as laid down by CIL and in the use of all incident and emergency response equipment.
- Ensuring that all incident and emergency response equipment is always maintained and ready for immediate use and is deployed to the scene of an incident or emergency.
- Ensure the incident site is not disturbed until appropriate authorities have given authority.
- For ease of identification, it is responsibility of Forward Controller to wear Reflective Jacket with "Forward Controller" identification on it.

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SITE RADIO OPERATIONS

Role Purpose

- ✓ To provide initial point of incident notification and to notify Incident Controller and site response teams.
- ✓ Maintain quality communications in times of emergencies by controlling the traffic flow and keeping airways open.

Person Assigned

On Duty Radio officer

Operated from

Incident Control Centre

Key Responsibilities

- To support the Incident Controller and Emergency Response Team Leader by manning the communications systems and establishing and maintaining communications with the incident or emergency scene as long as required
- When receiving notification of incident, ensure incident details are recorded accurately. Identify the caller and confirm the emergency.
- If incident notification is by radio, notify the site incident response team
- Establish and maintain communications with outside agencies such as Emergency Response Team, the Emergency Management Team (Gurgaon), radio Room, the remote site Control Centers, Government authorities and air and road transport.
- Notify Incident Controller of dedicated emergency frequency and update as further communications are received.
- Maintain the Journey Management System throughout an incident or emergency situation.
- Communicate the emergency information to alert or activate EMT Leader.
- Regularly update Incident Controller of all key incident communications / information passing through Site Radio Room
- Notify Incident Controller immediately if communications is lost with any respondent(s) during incident or communications failure.
- For any calls received by Radio Room not related to the incident, take a message for a return call.
- For any media calls received by Radio Room, ensure Emergency Response Team Leader and Incident Controller are informed about it.
- Log all the events and actions.

Rev. 29

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MUSTER COORDINATOR

Role Purpose

- ✓ Establish head count of mustered personnel and report numbers to Incident Controller.

Person Assigned

Head HSE

Operated from

Incident Control Centre

Key Responsibilities

- Tally input from the Security and Muster Checker of Muster points by maintaining high level of security at the site
- Maintain order and control the actions of mustered personnel.

HSE SUPPORT

Role Purpose

- ✓ To provide support and advice to the Incident controller on responses designed to mitigate the impact of the incident.

Person Assigned

Head HSE

Operated from

Incident Control Centre

Key Responsibilities

- Liaise with muster coordinator and to establish number of missing personnel and advise Incident Controller.
- Assist Incident Controller to organize additional ambulance and external medical support for the injured.
- Assist doctor in assessing the condition of the injured and medevac.
- Advise people not to disturb the evidence on incident location, if it is safe to leave the location undisturbed.
- Assist Incident Controller in preparing reports.

FIRE AND RESCUE TEAM

Role Purpose

- ✓ Under the direction of the Forward Controller conduct firefighting activities within the scope of their equipment and expertise.
- ✓ To carry out search and rescue for missing or trapped personnel.

Person Assigned

HSE Engineer (along with Trained Fire Team)

Operated from

Incident Location

Key Responsibilities

- When instructed organize and mobilize firefighting and rescue equipment.
- Assist Forward Controller in providing front line response to the incident.
- Under the direction of the Forward Controller attempt to contain the incident.
- Carry out search and rescue.

MEDICAL TEAM

Role Purpose

- ✓ To manage the Clinic and organize treatment for the sick and injured.
- ✓ Arrange for additional medical support to be available, liaise with external medical support.
- ✓ Organize the treatment and transfer of casualties.
- ✓ Establish medical reception area and administer medical aid.

Person Assigned

On Duty Paramedic

Operated from

Standby near Incident Location

Key Responsibilities

- Instruct the members of the medical team to prepare for casualties including the setting up of the triage.
- Stabilize and treat recovered casualties.
- To ensure that emergency medical equipment and medical transport are kept ready to always deploy.
- Ensure the site ambulance and its equipment is checked daily.
- Ensure the site medical equipment and consumables i.e., drugs etc. are stored in suitable receptacles and checked regularly for quality.
- Supervise and direct assessment and treatment of casualties.
- Assess situation, priorities and organize treatment-using team and identify any additional requirements.
- Update Incident Control Team on status of casualties and any further requirements, especially for urgent evacuations.
- When required liaise directly with the external medical support.
- Prepare casualties for evacuation and liaise with the Incident Control Team on evacuation requirements.
- Oversee evacuation of casualties ensuring all necessary records accompany patients.
- Prepare status reports for the Incident Controller and any external specialist
- Maintain communications with Incident Control Team and maintain records.

AMBULANCE DRIVER

Role Purpose

- ✓ To provide support to the medical team in transportation of medical personnel and equipment and casualties and to act as the radio link between the Doctor and Medical Response Team
- ✓ Leader and the Incident Control Team and Forward Controller if required.

Person Assigned

On Duty Ambulance Driver

Operated from

Standby near Incident Location

Key Responsibilities

- Transport medical personnel and equipment to the incident scene.
- Support the Medical team in recovery of casualties and safe removal from incident scene.
- Assist in the preparation of casualties for evacuation and transportation.
- Maintain communications with Incident Controller and Forward Controller.

LOGISTICS SUPPORT

Role Purpose

- ✓ To provide all logistical material and services needed by the Incident Response Teams dealing with an emergency.
- ✓ Coordinates all logistical activities during the emergency for establishing, maintaining, and coordinating the delivery of support services, including food, water, shelter, PPE sanitation services and etc.
- ✓ Obtaining the personnel, equipment, materials, and supplies needed to support emergency response operations.
- ✓ Providing the services to ensure emergency response operation are carried out in a safe and efficient manner.

Person Assigned

Logistics Manager

Operated from

Incident Control Centre

Key Responsibilities

- Work with Incident Controller to identify optimum location of stage resources for utilization,
- Obtain personnel, equipment, materials, and supplies needed.
- Assign tasks to appropriate personnel.
- Size up incident, identify Logistics problems and solutions.
- Brief Emergency Team Leader and other members of Response Team on nature and status of the work being done by Logistics.
- Work with Emergency Support Team to identify and ensure timely and efficient provision of support services:
 - A) Transportation
 - B) Communications systems
 - C) Others, as necessary
- Ensure that logistics support and services need are met in a timely and efficiently, and in a manner that maximizes personnel safety and efficiency of site response operations

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SECURITY SUPPORT

Role Purpose

- ✓ Assist Muster Coordinator.
- ✓ Establish Head count of Mustered personnel and report numbers to Incident Control Centre.

Person Assigned	Security Manager
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Operated from	Incident Control Centre
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Key Responsibilities

- Support the security and Muster Coordinator by maintaining High level of security at site.
- In case of Offsite Emergency, Security Manager shall report to Forward Controller and aid in road blockage and diverting road traffic.

SCRIBE

Role Purpose

- ✓ Maintain record of key events reported during any emergency and maintain an up-to-date picture of the incident link between the Forward Response Teams and Incident Control Team

Person Assigned	Instrumentation Supt/ Engineer (Designated Person)
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Operated from	Incident Control Centre
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Key Responsibilities

- Record key incident events/actions on incident board.
- Maintain essential equipment checklist status.
- Prompt Incident Controller on time-outs public address announcements and updates to the ERT.
- Ensure all status information is up to date and correctly displayed.
- Assist the Link Man keep the pictorial view up to date.
- Update the Casualty Tracking status board.
- In the event of Central Control area evacuation, take all necessary recorded material.

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COMMUNITY LIASON (CSR)

Role Purpose

- ✓ Providing support to the site emergency teams and advice to the Emergency Response Team Leader on local social issues.
- ✓ Ensuring the effectiveness of emergency response is not compromised through misunderstandings by liaising with members of the local communities.

Person Assigned

Admin Manager

Operated from

Incident Control Centre

Key Responsibilities

- Coordinating and carrying out all and any liaison which may be required with the local and government authorities and community representatives
- Providing Emergency Response Team Leader with information on who to, and how to, make contact with local community authorities and representatives
- Feeding back information to the Security and Muster Coordinator which may be relevant to dealing with an incident or emergency situation
- Assist Emergency Response Team Leader to arrange for the needed local support / additional resources.
- Advise the Incident controller on the statutory & social responsibility requirements during emergencies & prompt reporting to EMT.
- Maintain supporting information flow between Incident Controller, Duty EMT Manager.
- Collect the Information from the scene of incident and arrange support through competent agencies at the scene of incident to control the public reaction to the incident in co-ordination with Security Support.
- Liaise with Government officials visits.
- Follow up with EMT to fill up necessary forms and reports on the incident
- Coordinate support in areas of administration and information gathering.

Rev. 29

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24. SCENARIO SPECIFIC CHECKLIST

24.1 REPORTING AN EMERGENCY

Reporting an Emergency If witnessing an Incident at Site	
Remain calm, step back, observe and think about what is happening	
Stay upwind at safe location	
Remove yourself or any injured from any immediate exposure or danger, render First Aid to any injured	
Ensure safety of other personnel and secure/isolate area, deal with the emergency if within competency	
Follow the instructions of the Incident controller / alternate	
If Receiving an Incident Report at Site	
Identify caller and help him/her calm down	
Determine if they have activated any manual alarms	
Decide on seriousness of the emergency	
Get a description of exactly what has happened, confirm details	
When exactly?	
Where exactly?	
Nearest landmark (if applicable)?	
Extent of any injuries and/or damage?	
Number of persons involved?	
What risks continue to exist?	
What actions have already been initiated?	
By whom?	
What is planned to do next?	
What specific help or additional resources are needed?	
Who else knows about the situation so far?	
Who else has been involved (media etc.)?	
What time the caller will report again to provide an update (so the line can be kept clear)?	
Where is he/she calling from? Request caller to be available for any further inquiry.	
Always consider:	
· Confirm incident is not a false alarm/drill and all relevant early details	
· Notify appropriate emergency contacts immediately	
· Verify incident details, escalation potential and actions already taken	
· Activate appropriate resources	

25. EMERGENCY EVENTS FLOW CHARTS

25.1 PURPOSE

The purpose of this section is to provide risk-based approach to Incident Response Procedures to previously identified threats and hazards to CB/OS-2 field oil and gas operations formal risk assessment. The procedures are not intended to replace existing Standard Operating Procedures (SOP's), but to simply support standard procedures during emergencies. The procedures are not designed as hard and fast prescribed rules, merely suggested prompts to encourage respondents to address potential hazards or actual incidents in which common sense must always prevail.

25.2 SCOPE

The procedures are designed to address most, or all, CB/OS-2 production operations areas of activity including contractor areas of activity.

CAUTION

The suggested actions in each of the following flowcharts are additional to any that are included in the various Roles and Responsibilities as detailed in this Plan.

NOTE

The method of response to an emergency incident must be determined by the personnel involved, to either report an incident or threat immediately as an emergency, or to control the situation to prevent it from becoming a greater threat. This plan does not however, expect or encourage respondents to place themselves at risk by attempting to control a potential emergency. In the event respondents believe they can control a potential emergency, they should proceed only if trained and safe to do so, if not, raise the alarm immediately and respond as advised.

25.3 HOW TO USE THIS SECTION

The production and processing of oil and gas is by nature a hazardous activity. There are Company operating procedures in place which, when followed correctly, should prevent an emergency situation occurring. However, despite best endeavours, incidents and situations do occur which require immediate action to prevent them escalating to a situation which could result in injury to people, loss of life, damage to the environment, damage to or even loss of a Facility.

The following are a series of Incident Response Procedures that provide a template for dealing with emergencies, which the Company requires Installation Managers to follow when called upon to deal with an emergency. The Company requires Installation Managers and Staff at their Remote Locations to become familiar with the content of these Incident Response Procedures through frequent and regular exercises and drills.

Checklists should be developed to accompany the Incident Response Procedures. The checklists should act as an aide memoir for the Installation Manager to use when addressing an emergency situation.

The Emergency Response Procedures have been developed for a number of possible emergency situations. However, emergencies by their very nature are unpredictable and do not always follow a predictable route. The best course of action to prevent emergencies escalating and becoming out of control is to take early and decisive action. This can only be achieved by the Installation Manager, Production Superintendent, Supervisors and all location personnel being conversant with the Suvali Incident Response Plan and Procedures and well-practiced in the actions they are required to take whenever an emergency situation occurs.

The Suvali Incident Response Procedures flow charts start at the top left with an emergency situation and develop through a series of actions by the Installation Manager and his Incident Response Teams, which should result in a successful resolution to the situation. There are a number of decision points where the emergency situation is either successfully resolved or continues to deteriorate. If the emergency is resolved, then the Location can return to normal. If the emergency continues to deteriorate the procedure leads the Installation Manager, through a series of processes, eventually resulting in the evacuation or abandonment of the Location. At all times the Company requires life to be protected as the Installation Manager's primary consideration.

26. EMERGENCY EVENTS

Reference	Emergency Event Flow Chart Title
26.1	Offshore Emergency Events
26.1.1	Vessel – Platform Collision at Offshore
26.1.2	Fire and /or Explosion Offshore
26.1.3	Offshore Platform Abandonment
26.1.4	Helicopter Emergency/ Crash Landing at offshore
26.1.5	Man Overboard
26.1.6	Structural Failure Offshore
26.1.7	Well Control Incident
26.1.8	Radioactive Material Spill
26.1.9	Bursting of Pipeline
26.2	Onshore Emergency Events
26.2.1	Oil Spill Onshore
26.2.2	Fire and Explosion at Onshore
26.2.3	Helicopter Emergency Crash Landing Onshore
26.2.4	Road Transport Accident (Passenger Vehicles)
26.2.5	Tank Fire
26.2.6	Medical Evacuation
26.2.7	Propane Fire
26.2.8	Tanker Collision leading to Oil Spill
26.2.9	Electric Shock
26.3	Security Emergency Events
26.3.1	Bomb Threat
26.3.2	Criminal Activity
26.3.3	Kidnap / Extortion
26.3.4	Terrorist Threat Offshore
26.3.5	Terrorist Threat Onshore
26.3.6	Air Raid Warning
26.4	Natural Emergency Events
26.4.1	Storm threat (Cyclone)
26.4.2	Flood Threat
26.4.3	Earthquake
26.5	Social Event
26.5.1	Social Unrest
26.6	Pandemic Event

26.1 Offshore Emergency Events

26.1.1 Vessel – Offshore Platform Collision

Platform In charge- Production Engineer	
	Notify the Control Room and R.O about the incident and sound the hand operated siren at Platform.
	Assess the situation and initiate ESD of the Platform under instruction from IC.
	Communicate to the interconnected platforms and initiate shutdown to stop hydrocarbon feed.
	Coordinate and communicate with Onshore Production Superintendent / Control room.
	Perform Headcount and inform the details of missing personnel if any & report.
	Update the incident status as and when required to R.O. / Control room.
	Manage platform evacuation if required & intimate to IRC.

Incident Controller – Installation Manager	
	Obtain full briefing of the incident and take stock of the situation.
	Inform EMT Leader & DGM Marine Operations and provide full incident briefing and likely requirements.
	Assess the requirement for shut in, emergency rescue/and advise for evacuation & oil spill contingency implementation.
	Assess requirement of helicopter for Aerial Survey, Alert base for medevac, inform local authorities in case of fatalities.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Radio Officer	
	Inform IC/ IRC members about the incident.
	Call support vessel to the affected platform, under instructions from IC.
	Organize for Aerial Survey if necessary, with the approval from IC.

Radio Officer

	Inform all Cairn radio stations of incident and Minimize/Control non-essential communication.
	Maintain log of all events in chronological order.
	Send radio and other communications on instructions from Incident Controller.
	Inform –RO Gurgaon to activate EMT, if required.
	Communicate and coordinate for Helicopter service.
	Vessel head count to be obtained during the exercise.

Production Support – Production Manager

	Obtain full incident details.
	Ensure affected platform and interconnected platforms are in shutdown condition.
	Verify the headcount with the Flight manifest and collect details of missing personnel if any.
	Keep communication with the platform In-charge for necessary updates.
	Consult IC for platform evacuation in a safe manner.
	In case of oil spill, assess the extent and approximate quantities of oil spill and follow oil spill contingency plan guidelines.

Maintenance Support – Maintenance Manager

	Obtain full details of the incident.
	Follow procedures and flow charts of IRP manual.

HSE Support

	Obtain full details of the incident and advice IC on any HSE concerns.
	Instruct Medical Support to be on standby.
	Follow the instruction of IC and support for any assistance.

Medical Support

Upon the call proceed to Phase II Heli base with Ambulance and Additional Medical Rescue team.

Community Liaison - HR & Admin

Get the names from chopper manifest and keep the contact No's and blood group details of all the personnel in the affected platform.

Notify local authorities and Employees families as instructed by IC.

Co-ordinate with Production support for any shore cleaning activity in case of oil spill.

Liaison with Mutual Aid Partners for support as directed by IC.

Fire Officer

Co-ordinate with HSE for any support for shore clean up activity in case of oil spill.

Production Support Vessel

Establish continuous contact with vulnerable vessel.

Prepare Oil Spill Response Equipment for immediate mobilization.

Launch Rescue Boat under command from Incident Controller for rescue of personnel on board platform.

Restoration of Site after the Event

Ensure from IC the emergency status and closure of emergency.

Constitute a team from site for inspection/ Investigation to assess the damage.

Verify the assessment and mobilize resources for restoration.

Manage the hazardous waste disposal as per Waste Management Plan.

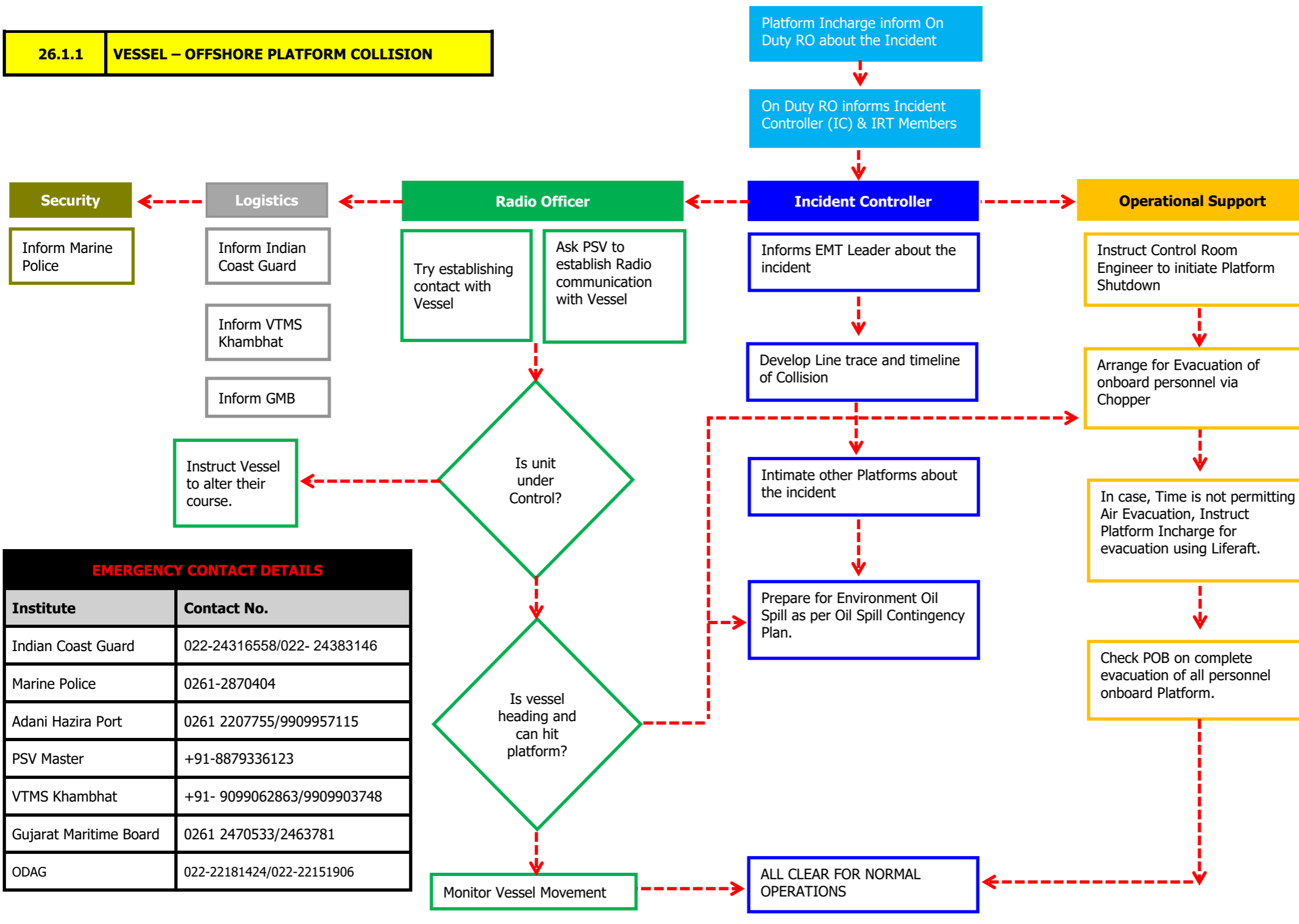
Ensure that statutory requirements are complied with, prior to recommencement of the operation.

Liaise with Gurgaon EMT team.

Organize for shore clean up in case of oil spill.

26.1.1 VESSEL – OFFSHORE PLATFORM COLLISION

REFERENCES	
1	Offshore Platform Layout
2	Oil Spill Contingency Plan



EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Indian Coast Guard	022-24316558/022- 24383146
Marine Police	0261-2870404
Adani Hazira Port	0261 2207755/9909957115
PSV Master	+91-8879336123
VTMS Khambhat	+91- 9099062863/9909903748
Gujarat Maritime Board	0261 2470533/2463781
ODAG	022-22181424/022-22151906

ACTIVATE EMT, IF	
●	Vessel not under control
●	Trajectory of Vessel towards Offshore Platform
●	Mutual Aid Response is required

26.1.2 Fire and /or Explosion Offshore

Platform In charge- Production Engineer	
	Activate ESD and shutdown the P/F.
	Close manually any valve which may feed fire, if it is safe to do so.
	Inform R.O./Control room of the incident and sound the hand operated siren at Platform.
	Communicate to the interconnected platforms and initiate shutdown to stop hydrocarbon feed.
	Assess the situation & attempt to extinguish fire with portable equipment, if it is safe to do.
	If fire is extinguished, ensure there is no gas leak, if gas leak detected and if safe to do so, shut off all ignition sources, close all relevant shut-off valves.
	Perform Headcount and inform the details of missing personnel if any & report.
	Update the incident status as and when required to R.O. / Control room.
	Consider platform evacuation if required & intimate to IC/ IRC.

Incident Controller - Installation Manager	
	Obtain full briefing of the incident and take stock of the situation.
	Inform EMT Leader; provide full incident briefing and likely requirements.
	Instruct Captain of Support vessel for support services and action for firefighting if it is safe to do so.
	Monitor the situation and if required call for additional firefighting assistance if available in the field.
	Assess the emergency rescue and advise on rescue and evacuation through vessel or Helicopter whichever is safer.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.
	Upon situation returning to normal inspect / investigate site to determine for corrective action.

Radio Officer

	Inform IC/ IRC members about the incident.
	Call support vessel to the affected platform, under instructions from IC.
	Organize for Aerial Survey if necessary with the approval from IC.
	Inform all Cairn radio stations of incident and Minimize/Control non-essential communication.
	Maintain log of all events in chronological order.
	Send radio and other communications on instructions from Incident Controller.
	Inform –RO Gurgaon to activate EMT if required.
	Communicate and coordinate for Helicopter service.
	Vessel head count to be obtained during the exercise.

Production Support – Production Manager

	Obtain full incident details.
	Ensure affected platform and interconnected platforms are in shutdown condition.
	Verify the headcount with the Flight manifest and collect details of missing personnel if any.
	Keep communication with the platform In-charge for necessary updates.
	Consult IC for platform evacuation in a safe manner.

Maintenance Support – Maintenance Manager

	Obtain full details of the incident.
	Follow procedures and flow charts of IRP manual

HSE Support

	Obtain full details of the incident and advice IC on any HSE concerns.
	Instruct Medical Support to be on standby.
	Follow the instruction of IC and support for any assistance.

HSE Support

	Follow procedures and Flow Charts of IRP manual and advice IC.
	Upon the call proceed to Phase II Heli base with Ambulance and Additional Medical Rescue team.
	Keep the details of causality ready for necessary Medical Treatment.
	Seek first Aider help in handling and examining the causality(s) and report to HSE.

Community Liaison - HR & Admin

	Get the names from chopper manifest and keep the contact No's and blood group details of all the personnel in the affected platform.
	Notify local authorities and Employees families if instructed by IC.
	Liaison with Mutual Aid Partners for support as directed by IC.

Production Support Vessel

	Establish continuous contact with Suvali Radio Room.
	Keep On board Fire Fighting Equipment and Personnel on standby.
	On Instruction from IC, Initiate Fire Fighting using Fire Monitors to extinguish the fire.
	Launch Rescue Boat under command from Incident Controller for rescue of personnel on board platform.

Restoration of Site after the Event

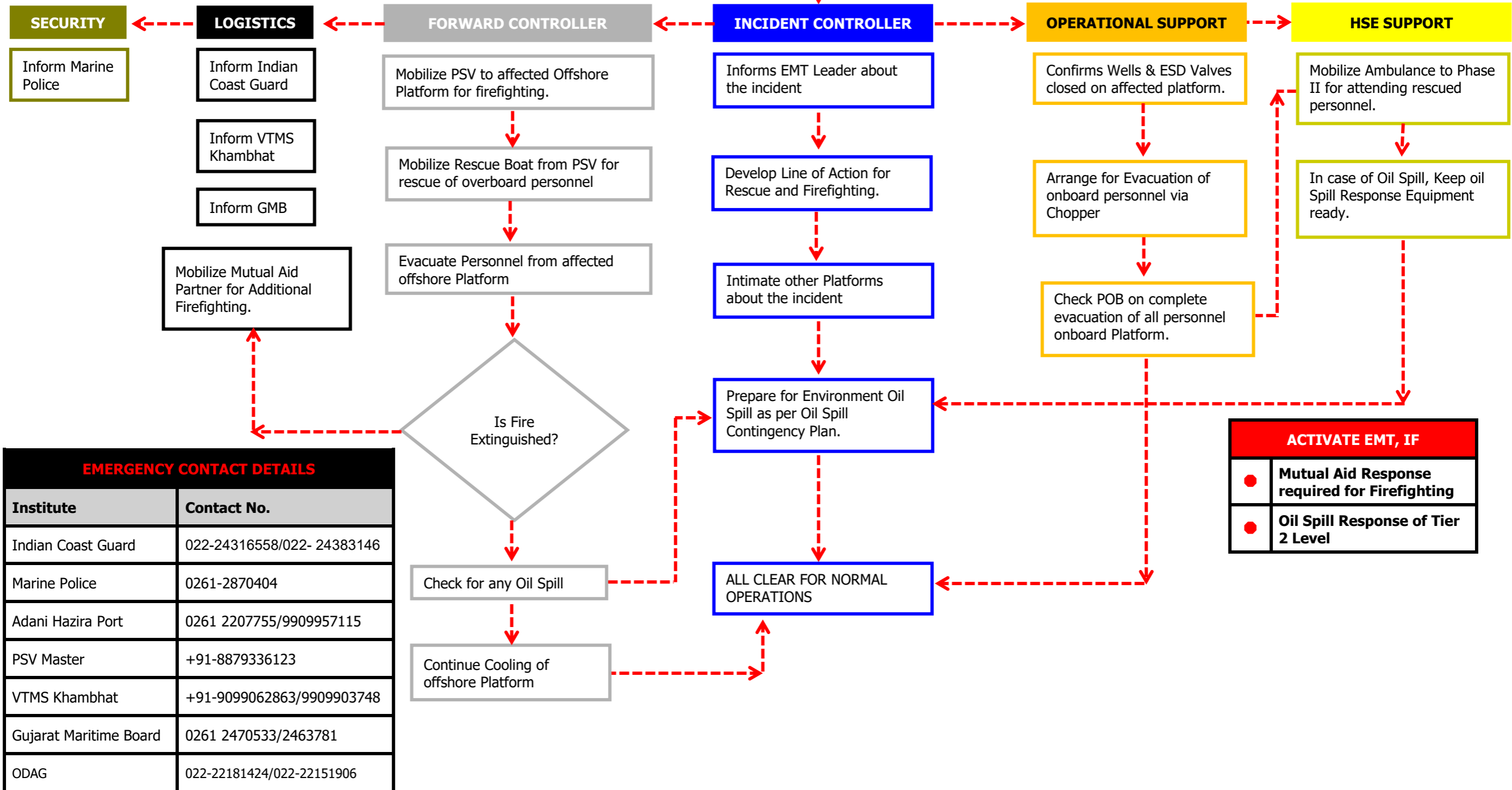
	Ensure from IC the emergency status and closure of emergency.
	Constitute a team from site for inspection/ Investigation to assess the damage.
	Verify the assessment and mobilize resources for restoration.
	Manage the hazardous waste disposal as per Waste Management Plan.
	Ensure that statutory requirements are complied with, prior to recommencement of the operation.
	Liaise with EMT team.

26.1.2 FIRE & EXPLOSION AT OFFSHORE PLATFORM

Platform Incharge inform On Duty RO about Fire Emergency

On Duty RO informs Incident Controller (IC) & IRT Members

REFERENCES	
1	Offshore Platform Layout
2	Oil Spill Contingency Plan



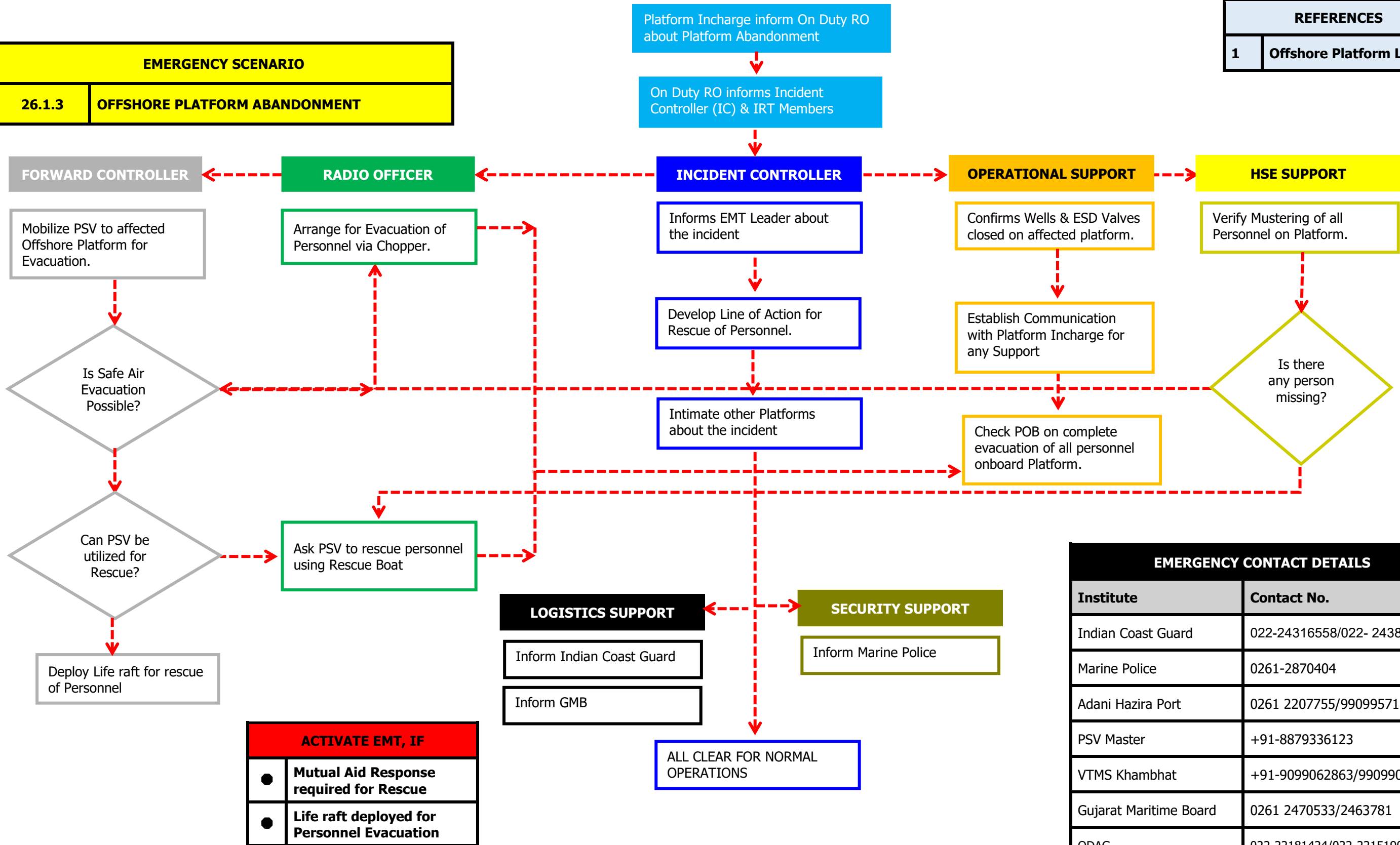
EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Indian Coast Guard	022-24316558/022- 24383146
Marine Police	0261-2870404
Adani Hazira Port	0261 2207755/9909957115
PSV Master	+91-8879336123
VTMS Khambhat	+91-9099062863/9909903748
Gujarat Maritime Board	0261 2470533/2463781
ODAG	022-22181424/022-22151906

ACTIVATE EMT, IF	
•	Mutual Aid Response required for Firefighting
•	Oil Spill Response of Tier 2 Level

26.1.3 Offshore Platform Abandonment

EMERGENCY SCENARIO	
26.1.3	OFFSHORE PLATFORM ABANDONMENT

REFERENCES	
1	Offshore Platform Layout



ACTIVATE EMT, IF	
●	Mutual Aid Response required for Rescue
●	Life raft deployed for Personnel Evacuation

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Indian Coast Guard	022-24316558/022- 24383146
Marine Police	0261-2870404
Adani Hazira Port	0261 2207755/9909957115
PSV Master	+91-8879336123
VTMS Khambhat	+91-9099062863/9909903748
Gujarat Maritime Board	0261 2470533/2463781
ODAG	022-22181424/022-22151906

26.1.4 Helicopter Emergency Crash landing at Offshore

Platform Incharge	
Crash on the Platform	
	Activate nearest ESD and shutdown the platform. In case it is unmanned remote S/D to be initiated.
	Notify Control Room/ R.O about the incident and Sound the hand operated siren at Platform.
	If it is safe to approach the helicopter, use the helicopter crash kit and attempt to save the personnel.
	Use the portable/ trolley mounted extinguisher to control fire if any. Muster all the personnel, take head count and identify the person overboard.
	Consider evacuation of the platform if the situation is out of control.
	Update Production Support from time to time.
Ditch at Sea	
	Notify control room/ RO about the incident.
	Watch out and update the status of the incident to RO/ Control room.
Radio officer	
	Notify Incident Controller of any reported crash, update as further communications received.
	Inform IC about the last communication received, its location and time. Obtain details from the manifest to confirm the missing personnel.
	Mobilise support vessel to the area on instruction from IC.
	Inform all Cairn radio stations of incident, and control / minimise non-essential communication.
	Maintain log of all events in chronological order
	Inform –RO Gurgaon to activate EMT as instructed by IC.
Incident Controller – Installation Manager	
	Obtain full briefing of the incident and take stock of the situation.

Incident Controller – Installation Manager

	Inform EMT Leader; provide full incident briefing and likely requirements
	Advise to mobilize support vessel to the location if the helicopter sortie was sent to offshore.
	Consider any need for additional resources to mitigate the situation.
	Inform ODAG, Eastern Naval Command headquarters & Maritime Rescue Coordination Centre at Chennai & Vizag for necessary SAR operation.
	Inform SAR teams and initiate the SAR operation.
	Activate EMT and Mutual Aid Partners as required for SAR operation.
	Inform local police /RDO on clearance from EMT.
	For offshore mobilise available marine search by local fishermen / boats if feasible.
	Organise standby chopper at Surat for the SAR operation and for other field personnel.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.
	Collect from PS details of the manifest to confirm the missing personnel.
	Have close coordination with EMT Gurgaon on SAR operation and assistance.

Production Support – Production Manager

	Obtain full incident briefing and the likely requirements.
	Confirm whether it poses any threat to the platform or personnel, if so consider for platform shutdown and evacuation of personnel.
	Consider shutting down the interconnected platforms.
	Verify the Flight manifest and collect details of personnel on board the chopper and inform IC.
	Co-ordinate with IC on SAR.
	Form a team as instructed by IC to inspect the damage & structural integrity before production recommencement.

Maintenance Support – Maintenance Manager

	Obtain full details of the incident.
	Follow procedures and flow charts of IRP manual
	Verify and advice IC from time to time.

HSE Support

	Obtain full details of the incident and advice IC on any HSE concerns.
	Instruct Medical Support to be on standby.
	Follow the instruction of IC and support for any assistance.
	Co-ordinate SAR team, Medical team as advised by IC.
	Follow procedures and Flow Charts of IRP manual and advice IC.

Medical Support

	Upon the call proceed to crash location Heli base with Ambulance and Additional Medical Rescue team.
	Get the Medical details of the personnel onboard helicopter.

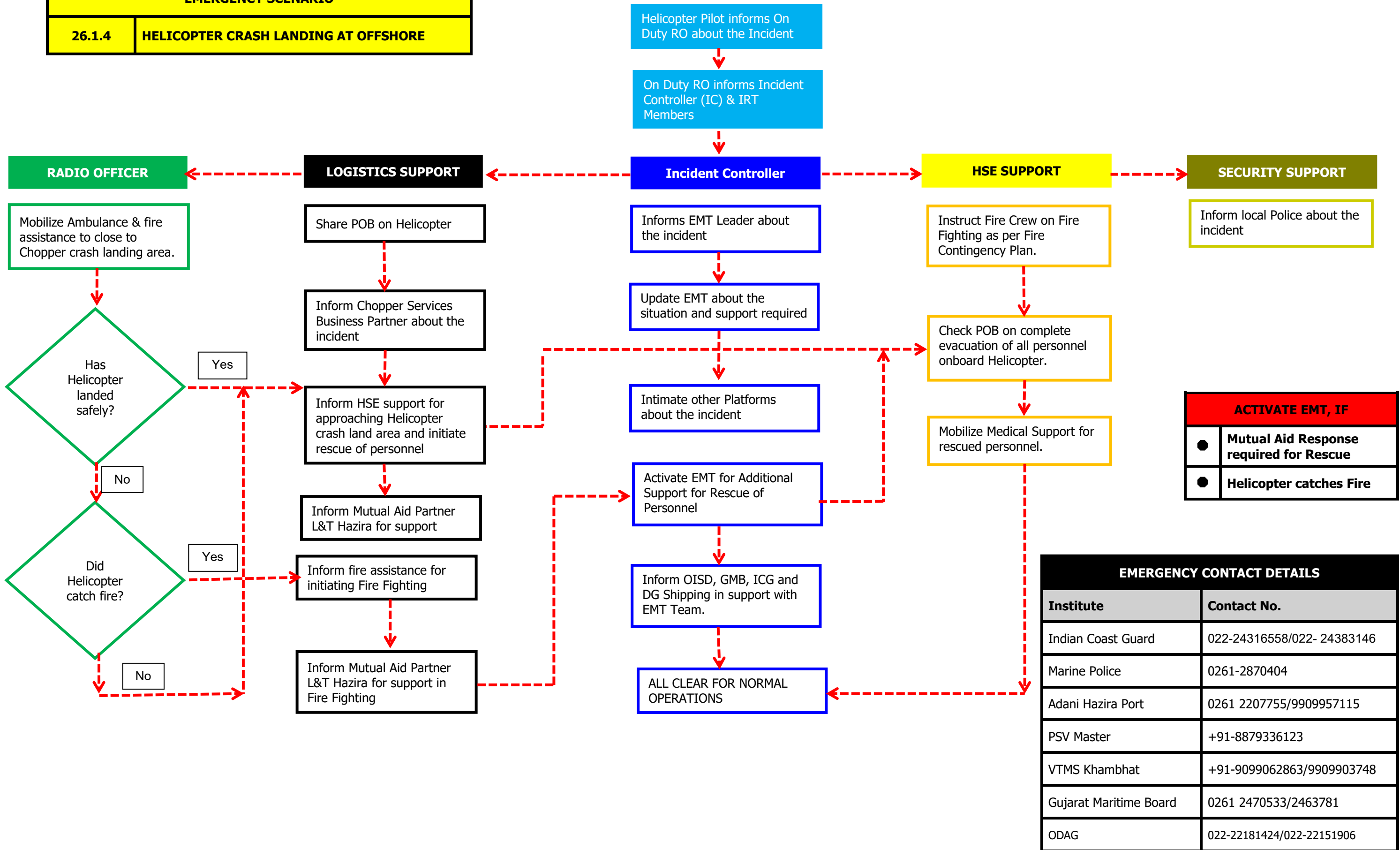
Community Liaison - HR & Admin

	Get the names from chopper manifest and keep the contact No's and blood group details of all the personnel in the affected platform.
	Co-ordinate for medevac arrangements as instructed by IC.
	Notify local authorities and Employees families if instructed by IC.
	Liaise with the village and local fishermen community for SAR operations assistance.
	Liaison with Mutual Aid Partners for support as directed by IC.

Restoration of Site after the Event

	Ensure from IC the emergency status and closure of emergency.
	Constitute a team from site for inspection/ Investigation to assess the damage.
	Verify the assessment and mobilize resources for restoration.
	Ensure that statutory requirements are complied with, prior to re-commissioning of the Platform.
	Liaise with Gurgaon EMT team.

EMERGENCY SCENARIO
26.1.4 HELICOPTER CRASH LANDING AT OFFSHORE



ACTIVATE EMT, IF	
●	Mutual Aid Response required for Rescue
●	Helicopter catches Fire

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Indian Coast Guard	022-24316558/022- 24383146
Marine Police	0261-2870404
Adani Hazira Port	0261 2207755/9909957115
PSV Master	+91-8879336123
VTMS Khambhat	+91-9099062863/9909903748
Gujarat Maritime Board	0261 2470533/2463781
ODAG	022-22181424/022-22151906

26.1.5 Man overboard

Platform Incharge	
	Alert control room / RO and Stand by vessel.
	Throw a life ring to person overboard. Throw a Lifebuoy in the Sea even if the person can't be seen as it will indicate the rate & direction of Drift.
	Do not lose sight of person overboard; till rescue.
	Muster all the personnel, take head count and identify the person overboard.
	Give details of the person overboard to RO.
	Keep support vessel updated on person's position, location of person overboard relative to the platform
	Notify Site Radio Room when person is recovered or if you lose sight of the person.
	Upon rescue, administer first aid as required
	Keep updating the status of the person over board from time to time.

Radio Officer	
	Inform IC members about the incident.
	Call support vessel to the location, under instructions from IC.
	Organise for helicopter on instruction from IC / ask helicopter service provider to prepare for winching operations also.
	Inform all Cairn radio stations of incident, and control / minimise non-essential communication
	Maintain log of all events in chronological order
	Inform –RO Gurgaon to activate EMT as instructed by IC.

Production Support Vessel	
	On receiving information, collect the co-ordinates of location and proceed to the scene.
	Keep ready the first aid kits, stretcher and trained first aiders, etc., for necessary assistance

	If it is appropriate, launch the Rescue Boat for quick rescue of the casualty.
	Locate the casualty, upon rescue notify RO and administer necessary first aid
	Update RO from time to time the status of casualty and inform any other assistance is required like Doctor, helicopter, etc.,

Incident Controller – Installation Manager

	Obtain full briefing of the incident and take stock of the situation.
	Inform EMT Leader; provide full incident briefing and likely requirements
	Advise to mobilize support vessel to the location if the helicopter sortie was sent to offshore.
	Organise chopper for SAR operation with winching capability.
	Instruct support vessels to go for SAR operation.
	Consider mobilizing Paramedic to the location, if warranted.
	Collect the details of the missing person(s); ensure all other persons.
	Alert Site Doctor to prepare to treat the affected person; consider need for Medevac
	If position of person overboard is lost, commence Search and Rescue (SAR) procedures (this section)
	Inform Surat base support, in case of medevac directly from platform to Surat.
	Ensure Hospitals are informed of the incident and likely requirements (i.e. medical assistance).
	Notify EMT Leader; provide full incident briefing and likely requirements & report update from time to time
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.
	Inform ODAG, Eastern Naval Command headquarters & Maritime Rescue Coordination Centre at Chennai & Vizag for necessary SAR operation.
	For offshore mobilise available marine search by local fishermen / boats if feasible.
	Have close coordination with EMT Gurgaon on SAR operation and assistance.

Production Support – Production Manager

	Obtain full incident briefing and the likely requirements.
	Get the details of the casualty and ensure necessary monitoring and support assistance are in place.

	Verify the Flight manifest and collect details of personnel on board the chopper and inform IC.
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	Co-ordinate with IC on SAR.
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Maintenance Support – Maintenance Manager

	Obtain full details of the incident.
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	Follow procedures and flow charts of IRP manual
--	---

	Verify and advice IC from time to time.
--	---

HSE Support

	Obtain full details of the incident and advice IC on any HSE concerns.
--	--

	Instruct Medical Support to be on standby.
--	--

	Collect the details of the casualty and inform HR to collect contact no's and Blood group details from FORM - O
--	---

	Follow the instruction of IC and support for any assistance.
--	--

	Co-ordinate SAR team, Medical team as advised by IC.
--	--

	Follow procedures and Flow Charts of IRP manual and advice IC.
--	--

Medical Support

	Upon the call proceed to Phase II Heli base with Ambulance and Additional Medical Rescue team.
--	--

	Collect the details of the casualty and get ready with necessary medical assistance as required.
--	--

Community Liaison - HR & Admin

	Get the names from chopper manifest and keep the contact No's and blood group details of all the personnel in the affected platform.
--	--

	Co-ordinate for medevac arrangements as instructed by IC.
--	---

	Notify local authorities and Employees families if instructed by IC.
--	--

	Liaise with the village and local fishermen community for SAR operations assistance.
--	--

Liaison with Mutual Aid Partners for support as directed by IC.

Surat Base Support

Alert local hospital and logistics arrangement for any likely receipt of casualties if instructed by IC.

Liaise with local authorities and communicate with IC.

Fire Officer

Co-ordinate with HSE for any support.

Restoration of Site after the Event

Ensure from IC the emergency status and closure of emergency.

Constitute a team from site for inspection/ Investigation to assess the damage.

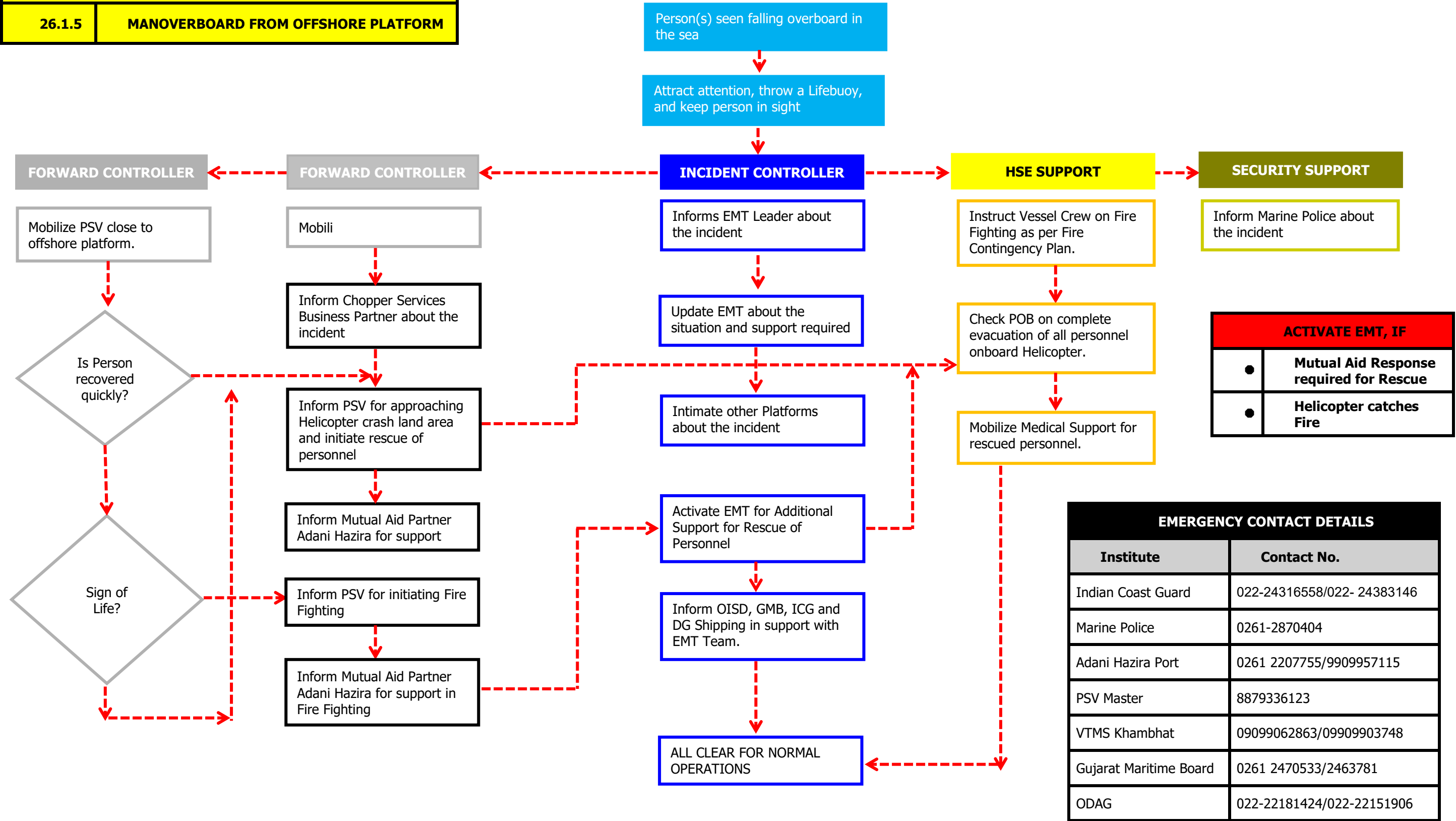
Verify the assessment and mobilize resources for restoration.

Ensure that statutory requirements are complied with, prior to re-commissioning of the Platform.

Liaise with Gurgaon EMT team.

EMERGENCY SCENARIO

26.1.5 MANOVERBOARD FROM OFFSHORE PLATFORM



26.1.6 Structural Failure at Offshore

Platform Incharge	
	Assess & notify the damage and imminent danger to the personnel on board / equipment.
	Inform RO/ Control room of the damage and Sound the hand operated siren at Platform if there is a potential danger
	Activate ESD if there is an immediate danger and initiate evacuation. Call PSV for assistance.
	Abandon installation immediately if there is a danger of collapse or sinking
	Keep updating IC on the developments and act as instructed by IC.
	Perform Headcount and inform the details of missing personnel if any & report.

Radio officer	
	Inform IC/ IRC members about the incident
	Call support vessel to the affected platform, under instructions from IC / IRC members
	Organise for Aerial Survey if necessary with the approval from IC
	Inform all Cairn radio stations of incident, and control / minimise non-essential communication
	Maintain log of all events in chronological order
	Inform –RO Gurgaon to activate EMT as instructed by IC.

Incident Controller – Installation Manager	
	Obtain full briefing of the incident and take stock of the situation.
	Inform EMT Leader; provide full incident briefing and likely requirements
	Advise to mobilize support vessel to the location if the helicopter sortie was sent to offshore.
	If there is an immediate threat to the personnel order Shutdown and evacuate the personnel.
	Inform ODAG, Eastern Naval Command headquarters & Maritime Rescue Coordination Centre at Chennai & Vizag for necessary SAR operation.
	Deploy resources for pollution control, if there is a pollution threat.

Incident Controller – Installation Manager

	Evaluate repairs; Request specialist assistance if necessary once the situation is under control.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.
	Collect from PS details of the manifest to confirm the missing personnel.
	Have close coordination with EMT Gurgaon on SAR operation and assistance.

Production Support – Production Manager

	Obtain full incident details.
	Ensure affected platform and interconnected platforms are in shutdown condition if necessary.
	Verify the headcount with the Flight manifest and collect details of missing personnel if any.
	Keep communication with the platform Engineer for necessary updates,
	Consult IC /IRC for platform evacuation
	In case of oil spill assess the extent of pollution and follow Oil spill contingency plan guidelines.

Maintenance Support – Maintenance Manager

	Obtain full details of the incident.
	Follow procedures and flow charts of IRP manual
	Verify and advice IC from time to time.

HSE Support

	Obtain full details of the incident and advice IC on any HSE concerns.
	Instruct Medical Support to be on standby.
	Follow the instruction of IC and support for any assistance.
	Follow procedures and Flow Charts of IRP manual and advice IC.

Medical Support

	Upon the call proceed to Phase II Heli base with Ambulance and Additional Medical Rescue team.
	Get the Medical details of the personnel onboard helicopter.

Community Liaison - HR & Admin

	Get the names from chopper manifest and keep the contact No's and blood group details of all the personnel in the affected platform.
	Co-ordinate for medevac arrangements as instructed by IC.
	Notify local authorities and Employees families if instructed by IC.
	Liaison with Mutual Aid Partners for support as directed by IC.

Fire Officer

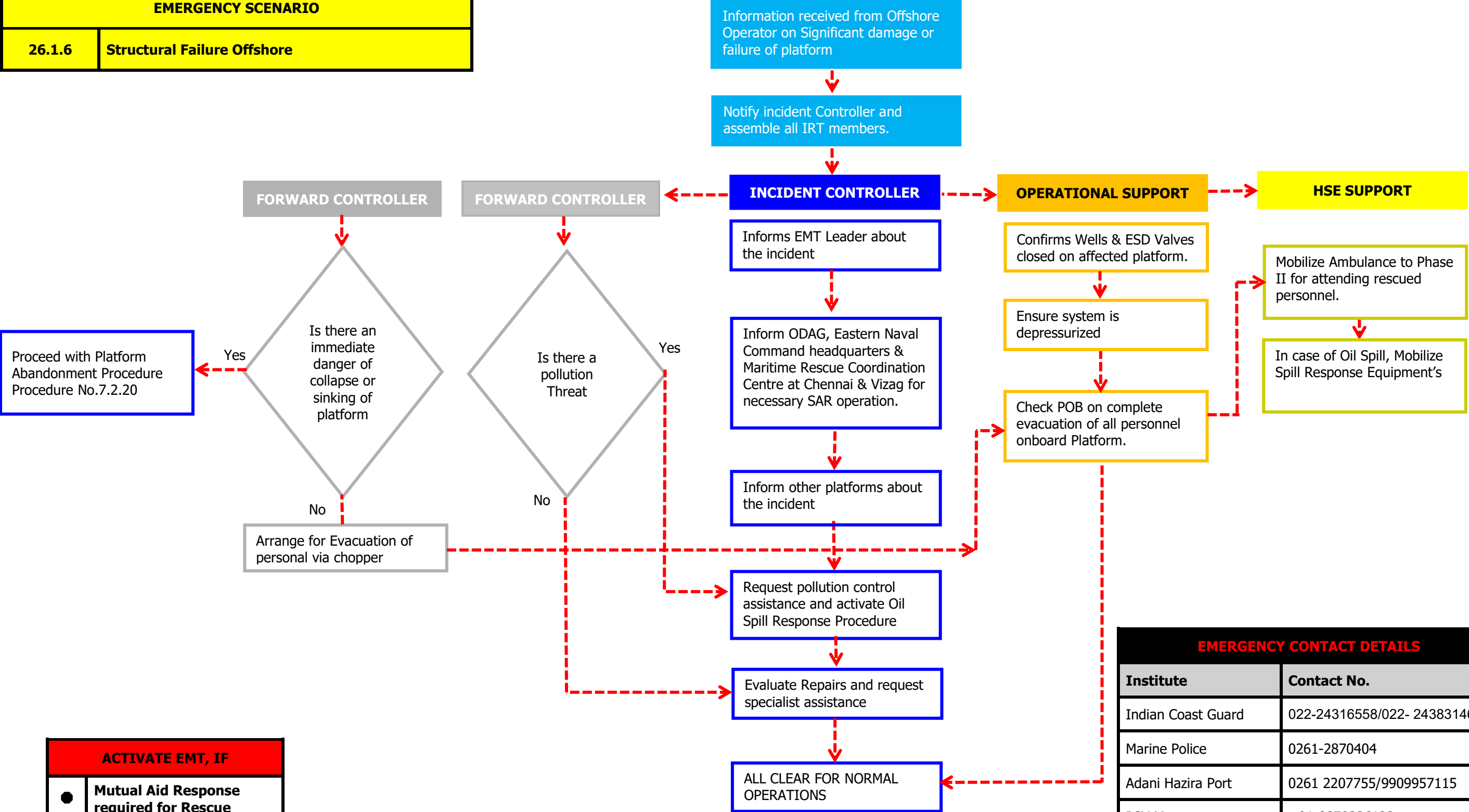
	Co-ordinate with HSE for any support.
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Restoration of Site after the Event

	Ensure from IC the emergency status and closure of emergency.
	Constitute a team from site for inspection/ Investigation to assess the damage.
	Verify the assessment and mobilize resources for restoration.
	Ensure that statutory requirements are complied with, prior to re-commissioning of the Platform.
	Liaise with Gurgaon EMT team.

EMERGENCY SCENARIO

26.1.6 Structural Failure Offshore



ACTIVATE EMT, IF

- Mutual Aid Response required for Rescue
- Life raft deployed for Personnel Evacuation

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Indian Coast Guard	022-24316558/022- 24383146
Marine Police	0261-2870404
Adani Hazira Port	0261 2207755/9909957115
PSV Master	+91-8879336123
VTMS Khambhat	+91-9099062863/9909903748
Gujarat Maritime Board	0261 2470533/2463781
ODAG	022-22181424/022-22151906

26.1.7 Well Control Incident

Platform Incharge	
	Notify Control Room / site R.O about the incident and Sound the hand operated siren at Platform if there is a potential danger
	Instruct all non-essential personnel to proceed to Muster Point(s); conduct headcount(s) as required
	Ensure all possible ignition sources on affected platform are turned off.
	Determine source of the problem and most effective way to prevent incident from escalating
	Ensure wire line crew are advised/aware of any incident and likely requirements
	Activate ESD if there is a potential danger and evacuate the platform. Notify IC/RO.

Radio officer	
	Inform IC/ IRC members about the incident
	Call support vessel to the affected platform, under instructions from IC / IRC members
	Organise for Aerial Survey if necessary, with the approval from IC
	Inform all Cairn radio stations of incident, and control / minimise non-essential communication
	Maintain log of all events in chronological order
	Inform –RO Gurgaon to activate EMT as instructed by IC.

Incident Controller - Installation Manager	
	Obtain full briefing of the incident and take stock of the situation.
	Inform EMT Leader; provide full incident briefing and likely requirements
	Drilling and/or Wire line incident, ensure Drilling Manager and Petroleum Engineer is notified
	Ensure that support vessel(s) are called to the immediate safe area of the affected platform and Masters of the vessel(s) are briefed about the incident.
	Mobilize Helicopter standby to evacuate personnel from platform.

Incident Controller – Installation Manager

	Instruct for Platform Shutdown and order for evacuation if there is a danger to the platform / personnel
	Keep EMT updated from time to time & forward reports.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Production Support – Production Manager

	Obtain full briefing of the incident and advise the platform Engineer.
	Assess the situation and instruct for S/D of wells on P/F and monitor and advise for any changes in well pressures.
	If the well work being executed by a rig; Instruct Platform In-charge to be on standby, to close in any producing wells if situation deteriorates.
	Consider need to evacuate platform; request results of any headcounts, ensure all personnel are accounted for; conduct SAR for any missing personnel
	If the well work being not carried out from platform; Shut in all wells on affected platform and close ESD valves.
	Monitor situation from IRC.
	If wire line in well Instruct well services supervisor to close in well services BOP shear ram/well Xmas tree valves.
	Monitor well pressures.
	Account for all the personnel at platform and their safety.
	Call standby vessel for any assistance or fire fighting.
	Assess the situation and update IC from time to time.
	Consider closing in other wells on platform.
	Monitor and advice of any change in associated well pressures.

Maintenance Support – Maintenance Manager

Obtain full details of the incident.

Follow procedures and flow charts of IRP manual

Verify and advice IC from time to time.

HSE Support

Obtain full details of the incident and advice IC on any HSE concerns.

Instruct Medical Support to be on standby.

Follow the instruction of IC and support for any assistance.

Medical Support

Upon the call proceed to Phase II Heli base with Ambulance and Additional Medical Rescue team.

Get the Medical details of the personnel onboard helicopter.

Community Liaison - HR & Admin

Get the names from chopper manifest and keep the contact No's and blood group details of all the personnel in the affected platform.

Co-ordinate for medevac arrangements as instructed by IC.

Notify local authorities and Employees families if instructed by IC.

Liaison with Mutual Aid Partners for support as directed by IC.

Fire Officer

Co-ordinate with HSE for any support.

Restoration of Site after the Event

Ensure from IC the emergency status and closure of emergency.

Constitute a team from site for inspection/ Investigation to assess the damage.



Restoration of Site after the Event

	Verify the assessment and mobilize resources for restoration.
	Liaise with Gurgaon EMT team.

EMERGENCY SCENARIO

26.1.7 Well Control Incident

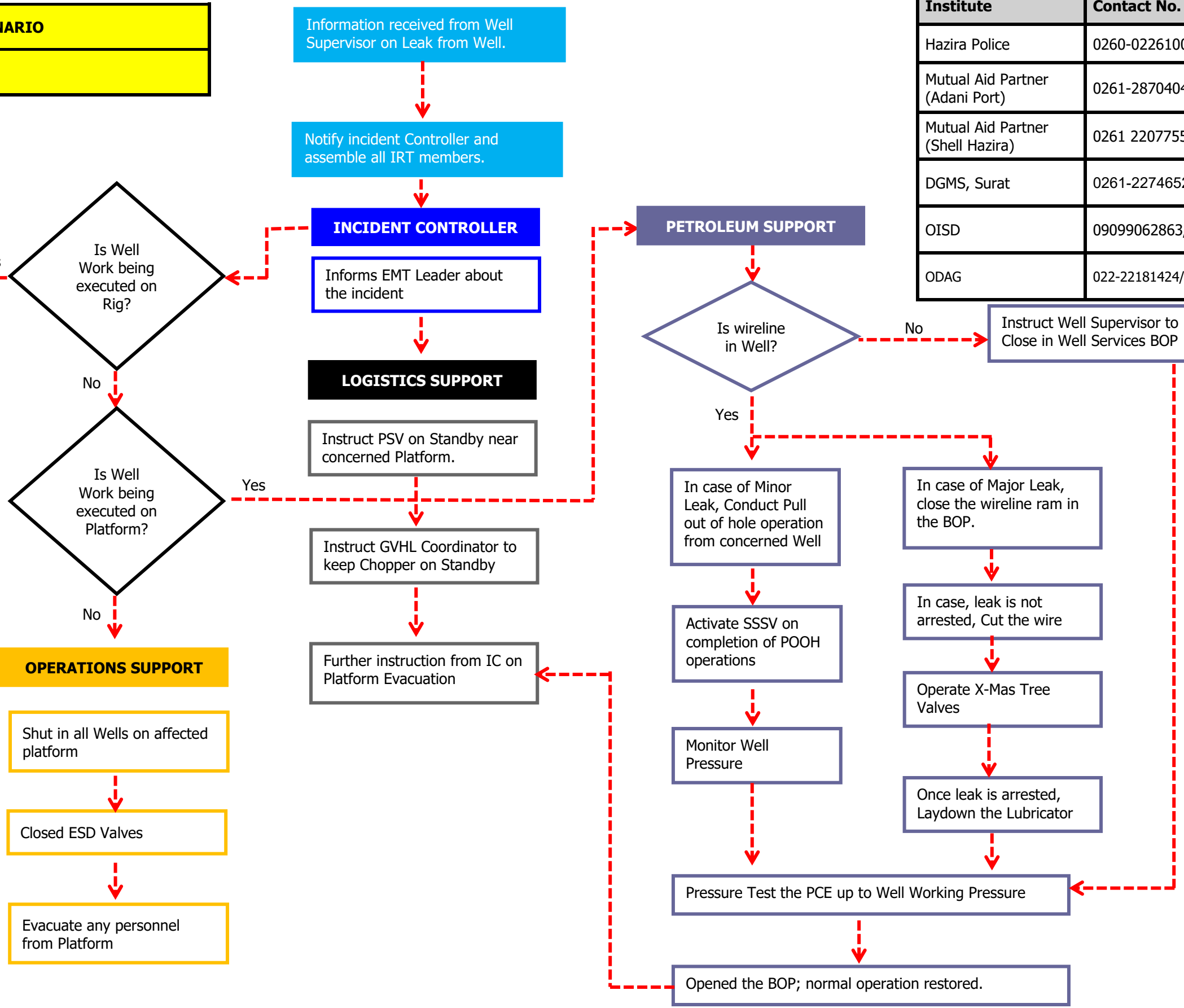
EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Hazira Police	0260-02261005/0971965734
Mutual Aid Partner (Adani Port)	0261-2870404
Mutual Aid Partner (Shell Hazira)	0261 2207755/9909957115
DGMS, Surat	0261-2274652
OISD	09099062863/09909903748
ODAG	022-22181424/022-22151906

Business Partner – Rig Manager

Rig Manager responsible to address situation in accordance with drilling procedure.

Site Incident Controller and IRT Members are on standby for assistance.

- ACTIVATE EMT, IF**
- Mutual Aid Response required for Rescue
 - Situation escalated to activation of BOP
 - Leak results in Blowout



26.1.8 Radioactive Material Spill

Platform Incharge	
	Stop all the activities on the platform.
	Notify Control Room/ R.O about the incident and sound siren at Platform
	Perform Headcount and inform the details of missing personnel if any.
	Perform Decontamination of personal if required for anyone.
	Arrange to place the lead shield and barricade the area.
	Initiate the containment process.
	If anyone is injured arrange for initial decontamination and First Aid.
	Update the incident status as and when required to R.O. / Control room.
	Manage platform evacuation & intimate to IRC.

Radio officer	
	Inform IC/ IRC members about the incident
	Call support vessel to the affected platform, under instructions from IC / IRC members
	Organise for Aerial survey if necessary, with the approval from IC
	Inform all Cairn radio stations of incident, and control / minimise non-essential communication
	Maintain log of all events in chronological order
	Inform –RO Gurgaon to activate EMT as instructed by IC.

Incident Controller – Installation Manager	
	Obtain full briefing of the incident and take stock of the situation.
	Inform EMT Leader; provide full incident briefing and likely requirements
	Consider any need for additional resources to mitigate the situation
	Notify local authorities and statutory agencies.
	Alert and office for any medevac requirements.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Production Support – Production Manager

	Obtain full briefing of the incident and advise the platform Engineer.
	Verify the headcount with the Flight manifest and collect details of missing personnel if any.
	Establish communication with the platform Engineer for necessary updates.

Maintenance Support – Maintenance Manager

	Obtain full details of the incident.
	Follow procedures and flow charts of IRP manual
	Verify and advice IC from time to time.

HSE Support

	Obtain full details of the incident and advice IC on any HSE concerns.
	Follow the instruction of IC and support for any assistance.

Radiation Safety Officer

	Co-ordinate with Incident Controller during retrieval of source.
	On retrieval of Source, Ensure source container is anchored properly while transporting in the vehicle.
	Verify source inventory on retrieval.
	Radiation Safety officer shall ensure safe transportation of source to defined location.

Restoration of Site after the Event

	Ensure from IC the emergency status and closure of emergency.
	Constitute a team from site for inspection/ Investigation to assess the damage.
	Verify the assessment and mobilize resources for restoration.
	Liaise with Gurgaon EMT team.

AERB – Incident Reporting Format for events involving Radioactive Material.

Detailed follow up report including the following shall be submitted to the competent authority:

- (a) Date and Time of Occurrence:
- (b) Radionuclide, its activity:
- (c) Brief Description of Incident:
- (d) Action Taken:
- (e) Probable cause of Incident:
- (f) Steps taken for avoiding recurrence of the incident:

Source Details:

Radioisotopes	No. of Sources	Range of Activity
Ba-133	05	10 m Curie

Details of the MPFM (number, type of devices, Source/Activity)

Identification tag: LB MPFM-A, LB MPFM-B, LB MPFM-C, LA MPFM, GA MPFM

Quantity: 5 nos.+ 01 (Standby at Onshore)

Type of Device: Multiphase flow meter. Used for well logging to measure the density of Oil, Gas & produced water.

Source: Barrium-133

Activity- 10 mCurie

Serial no. of Source: Ba133.477.17 – LB MPFM-B

Serial no. of Source: Ba133.478.17 – LB MPFM-C

Serial no. of Source: Ba133.048.18 – LB MPFM-A

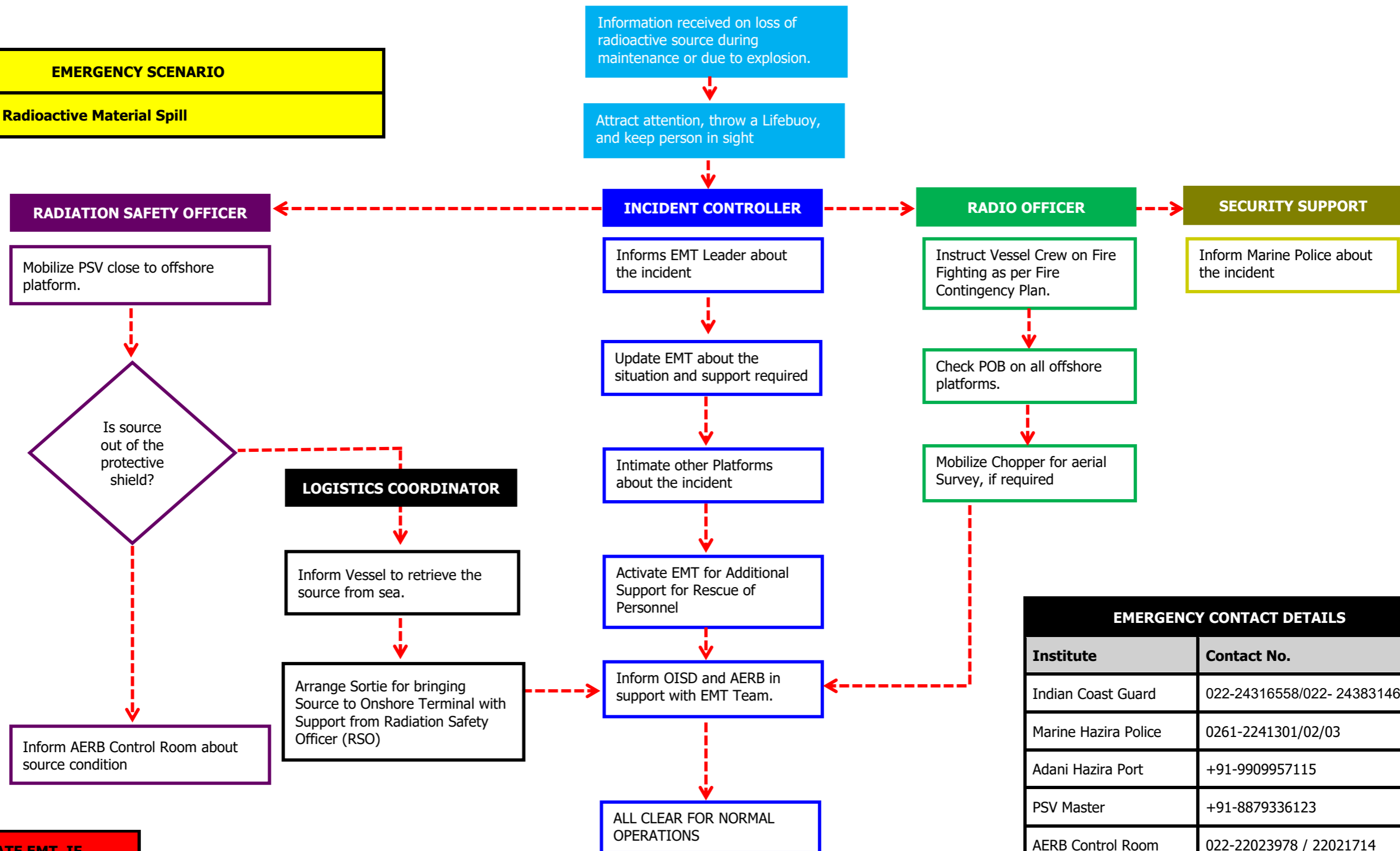
Serial no. of Source: Ba133.049.18 – LA MPFM

Serial no. of Source: Ba133.114.18 – GA MPFM

AERB Institute Reg.# VP84908

EMERGENCY SCENARIO

26.1.8 Radioactive Material Spill



ACTIVATE EMT, IF	
●	Mutual Aid Response required for Rescue
●	Source is not retrievable

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Indian Coast Guard	022-24316558/022- 24383146
Marine Hazira Police	0261-2241301/02/03
Adani Hazira Port	+91-9909957115
PSV Master	+91-8879336123
AERB Control Room	022-22023978 / 22021714
Gujarat Maritime Board	0261-2470533 / 2463781
ODAG	022-22181424/022-22151906

26.1.9 Bursting of Pipeline

An Oil Spill from rupture of submerged pipelines from the production site to shore station will activate the auto shut off valves of the concerned platform through appropriate control system, if the flow pressure drops down to 8 bar. Taking into consideration the rate of oil flow (10000 BOPD), length and diameter of the submerged discharge pipe [Flow of 55 TPH, Length of submerged pipe below the sea - 32 km, and Diameter 600 mm] and reaction time of 1 minute, it is estimated that approx. 150 tonnes of oil will flow out as the spillage. This is only a part of the total volume of oil that is expected to come out from the pipeline, as the pumping pressure would stop immediately and the remaining available crude pressure will be neutralized by the sea water column pressure. Almost 95% and above oil remain inside the pipeline. The Bursting of individual flow lines from the well will result in lesser quantity of spill due to smaller pipe diameter and length.

The event will follow Cairn Oil Spill Contingency Plan (CB-PLN-LT-H-0003) to determine required course of action.

20610.139563

Person discovering Spill	
	Notify the Control Room / R.O about source extent of the spill, and be on standby.

Platform Incharge	
	Identify the leak and close Up & down stream valves of leak source.
	Communicate to the interconnected platforms and initiate shutdown to stop hydrocarbon feed.
	Coordinate and communicate with Onshore PS / Control room and Sound the hand operated siren at Platform if there is a potential danger
	Perform Headcount and inform the details of POB.

Radio officer	
	Inform IC/ IRC members about the incident.
	Call support vessel to the affected platform, under instructions from IC / IRC members
	Organise for Aerial Survey if necessary with the approval from IC
	Inform all Cairn radio stations of incident, and control / minimise non-essential communication

Radio officer

Maintain log of all events in chronological order

Inform –RO Gurgaon to activate EMT as instructed by IC.

Vessel Captain

Locate and track the extent of spill.

Ready to deploy Oil Spill Containment boom.

Upon IC instructions apply dispersant.

Incident Controller – Installation Manager

Obtain full briefing of the incident and take stock of the situation.

Confirm oil spill, approximate quantity and source.

Inform EMT Leader; provide full incident briefing and likely requirements

Request for support vessel or helicopter assistance as appropriate;

Ensure all possible ignition sources are isolated

Activate OSCP as per the OSCP East Coast and monitor Tier system.

Ensure Helicopter / support vessel are mobilized to monitor spill & assist in the operations

Conduct Ariel Survey and shoreline survey as appropriate to confirm the slick movement.

Monitor effectiveness and helicopter to report the slick movement is towards shore side.

Consider the use of Dispersant spray through MUV/PSVs.

Arrange for onshore containment or clean up as required mobilize equipment / personnel, monitor response activities and determine the waste management plan required.

Prepare for any medevac requirements. and evacuation of personnel

Notify concerned authorities such as ICG, / ODAG, APPCB as required.

Update EMT leader time to time & forward the scribe report received from Technical support to EMT.

Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Production Support – Production Manager

Obtain full incident details and coordinate.

Consult IC /IRC for platform evacuation in a safe manner if required

Production Support – Production Manager

	Ensure affected platform and interconnected platforms are in shutdown condition.
	If leak / Spill source not known. Ensure ESD is closed, observe for oil spill stoppage & Investigate cause of Oil spill.
	Upon leakage stops commence repair and restoration process.
	Consult IC /IRC for platform evacuation in a safe manner if required

Maintenance Support – Maintenance Manager

	Obtain full details of the incident and be in readiness to arrange any support required at field.
	Follow Procedures and flow charts of ERP& OSCP manual.
	Verify and forward the scribe report to IC & EMT

HSE Support

	Obtain full briefing of the incident and advise IC on any HSE concerns, coordinate on OSCP activities.
	Instruct Medical support and HR to be on standby for any assistance.
	Follow the instructions of IC and support for any assistance.
	Initiate sample collection process (Refer OSCP)
	Assess Oil Spill level (Tier 1 / 2 /3) and communicate to all the relevant personnel. Updates to be sent as and when required.
	Ensure that POLREP form is duly filled in and send to the concerned personnel.

Community Liaison - HR & Admin

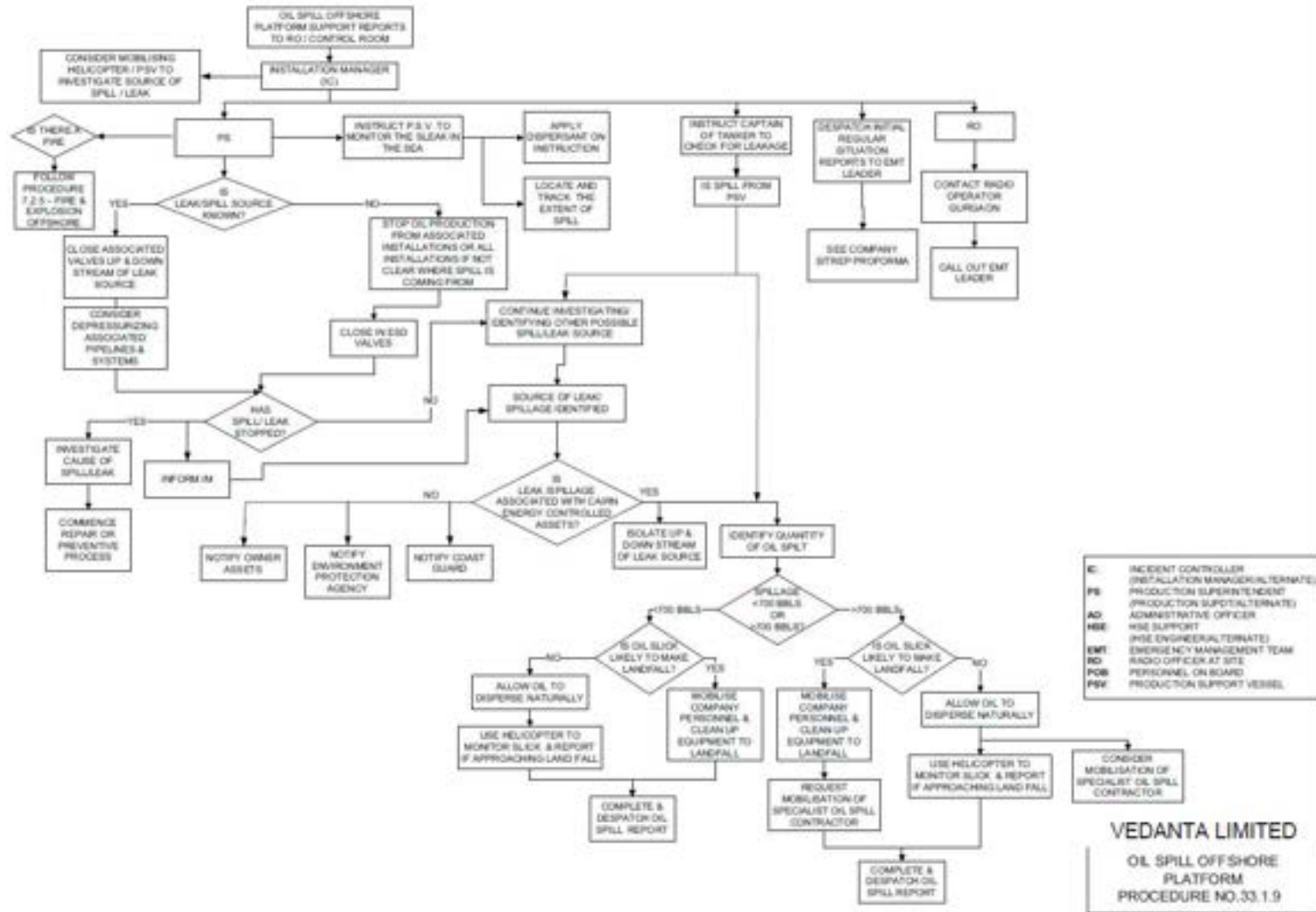
	Co-ordinate for medevac arrangements as instructed by IC.
	Notify local authorities and Employees families if instructed by IC.
	Liaison with Mutual Aid Partners for support as directed by IC.

Restoration of Site after the Event

	Ensure from IC the emergency status and closure of emergency.
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Restoration of Site after the Event	
	Constitute a team from site for inspection/ Investigation to assess the damage.
	Verify the assessment and mobilize resources for restoration.
	Liaise with Gurgaon EMT team.



IC: INCIDENT CONTROLLER (INSTALLATION MANAGER/ALTERNATE)
PS: PRODUCTION SUPERINTENDENT (PRODUCTION SUPER/ALTERNATE)
AO: ADMINISTRATIVE OFFICER
HSE: HSE SUPPORT (HSE ENGINEER/ALTERNATE)
EMT: EMERGENCY MANAGEMENT TEAM
RO: RADIO OFFICER AT SITE
POB: PERSONNEL ON BOARD
PSV: PRODUCTION SUPPORT VESSEL

VEDANTA LIMITED
OIL SPILL OFFSHORE PLATFORM
PROCEDURE NO.33.1.9

26.2 Onshore Emergency Events

26.2.1 Oil Spill Onshore

Person discovering Spill	
	As soon as leak is observed, check for location, Source and inform Control Room.
	Avoid creating any source of ignition. Stop all Hot Work Jobs nearby.

Area Engineer	
	If location of the leak is known, and if safe to do so, isolate the leak source by closing the relevant manual valves.
	Shutdown production by activating ESD if leak is uncontrollable.
	Inform Control room/Site support; provide incident briefing and any likely requirements.
	Await for further instructions.

Radio officer	
	Inform IC/ IRC members about the incident.
	Organise for Aerial Survey if necessary with the approval from IC.
	Inform all Cairn radio stations of incident, and control / minimise non-essential communication.
	Maintain log of all events in chronological order.
	Inform –RO Gurgaon to activate EMT as instructed by IC.

Incident Controller – Installation Manager	
	Obtain full briefing of the incident and take stock of the situation.
	Ensure the location of leak is identified and the possible sources of leak are isolated.
	Mobilise ERT with equipment to build temporary bund around oil spill site if required.
	Confirm the possibilities of the oil spill moving to the nearby water sources and initiate Oil spill contingency plan.
	Notify EMT Leader; provide full incident briefing.
	Coordinate for containment, recovery, clean up and waste management operations, and forward pollution control report.

Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Production Support – Production Manager

Obtain full incident details and coordinate.

Ensure the source of leak/spill is arrested and order ESD activation if required.

Stop oil production if not clear where the spill is coming from.

Investigate cause of spill/Leak and commence repair or preventive process.

If the spill is on-land from any underground pipe line and oil spill is noticed in the village areas, mobilize ERT for spill containment and clean up using booms.

Ensure the source of ignition is isolated and initiate all fire prevention/ protection measures.

Update IRC on the developments and further course of action.

Maintenance Support – Maintenance Manager

Obtain full details of the incident and be in readiness to arrange any support required at field.

Follow Procedures and flow charts of ERP& OSCP manual.

Verify and forward the scribe report to IC & EMT

Assist / coordinate for site restoration activities and plant normalizing.

HSE Support

Obtain full briefing of the incident and advise IC on any HSE concerns, coordinate on OSCP activities.

Instruct Medical support and HR to be on standby for any assistance.

Follow the instructions of IC and support for any assistance.

Initiate sample collection process (Refer OSCP)

Co-ordinate with fire supervisor and arrange necessary resources to mitigate the situation.

Medical Support

On receipt of the message be in readiness for any emergency calls.

Community Liaison - HR & Admin

	Keep in readiness for any support requirements, site evacuation ,etc.
	Co-ordinate for resources and logistics arrangements as instructed by HSE.
	Notify local authorities if instructed by IC.

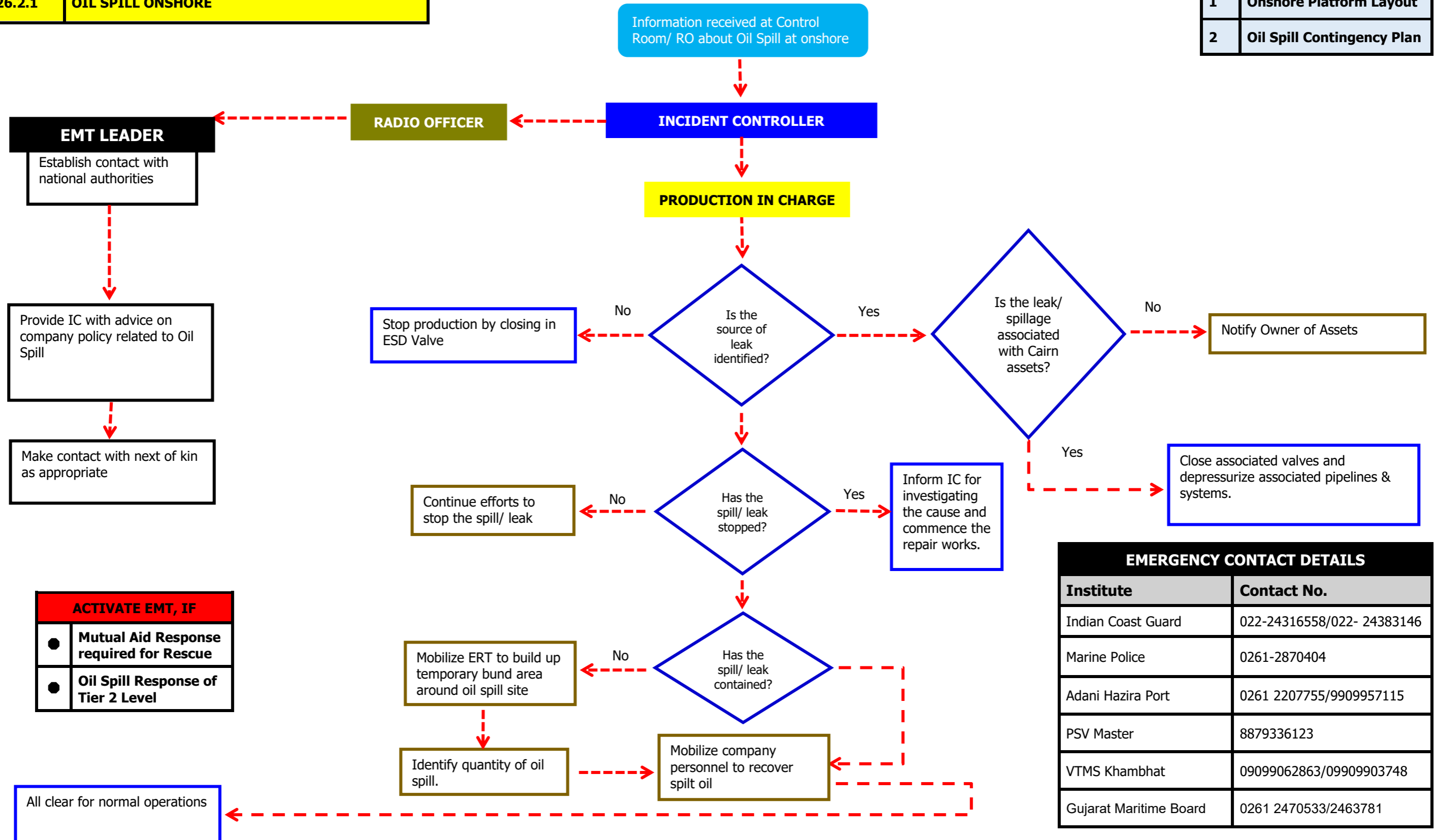
Restoration of Site after the Event

	Ensure from IC the emergency status and closure of emergency.
	Constitute a team for site inspection/ Investigation to assess the damage
	Verify the assessment and mobilize resources for restoration
	Manage the hazardous waste disposal as per Waste Management Plan
	Ensure that statutory requirements are complied.
	Liaise with Gurgaon EMT on all

EMERGENCY SCENARIO

26.2.1 OIL SPILL ONSHORE

REFERENCES	
1	Onshore Platform Layout
2	Oil Spill Contingency Plan



ACTIVATE EMT, IF	
●	Mutual Aid Response required for Rescue
●	Oil Spill Response of Tier 2 Level

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Indian Coast Guard	022-24316558/022- 24383146
Marine Police	0261-2870404
Adani Hazira Port	0261 2207755/9909957115
PSV Master	8879336123
VTMS Khambhat	09099062863/09909903748
Gujarat Maritime Board	0261 2470533/2463781

26.2.2 Fire and Explosion at Onshore

Person observing Fire	
	Notify the emergency through Pager or Walkie or any other communication to control room / activate the nearest break glass unit fire call point.
	If there is an imminent danger, Shut down production by activating the nearest ESD & inform Control room.

Area Engineer	
	On receipt of the message, access the situation and activate the nearest ESD.
	Close down any manual feed valve that may feed fire, if safe to do so.
	Attempt to extinguish fire with portable equipment or water spray/foam, if safe to do so
	Inform Control room on the details and actions taken.
	Keep a close watch and be in contact with the control room.

Control Room Engineer	
	On receipt of information, confirm and raise Emergency siren and Inform IC.
	Confirm the details of fire and activate fire water pumps and monitor fire water header pressure and the fire pumps are in auto mode.
	Shutdown the plant upon instructions from Onshore PS /IRC
	Ensure no liquid level in the H.P. Flare scrubber prior to initiation of ESD. Liquid level could result in carryover. Reduce liquid level before actuation of ESD.
	Monitor the situation and communicate.
	Be in close contact with the production support and await for instructions.

Radio officer	
	Notify Incident Controller of incident and update when any communications received
	Inform all Cairn radio stations of incident, and to clear/minimise non-essential traffic
	Alert Heli base for helicopter requirement if advised by IC.
	Maintain log of all events in chronological order

Inform –RO Gurgaon to activate EMT as instructed by IC.

Incident Controller – Installation Manager

Obtain full briefing of the incident and take stock of the situation.

Ensure ERT Team has been activated and adequate resources are available.

Contact EMT Leader; provide full incident briefing and likely requirements; maintain liaison

Ensure all personnel are accounted for and in case of any missing personnel initiate SAR.

Assess the situation , If fire cannot be extinguished safely, consider need for evacuation of personnel from facility

Keep the Helicopter in readiness for any Medevac support.

Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

After situation has returned to normal, inspect incident site to determine whether further corrective action is required to make situation safe. Do not disturb the evidence.

Upon return to normal , Initiate for Plant restoration activities

Production Support – Production Manager

In case of fire at compressor shed; the blower should be kept in off mode.

In case of a gas leak fire from upstream flange of pipelines SDV impinging on other lines in terminal area; Depressurize the line from the platform end till the line pressure reaches 1 Bar. Then stop depressurizing the line.

For other incidents; Obtain full incident briefing and likely requirements from Incident Controller.

Stop production and isolate process plant in area of fire as required.

Consider shutting the platform and coordinate with the site support.

Mobilise adequate resources to the site of emergency as required.

Coordinate for plant inspection / investigation and restoration activities when the situation is back to normal.

Maintenance Support – Maintenance Manager

Obtain full details of the incident and be in readiness to arrange any support required at field.

Follow Procedures and flow charts of ERP& OSCP manual.

Verify and forward the scribe report to IC & EMT

Maintenance Support – Maintenance Manager

Ensure availability and use of non-sparking tools with maintenance crew.

Assist / coordinate for site restoration activities and plant normalizing.

HSE Support

Obtain full briefing of the incident and advise IC on any HSE concerns

Instruct Medical support and HR to be on standby for any assistance.

Follow the instructions of IC and support for any assistance.

Co-ordinate with fire supervisor and arrange necessary resources to mitigate the situation.

Medical Support

Upon the call be ready at Plant Clinic with Ambulance & MRT team as instructed by HSE

Proceed to Incident location if instructed

Keep in close contact with HSE for any additional resource requirements.

Community Liaison - HR & Admin

Keep in readiness for any support requirements, site evacuation ,etc.

Co-ordinate for resources and logistics arrangements as instructed by HSE.

Notify local authorities if instructed by IC.

Restoration of Site after the Event

Ensure from IC the emergency status and closure of emergency.

Constitute a team for site inspection/ Investigation to assess the damage

Verify the assessment and mobilize resources for restoration

Manage the hazardous waste disposal as per Waste Management Plan

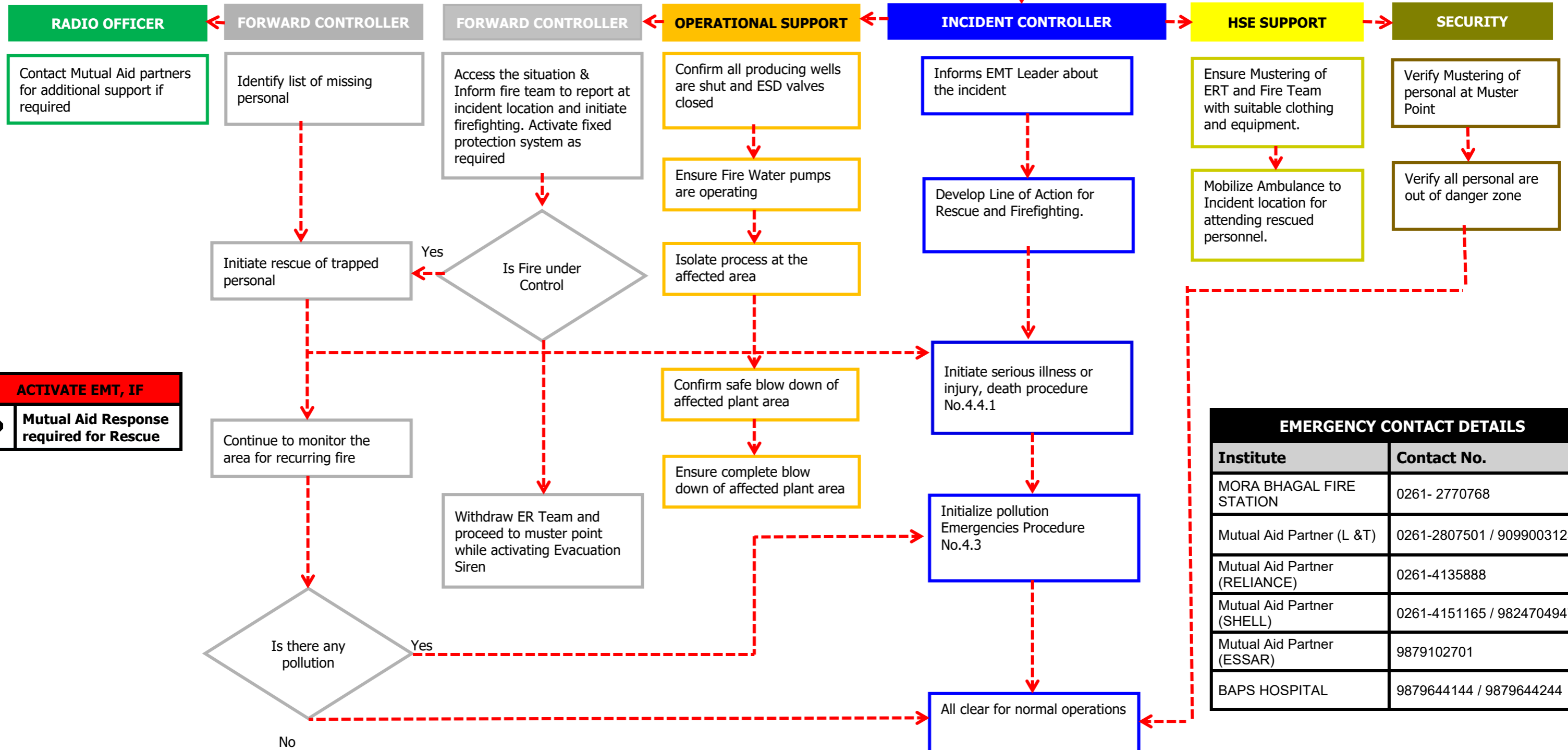
Ensure that statutory requirements are complied.



Liase with Gurgaon EMT on all

EMERGENCY SCENARIO
26.2.2 Fire & Explosion at Onshore

Area Engineer inform Control Room about Fire Emergency
 ↓
 Control informs Incident Controller (IC) ,IRT Member & Fire Team



ACTIVATE EMT, IF
 ● Mutual Aid Response required for Rescue

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
MORA BHAGAL FIRE STATION	0261- 2770768
Mutual Aid Partner (L &T)	0261-2807501 / 9099003123
Mutual Aid Partner (RELIANCE)	0261-4135888
Mutual Aid Partner (SHELL)	0261-4151165 / 9824704947
Mutual Aid Partner (ESSAR)	9879102701
BAPS HOSPITAL	9879644144 / 9879644244

26.2.3 Helicopter Emergency Crash Landing

Helicopter Pilot	
	Declares May day and inform the intention of Emergency landing

Radio Room	
	Obtains as much information as possible from the Chopper pilot.
	Alert Helicopter ground crew for necessary support services.
	Refer Flight manifest and report POB to IC.
	On IC instruction contact Radio room –Gurgaon & EMT and Helicopter Operator.

Incident Controller – Installation Manager	
	Obtain full briefing of the incident and take stock of the situation.
	Mobilise personnel to prepare for emergency landing.
	Contact Production Support to mobilize ERT and HSE for Medical / Logistic support.
	Instruct RO to alert Gurgaon for any other likely requirements.
	If chopper crashes near the shore, consider mobilizing the local fishing boats or divers for rescue of personnel.
	If chopper crashes in the village area, send ERT and MRT for necessary help. Arrange vehicles for medevac if necessary.
	Inform to Helicopter operator of the incident and upon their advice inform to the Emergency Coordination Centre, Gurgaon.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.
	Notify local authority, police, DGCA if necessary upon clearance from EMT

Production Support – Production Manager	
	Mobilize ERT to landing site, also verify for readiness of ground crew.
	Monitor the situation and if the Helicopter is to Crash in the process area shutdown the plant and consider for evacuation of personnel from plant.
	Instruct all personnel to stay inside a protected area.

Liaise with EMT leader and update ECC.

Maintenance Support – Maintenance Manager

Obtain full details of the incident and be in readiness to arrange any support required at field.

Follow Procedures and flow charts of ERP& OSCP manual.

Verify and forward the scribe report to IC & EMT

HSE Support

Obtain full briefing of the incident and advise IC on any HSE concerns

Instruct Medical support and HR to be on standby for any assistance.

Follow the instructions of IC and support for any assistance.

Co-ordinate with fire supervisor and arrange necessary resources to mitigate the situation.

Fire Officer

Liaise with Production Support and update.

Mobilise ERT as appropriate.

Rescue personnel from accident site and handover to MRT

Medical Support

Upon the call be ready with Ambulance & MRT team as instructed by HSE.

Proceed to Incident location if instructed.

Keep in close contact with HSE for any additional resource requirements.

Community Liaison - HR & Admin

Keep in readiness for any support requirements, site evacuation etc.

Co-ordinate for resources and logistics arrangements as instructed by HSE.

Community Liaison - HR & Admin

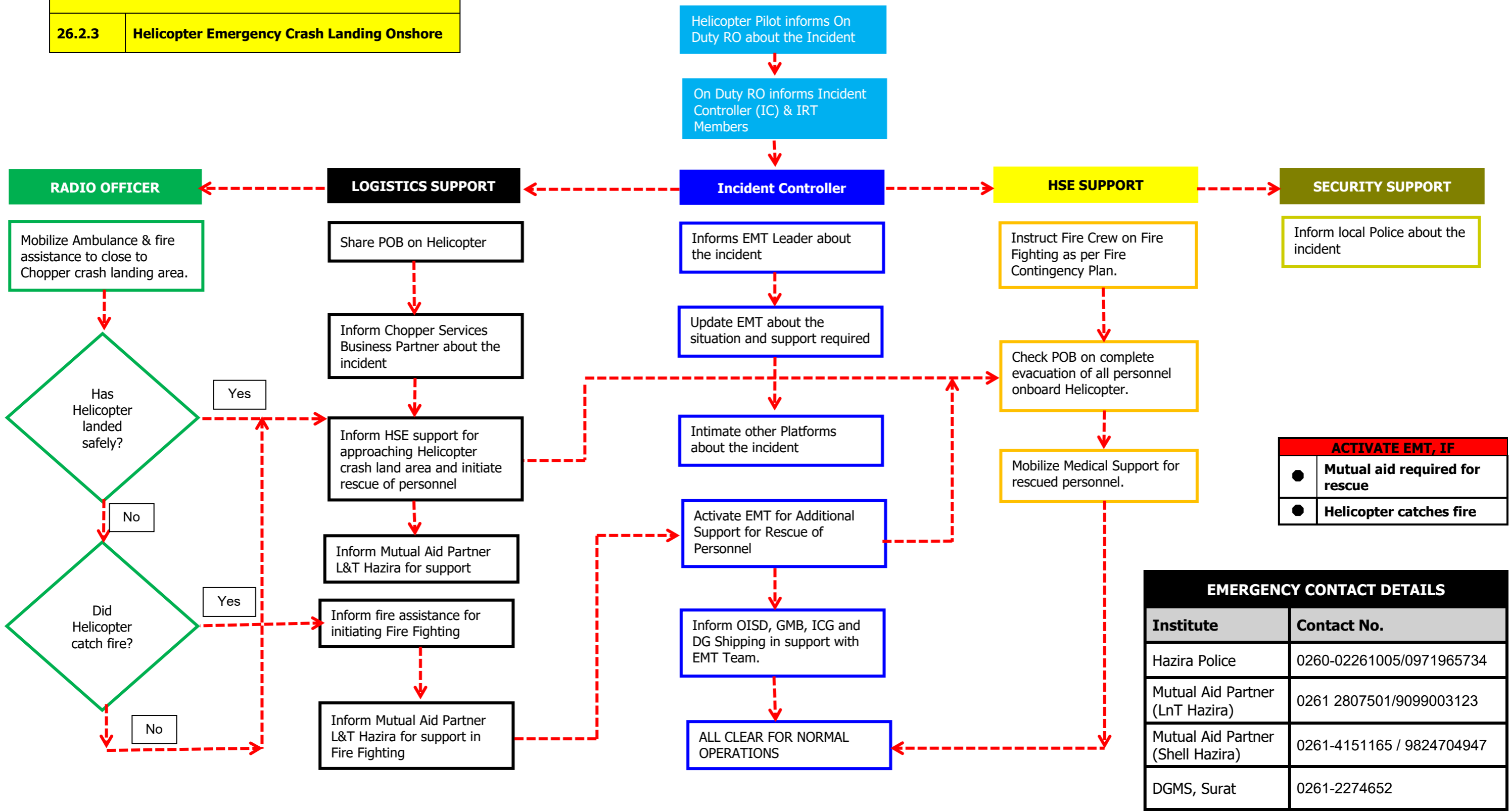
	Keep in readiness for any support requirements, site evacuation etc.
	Assist Doctor in preparing the sick bay (multiple causality handling centre)
	Notify local authorities if instructed by IC.

Restoration of Site after the Event

	Ensure from IC the emergency status and closure of emergency.
	Constitute a team for site inspection/ Investigation to assess the damage
	Verify the assessment and mobilize resources for restoration
	Ensure that statutory requirements are complied.
	Liaise with Gurgaon EMT.

EMERGENCY SCENARIO

26.2.3 Helicopter Emergency Crash Landing Onshore



ACTIVATE EMT, IF	
●	Mutual aid required for rescue
●	Helicopter catches fire

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Hazira Police	0260-02261005/0971965734
Mutual Aid Partner (LnT Hazira)	0261 2807501/9099003123
Mutual Aid Partner (Shell Hazira)	0261-4151165 / 9824704947
DGMS, Surat	0261-2274652

26.2.4 Road Transport Accident (Passenger Vehicles)

Person / Driver at Accident Scene	
	Switch off vehicle ignition (if relevant)
	Attempt to extinguish any fire, if trained and safe to do so
	Notify Site RO / Control Room immediately.
	Assess vehicle and site damage; take necessary actions to secure/isolate accident scene
	If vehicle is in contact with power lines, stay clear and advise occupants to stay in vehicle
	Do not try to remove casualties from vehicle unless you are sure other dangers are not present
	When possible, rescue trapped or injured personnel and provide medical aid if qualified
	Cover any spilt petrol/diesel with sand
If Cairn Driver:	
	Provide necessary information to Police or other vehicle driver (if applicable) – DO NOT ADMIT COMMITMENTS & LIABILITY or make promises that Cairn may not be able to fulfil
	Provide a report of your version of events to Incident Controller when possible
	Take whatever precautions are necessary to minimise impact of damages and liability
	If the vehicle can safely continue to its destination, it should do so, and upon arrival, contact R.O./ Cairn representative, providing a report of the accident
	Emergency services to be informed if dangerous goods involved
	Call out local Cairn resources as necessary and available for tow assistance
	Have appropriate Cairn manager attend site to initiate accident investigation
	If Cairn vehicle, make arrangements for vehicle to be towed or moved for repairs

Radio Room	
	Upon call from the person / driver in the car / location collect information
	Ascertain the following. <ul style="list-style-type: none"> • Location of accident • Number of people. • Type of Injuries.

Radio Room

Specialist equipment needed.

Provide radio communications with emergency response Team.

Notify other cars, for any possible help.

Update IC as and when any communications are received.

Incident Controller - Installation Manager

Obtain full briefing of the incident and take stock of the situation.

Liaise with EMT Leader and advise of likely requirements

Consider need to send assistance (e.g. Site Paramedic, HR & Admin, -HSE, etc.) to accident site as appropriate

Consider need for contact with Cairn Legal Department and/or Cairn Insurance Representative; liaise with EMT Leader as appropriate

Instruct Manager-HR & CSR to seek for local authorities (Police /RDO) support if necessary.

Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Keep in contact with Cairn rep at site for any assistance and further requirements.

If the incident involves multiple vehicles, check the assistance requirement for the personnel involved in other vehicles also.

Maintenance Support - Maintenance Manager

Obtain full details of the incident and be in readiness to arrange any support required at field.

Follow Procedures and flow charts of ERP& OSCP manual.

Verify and forward the scribe report to IC & EMT

HSE Support

Obtain full briefing of the incident and advise IC on any HSE concerns

Be in readiness to proceed to the scene if instructed by IC.

Advise Medical support to be in readiness with adequate resources.

Intimate / establish contact with BARC Authorities for support and guidance

Medical Support

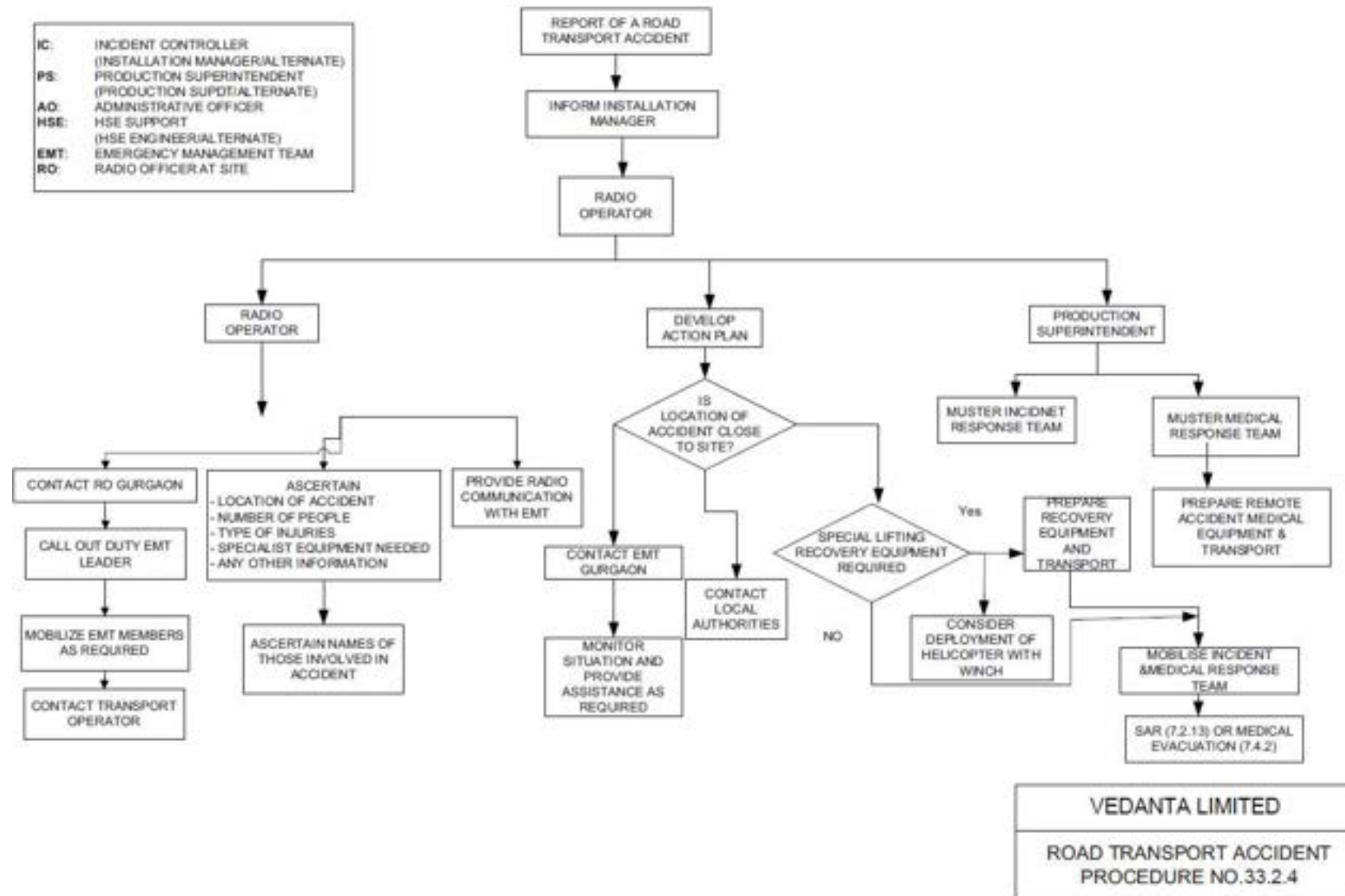
	Upon call be ready at Clinic with Ambulance & MRT team as instructed by HSE
	Proceed to Incident location when instructed
	Request for any resources from HSE.

Community Liaison - HR & Admin

	On receipt of the information collect details and inform IC.
	Proceed to site and send appropriate personnel to the site of the incident.
	Co-ordinate for medevac and logistics arrangements as instructed by IC.
	Coordinate with local authorities for any assistance and update IC from time to time.
	If the vehicle has any radioactive materials, coordinate for transportation of radioactive materials with local authorities for any assistance.
	If the vehicle has any radioactive materials, coordinate for mobilization of resources to enable containment of the materials & decontamination of the exposed personal.

Restoration of Site after the Event

	Ensure from IC the emergency status and closure of emergency.
	Constitute a team for site inspection/ Investigation to assess the damage
	Verify the assessment and mobilize resources for restoration
	Ensure that statutory requirements are complied.
	Liaise with Gurgaon EMT.



26.2.5 Tank Fire

Person observing Fire

Notify the Emergency through pager or Walkie talkie and communicate to the control room

Radio Room

Site R.O shall inform IC about the incident

Control all the non-essential communication.

Inform Gurgaon R.O and EMT as instructed by IC.

Tally the head count and communicate to IC.

Incident Controller – Installation Manager

Obtain full briefing of the incident and take stock of the situation.

Ensure ERT is deployed and adequate resources are arranged.

Order plant shutdown and transfer of fluids, if it is safe to do so.

Consider information to the public and local authorities if the situation warrants an offsite emergency.

Consider Evacuation of personnel from site, if fire cannot be controlled.

Notify EMT leader and decide EMT to be activated.

Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Inform Helicopter to be in readiness for any medevac requirements.

Keep in contact with Production support to ensure safety of the personnel at scene.

Consider calling the additional resources if the fire is not under control.

Production Support – Production Manager

Mobilize ERT to landing site, also verify for readiness of ground crew.

Monitor the situation and if the Helicopter is to Crash in the process area shutdown the plant and consider for evacuation of personnel from plant.

Instruct all personnel to stay inside a protected area.

Liaise with EMT leader and update ECC.

Maintenance Support – Maintenance Manager

	Obtain full details of the incident and be in readiness to arrange any support required at field.
	Follow Procedures and flow charts of ERP& OSCP manual.
	Verify and forward the scribe report to IC & EMT
	Ensure availability and use of non-sparking tools with maintenance crew.

HSE Support

	Obtain full briefing of the incident and advise IC on any HSE concerns
	Instruct Medical support and HR to be on standby for any assistance.
	Follow the instructions of IC and support for any assistance.
	Co-ordinate with fire supervisor and arrange necessary resources to mitigate the situation.

Fire Officer

	Liaise with Production Support and update
	Mobilise ERT as appropriate
	Rescue personnel from accident site and handover to MRT

Medical Support

	Upon the call be ready at Plant Clinic with Ambulance & MRT team as instructed by HSE
	Proceed to Incident location if instructed
	Keep in close contact with HSE for any additional resource requirements.

Community Liaison - HR & Admin

	Keep in readiness for any support requirements, site evacuation etc.
	Co-ordinate for resources and logistics arrangements as instructed by HSE.
	Keep in readiness for any support requirements, site evacuation etc.

	Assist Doctor in preparing the sick bay (multiple causality handling centre)
	Notify local authorities if instructed by IC.

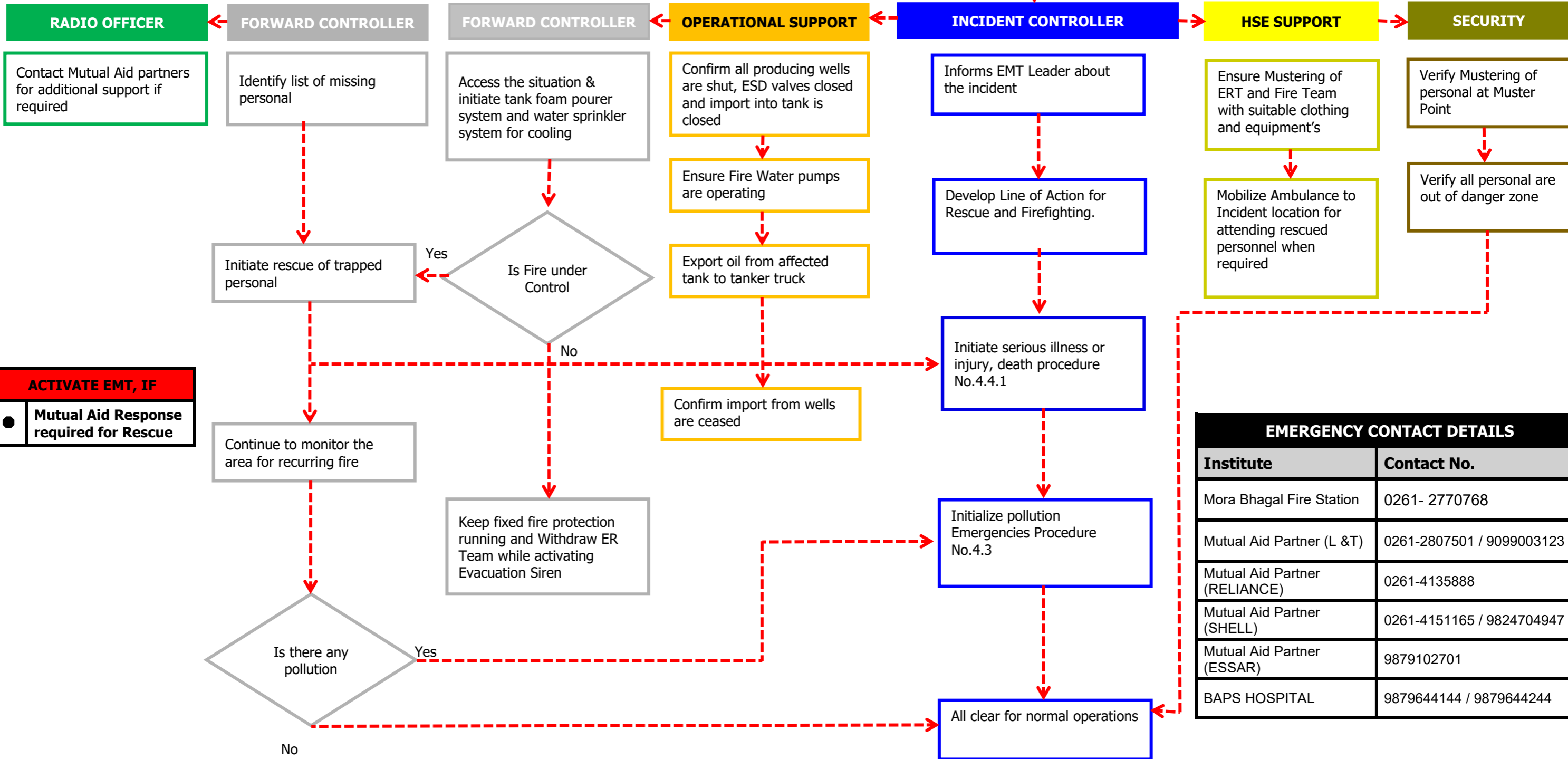
Restoration of Site after the Event

	Ensure from IC the emergency status and closure of emergency.
	Constitute a team for site inspection/ Investigation to assess the damage
	Verify the assessment and mobilize resources for restoration
	Ensure that statutory requirements are complied.
	Liaise with Gurgaon EMT.

EMERGENCY SCENARIO
26.2.5 Tank Fire

Area Engineer inform Control room about Tank Fire

Control room operator informs Incident Controller (IC), IRT Member & Fire Team



ACTIVATE EMT, IF
 Mutual Aid Response required for Rescue

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Mora Bhagal Fire Station	0261- 2770768
Mutual Aid Partner (L &T)	0261-2807501 / 9099003123
Mutual Aid Partner (RELIANCE)	0261-4135888
Mutual Aid Partner (SHELL)	0261-4151165 / 9824704947
Mutual Aid Partner (ESSAR)	9879102701
BAPS HOSPITAL	9879644144 / 9879644244

26.2.6 Medical Evacuation

Medical Support	
	Examine patient; determine need for Medevac, type and special conditions of transport required; consult with HSE support/Incident Controller regarding appropriate action; maintain liaison.
	Review details of patient condition with hospital/ medical provider as appropriate.
	If instructed by Incident Controller, accompany patient to hospital.
	Generate Medevac Patient Details form (refer section 05, Reporting Forms) to accompany the patient.
	Provide assistance as instructed by site doctor and accompany the patient to hospital if instructed.
	Update site doctor on any developments during medical evacuation and render medical assistance as instructed by site doctor.
	In case of multiple casualties, seek advice from site doctor and render the necessary medical assistance as instructed by site doctor to casualties who are not being personally attended by the site doctor.

Radio Officer	
	On IC instructions contact RO Gurgaon.
	Inform all Cairn radio stations of incident, and to clear/Minimise non-essential traffic.
	Maintain log of events in chronological order.

Incident Controller – Installation Manager	
	Determine need for Medevac, type and special conditions of transport required; consult with Site Doctor regarding appropriate action; maintain liaison.
	If the medical evacuation is being taken up through road, a dedicated vehicle should follow the ambulance.
	Consult with Site Paramedic on appropriate destination Chennai/Hyderabad (Apollo Hospital) for serious Medevac.
	If site helicopter is not available, contact Suvali base support to arrange Medevac flight to SUVALI Field; ensure aircraft appropriately equipped for Medevac.
	Provide Surat support base with destination details, type and special conditions of transport required
	Ensure completed Medevac Patient Details form (Refer section 05,Reporting Forms) accompanies patient.
	If patient is a contractor, inform contractor and Collect details of the casualty.

	Notify EMT Leader; provide full incident briefing and likely requirements; name of ill/injured person(s) to be communicated by secure communications.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

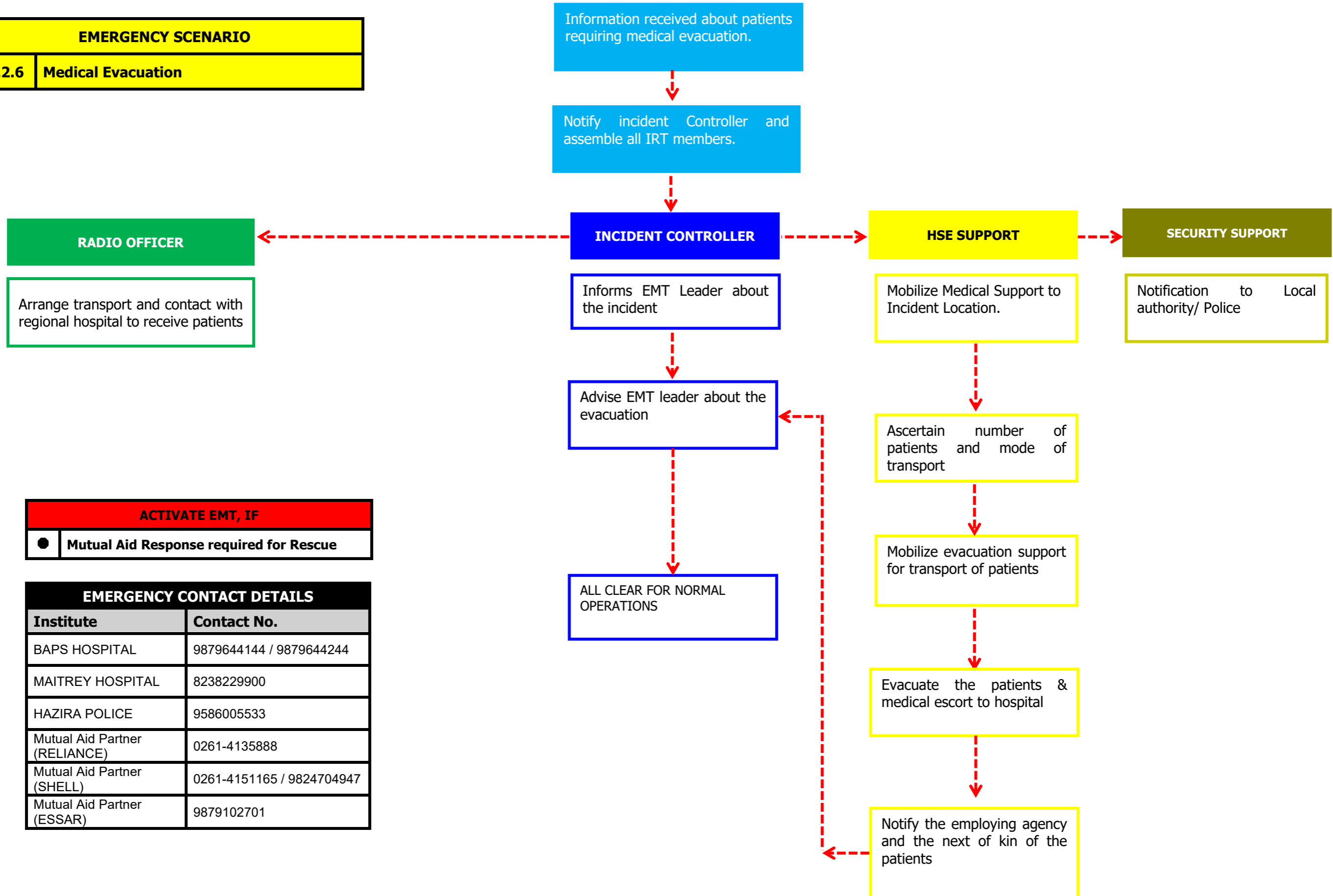
Surat Base Support

	Obtain full Medevac details from Incident Controller.
	If Medevac is to Surat, contact hospital, alert hospital to incoming Medevac; arrange ambulance to meet helicopter etc.

HSE Support

	Confirm that employing company & next of kin are being notified (on instruction from IC).
	If the causality is being transported through road, a dedicated vehicle shall follow the ambulance.
	Obtain full briefing of the incident and advise IC on any HSE concerns.
	Coordinate with Medical support and HR for any requirements.
	Follow the instructions of IC and support for any assistance.

EMERGENCY SCENARIO	
26.2.6	Medical Evacuation



ACTIVATE EMT, IF	
●	Mutual Aid Response required for Rescue

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
BAPS HOSPITAL	9879644144 / 9879644244
MAITREY HOSPITAL	8238229900
HAZIRA POLICE	9586005533
Mutual Aid Partner (RELIANCE)	0261-4135888
Mutual Aid Partner (SHELL)	0261-4151165 / 9824704947
Mutual Aid Partner (ESSAR)	9879102701

26.2.7 Propane Leak resulting in Fire

Person discovering Leak	
	As soon as leak is observed, check for location, Source and inform Control Room.
	Avoid creating any source of ignition. Stop all Hot Work Jobs nearby.

Area Engineer	
	If location of the leak is known, and if safe to do so, isolate the leak source by closing the relevant manual valves
	Shutdown production by activating ESD if leak is uncontrollable.
	Inform Control room/Site support; provide incident briefing and any likely requirements
	Await for further instructions

Radio officer	
	Inform IC/ IRC members about the incident
	Inform all Cairn radio stations of incident, and control / minimise non-essential communication
	Maintain log of all events in chronological order
	Inform –RO Gurgaon to activate EMT as instructed by IC.

Incident Controller – Installation Manager	
	Obtain full briefing of the incident and take stock of the situation.
	Ensure the location of leak is identified and the possible sources of leak are isolated.
	Mobilise ERT with equipment to build temporary bund around leak site if required.
	Notify EMT Leader; provide full incident briefing.
	Coordinate for containment, recovery, clean up and waste management operations, and forward pollution control report.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Production Support – Production Manager

	Obtain full incident details and coordinate.
	Ensure the source of leak/spill is arrested and order ESD activation if required.
	Stop oil production if not clear where the Leak is coming from.
	Investigate cause of spill/Leak and commence repair or preventive process.
	If the leak is from any pipe line, mobilize ERT for containment and rectification.
	Ensure the source of ignition is isolated and initiate all fire prevention/ protection measures.
	Update IRC on the developments and further course of action.

Maintenance Support – Maintenance Manager

	Obtain full details of the incident and be in readiness to arrange any support required at field.
	Follow Procedures and flow charts of ERP manual.
	Verify and forward the scribe report to IC & EMT
	Assist / coordinate for site restoration activities and plant normalizing.
	Ensure availability and use of non-sparking tools with maintenance crew.

HSE Support

	Obtain full briefing of the incident and advise IC on any HSE concerns, coordinate on leak attending activities.
	Instruct Medical support and HR to be on standby for any assistance.
	Follow the instructions of IC and support for any assistance.
	Initiate sample collection process.
	Co-ordinate with fire supervisor and arrange necessary resources to mitigate the situation.

Medical Support

	On receipt of the message be in readiness for any emergency calls.
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Community Liaison - HR & Admin

	Keep in readiness for any support requirements, site evacuation ,etc.
	Co-ordinate for resources and logistics arrangements as instructed by HSE.
	Notify local authorities if instructed by IC.

Restoration of Site after the Event

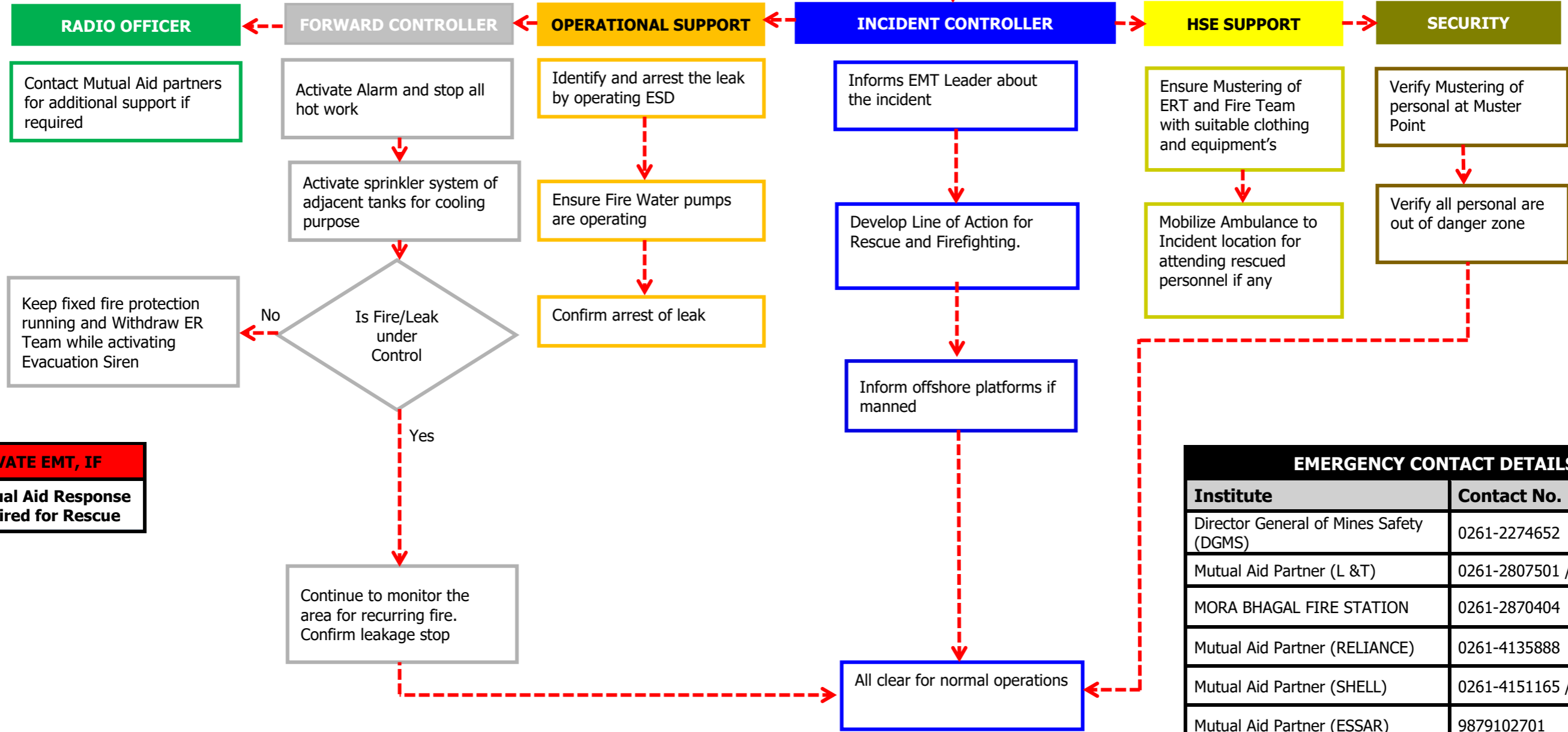
	Ensure from IC the emergency status and closure of emergency.
	Constitute a team for site inspection/ Investigation to assess the damage
	Verify the assessment and mobilize resources for restoration
	Manage the hazardous waste disposal as per Waste Management Plan
	Ensure that statutory requirements are complied.
	Liaise with Gurgaon EMT on all

EMERGENCY SCENARIO

26.2.7 Propane Fire Emergency

Area Engineer inform Control room about leak from propane tank

Control room operator informs Incident Controller (IC), IRT Member & Fire Team



ACTIVATE EMT, IF

- Mutual Aid Response required for Rescue

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Director General of Mines Safety (DGMS)	0261-2274652
Mutual Aid Partner (L &T)	0261-2807501 / 9099003123
MORA BHAGAL FIRE STATION	0261-2870404
Mutual Aid Partner (RELIANCE)	0261-4135888
Mutual Aid Partner (SHELL)	0261-4151165 / 9824704947
Mutual Aid Partner (ESSAR)	9879102701
BAPS HOSPITAL	9879644144 / 9879644244

26.2.8 Tanker Collision leading to Oil Spill

Radio officer	
	When receiving notification of incident, ensure incident details are recorded accurately. Identify the caller and confirm the emergency. Get the exact location of the incident
	If the informer is a tanker crew (driver or helper) then inform to barricade the area, control traffic and if possible, keep the oil spill contained & isolate the spark potential sources.
	Notify Incident Controller and update as further communications are received. Notify all IRT members as directed by IC.
	For any media calls received by Site Radio Room, ensure Incident Controller is informed about it. Do not discuss any matters with media
	Activate EMT as instructed by IC.
	Log all the events and actions.

Incident Controller – Installation Manager	
	Activate Incident Response Team (IRT). Ensure the early contact is made with the scene of incident.
	Evaluate and initiate immediate actions viz., spill containment, recovery etc. to contain and mitigate effects; ensure all resources are mobilized for oil transfer, spill recovery, spill containment, contaminated soil recovery, collection tanks etc. Request any additional resources likely to be required to IRT Team.
	Ensure any injured or at-risk personnel are evacuated/rescued to a safe area.
	Evaluate the public reaction and request for support from EMT Team.
	Develop initial priority action plan with IRT members and continually review to ensure response is appropriate to incident
	Constantly monitor need for external requirements
	Mobilise Forward Controller and Security Support to incident location to take control of the area and report back the situation.
	Mobilize HSE Coordinator to establish availability of spill containment equipment and prepare it for dispatch to incident location.
	Ensure Medical Team are prepared to mobilize or assist as required
	Ensure all contact points and numbers of key personnel are on hand (Contact directory)
	Confirm spill containment and clean-up equipment mobilized to scene.
	Establish if additional resources are required by Forward Controller
	Do not disturb anything at the accident area until the statutory authorities clear it or unless it threatens the safety of the personnel. In such a case, take necessary photographs.
	Mobilize Business Partner support for

Forward Controller

Activate Support functions. Meet at Incident Control Centre

Mobilize to incident location.

Cordon-off the area and ensure minimum disturbance to traffic.

Extend support to site in terms of Security, public liaison, logistics and additional resources required for spill control, recovery, and mobilization etc.

Contact the tanker owners and intimate on the incident details including injuries.

In case of fire, mobilize fire tenders to the scene of incident

Mobilize additional ambulance services if required

Call of additional support required from Security, HSE or Mutual Aid Partners.

Mobilize required resources, if necessary, for contaminated soil recovery.

Ensure Gas Testing of the area before commencing the transfer of crude from one tanker to another.

Rev. 26

Identify the authorized hazardous waste handlers for safe disposal of the contaminated soil.

Coordinate with local police for road diversion.

Provide regular updates to Incident Controller.

Ensure availability and use of non-sparking tools with maintenance crew.

Rev. 24

Business Partner Representative

Report to Incident Location.

Coordinate with Transporter for mobilizing Fighter tanker to incident location.

Assess and Coordinate for mobilizing Oil Spill response equipment to incident location.

Evaluate requirement of suitable Crane in case of tanker topple or offroad scenario.

Coordinate with Tie Up Hospital for injured person.

Provide regular update to Forward Controller / Incident Controller.

Security Support

Mobilize Quick Response Team to control public movement on the incident

	Support local administration to control the traffic on Highway
	Barricade the effective area for controlled movement

Spill Clean Up Resources

	Vacuum Pumps (Diesel)
	Fuel for Pumps
	Connecting Hoses
	Collection Barrels or tankers (if available)
	Shovel & Other relevant tools
	PPE – Hand Gloves, Shoes and Goggles
	Sawdust
	Adequate Manpower
	Traffic Cones and Barricading Tapes

Safety and Environment Requirement

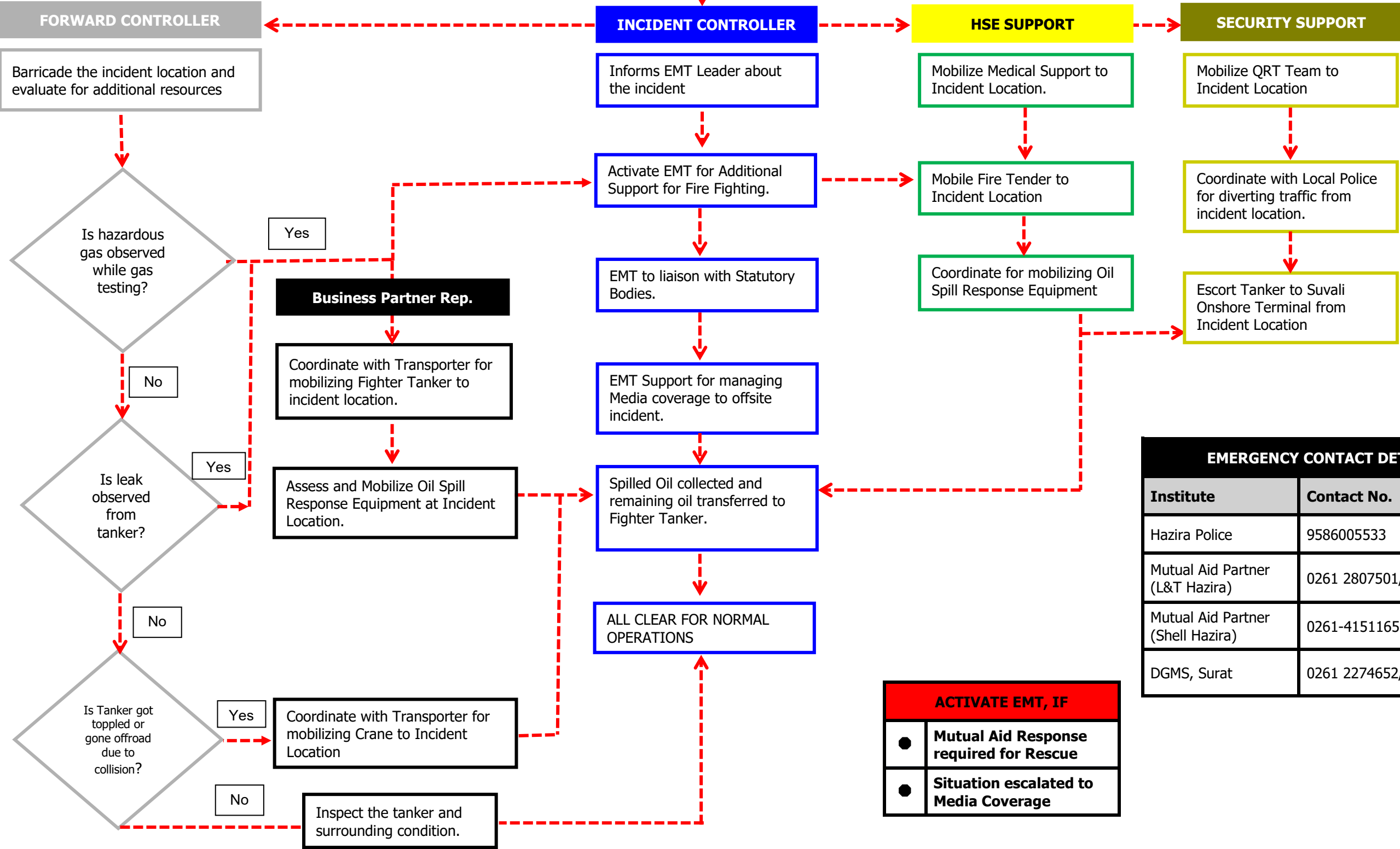
	Site Clean Up – Recovery of Oil Contaminated Soil / Sand.
	Responsible Disposal of Contaminated material to the authorised Vendors.
	Usage of PPE – High Ankle Shoes, PVC Gloves and Goggles.

Community Liaison - HR & Admin

	Keep in readiness for any support requirements, site evacuation ,etc.
	Co-ordinate for resources and logistics arrangements as instructed by HSE.
	Notify local authorities if instructed by IC.

26.2.8 Tanker Collision leading to Oil Spill

Information received on Tanker Collision with Third Party vehicle.
 Notify incident Controller and assemble all IRT members.



EMERGENCY CONTACT DETAILS	
Institute	Contact No.
Hazira Police	9586005533
Mutual Aid Partner (L&T Hazira)	0261 2807501/9099003123
Mutual Aid Partner (Shell Hazira)	0261-4151165 / 9824704947
DGMS, Surat	0261 2274652/2274651

ACTIVATE EMT, IF

- Mutual Aid Response required for Rescue
- Situation escalated to Media Coverage

26.2.9 Electric Shock

Person Observing an Electric Shock Situation

	DO NOT TOUCH THE VICTIM directly if they are still in contact with the electrical source
	TURN OFF THE ELECTRIC POWER SOURCE, if possible.
	Notify the Emergency through pager or Walkie talkie and communicate to the control room
	Use a rescue hook or dry non-conductive material to move the casualty away if power can't be switched off.
	Assess the casualty pulse and breathing, if either has stopped begin CRP immediately
	Ensure casualty is on firm flat surface
	Loosen the clothing and open the airway by lifting the chin and tilting the head backwards.
	Follow steps to be taken as per Electrical Shock Treatment Chart

Radio Room

	Site R.O shall inform IC about the incident
	Control all the non-essential communication.
	Inform Medical Team about the location and incident.
	Maintain log of events in chronological order.

Incident Controller – Installation Manager

	Obtain full briefing of the incident and take stock of the situation.
	Ensure Medical Team is deployed and adequate resources are arranged.
	Keep in contact with Medical Team to ensure safety of the personnel at scene.

Medical Support

	Upon the call be ready at Plant Clinic with Ambulance & MRT team as instructed by HSE
	Proceed to Incident location
	Assess the person pulse and breathing, if either has stopped begin CRP immediately

Medical Support

If casualty breathing normally turn into recovery position

Recheck Airway, breathing and circulation.

If exposed to burns, immerse the affected area in cool running water for at least 10 minutes

Transfer the casualty to First Aid center.

If transport to hospital required; consult with HSE support/Incident Controller regarding appropriate action; maintain liaison and accompany the patient to hospital.

Keep in close contact with HSE for any additional resource requirements.

HSE Support

Obtain full briefing of the incident and advise IC on any HSE concerns

Coordinate with Medical support for any requirements and ensure safety of the personnel at scene.

Follow the instructions of IC and support for any assistance.

Fire & Rescue Officer

Support Medical Team on shifting of person in Ambulance, if required.

Mobilise ERT as appropriate

Restoration of Site after the Event

Ensure from IC the emergency status and closure of emergency.

Constitute a team for site inspection/ Investigation to assess the damage.

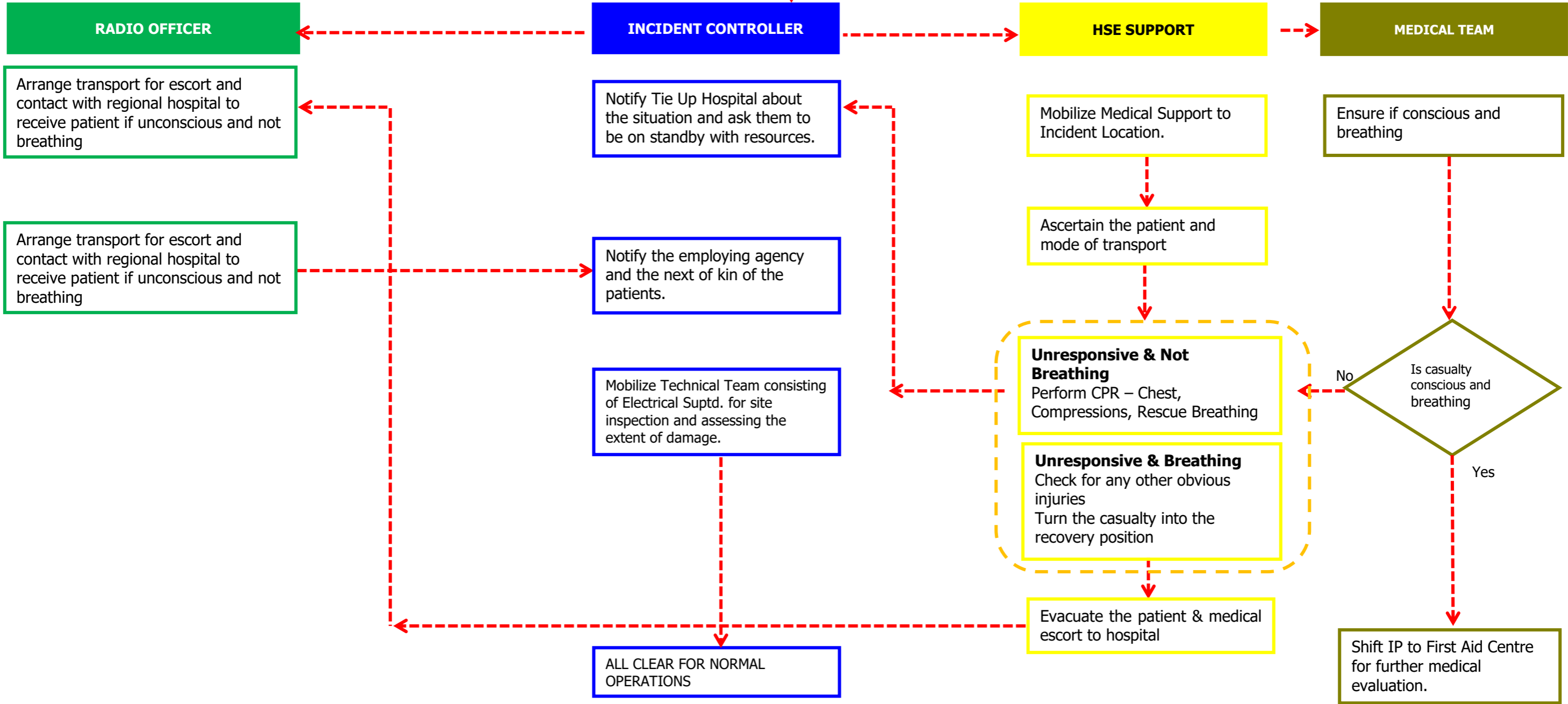
Verify the assessment and mobilize resources for restoration

EMERGENCY SCENARIO	
26.2.9	Electric Shock

Rev. 27

Ensure Your Own Safety
 • DO NOT TOUCH THE VICTIM
 • TURN OFF THE ELECTRIC POWER SOURCE
 • INSULATE YOURSELF from the ground with rubber mat
 • Use a RESCUE HOOK or dry non-conductive material

Notify Control Room about the incident.



Electric Shock

1. Danger

If you suspect someone has received an electric shock you must ensure all power sources are isolated before you can treat the casualty.

High voltage

Overhead power cables are an example of a power source generating high voltage electricity. High voltage electricity has the ability to 'jump' or 'arc' up to distances of 15 metres or over. If faced with a casualty resulting from high voltage electricity:

Do not approach. Stay at least 25 metres away from the casualty until the power has been switched off by an official agency i.e. Electricity Board.

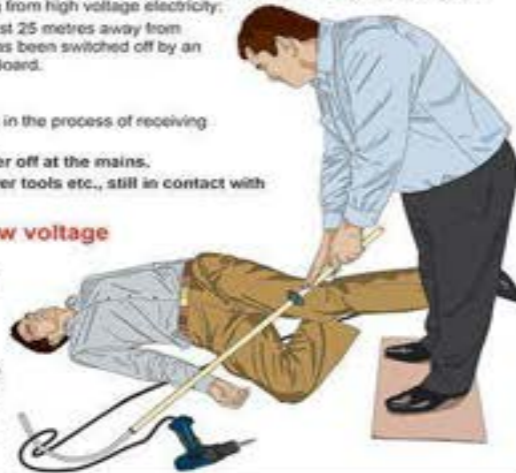
Low voltage

If faced with a casualty who is in the process of receiving an electric shock you should:

- + Attempt to turn the power off at the mains.
- + Remove any cables/power tools etc., still in contact with the casualty.

Action to take for low voltage

- + Insulate yourself from the ground with books, newspapers or rubber matting.
- + Use an electric shock rescue hook or object of low conductivity i.e. a wooden broom or rolled up newspaper, to push away the power source from the casualty.



2. Response

To give the casualty the optimum chances of survival you must quickly assess the levels of response. A rapid assessment will allow effective treatment to be administered and will also allow for accurate information to be passed on to the ambulance service.

Check whether the casualty is responsive

01. Ask "Open your eyes if you can hear me" and call their name if known.
02. Ask in both the casualty's ears to open their eyes.
03. Offer a mild stimulus by shaking casualty's shoulders.
04. Do not move the casualty unless the environment or situation is dangerous.



6. Defibrillation

Use an AED (Automated External Defibrillator) if available and follow prompts.



3. Airway & Breathing

For an unresponsive casualty

Open the airway

01. Look in the mouth to ensure there are no obvious obstructions.
02. Open the airway by lifting the chin and tilting the head back. This will free the tongue from the back of the throat.
03. If neck/spinal injury is suspected, put one hand on the stomach to feel if it rises and falls. This indicates normal breathing.



Assess for breathing

01. Look for the rise and fall of the chest and beyond.
02. Listen for sounds of breathing near to the face.
03. Feel for breath on your cheek near to the face.
04. Carry this out for up to 10 seconds.

Breathing normally

- + If normal breathing is present go straight to the Unresponsive - Breathing section. (See box 7)

Not breathing normally

- + If the casualty is not breathing normally, call for the Emergency Medical Services (EMS) or ask for people nearby to call, when calling ask for a defibrillator if it is available - commence full Cardio Pulmonary Resuscitation (CPR).



4. Getting Help

Call for help

If alone, use a mobile phone to call the Emergency Medical Services (EMS) by dialling 999 / 112.

If a bystander is present ask them to call the EMS once the casualty's airway and breathing has been checked.

Calling the Emergency Medical Services

01. Dial 999 / 112.
 02. The operator will ask you which service you require. Once you have stated 'ambulance' you will be connected to ambulance control. The operator will ask you a set of questions.
- Do not hang up at any stage of the conversation. The operator will terminate the call when appropriate.

Isolate or cordon off the exposed, damaged or faulty electrical source

As soon as possible after the casualty has been taken to hospital report the incident to the local supervisor. Give all information you can as an IRF needs to be completed for all accidents and incidents.

Leave details about yourself so that you can be contacted should the need arise. Report defective equipment that caused the shock (if applicable) so that repairs can be made.



RIDDOR (Reporting of Injuries, Diseases and Dangerous Occurrences Regulations 2013).

5. Unresponsive - Not Breathing

To commence CPR:

For an unresponsive casualty

01. Ensure the casualty is on a firm, flat surface.
02. Place your hands one on top of the other in the centre of the casualty's chest. (Fig. 1)
03. Compress the chest (up to a maximum depth of approximately 5-6cm) 30 times at a rate of 100-120 compressions per minute. The compressions and releases should take an equal amount of time.
04. After 30 compressions, open the airway again using head tilt/chin lift.
05. Seal the nostrils with your thumb and forefinger. (Fig. 2)
06. Blow steadily into the mouth until you see the chest rise, take about a second to make the chest rise, 2 effective rescue breaths in total (Blow in for 1 second, 2 breaths within 10 seconds). (Fig. 2)
07. Remove your mouth to the side and let chest fall. Inhale some fresh air, when breathing for the casualty.
08. Repeat so you have given 2 effective rescue breaths in total within 10 seconds.
09. If chest does not rise after the second breath, go back to 30 compressions then try again with 2 breaths.
10. Return your hands to the correct position on the chest and give a further 30 chest compressions.



Continue with CPR until

- + The casualty shows signs of recovery.
- + Emergency services arrive.
- + You become exhausted and unable to continue.
- + The situation changes and you are now in immediate danger.

7. Unresponsive - Breathing

If the casualty is breathing normally, turn into the recovery position

01. Check for any other obvious injuries.
02. Remove sharp objects from pockets.
03. Turn the casualty into the recovery position.
04. Place the nearest arm at a right angle to the body. (Fig. 1)
05. Draw the furthest arm across the chest and place the back of the hand across the cheek. (Fig. 2)
06. Keep this here whilst you raise the furthest leg by grasping the top of the knee. (Fig. 3)
07. Gently pull on the knee so that the casualty pivots over onto their side facing you. (Fig. 3)
08. The casualty should be fully over and stable.
09. Re-check the airway, breathing and circulation.
10. Draw up the leg at a 90 degree angle. (Fig. 4)
11. Check for continued breathing.
12. Send someone to ring 999 / 112 or if you are alone, leave the casualty and call 999 / 112.



8. Burns

Burns

Exposure to electricity can cause burns to the skin and, in severe cases, internal organs. In such cases the electricity may, for example, enter via a hand and leave via the feet causing 'entry' and 'exit' burns.

Responsive casualties

01. Burns should be immersed in cold running water for a minimum of 10 minutes (any constricting items such as watches should be removed). (Fig. 1)
02. Once cooled, the burn should be covered with a sterile dressing (non-fluffy). (Fig. 2)

Unresponsive casualties

Cool the burn with wet dressings after placing them in the recovery position.

Do not:

- + Burst any blisters.
- + Apply adhesive dressings.
- + Remove damaged skin.
- + Apply ointments or creams.
- + Cover with 'fluffy' dressings.
- + Affix dressing too tightly.
- + Apply butter, fats or margarine.
- + Remove damaged clothing.
- + Apply ice.



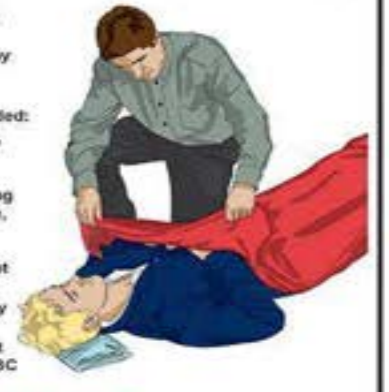
9. Other Injuries

Muscle spasm / seizures

These may be present for some time after the exposure to electricity and indicate a seriously ill casualty.

Action in the event of a major seizure

- + The casualty will almost definitely collapse during a major seizure. Try to control the fall.
- + Ensure the safety of the casualty by removing any objects that may cause injury if they are struck.
- + Place padding under the head of the casualty. Improvise if necessary by using clothing.
- + Do not place anything in the casualty's mouth.
- + Loosen any clothing that may restrict the airway.
- + Time the seizure.
- + When the seizure has subsided:
- + Check the casualty's Airway, Breathing and Circulation (ABC).
- + If unresponsive and breathing normally or semi-responsive, place the casualty in the recovery position (see opposite). Perform CPR if not breathing.
- + Place a blanket over casualty to preserve modesty.
- + Reassure the casualty whilst continuing to monitor the ABC and any other injuries.



Casualties with no apparent injury

If no injury is present and the casualty appears well, it is still advisable to take the casualty to a hospital or medical facility for a check up, as certain organs/systems within the body may be affected several hours after a shock.

26.3 Security Emergency Events

26.3.1 Bomb Threat

Person receiving Threat	
	For written threat, keep all paper, envelopes etc. to preserve evidence.
	For verbal threat, use Bomb Threat Checklist (See Section 05, Reporting Forms) while talking to the person making threat; write detailed notes if Checklist not available.
	Do not use radio to raise alarm – radio signals may trigger an explosive device. Give a pager message immediately not to use radios by any person. Inform RO by telephone.
	For verbal contact, be calm and respectful; appearing sympathetic and using pleasant tone may extend the call; <u>DON'T PANIC.</u>
	Take threat seriously.
	Signal for assistance if in a position to do so.
	Pay attention to what is being said and to any background noises.
	Accurately write all that is being demanded, ask calmly for confirmation if unclear.
	Do not agree or concede to any demands without prior approval.
	Try to keep caller talking as long as possible, <u>DON'T HANG UP.</u>
	If caller "hangs up, do not hang up your phone (it may be possible to trace call).
	At the conclusion of the call, check all notes taken to ensure accuracy.

Radio officer	
	Inform IC/ IRC members about the incident
	Inform all Cairn radio stations of incident, and control / minimise non-essential communication
	Maintain log of all events in chronological order
	Inform –RO Gurgaon to activate EMT as instructed by IC.

Incident Controller – Installation Manager	
	The first priority will be to decide on the new muster point (decision by IC); which will be communicated to the muster point controller.
	Immediately shut in all production if appropriate.

Incident Controller – Installation Manager

	Notify EMT Leader; provide full incident briefing and likely requirements.
	Evacuate all contractor personnel to a safe area; consider total evacuation if required.
	Ensure all relevant authorities (e.g. Police etc.) are notified immediately for bomb squad mobilization.
	Ensure Bomb Threat Checklist is completed by person receiving a verbal threat.
	Make every effort to calm all involved; don't aggravate situation by personal attempts to resolve situation hastily.
	Ensure someone is continually standing by a phone to receive next communication from extortionist or ensure alternative number is provided to caller.
	Await assistance from appropriate authorities.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Production Support – Production Manager

	Instruct to announce in PA system not to use Radios (Walkie Talkie) as there is chance of triggering bomb.
	Advise control room for readiness to shut down the plant in case required.
	Liaise with IRC and coordinate operation.

Maintenance Support – Maintenance Manager

	Obtain full details of the incident and be in readiness to arrange any support required at field.
	Follow Procedures and flow charts of ERP manual.
	Verify and forward the scribe report to IC & EMT
	Assist / coordinate for site restoration activities and plant normalizing.
	Ensure availability and use of non-sparking tools with maintenance crew.

HSE Support

	Obtain full briefing of the incident and advise IC on any HSE concerns, coordinate on leak attending activities.
	Instruct Medical support and HR to be on standby for any assistance.

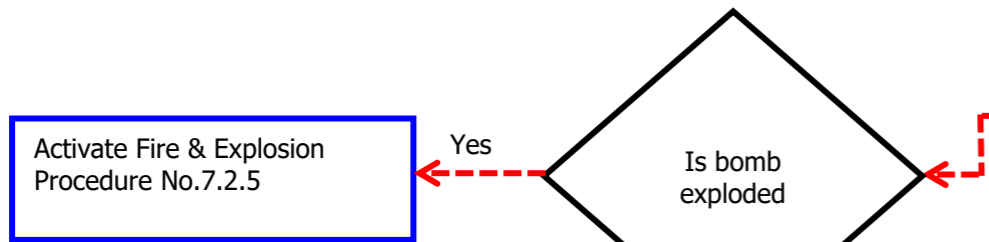


	Follow the instructions of IC and support for any assistance.
	Initiate sample collection process.
	Co-ordinate with fire supervisor and arrange necessary resources to mitigate the situation.

Community Liaison - HR & Admin

	Contact Deputy Superintendent of Police and Superintendent of Police for bomb disposal squad. Obtain full incident briefing and likely requirements from Incident Controller; maintain liaison.
	Instruct site security to stop access to Plant / LQ.
	Place transport on standby to evacuate personnel.

EMERGENCY SCENARIO	
26.3.1	Bomb Threat



Information received about bomb threat

Information receiver to fill the details in Bomb Threat Form and Inform Incident Controller

INCIDENT CONTROLLER

Informs EMT Leader about the incident

Gather all supervisors in Incident Control Room and consider the option of plant shutdown

Advice superintendent of police, Surat for deploying bomb squad.

Request advice from police and bomb experts for safe diffusion

Confirm Bomb diffusion

All clear for normal operations

HSE SUPPORT

Consult with IC regarding notifications to police and public authorities

Coordinate with Admin Team to arrange vehicle for personnel evacuation

Ensure Mustering of ERT Team and Fire Fighting team with appropriate Suit and Equipment

SECURITY

Stop any further entry of personnel to site

Verify Mustering of personal at Muster Point

Verify all personal are out of danger zone

ACTIVATE EMT, IF

Mutual Aid Response required for Rescue

RADIO OFFICER

Make PA announcement to personal about bomb threat or sound general alarm

Stop usage of Radios at plant

Inform to restrict communications to telephone

EMERGENCY CONTACT DETAILS	
Institute	Contact No.
HAZIRA POLICE	9586005533
DISTRICT COLLECTOR	0261-2655151

26.3.2 Criminal Activity

Incident Controller – Installation Manager	
	Take actions to detain offender(s) if appropriate.
	Notify EMT Leader; provide full incident briefing: <ul style="list-style-type: none"> - Nature of Crime - Identify person(s) involved - Extent of injury to personnel and if Medevac required. - Actions taken - Any assistance required - If person have been taken into custody
	Determine, with EMT Leader, need to involve Police; contact Police as appropriate.
	Secure evidence; close off incident site, prepare sketches and photographs, identify witnesses and obtain statements.
	Consider need for suspension of any impending crew change.
	Consider restriction of information to "need-to-know" basis.
	Assist Police with their inquiries
Violation including Self-inflicted:	
	Mobilise security supervisor.
	Take witness statements and photographs of any injuries.
	Request for medical assistance/advice if necessary.
	Identify safe place to detain person.
Suspected Sabotage:	
	Refer Bomb Threat procedure (Refer above procedure).
Significant Theft:	
	Mobilise security supervisor.
	Conduct search in presence of suspect.
	Maintain constant supervision of restrained person.
Drug Related:	
	Secure evidence and take witness statements.
	Refer company Drug and Alcohol policy.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.
Radio officer	
	Inform IC/ IRC members about the incident

Radio officer

Maintain log of all events in chronological order

Inform –RO Gurgaon to activate EMT as instructed by IC.

Production Support – Production Manager

Obtain full information of the incident and prepare for S/D of operation in case of suspected sabotage.

Advise control room for readiness to shut down the plant in case required.

Liaise with IRC and coordinate operation.

Maintenance Support – Maintenance Manager

Obtain full details of the incident and be in readiness to arrange any support required at field.

Follow Procedures and flow charts of ERP manual.

Verify and forward the scribe report to IC & EMT

Assist / coordinate for site restoration activities and plant normalizing.

Community Liaison - HR & Admin

Instruct for closing entry in to the plant and L.Q.

Instruct to Security for assistance in handling the situation.

Inform Police / local authorities as instructed by IC.

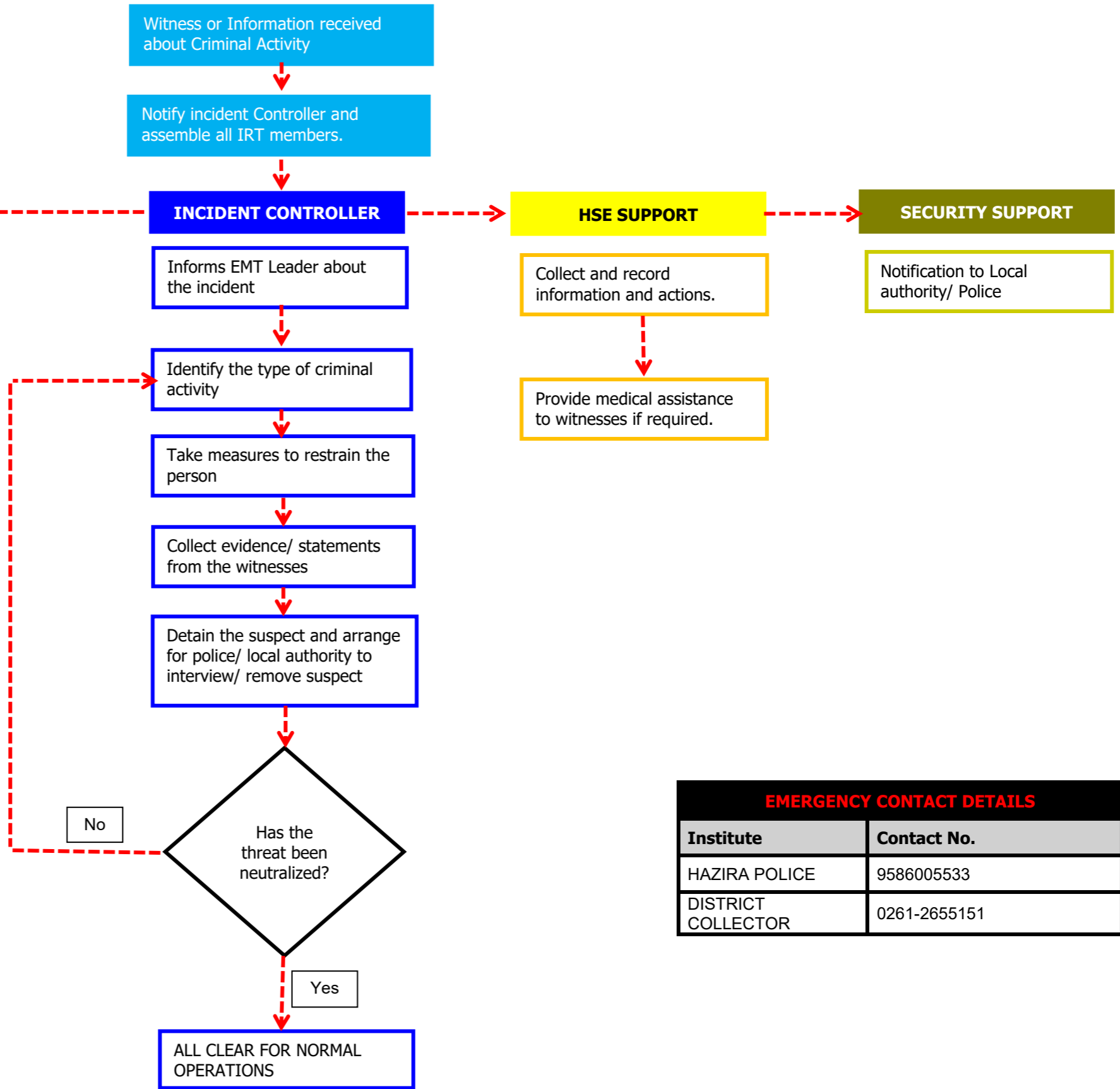
EMERGENCY SCENARIO	
26.3.2	Criminal Activity

RADIO OFFICER

Contact with EMT & RO - Gurgaon

ACTIVATE EMT, IF

● Mutual Aid Response required for Rescue
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EMERGENCY CONTACT DETAILS	
Institute	Contact No.
HAZIRA POLICE	9586005533
DISTRICT COLLECTOR	0261-2655151

26.3.3 Kidnap and Extortion

Radio officer	
	Obtain full incident briefing and likely requirements from Incident Controller; maintain liaison.
	Notify Radio operator & EMT Gurgaon on IC instruction.
	Carryout headcount tally and report for the missing personnel if any.
	Log all events and communicate to IC.

Incident Controller – Installation Manager	
	Gather information regarding kidnap.
	Confirm that a person has actually been kidnapped from site.
	Verify and confirm through muster for any missing personnel.
	Record all details regarding kidnap & demands.
	Endeavour to ascertain. a. Who you are dealing with b. What they want c. How to contact them
	Make clear that you have no authority to comply and must refer all demands to head office.
	Advise EMT leader immediately & accurately any demands made.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Radio officer	
	Inform IC/ IRC members about the incident
	Maintain log of all events in chronological order
	Inform –RO Gurgaon to activate EMT as instructed by IC.

Production Support – Production Manager	
	Obtain full information of the incident and verify for any missing personnel.
	Liaise with IRC and coordinate operation.

Maintenance Support – Maintenance Manager

	Obtain full details of the incident and be in readiness to arrange any support required at field.
	Follow Procedures and flow charts of ERP manual.
	Verify and forward the scribe report to IC & EMT
	Assist / coordinate for site restoration activities and plant normalizing.

HSE Support

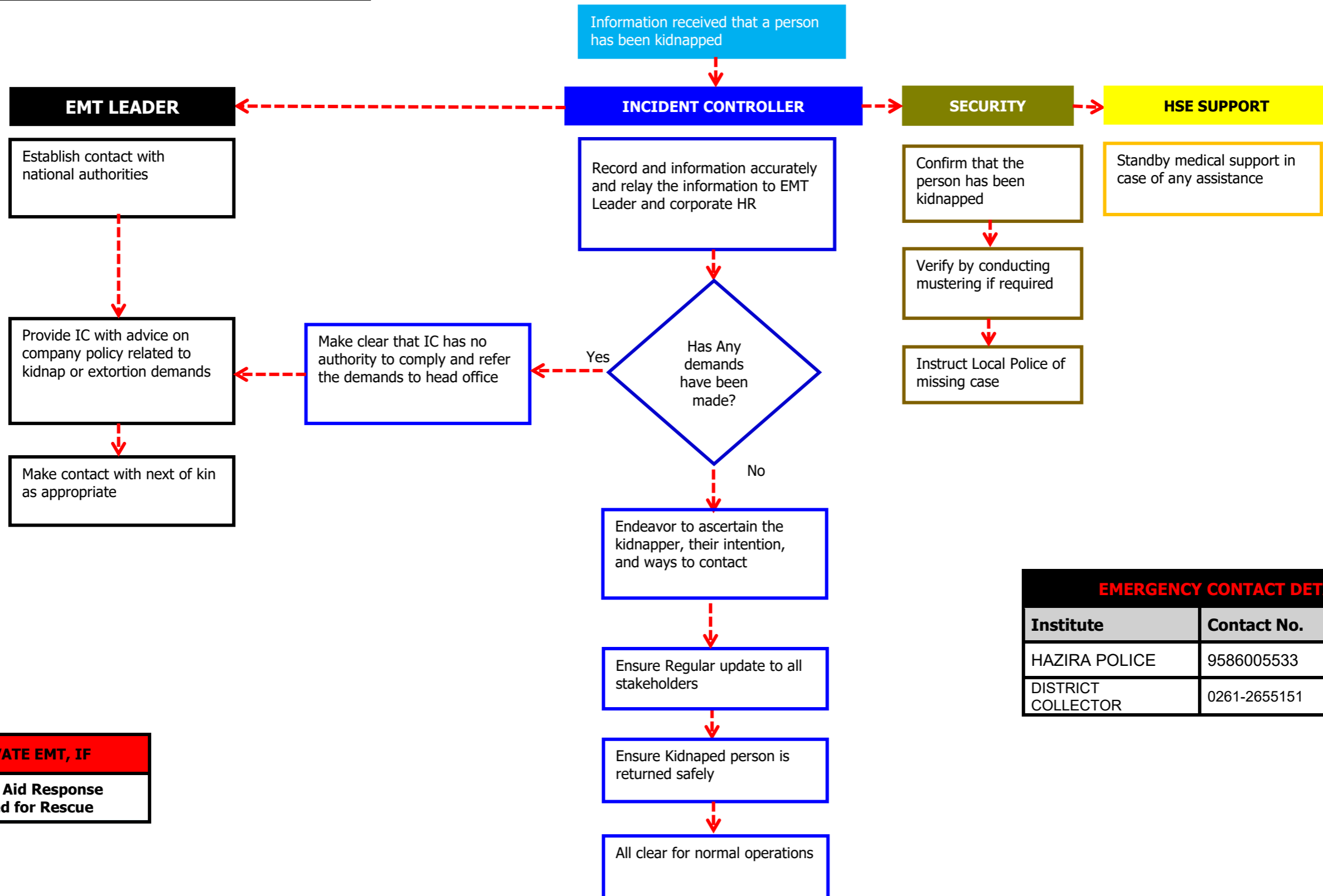
	Obtain full briefing of the incident and advise IC on any HSE concerns.
	Instruct Medical support and Manager-HR & CSR to be on standby for any assistance.
	Follow the instructions of IC and support for any assistance.

Community Liaison - HR & Admin

	Instruct for closing entry in to the plant and L.Q.
	Instruct to Security for assistance in handling the situation.
	Inform Police / local authorities as instructed by IC.

EMERGENCY SCENARIO

26.3.3 Kidnap / Extortion



EMERGENCY CONTACT DETAILS	
Institute	Contact No.
HAZIRA POLICE	9586005533
DISTRICT COLLECTOR	0261-2655151

ACTIVATE EMT, IF

- Mutual Aid Response required for Rescue

26.3.4 Terrorist Activity Offshore

Warning: In the event of a direct attack all are instructed to comply with the requests of the Terrorists. It is NOT recommended that any action be taken to resist or defy such terrorist attack.

Platform Incharge	
	Inform radio room of the suspected activity.
	Order evacuation of the platform through Sea after initiating shutdown of the platform.
	Move away from the suspected vessels.
	Keep in touch with the radio room and keep him updated on the developments.

Radio officer	
	The following information shall be sought from the reporter: <ul style="list-style-type: none">- Location of sighting- Nature of Sighting- Whether the Terrorists are armed or not?
	On receipt of information notify Incident Controller of incident and keep him updated on the developments / Activate IRC.
	Instruct Manager Security to report to IRC.
	Inform all Cairn radio stations of incident, and to clear/minimize non-essential traffic.
	Maintain log of events in chronological order.
	Instruct GGN Radio Officer to activate EMT on instruction of IC.

Incident Controller – Installation Manager	
	Obtain full incident briefing.
	Seek external support.
	Order controlled shutdown of the platforms and the plant from Control Room.
	Order evacuation of all personnel to 'Safe Haven'. Instruct Manager HR & CSR to initiate evacuation of LQ to 'Safe Haven' at LQ. Order evacuation of personnel from all platforms.
	Contact EMT Leader; provide full incident briefing and likely requirements; maintain liaison.

Incident Controller – Installation Manager

	Contact EMT Leader; provide full incident briefing and likely requirements; maintain liaison.
	Upon return to normal, initiate restoration activities.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Production Support – Production Manager

	Obtain full incident briefing and likely requirements from Incident Controller.
	Assist in completing controlled shutdown of the plant.
	Instruct support vessels to aid in evacuation of personnel from the platforms.
	Instruct vessels to launch zodiacs for facilitating the evacuation process.
	Instruct support vessels to move out of the field after evacuating all the personnel.

Maintenance Support – Maintenance Manager

	Keep in touch with the Plant 'Safe Haven' in charge.
	Keep him updated on the developments and instruct him as per instructions of Incident Controller.
	All communications between IRC and the safe haven should be preferably through landline.

HSE Support

	Keep him updated on the developments and instruct him as per instructions of Incident Controller.
	All communications between IRC and the safe haven should be preferably through landline.
	Follow the instructions of IC and support for any assistance.

Security Officer

	Advice IC on the action to be taken
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26.3.5 Terrorist Activity Onshore

Warning: In the event of a direct attack all are instructed to comply with the requests of the Terrorists. It is NOT recommended that any action be taken to resist or defy such terrorist attack.

Person noticing any suspected

	He / she shall immediately take a covered position.
	If it is unsafe to move from the covered position, then continue to be in covered position.
	If possible report to control room / radio room without endangering themselves.

Radio officer

	The following information shall be sought from the reporter: <ul style="list-style-type: none">- Location of sighting- Nature of Sighting- Whether the Terrorists are armed or not?
	On receipt of information notify Incident Controller of incident and keep him updated on the developments / Activate IRC.
	Instruct Manager Security to report to IRC.
	Inform all Cairn radio stations of incident, and to clear/minimize non-essential traffic.
	Maintain log of events in chronological order.
	Instruct GGN Radio Officer to activate EMT on instruction of IC.

Incident Controller - Installation Manager

	Obtain full incident briefing.
	Seek external support.
	Order controlled shutdown of the platforms and the plant from Control Room.
	Order evacuation of all personnel to 'Safe Haven'. Instruct Manager HR & CSR to initiate evacuation of LQ to 'Safe Haven' at LQ. Order evacuation of personnel from all platforms.
	Contact EMT Leader; provide full incident briefing and likely requirements; maintain liaison.

Incident Controller – Installation Manager

	Contact EMT Leader; provide full incident briefing and likely requirements; maintain liaison.
	Upon return to normal, initiate restoration activities.
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.

Production Support – Production Manager

	Obtain full incident briefing and likely requirements from Incident Controller.
	Assist in completing controlled shutdown of the plant.
	Instruct support vessels to aid in evacuation of personnel from the platforms.
	Instruct vessels to launch zodiacs for facilitating the evacuation process.
	Instruct support vessels to move out of the field after evacuating all the personnel.

Maintenance Support – Maintenance Manager

	Keep in touch with the Plant ‘Safe Haven’ in charge.
	Keep him updated on the developments and instruct him as per instructions of Incident Controller.
	All communications between IRC and the safe haven should be preferably through landline.

HSE Support

	Keep him updated on the developments and instruct him as per instructions of Incident Controller.
	All communications between IRC and the safe haven should be preferably through landline.
	Follow the instructions of IC and support for any assistance.

Security Officer

	Advice IC on the action to be taken
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Rev. 29

26.3.6 Air Raid Warning

Radio officer

	On receipt of information notify Incident Controller of incident and keep him updated on the developments / Activate IRC.
	Instruct Manager Security to report to IRC.
	Maintain log of events in chronological order.
	Instruct GGN Radio Officer to activate EMT on instruction of IC.

Incident Controller - Installation Manager

	Obtain full incident briefing.
	Seek external support.
	Order controlled shutdown of the platforms and the plant from Control Room.
	Order evacuation of all personnel to 'Safe Haven'. Instruct Manager HR & CSR to initiate evacuation of LQ to 'Safe Haven' at LQ. Order evacuation of personnel from all platforms.
	Contact EMT Leader; provide full incident briefing and likely requirements; maintain liaison.
	Prepare list of essential personnel to remain at site location
	If safe to do so, mobilize Forward Controller and Security team to secure the scene and check for casualties
	Upon return to normal, initiate restoration activities.
	Ensure that all stakeholders (including employees, although not limited to) are given regular updates on the incident.

Production Support - Forward Controller

	Obtain full incident briefing and likely requirements from Incident Controller.
	Assist in completing controlled shutdown of the plant.
	If safe to do so, instruct/deploy Fire Team at forward control point
	Maintain communication and inform site condition to IC
	Extinguish Fire and search for casualties
	Inform IC when Fire is extinguished and site is safe

	Liaise with site medical team on casualty handling details and recovery.
	Instruct support vessels to move out of the field after evacuating all the personnel.

HSE Support

	Keep him updated on the developments and instruct him as per instructions of Incident Controller.
	All communications between IRC and the safe haven should be preferably through landline.
	Follow the instructions of IC and support for any assistance.
	Coordinate with medical support for any requirements and ensure safety of the personnel
	Advice on Authority notification

Security Officer

	Advice IC on the action to be taken
	Deploy security guard to remain at perimeter of exclusion zone.
	Contact with District Administration
	Establish Triage Area for receipt, prioritization and treatment of casualties and/or their transportation to hospital

Logistics Coordinator

	Liaise with Forward Controller
	Prepare medical evacuation arrangement
	Arrange preferred transport and liaise with EMT Logistics member on availability of transport facilities

26.4 Natural Emergency Events

26.4.1 Cyclone Storm Threat

Generic Guidelines – Weather Limits for Specific Activities	
	Prohibit personnel transfers to/from a vessel when wind speed exceeds 20 knots.
	Prohibit personnel transfer to platform boat landings when sea swell / waves exceed 2 meters.
	Regardless of the above limits have been reached, the P/F Engineer may prohibit personnel transfers and his / her decision is final.

Radio officer	
	Inform IC about the storm threat and keep him updated on the developments.
	Ensure that handheld radio batteries and satellite phone battery is fully charged.
	Plot cyclone movement and monitor storm progress.
	Contact Gurgaon R.O. and EMT as instructed by IC.
	Maintain log of events in chronological order.

Incident Controller – Installation Manager	
	Depending on the level of cyclone, evaluate the need for shutting down the operations. Activate cyclone impact abatement plan (annexed to this procedure).
	Evacuate all the non-essential personnel from the plant.
	Stop all non-critical activities and high risk activity.
	Advise IRT for securing all loose materials and evaluate need for evacuation.
	Liaise with government bodies and local authorities for changing weather, latest updates and mutual aid support.
	Keep in touch with Vessel Captains and advise them on weather condition and their expected response.
	Ensure adequate rations and medicines are available. Minimum 07 days of stocks to be ensured
	Instruct Helicopter pilot regarding relocation to Surat Airport or fastening of Helicopter as per the weather condition
	Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident.
	Give clearance for resuming operations after the cyclone.

Rev. 29

Incident Controller – Installation Manager

	Constitute a team to determine the extent of damage / flooding before giving access to site / Keep EMT updated on the developments.
	Give clearance for resuming operations after the inclement weather subsides and damage assessment is completed
	Conduct Survey of trees and identify potential weak trees. Remove the material around the area
	Restrict non-essential vehicle movement to and from plant (except Fire Tender and Ambulance)
	Ensure and instruct Security team of no Open area patrolling during inclement weather (In view of Lightning incident in Group company)
	Constitute a team to determine the extent of damage / flooding before giving access to site / Keep EMT updated on the developments.

Production Support – Production Manager

	Instruct all personnel to stop work and proceed to buildings designated as storm shelters.
	Instruct lab personnel to analyse samples of the water from the storm water drain near to the outlets (along the boundary wall).
	Ensure that all personnel are evacuated from P/F before weather conditions deteriorate.
	Check for adequate supply of fuel / water.
	Secure all loose materials.
	Only personnel on 'essential duty' shall be allowed to remain in operations area.
	Ensure no person is in field during the inclement weather condition

Maintenance Support – Maintenance Manager

	Obtain full details of the incident.
	Instruct to locate trailers under cover, possibly inside workshops.
	Ensure that all electronic equipment is covered.
	Instruct personnel to stop work and proceed to buildings designated as Storm Shelters.
	No maintenance work is done during inclement weather conditions
	No Electrical maintenance work during rains, cyclones

HSE Support

	Carryout final site inspection and verify head count through R.O.
	Inspect all drainage systems for potential blockage of materials, if so arrange for clearing it.
	Arrange for evacuating contractor / non-essential personnel.
	Confirm securing of loose items.
	Arrange for Medical and logistics support.
	Before resuming the operations, take the head count.

Community Concern – HR Admin

	Ensure stock of food and water supplies.
	Contact district administration as advised by IC.

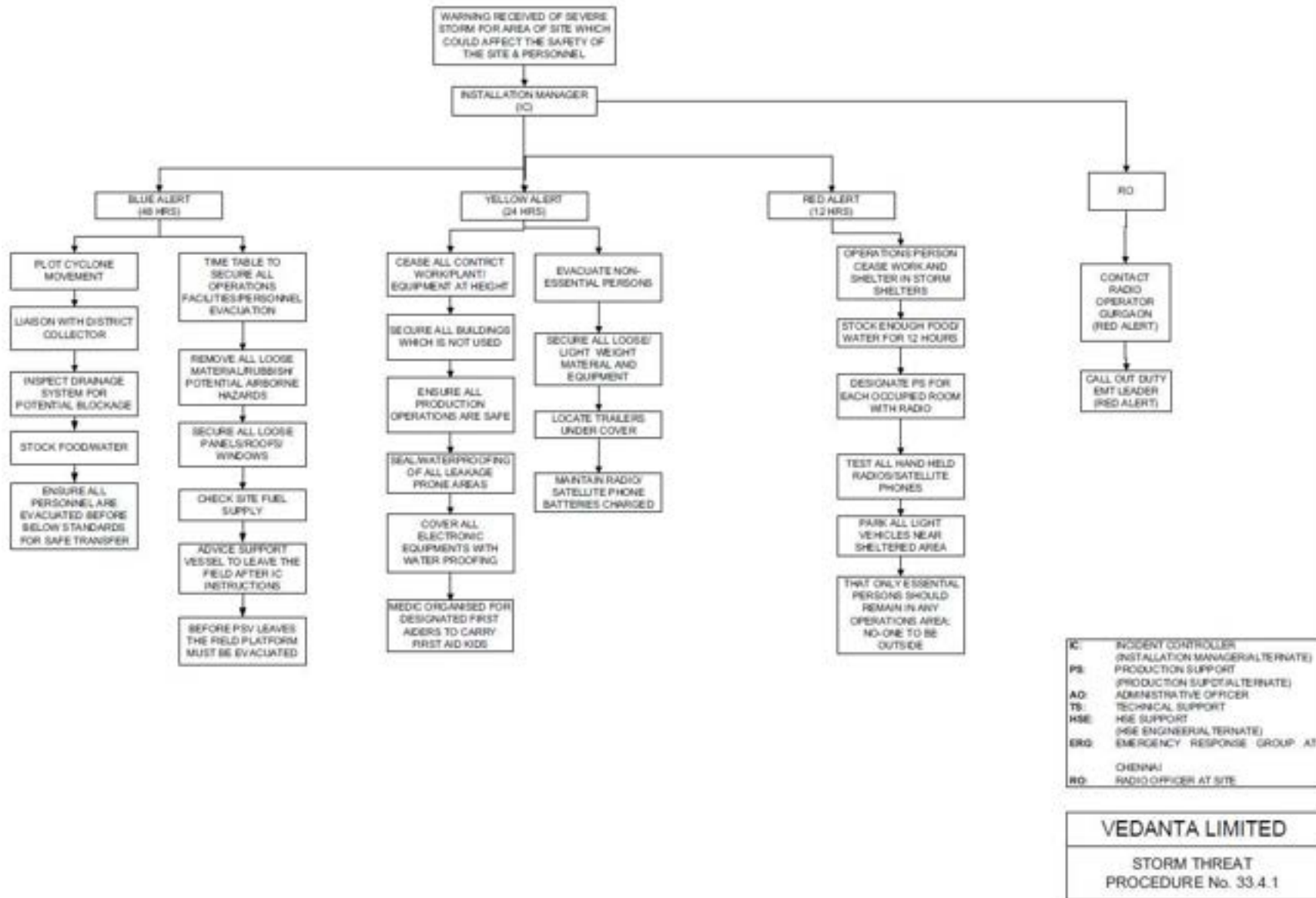
Medical Support

	Be on standby with the designated ERT Team.
	Ensure adequate stock of medicines.

Marine Specialist

	Support IM/Operations team as per changing weather conditions
	Decide upon tanker loading, if not started and actions expected by vessel, if loading already started
	Maintain contact with Radio room to get weather updates and sea-state

For detailed Cyclone Response Procedure refer **Annexure 1**



IC: INCIDENT CONTROLLER (INSTALLATION MANAGER/ALTERNATE)
 PS: PRODUCTION SUPPORT (PRODUCTION SUPD/ALTERNATE)
 AO: ADMINISTRATIVE OFFICER
 TS: TECHNICAL SUPPORT
 HSE: HSE SUPPORT (HSE ENGINEER/ALTERNATE)
 ERG: EMERGENCY RESPONSE GROUP AT CHENNAI
 RO: RADIO OFFICER AT SITE

VEDANTA LIMITED
 STORM THREAT
 PROCEDURE No. 33.4.1

26.4.2 Flood Threat

Generic Guidelines – Weather Limits for Specific Activities

- | | |
|--|---|
| | Prohibit personnel transfers to/from a vessel when wind speed exceeds 20 knots. |
| | Prohibit personnel transfer to platform boat landings when sea swell / waves exceed 2 meters. |

Radio officer

- | | |
|--|--|
| | Inform IC about the storm threat and keep him updated on the developments. |
| | Ensure that handheld radio batteries and satellite phone battery is fully charged. |
| | Plot cyclone movement and monitor storm progress. |
| | Contact Gurgaon R.O. and EMT as instructed by IC. |
| | Maintain log of events in chronological order. |

Incident Controller – Installation Manager

- | | |
|--|--|
| | Depending on the level of cyclone, evaluate the need for shutting down the operations. Activate cyclone impact abatement plan (annexed to this procedure). |
| | Evacuate all the non-essential personnel from the plant. |
| | Stop all non-critical activities and high risk activity. |
| | Advise IRT for securing all loose materials and evaluate need for evacuation. |
| | Liaise with government authorities and local authorities for mutual aid support. |
| | Keep in touch with Mooring Master (Tanker) / Vessel Captains at SPM and advise them on whether or not to stay in the field. |
| | Ensure adequate rations and medicines are available. |
| | Instruct Helicopter pilot regarding relocation or fastening of Helicopter. |
| | Ensure that all stakeholders (including employees assembled at muster point, although not limited to) are given regular updates on the incident. |
| | Give clearance for resuming operations after the cyclone. |
| | Constitute a team to determine the extent of damage / flooding before giving access to site / Keep EMT updated on the developments. |

Rev. 29

Production Support – Production Manager

- | | |
|--|--|
| | Instruct all personnel to stop work and proceed to buildings designated as storm shelters. |
|--|--|

Production Support – Production Manager

	Instruct lab personnel to analyse samples of the water from the storm water drain near to the outlets (along the boundary wall).
	Ensure that all personnel are evacuated from P/F before weather conditions deteriorate.
	Check for adequate supply of fuel / water.
	Secure all loose materials.
	Only personnel on 'essential duty' shall be allowed to remain in operations area.

Maintenance Support – Maintenance Manager

	Obtain full details of the incident.
	Instruct to locate trailers under cover, possibly inside workshops.
	Ensure that all electronic equipment is covered.
	Instruct personnel to stop work and proceed to buildings designated as Storm Shelters.

HSE Support

	Carryout final site inspection and verify head count through R.O.
	Inspect all drainage systems for potential blockage of materials, if so arrange for clearing it.
	Arrange for evacuating contractor / non-essential personnel.
	Arrange for Medical and logistics support.
	Before resuming the operations, take the head count.

Community Concern – HR Admin

	Ensure stock of food and water supplies.
	Contact district administration as advised by IC.

Medical Support

	Be on standby with the designated ERT Team.
	Ensure adequate stock of medicines.

26.4.3 Earthquake

Control Room	
	Initiate Alarm / Warning and Muster IRT Team in Control Room
	Instruct Personnel to proceed for mustering with caution.
	Consider Shutdown of facility on instruction of Incident Controller.

Incident Controller – Installation Manager	
	Assess Situation and determine action plan
	Establish Contact with site team and determine support required
	Establish contact with Drilling Team, in case of ongoing drilling operations and Obtain damage report
	Monitor for hazardous release, if Loss of containment occurs initiate shutdown protocol.
	Deploy Medical Team as required
	Consider need for precautionary evacuation of non-essential personnel.
	Initiate Inspection of Site Facilities.
	Inform EMT leader about situation.
	Constitute a team to determine the extent of damage before giving access to site / Keep EMT updated on the developments.
	Evacuate site if imminent threat to site facilities otherwise wait for earthquake subsidence to finish.
	Look for alternate Control Centre in case Earthquake damage extend to Primary Control Room.

Forward Controller – Production Superintendent	
	When instructed by Incident Controller, deploy to site and report back
	Establish Forward Control Point near to Incident Location.
	Collate details of damage and advise Incident Controller
	Liaise with Control Room
	Search and Rescue for Casualties and Assist Medical Team
	Plan for inspection of pipelines route and remote sites

Production Support – Head Production

	Evaluate scenario for Facility shutdown and advise Incident Controller accordingly.
	Close in Wells and Depressurize any process plant.
	Assist Incident Controller in establishing extent of potential damage.

HSE Support

	Contact Muster Points and Account for all personnel.
	Obtain Muster Roll and update Incident Controller.
	Obtain Information of Missing persons, if any.
	When instructed by Incident Controller, deploy Medical Team at site.
	Medical Team to review status of any casualties and report situation to Incident Controller.
	Coordinate for Medical Evacuation of casualties.
	Provide assistance and advice to incident controller on safety issues.

Logistics Support

	Prepare for Transportation means for mustered location evacuation.
	Liaise with Incident Response Team to ensure any additional transport support if required.

Security Support

	Assist in safe and discipline mustering of personnel.
	Identify and report incident controller on any missing personnel.
	On instruction from Incident Controller, deploy search and rescue team at site.

Medical Support

	Establish continuous communication with Incident Response Team.
	Take action as per instruction from IRT Team.
	Ensure adequate stock of medicines.
	Advise Incident Controller on treatment of casualties, if any.

26.3 Social Unrest

Control Room	
	On Incident controller instruction contact Suvali Control Room
	When instructed contact EMT leader
	Maintain communication with EMT and Suvali Control Room.
	Follow Incident Controller instructions
	If instructed notify/liaise with 1. Factory Inspector, 2. Police station/SP 3. District collector. 4. Other emergency services.
	Appraise IC about status on movement of external help/communication from Suvali Control Room /Gurgaon/Statutory bodies and Marine updates time to time.
	If instructed by Incident controller Notify/ Liaise with the following: 1. Mutual aid. 2. Fire services at MoraBhagal Fire Station, Surat. 3. Ambulance from BAPS Hospital Adajan.

Incident Controller – Installation Manager	
	Assess Situation and determine action plan
	Mobilise IRT and establish Contact with site team and determine support required
	Inform to HO at Gurgaon and SRT
	Consider potential for escalation: <ol style="list-style-type: none"> 1. Degree or Level (1,2,3 or 4) of the unrest 2. Reason for civil unrest 3. Explore local connection and gather intelligence from difference sources 4. Evaluate potential to escalate to higher degree 5. Consider the employees and vehicles in transit/outside the installation 6. Consider the immediate threat to and/or the probability of escalating to cause immediate danger to life, health, asset and environment. 7. Links and overlap among the threats to understand the escalation factor, barrier to be put in place and recovery of top event.
	Evaluate need for additional resources i.e. <ol style="list-style-type: none"> 1. Mobilisation police force 2. Update to Mutual Aid Chairman/SRT and assistance 3. Mobilization of emergency supply i.e., food, water, medicine and Fuel etc 4. Any local purchase. 5. Any medical assistance/requirement of fire bigrade. 6. Preservation of leak storage of important document.(statutory/legal/other important operational documents) 7. Rationing of drinking water/Food/Fuel and other resources 8. Requirement of addition accommodation/vehicle 9. Consider assistance from Jamnagar office
	Consider lock closing of entry/Exit and LQ gate and restrict all in/out movement

Incident Controller – Installation Manager

	Establish communication plan to link with local connection/statutory bodies and Prepare Media management plan. Be geared up with Alternative Communication Plan in the event of any disruption or breakdown of the normal communication linkage
	Report to SRT and ERT
	Try to pacify the unrest, if deliberately targeted to the installation and consider for police protection
	Consider suspension of all PTW and deployment of only emergency OPS staff. Rest to move at LQ Muster point
	Muster all site personnel along with visitors
	Consider man and material in transit and assistance from mutual aid partners
	Consider safe shutdown of the Terminal with stoppage of the operations that are deemed to be necessary by considering degree of severity and potential of further escalation after informing to EMT
	Notify duty EMT leader and SRT regarding emergency level.
	Consider de-mobilisation of staff, if possible and also rationing of Food, water, Fuel and other resources .
	Consider rationing of Food, water, Fuel and other resources .
	Keep Medical evacuation and staff evacuation plan ready. Consider evacuation of non-emergency staff
	Continue to Assess situation until stabilised
	If emergency reaches tier 3 level, inform EMT and take instruction, if any.
	If situation worsen beyond control, inform EMT and declare offsite emergency upon advice of EMT.

Forward Controller – Production Superintendent

	Consider the following: <ol style="list-style-type: none">1.Established link with local contact2. Establish contact with local administration3. Establish communication channel with SRT4. Try to get details of incident5. Manage the situation with the help of neighbour with good intent, police etc in considering threat to People, asset, environment and reputation
	Establish forward control point and advise IC of location
	Report details to IC and shout for additional resources, if required.
	Stand by and act as per IC instruction

Production Support – Head Production

	Prepare list of emergency man power required to man the installation
	Keep safe shut down plan ready
	Obtain PTW details
	Determine any potential threat to asset and people.
	Determine options and methods for safely isolating equipment, if warrants
	If instructed liaise directly with Gurgaon technical team
	If instructed by IC liaise with other response team
	Ensure status board is being kept up to date
	Continue to support and advise incident controller on technical/other issues

HSE Support

	Advise on authority notifications
	Distribute Incident Check list / Prompts.
	Liaise with External support to obtain additional resources as required
	Help medical/Ops team in for preparation of Medical Evacuation and Staff Evacuation Plan
	Ensure HSSE preparedness is maintained
	Continue to support Incident controller and prompt all statutory notification/requirement

Logistics Support

	Brief transport drivers and position vehicles for emergency usage. Check availability of at least three cars with spark arrestor and keep ready for movement
	Arrange for local purchase and resource mobilisation as directed by IC
	Consider the staff/material in transit or stationed at other location
	Confirm with incident controller method of evacuation
	Co-ordinate with radio officer for any emergency movement.
	Arrange preferred transport

Security Support

	Prepare and brief site security team
	Lock/secure entry exit gate and restrict movement. Do not confront with locals.
	Follow the following: 1. Do not confront with locals. Keep your temper cool 2. Do not enter in the Hot Zone 3. Move away from the worst 4. BE ALERT
	Consider the followings: 1. Additional staff requirement 2. Any other resources requirement 3. External help like police deployment
	Advise IC on best method for securing the incident scene
	Liaise with police and administration as instructed by IC
	If Personnel Mustered obtain and report muster number, reconcile the total manpower in the installation. Report to IC.
	Keep QRT ready
	Direct the external help like police, local administration, mutual aid, medical and update IC
	Continuously monitor the situation and requirement and inform to IC

Medical Support

	Brief and prepare medical team
	Prepare Medical evacuation plan
	Keep team alert and advise IC for resource requirement any.
	Liaise with forward controller and security

26.4 COVID 19 Pandemic

Coronavirus disease (COVID-19) is an infectious disease caused by a newly discovered coronavirus (NOVEL Corona Virus)

Most people infected with the COVID-19 virus will experience mild to moderate respiratory illness and recover without requiring special treatment. Older people, and those with underlying medical problems like cardiovascular disease, diabetes, chronic respiratory disease, and cancer are more likely to develop serious illness.

The best way to prevent and slow down transmission is to be well informed about the COVID-19 virus, the disease it causes and how it spreads. Protect yourself and others from infection by washing

your hands or using an alcohol-based rub frequently and not touching your face. Site has developed a COVID-19 Workplace Safety Plan (refer CB-PLN-LT-P-0007) for handling and management.

27 Reporting of Incident

27.2 Reporting

When witnessing or receiving notification of an emergency, as much information as possible should be taken and /or conveyed to the relevant emergency activation authority. Wherever possible, all information should be logged in written form with time and date included and provided to the Incident Controller.

Personnel working on CB/OS-2 –field may, at any time, be exposed to an emergency which could take many forms, for example (but not limited to):

Injuries and/or fatalities	Exposures
Aggressive releases	Fires and/or explosions
Equipment hazards	Impacts
Extreme weather	Adverse environments

When an emergency occurs, an appropriate and prompt response is required, providing precise action to control, correct and return the site to a safe condition. Timely action is also required to protect people, the environment and property from harm.

Refer to the "Reporting Forms" Section 8 of this plan for actions to be considered when witnessing an emergency or receiving a report of an emergency.

27.3 Reporting within the Field

Cairn Observation Program (COP) audit system is implemented in Cairn Suvali facility, this is to appreciate the personal for safe practices followed as well as to identify unsafe act, unsafe conditions across plant area. All unsafe acts / conditions/ practices are being audited through COP system. Regularly monitored carried out for the same towards system compliance.

28 Reporting to Head office - Gurgaon the Field

All accidents and incidents occurring within the CB/OS2 production facilities shall be reported to the GM (CB/OS-2) and Chief Health and Safety Officer (CHSO) – CB/OS-2 & Rava as per Cairn Emergency Preparedness Guide. This includes both situations where there is actual damage to health or equipment and also where there has been a threat of danger or a near miss.

28.2 Incident Report

All accidents / incidents, near miss shall be reported as per Cairn Incident Reporting Procedure in Cairn Incident Management system (CIMS). Incident report should be submitted regardless of the

severity of the injury, or whether the injured party is a Cairn employee or a contractor employee. All incident reports are to be followed up with the CIL investigation report as per the procedure.

28.3 Incident Situation Report Format (SITREP)

To be completed and endorsed by the site Incident Controller and faxed or email to the Emergency Management Team (EMT) at the commencement of any significant incident. The EMT may also fax/ email copies of the SITREP to the CMT Leader as appropriate. The SITREP is continually used to further update the EMT on incident activity.

28.4 Medical Evacuation (Medevac) Report

To be completed by the Site Paramedic and the Paramedic should accompany the patient during Medevac, the purpose of which is to provide full information on the patient's condition to the destination hospital.

28.5 Internal Distribution

The HSE co-ordinator from EMT will distribute copies of reports to the GM (Cambay), Director (Operations), Head- HSE, Risk & Assurance and Chief Operating Officer. In the event of a major incident, distribution of various reports (i.e. Incident SITREP/Medevac etc.) will be authorised by the EMT Leader.

28.6 Notification Period

The Incident Controller at a Field, Plant or Site location must notify the relevant Emergency Response Team Leader in a timely manner in the event of any of the following occurring in their area of responsibility:

Situation / Incident / Emergency	Time
Injury Any medical treatment category injury	Immediately if during office hours, or start of next working day if outside office hours.
Injury Any injury which requires further treatment either by a doctor or in hospital	Immediately at any time
Sickness Where a person or persons have to be evacuated	Immediately at any time
Sickness Which affects 3 or more people, such as food poisoning or contagious disease.	Immediately at any time
Death Resulting from any cause	Immediately at any time
Fire or Explosion At operational or accommodation location which causes injury to person(s) or damage to equipment, property, including third party property.	Immediately at any time
Fire At operational or accommodation location which causes no injury to person(s) or damage to property.	Start of Next Working day
Gas leak From whatever source	Immediately at any time
Oil or Chemical spill >1 bbl.	Immediately at any time
Oil or Chemical spill <1 bbl.	Start of Next Working day
Road traffic accident (RTA) With injury to any person or damage to property	Immediately at any time
Road traffic accident (RTA) Without injury or damage to property	Start of Next Working day
Security breach With loss or damage to property or threat to personnel	Immediately at any time
Kidnap or Extortion threat Immediately at any time	Immediately at any time
Near miss Which could have resulted in injury or damage	Start of Next Working day

If any incident or emergency situation occurs which is not specifically listed above, the site Incident Controller must use his discretion with a view to notifying the Emergency Response Duty Manager in a timely fashion. If in doubt, notify as soon as reasonably practicable.

Incident Reporting to the Indian Regulators

1. For incidents involving fatalities, explosion / blowout, major loss of property shall be reported to the concerned Director in OISD and DGMS by text message immediately on receipt of the information of the incident. It shall be followed by a call, first on cell phone and if that is not available on the landline of the officer concerned. *(Intention is to submit initial information at earliest, before the incident becoming possible news item).*
2. Further, detailed information shall be sent by e-mail to the concerned Director with copy to ED, OISD.
3. Finally, internal investigations are to be undertaken in case of all incidents to identify the root cause and firm up the remedial action plan. A copy of the incident investigation report shall be forwarded to OISD immediately on acceptance by the Management.

29 Incident Reporting Forms

29.1 Media Statement

MEDIA RELEASE STATEMENT

The media Release Statement is to be filled in and issued as soon as possible after the incident starts and issued as a Media Statement.

Use Vedanta Cairn letter head paper.

The duty CMT leader must authorise the release of all media statements after consultation with the duty EMT Leader.

MEDIA STATEMENT

Date:

Press Release No:

Time:

Vedanta Limited, Cairn Oil and Gas regret to inform that an incident (describe in broad terms) occurred on (installation and location of incident) at (date and time of incident).

The last reported situation was (give information on last confirmed situation).

Company has mobilised its Emergency Management Team, and is working closely with the Local Emergency Services.

Firm details of the incident are not yet confirmed, but every action is being taken to safeguard lives.

A further statement will be issued as soon as more information becomes available.

Direct enquiry lines have been established as follows:

Media (Telephone number to handle media calls)

Relatives (Telephone number to handle relatives calls)

Notes for Editors:

(Background information about specific business affected)

29.2 **SITREP**

NOTIFICATION (Circle either Notifying of, or Updating Incident Information)

UPDATE

Location: SITREP No: Date: Time:

Priority: Tier 1: Tier II: Tier III:

Incident: Medical Fatality Environment Natural Disaster

Oil Spill Marine Explosion Fire Aviation Extortion

Other:

Injuries: No. of Fatalities No. of Serious Injuries No. of Minor Injuries

DO NOT LIST NAMES ON THIS FORM - Report names verbally to IC/EMT Leader

Injuries This Report:

Updated Weather: Dry Wet Windy Wind Direction Wind Speed

Forecast: Other:

Impact on Immediate Operations:

External Assistance: Govt. Mutual Aid External Agency Medical Police Fire

Mobilised: Other:

Forward Response Plan:

Next 30 Mins:

Next 6 Hrs:

Next 12 Hrs:

Last External Contact:

Agency	Time	By	Agency	Time	By	Agency	Time	By
Aviation			Govt.					
Medical								
Police								

Response Room Incumbents: (Role and Person)

Note: Mark any speculative information with an asterisk (*).

Prepared by:		Approved by:	
Distribution:	EMT <input type="checkbox"/>		



29.3 OIL SPILL REPORTING FORM

Location:	Date:	Time:
------------------	--------------	--------------

*Tier 1 *Tier 2 *tick whichever is applicable.

1. Spill Observer :
2. Material Spilled :
3. Apparent Source / Cause :
4. Time and Date Spill Occurred:/...../..... @.....Hrs.
5. Location of Spill : lat:..... long:.....
6. Is Spill Continuing : Yes / No
7. If Yes, Estimated Rate Of Release : (m³/kilolitres per day)(bbl per day)
8. Volume of Discharge :
 a) Estimatedm³/kilolitresbbl
 b) Knownm³/kilolitres.....bbl
9. Size of Spill: (plot on chart)
10. Rate and Direction of Slick Movement :
11. Oil Slick Type: Continuous..... Windrows..... Appearance on Water : ..
12. Estimated Average Thickness :
13. Samples/Photographs Taken : Where Located :
14. Identity/Position of Vessels in Area :

Current Meteorological Data

15. Temperature: Air(°C).....
16. Wind: Speed.....Knots. Direction.....
17. Precipitation :
18. Visibility :
19. Forecast:

Current Oceanographic Data

20. Temperature: Air (°C)..... Sea (°C).....
21. Tide State :
22. Currents: Speed Knots, ms⁻¹ Direction.....
23. Sea State: 1 2 3 4 5 6+.....
24. Average Wave Height: Metres Period..... Seconds
25. Remarks:

Prepared By:	Phone:
Company/Agency:	Fax:
Position:	Mobile:

29.4 Medevac Patient Details

Medivac-Patient Details	
DATE:	TIME:
LAST (FAMILY) NAME:	
GIVEN NAMES:	
NATIONALITY:	
EMPLOYING COMPANY:	
POSITION:	
NATURE OF INJURY / ILLNESS: _____	
VITAL SIGNS: _____	
COLOUR: _____	
EXTENT OF BLEEDING (IF ANY): _____	
STATE OF CONSCIOUSNESS: _____	
PULSE RATE: _____	
URINE OUTPUT: _____	
ECG: _____	
ANY OTHER SYMPTOMS CONSIDERED IMPORTANT: _____	
TREATMENT / MEDICATION: _____	
ALLERGIES / MEDICATION USED: _____	



Medivac-Patient Details (Continued)

BLOOD GROUP:		
IF MEDICAL PROBLEM, ANY PREVIOUS HISTORY OF SAME OR SIMILAR:	YES	NO
IF YES GIVE DETAILS:		
TYPE OF MEDICAL AID:		
IS X-RAY REQUIRED:		
DESTINATION HOSPITAL INFORMED BY SITE DOCTOR:	YES	NO
WHICH HOSPITAL:		
IS MEDICAL ESCORT REQUIRED ON FLIGHT:		
IF YES GIVE DETAILS:		
ACCOMMODATION:		
AMBULANCE:	OTHERS:	
ATTENDING DOCTOR:		
TEL. No.		
ANY OTHER INFORMATION:		
SITE DOCTOR NAME:		
SITE DOCTOR SIGNATURE:		
CAIRN REPRESENTATIVE NAME:		
CAIRN REPRESENTATIVE SIGNATURE:		

29.5 Site Medical Causality Report

MEDICAL/CASUALTY REPORT FROM SITE DOCTOR / MEDIC TO FIELD MEDICAL CO-ORDINATOR

Patient Information:

Name: _____
(First Name) (Middle Name) (Surname)

Date of Birth: ____/____/_____(DD/MM/YYYY) Sex: Male / Female

Nationality: _____(Country of Origin)

Name of Employing Company: _____

Medical Report:

This is to inform you that the above patient complained of the following:

Since: Time _____ Hrs. Date: _____

Current Diagnosis:

OPD Treatment

Date and time of 1st Symptom: _____

Date and time of 1st Consultation: _____

Treatment and progress: _____

Recommendation: It is recommended that the patient does / does not need to be moved to hospital.

In patient Treatment

Date of Admission: _____(DD/MM/YY)

Name of Hospital: _____ Location: _____

Previous Medical History: _____

Treatment and progress: _____

Recommendation: It is recommended that the patient be moved / not moved from the current hospital.

Preferred method for patient evacuation: Ambulance/Aircraft with/without escort.

Case discussed with SOS Doctor at the Alarm Centre at _____ on _____

Signature of Site Doctor / Medic: _____

Name: _____ Date: _____

29.6 Fatality Report

ACTION	DETAILS
Date and time of incident	
Location of Incident (take photographs)	
If fatality occurs on the spot, take photographs and remove the body from the scene of incident with the help of Medical teams	
Contact Incident Controller immediately & Incident Controller to contact ERG immediately.	
Bar access to fatality area until investigation has been concluded	
Move all non essential personnel away from the incident area	
Advise Police and request they attend incident scene (by Emergency Response Team Leader with info to ERG)	
Identify deceased and ensure their dignity is preserved	
Check employee records for relatives working on site; advise of situation	
Consider removing relatives and close friends from site for trauma counseling	
Obtain statement from initial witness or person first on the scene	
Ensure area is photographed by Cairn representative if possible	
If any first aid / treatment given – obtain details	
Obtain Doctor's (who attended the casualty) Statement	
Ambulance requested, if any	
Notification to Next-of-Kin (by ERG)	
Co-operate Police visits to site for investigation	
Handover the dead body for autopsy (by Emergency Response Team Leader with info to ERG)	
Initiated Cairn investigation	
Authorize supervisor to collect personal effects	
Itemize personal effects of deceased	
Witness to itemizing of personal effects	
Pass personal effects to	
Fax Fatality Checklist to ERG Leader	



29.7 Bomb Threat

<p>EXACT WORDING OF THREAT</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>.....</p> <p>QUESTIONS TO ASK</p> <p>When will it explode?</p> <p>Where is it right now?</p> <p>What does it look like?.....</p> <p>What kind of bomb is it?.....</p> <p>What will set it off?.....</p> <p>Did you place the bomb?.....</p> <p>Why?.....</p> <p>What is your name?.....</p> <p>What is your address?.....</p> <p>Where are you now?.....</p> <p>When will you call again?.....</p> <p>Represent what group?.....</p> <p>CALLER DESCRIPTION</p> <p>Sex: M/F Age: Race:</p> <p>TELEPHONE (TICK)</p> <p>Local Long/D Satphone Public Mobile</p> <p><input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/> <input type="checkbox"/></p> <p>CALL DESCRIPTION</p> <p>Time: AM/PM.....</p> <p>Duration: Sec/Min.....</p> <p>Your Phone Number.....</p>	<p>COMMENTS (TICK)</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Calm</td> <td><input type="checkbox"/> slurred</td> </tr> <tr> <td><input type="checkbox"/> Angry</td> <td><input type="checkbox"/> rapid</td> </tr> <tr> <td><input type="checkbox"/> Excited</td> <td><input type="checkbox"/> stutter</td> </tr> <tr> <td><input type="checkbox"/> Slow</td> <td><input type="checkbox"/> clearing throat</td> </tr> <tr> <td><input type="checkbox"/> fast</td> <td><input type="checkbox"/> disguised</td> </tr> <tr> <td><input type="checkbox"/> Soft</td> <td><input type="checkbox"/> deep breathing</td> </tr> <tr> <td><input type="checkbox"/> Loud</td> <td><input type="checkbox"/> cracking voice</td> </tr> <tr> <td><input type="checkbox"/> Laughter</td> <td><input type="checkbox"/> unusual accent</td> </tr> <tr> <td><input type="checkbox"/> Crying</td> <td><input type="checkbox"/> yelling</td> </tr> <tr> <td><input type="checkbox"/> Normal</td> <td><input type="checkbox"/> threatening</td> </tr> </table> <p>If the voice is familiar; who is it like?</p> <p>Did the caller appear familiar with operations?</p> <p>BACKGROUND SOUNDS (TICK)</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Clear</td> <td><input type="checkbox"/> motor</td> </tr> <tr> <td><input type="checkbox"/> Voices</td> <td><input type="checkbox"/> factory</td> </tr> <tr> <td><input type="checkbox"/> Static</td> <td><input type="checkbox"/> office</td> </tr> <tr> <td><input type="checkbox"/> Local</td> <td><input type="checkbox"/> street noise</td> </tr> <tr> <td><input type="checkbox"/> Music</td> <td><input type="checkbox"/> animal noise</td> </tr> <tr> <td><input type="checkbox"/> Crockery</td> <td><input type="checkbox"/> PA system</td> </tr> <tr> <td><input type="checkbox"/> Booth</td> <td><input type="checkbox"/> train</td> </tr> <tr> <td><input type="checkbox"/> aircraft</td> <td><input type="checkbox"/> house noises</td> </tr> </table> <p>Other.....</p> <p>THREAT DELIVERY (TICK)</p> <table style="width: 100%;"> <tr> <td><input type="checkbox"/> Foul</td> <td><input type="checkbox"/> irrational</td> </tr> <tr> <td><input type="checkbox"/> Taped</td> <td><input type="checkbox"/> message read out</td> </tr> <tr> <td><input type="checkbox"/> well spoken</td> <td><input type="checkbox"/> nervous</td> </tr> </table> <p>Remarks.....</p> <p>.....</p>	<input type="checkbox"/> Calm	<input type="checkbox"/> slurred	<input type="checkbox"/> Angry	<input type="checkbox"/> rapid	<input type="checkbox"/> Excited	<input type="checkbox"/> stutter	<input type="checkbox"/> Slow	<input type="checkbox"/> clearing throat	<input type="checkbox"/> fast	<input type="checkbox"/> disguised	<input type="checkbox"/> Soft	<input type="checkbox"/> deep breathing	<input type="checkbox"/> Loud	<input type="checkbox"/> cracking voice	<input type="checkbox"/> Laughter	<input type="checkbox"/> unusual accent	<input type="checkbox"/> Crying	<input type="checkbox"/> yelling	<input type="checkbox"/> Normal	<input type="checkbox"/> threatening	<input type="checkbox"/> Clear	<input type="checkbox"/> motor	<input type="checkbox"/> Voices	<input type="checkbox"/> factory	<input type="checkbox"/> Static	<input type="checkbox"/> office	<input type="checkbox"/> Local	<input type="checkbox"/> street noise	<input type="checkbox"/> Music	<input type="checkbox"/> animal noise	<input type="checkbox"/> Crockery	<input type="checkbox"/> PA system	<input type="checkbox"/> Booth	<input type="checkbox"/> train	<input type="checkbox"/> aircraft	<input type="checkbox"/> house noises	<input type="checkbox"/> Foul	<input type="checkbox"/> irrational	<input type="checkbox"/> Taped	<input type="checkbox"/> message read out	<input type="checkbox"/> well spoken	<input type="checkbox"/> nervous
<input type="checkbox"/> Calm	<input type="checkbox"/> slurred																																										
<input type="checkbox"/> Angry	<input type="checkbox"/> rapid																																										
<input type="checkbox"/> Excited	<input type="checkbox"/> stutter																																										
<input type="checkbox"/> Slow	<input type="checkbox"/> clearing throat																																										
<input type="checkbox"/> fast	<input type="checkbox"/> disguised																																										
<input type="checkbox"/> Soft	<input type="checkbox"/> deep breathing																																										
<input type="checkbox"/> Loud	<input type="checkbox"/> cracking voice																																										
<input type="checkbox"/> Laughter	<input type="checkbox"/> unusual accent																																										
<input type="checkbox"/> Crying	<input type="checkbox"/> yelling																																										
<input type="checkbox"/> Normal	<input type="checkbox"/> threatening																																										
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<input type="checkbox"/> Static	<input type="checkbox"/> office																																										
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<input type="checkbox"/> aircraft	<input type="checkbox"/> house noises																																										
<input type="checkbox"/> Foul	<input type="checkbox"/> irrational																																										
<input type="checkbox"/> Taped	<input type="checkbox"/> message read out																																										
<input type="checkbox"/> well spoken	<input type="checkbox"/> nervous																																										

REMAIN CALM

AND

REPORT THREAT

TO A SUPERIOR/AUTHORITIES

IMMEDIATELY



29.8 Telephone Call Record

TELEPHONE CALL RECORD										
(Use 1 page per call)										
Call received by:			Extension No:			Date:		Time:		
Call Source:	Government	<input type="checkbox"/>	Media	<input type="checkbox"/>	Employee	<input type="checkbox"/>	Next-of-kin	<input type="checkbox"/>	Public	<input type="checkbox"/>
	Assistance Offer	<input type="checkbox"/>	Others:	(Specify)						
Caller Details										
Name:										
Title / Relationship:										
Organisation / Department:										
Phone Number:			Fax Number:			Mobile Number:				
Message for:					Return call by:					
Message / Information Request:										
Action Required:	Call Back	<input type="checkbox"/>	Send Fax	<input type="checkbox"/>	Want to See You	<input type="checkbox"/>	Will Call You	<input type="checkbox"/>		
	Others:	(Specify)								

29.9 Pollution Report

Location:

Date:

Time:

Tier 1

Tier 2

Tier 3

*tick whichever is applicable.

Spill Observer:

Material Spilled:

Apparent Source / Cause:

Time and Date Spill Occurred:

Is Spill Continuing : YES / NO

If Yes, Estimated Rate Of Release :(m³/kilolitres per day)(bbl per day)

Volume of Discharge : a) Estimatedm³/kilolitresbbl

b) Knownm³/kilolitresbbl

Size of Spill: (Area spread)

Approximate quantity of sand/soil to be removed:.....

Samples/Photographs Taken: YES.NO

Current Meteorological Data

Temperature:

Wind: Speed.....Knots..... Direction

Forecast:

Any other details:

Prepared By:
Company/Agency:
Position:
Phone:
Fax:
Mobile:

29.10 Government Incident Notification

1.	(a) Name of Site:	Date:	Time:
	(b) Name of Manufacturer:	Ph:	Fax:
	Address of Site		
	(c) (i) Registration Number:		
	(ii) Licence Number: (as applicable)		
	(d) (i) Nature of Site Activity: (products manufactured)		
	(ii) National Industrial Classification, 1987		
	(at four-digit level)		
2.	Type of Explosion <input type="checkbox"/>	Environmental <input type="checkbox"/>	Emission of Dangerous Substance <input type="checkbox"/>
	Accident:		
	Fire <input type="checkbox"/>	Substance(s) Emitted <input type="checkbox"/>	
3.	Description of the Accident:		
	(a) Date	Shift	Time
	(b) Department	Section	Location
	(c) Department Process		
	(d) Accident Circumstances		
4.	Emergency Measures Taken:		
5.	Causes of Accident:		
	- Known (specify)		
	- Not Known		
	- Information to be Supplied ASAP		
6.	Nature and Extent of Damage:		
	(a) Within the Site	No. of Fatalities	No. of Injuries
			No. of Illness
	Persons Exposed to Accident		
	Material Damage <input type="checkbox"/>	Danger Still Present <input type="checkbox"/>	Danger No Longer Exists <input type="checkbox"/>
	(b) Offsite	No. of Fatalities	No. of Injuries
			No. of Illness
	Persons Exposed to Accident	Damage to the Environment <input type="checkbox"/>	
	Material Damage <input type="checkbox"/>	Danger Still Present <input type="checkbox"/>	Danger No Longer Exists <input type="checkbox"/>
7.	Data Available for Assessing Effects of the Accident on Persons and Environment:		
8.	Steps Already Taken or Envisaged:		
	(a) To Alleviate Medium or Long-term Effects		
	(b) To Prevent a Recurrence		
	(c) Any other relevant Information		

30 Location Specific Information

30.1 Hospital or Sickbay Equipment List

Fire Aid Medical Centre	
<ul style="list-style-type: none"> • Portable Suction Machine • Ambulance with Facilities • Oxygen cylinder with set • Gel Burns Dressing • Spinal /Scoop Stretcher • Defibrillator • B.P Instrument • Ambu bag • Spine Board • ECG Machine • X-Ray Machine 	<ul style="list-style-type: none"> • Pulse Oximeter • Electronic Suction Apparatus • Nebuliser • Blood Glucometer • Stethoscope • Digital Thermometer • Spinal Board • Weight Machine • Scoop Stretcher • Drug Analyser • Needle Burner

Rev. 29

30.2 Fire Fighting Facilities

Fire Fighting Facilities

Water Storage and Pumping Capacity		
Description	Quantity	Total Capacity
Fire water reservoir	2* 2750	5500 m ³
Jockey pump	2* 45m ³	90 m ³ /hr
Diesel Fire water pump	3* 681m ³	2043 m ³ /hr
Electrical Fire water pump	1*681 m ³	681 m ³ /hr

Fire Fighting Equipment's	
Description	Quantity
Fire hydrant (instantaneous)	88 Nos.
Isolation valve	35 Nos.
Water cum Foam Fire Monitor	31 Nos.
Water monitor	12 Nos.
Fire hose (2 ½" Size)	78 Nos. (15m)
Fire hose box	39 Nos.
Fire Turn Out Gear	07 Nos.
SCBA sets (45 minutes each)	07 Nos.
Fire Hose (1 ½" Size)	10 Nos.
Foam Branches with Inline Inductor	14 Nos.(Foam Branch – 04)
Multipurpose Handheld Water Nozzle	52 Nos.

Description	Location	Quantity
Sand Bucket	Loading Bay	08 Nos.
	ESR	04 Nos.
	LER	04 Nos.
	Old ETP MCC	02 Nos.
	New ETP MCC	02 Nos.
	1 MLD ETP	02 Nos.
Building Hose Reel	Warehouse	01 Nos.
	Old Heli-Hanger	02 Nos.
	LQ	02 Nos.
	Mechanical Workshop	01 Nos.
	CCR	04 Nos.
	Loading Bay	01 Nos.

Fixed Protection Systems	
Fixed Water Spray System (09 Nos.)	Protected Areas
	Tank A
	Tank B
	Tank C
	Tank D
	New Slop Oil
	Old Slop Oil
	Gas Gas Exchanger
	Loading Bay
	HCDP Aftercooler Fan
Sprinkler System (03 Nos.)	ESR Transformer
	Propane Storage Tank
	HCDP Compressor
Fire Extinguisher	
Description	Quantity
01 kg CO ₂ Cartridge	09 Nos.
02 kg CO ₂ extinguisher (Stored Pressure Type)	02 Nos.
02 kg CO ₂ Cartridge	22 Nos.
4.5 kg CO ₂ extinguisher	61 Nos.
6.5 kg CO ₂ extinguisher	14 Nos.
09 kg CO ₂ extinguisher	02 Nos.
22.5 kg CO ₂ extinguisher	09 Nos.
02 kg DCP extinguisher	10 Nos.
04 kg DCP extinguisher	02 Nos.
06 kg DCP extinguisher	37 Nos.
09 kg DCP extinguisher	102 Nos.
25 kg DCP extinguisher (Trolley)	09 Nos.
50 kg DCP extinguisher (Trolley)	04 Nos.
75 kg DCP extinguisher (Trolley)	12 Nos.

Gaseous Suppression Systems		
	Protected Areas	Quantity
CO2 Flooding Systems	EDG	01 Nos.
	GTG-A/B	08 Nos.
	PGC – A/B/C	12 Nos.
	PGBC – A/B/C	12 Nos.
	ESR	02 Nos.
NOVEC 1230 system Cylinder	CCR Building	12 Nos.
	ESR	14 Nos.
	ETP MCC	02 Nos.
	1 MLD ETP	01 Nos.
	LER	06 Nos.

Fire Fighting Foam		
Description	Location	Quantity
Foam Bladder Tank	Loading Bay	8000 Ltrs
Foam Bladder Tank	Crude Storage Tank Area	3000 Ltrs
Foam Bladder Tank	New/Ols Slop Oil Tank Area	1600 Ltrs
Foam Pourer	Tank A/B/C/D/New/Old Slop Oil	12 Nos.
Angus foam trailer unit	Loading Bay	1200 Ltrs
FM 200 Foam Trolley unit	ETP near Diesel Storage Tank	200 Ltrs
Type of Foam	Quantity	
AFFF	40 Nos. (200 Ltrs Each)	
AR-AFFF	14 Nos. (200 Ltrs Each)	

Fire Tender Details	
Description	Quantity
Foam Capacity	3000 Litres.
Water Capacity	4500 Litres.
Pump Capacity	3000 LPM
Fire Monitor	1250 GPM (Water cum Foam Capable)
Medium Expansion Foam Generator	02 Nos.
Breathing Apparatus Set	04 Nos.
First Aid Box	01 Nos.
Rescue Ladder	30m (01 No.)

Inventory of Detection Systems	
Smoke Detectors	256 Nos.
Heat Detector	33 Nos.
Flame detectors	83 Nos.
Gas Detector	188 Nos.
Gas Detector (Open Path)	09 Nos.
Manual Call Point	14 Nos.

31 Specifications of Rescue Tools & Equipment's

Specifications of Rescue Tools & Equipment's			
Work at Height Rescue Equipment's			
Sr. No.	Equipment Name	Specification & Purpose	Qty
1	Retractable fall arrestor block	Retractable wire rope fall arrestor block PCGS30R, with retrieval system, plastic casing, with galvanised steel cable 30 metre length with pn162 at attachment end & PN112 at top of anchorage eye	1
2	Rope grab fall arrestor and karabiner	Stainless Steel for Rope Dia 14-16 mm Conforming to EN-353-2	2
3	Kernmantle rope	Rope for recue from height	2
4	Anchorage line rope	Anchorage line 50 mts. Long kara mental semi static rope with one side hook PN 121 & other side end stop knot	2
5	Cows tail & knife	For light cutting purpose during rescue situations	1
6	Descender	For controlled safe descending from height	1
7	Ascender	Designed for rappelling in rescue situations	1
8	Aluminium Rope Clamp	For rope Dia 9-11 mm with small karabiner DSA00153-8	1
9	Anchorage sling	For attaching anchorage rope	1
10	fork lanyard with shock absorber	HARNES, SAFETY INDUSTRIAL; TYPE: FULL BODY BELT MATERIAL: POLYESTER, WEBBING SIZE: 1.75 INCH	46
11	Full body safety harness	HARNES, SAFETY INDUSTRIAL; TYPE: FULL BODY BELT, MATERIAL: POLYESTER, WEBBING SIZE: 1.75 INCH. Without shock absorber	5
Confined Space Rescue Equipment's			
Sr. No.	Equipment Name	Specification & Purpose	Qty
14	Trolley mounted breathing apparatus	150 Bar - cylinder. (2Nos) with hose reel and face mask Used for confined space entry where use of SCBA is difficult	1
15	Basket stretcher	For rescue for IP by lifting	1
16	Tripod	Tripod 10 ft on wheels with double pulley head PN800(DPW)(10FT) with 2 no's mounting bracket PN-800(44) SUB1 for lifting IP using harness	1
17	SCBA Set	Charging pressure - 300 Bar For breathing in toxic/hazardous environment	23

General Rescue Equipment's

Sr. No.	Equipment Name	Specification & Purpose	Qty
18	Fire Tender	Foam - 3000L, Water -4500L, Pump capacity 3000LPM, BA Set - 4 Nos, First Aid Box- 1 No, Rescue Ladder - 1 No	1
19	Rescue Trained Personnel	Trained in Confined Space and Work at Height Rescue by NIST	15
20	Fire Turn out Gear	Gear for firefighting and rescue	4
21	Rescue Ladder	Length - 30m	1
22	Hydraulic jack	For lifting of structures for rescue	1
23	Split Stretcher	For IP transfer	1
24	Basket Stretcher	For IP transfer by lifting	1
25	Lukas Premium Cutter S 511	Cutting force up to - 1170 kN, round steel up to Dia - 43 mm, Blade opening - 150 mm, Oil requirement - 150 cm3, Dimensions (LBH) - 740 x 245 x 170 mm, Weight - 19 kg	2
26	Lukas Spreader SP 512	Spreading force - 84 to 540 kN, spreading distance - 610 mm, Squeezing force - 128 kN, Pulling distance - 437 mm Pulling force up to - 99 kN, Oil requirement - 341 cm3 Dimension (LBH) - 795 x 380 x 216 mm, Weight - 26.4 kg	1

General Rescue Equipment's

Sr. No.	Equipment Name	Specification & Purpose	Qty
25	PSV Rescue Boat	To supply offshore oil and gas platforms and other offshore installations.	1
26	Chopper	Bell - 412 (Double Engine) Seating Capacity - 11. For rescue and evacuation of personnel	1
27	Life Rings	To assist a person struggling to stay afloat in water and at risk of drowning BUOY; TYPE: LIFE RING, DIMENSIONS: ID 44.5 X OD 74.5 X THK 11.5 CM, MATERIAL: H-DENSITY POLYETHYLENE SHELL FILLED, COLOR: ORANGE; WEIGHT:2.5KG, BUOYANCY:>150N,DROP HEIGHT	33

32 Emergency Contact Directory

Note: Below is the latest contact detail for Emergency Contact directory. Suvali Radio officer will circulate the emergency contact detail through email for any changes in contact details. Final update copy of contact detail will be available in Suvali Radio Room. Entire document will not be revise due to change in contact details.

Rev. 29

- Crisis Management Team
- Emergency Management Team
- Suvali Incident Response Team
- Emergency Services
- Regulatory/Government Authorities
- Oil Spill Agencies
- Weather Forecasting Services
- Local Industries (Hazira)
- Flood Control
- Viramgam
- Yanam



Rev. 29

32.1 Emergency Response Group

CRISIS MANAGEMENT TEAM			
Name	Designation	Role	Contact Details
Avinash Kumar	Director, West Coast	CMT Leader	+91- 8527098696
EMERGENCY MANAGEMENT TEAM			
Name	Designation	Role	Contact Details
Arun Kumar Suhag	Sr. Manager Ops., Cambay	Operations Support	+91-9001894595
Paresh Lad	Head Maintenance	Operations Support (Alternate)	+91 9825100497
Shakti Jain	Sub-Surface, West Coast	Sub-Surface Support	+91 8527044880
Hari Krishna	Sub-Surface, Offshore	Sub-Surface Support (Alternate)	+91 8527592191
Vivek Sharma	CFO Finance, Offshore	Finance Support	+91 8130292340
Kishor Nagar	Manager Finance, Cambay	Finance Support (Alternate)	+91 9662539527
Sunayana Pathak	Human Resource Manager	HR Support	+91 9910694341
Honey Shah	Human Resources CHRO	HR Support (Alternate)	+91 7990559707
Ankur Jain	PSCM Head, West Cost	Logistics Support	+91 9898597740
Siddhant Jain	CCO, Offshore	Logistics Support (Alternate)	+91 9799998062
Capt. Omprakash	Security Head, Offshore	Security Support	+91 9829600075
Soumen Dev	IR Sr. Manager	Security Support (Alternate)	+91 9676422291
Radio Office	On Duty RO	Recorder	+91 9818174676
Vijay Kansagara	HSE Head, West Coast	HSE Support	+91-9099994566
Ishwari Lande	Fire Officer, West Coast	HSE Support (Alternate)	+91-9834698939
Hari Singh	Manager Communication	Public Affairs	+91 9717093336
Neeraj Kumar	Dy. Manager IT	Telecommunication	+91 9821500329
Dr. Aritra Banerjee	CMO, Cairn	Medical Officer	+91 9773380203
Virendra Veer Arya	Legal Consultant	Legal Support	+91 9001995480
Anil K Rattan	Aviation Head, Cairn	Aviation Support	+91 9220449434
Harish Belwal	Marine Head, Offshore	Marine Support	+91 9650698295

Rev. 29

32.2 SITE INCIDENT RESPONSE TEAM

Position	Appointed Person	Landline Extension	Mobile
Suvali Radio Room (24x7)	On Duty Radio Officer	0261-2292450	9909941774
Installation Manager	Samarth Kaji	0261-2292530	8130392248
Head Production	Urvesh Shah	0261-2292455	9824134413
Production Superintendents	On Duty Production Incharge	0261-2292476	9687675994
Mutual Aid Coordinator	Paresh Lad	0261-2292531	9825100497
Muster Coordinator	Vijay Kansagara	0261-2292434	9099994566
Medical Support	On Duty Paramedic	0261-2292456	----
Maintenance Support	Hemraj Rathod	0261-2292487	99729265547
Hospital Tie Up Coordinator	Sanad Nambiar	0261-2292470	8980801979
Offsite Logistics Support	Lakin Naik	0261-2292554	8238055759
Control Room	On Duty CCR Engineer	0261-2292500	----
Fire Room	On Duty Fire Supervisor	0261-2292424	----
Security Manager	Capt. Omprakash	0261-2292430	9829600075
Security Main Gate	On Duty Supervisor	0261-2292472	----

Rev. 29

	Additional First Aiders	Dept.
1	Niraj Naik (Lead)	Electrical
2	Priyank Mistry	Electrical
3	Chirag Maisuriya	Electrical
4	Naresh C. M	Electrical
5	Siddartha Modi	Instrumentation
6	Sisara Lalji	QAQC

	Additional Fire Fighters	Dept.
1	Hemraj Rathod (Lead)	Mechanical
2	Snehal Patel	Mechanical
3	Hardik Patel	Mechanical
4	Sanjay Parmar	Electrical
5	Mayur Kothiya	Mechanical



Rev. 25

32.3 Emergency Services

GOVERNMENT AGENCIES			
Authority	Contact Person	Email id	Contact Details
Gujarat Pollution Control Board (GPCB)	Vigilance Officer	vo-gpcb-sura@gujarat.gov.in	0261-2442696 / 2411192
Director General of Mines Safety (DGMS)	Shri M D Mishra	Region.surat@gmail.com	0261-2274652
Oil Inspector Safety Directorate (OISD)	PS to ED	ps-ed.oisd.gov.in	0120-2593800
Atomic Energy Regulatory Board (AERB)	Control Room	vsbecr@npcil.co.in	022-25991070 / 25515283
Ministry of Environment and Forest (MOEF)	Control Centre	----	011-20819220
Gujarat Maritime Board (GMB)	Control Centre	----	0261- 2470533/2463781
INDIAN COAST GUARD (ICG)	Control Room	mrcc-west@indiancoastgurad.nic.in	022-24316558/022-24383146
INDAIN METEOROLOGICAL DEPARTMENT (IMD)	Gujarat Control Room	m.mohanty@imd.gov.in	7929705011
SURAT AIRPORT	Air Traffic Controller	----	0261-2700228 / 7621004228
HAZIRA POLICE	Police Station	----	9586005533
DISTRICT COLLECTOR	PS to Collector	----	0261-2655151
ODAG	Control Room	----	022-22181424/022-22151906

Rev. 27

Rev. 27

MUTUAL AID PARTNER SUPPPORT		
Mutual Aid Partner	Contact Person	Contact Details
L &T	L &T CONTROL ROOM	0261-2807501 / 9099003123
RELIANCE	CONTROL ROOM	0261-4135888
SHELL	RADIO ROOM	0261-4151165 / 9824704947
NIKO BASE	CONTROL ROOM	0261-2870019 / 9909921526
ESSAR	CONTROL ROOM	9879102701
ADANI MARINE	CONTROL CENTRE	9909957115 / 0261-220775

SECURITY SUPPPORT		
Service Provider	Contact Person	Contact Details
SHELL	SECURITY CONTROL ROOM	0261-4051230
RELIANCE	CONTROL ROOM	0261-4135888
L&T	CONTROL ROOM	0261-2807501 / 9099003123



MEDICAL SUPPORT

Service Provider	Contact Person	Contact Details
BAPS HOSPITAL	EMERGE CNY WARD	9879644144 / 9879644244
MAITREY HOSPITAL	EMERGENCY ROOM	8238229900
MAHAVIR HOSPITAL	EMERGENCY ROOM	0261-2290000

FIRE SERVICES

Service Provider	Contact Person	Contact Details
MORA BHAGAL FIRE STATION	CONTROL ROOM	0261- 2770768
KATARGAM FIRE STATION	CONTROL ROOM	0261-2482269

AVIATION SERVICES

Service Provider	Contact Person	Contact Details
GLOBAL VECTRA HELICORP	SANDEEPAN HANDA	9910732555
DECCAN AVIATION	JAYANTH POOVAIAH	9845022772

MARINE SERVICES

Service Provider	Contact Person	Contact Details
COASTAL AABHAAR	MARINE INCHARGE	8879336123/9222051435
GLOBAL OFFSHORE SERVICE	MARINE INCHARGE	9167136406/0224234000

OIL SPILL RESPONSE SERVICES

Service Provider	Contact Person	Contact Details
JVM MARKETING	DIGVIJAY SINGH	9323812109
DESMI	JIGAR PARMAR	7893399311
VIRAJ CLEAN SEA	PRAVEEN MITTAL	8879698168

CRANE / PNC SERVICES

Service Provider	Contact Person	Contact Details
CTPL	KHETMAL BHOTRAJI	909953367
CHAUDHARY CRANE	PARAS CHAUDHARY	968744455

TRAILER / TRUCK SERVICES

Service Provider	Contact Person	Contact Details
CTPL	KHETMAL BHOTRAJI	909953367
MFC TRANSPORT	SHEELA	9833222083 / 0222-8795517

WEATHER FORECAST SERVICES


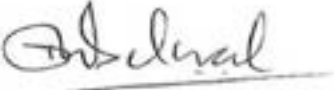
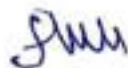
Service Provider	Contact Person	Contact Details
SKYMET	CONTROL ROOM	0120 - 4094500
STORMGEO	CONTROL ROOM	+ 4755706170

CYCLONE SOP					
Revision Number	02	Date of Issue	01 st Oct 2025	Next Review	01 st Oct 2026
Owner	HSE				
Application	CB/OS-2 Offshore Operations				
Classification	Internal				



VEDANTA LIMITED, CAIRN OIL & GAS

CYCLONE RESPONSE PROCEDURE

Prepared by	Vijay Kansagara HSE Head	
Reviewed by	Harish Belwal Marine Head	
Approved by	Samarth Kaji Installation Manager	
Document Number	PRO-LX-H-0004	



Document Change History

Rev	Date	Section	Nature of Change
0	01/10/2023	Entire Document	For Release
1	01/10/2024	Entire Document	For Release
2	01/10/2025	Section 09 – Emergency Contact Details	Inclusion of Emergency contact details of Government Agencies.

DOCUMENT CONTROL AND DISTRIBUTION LIST

This Incident Response Plan prepared for Cairn Oil & Gas Vedanta Limited CB/SO-2 Onshore Terminal and Offshore Platforms (Lakshmi Alpha, Lakshmi Bravo and Gauri Alpha) and is issued on the authority of the Installation Manager CB/OS-2. It is the responsibility of the Installation Manager CB/OS-2 to ensure that the document reflects the latest emergency response information and for ensuring that the whole document is reviewed at regular intervals not exceeding three years or when there is a change in the operating asset structure that has an impact on the contents.

A copy of this document will be issued to everyone in the distribution list. The original electronic version is also available in Documentum. Those with specific duties for dealing with an incident or emergency must ensure that they are aware of their responsibilities and duties as contained in this manual, and the way these procedures interface with the other support groups and organizations

Distribution List

Copy Identification	Recipient
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Soft copy	Director West Coast BU
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Soft copy	Head HSE (CB/OS-2)
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TABLE OF CONTENTS

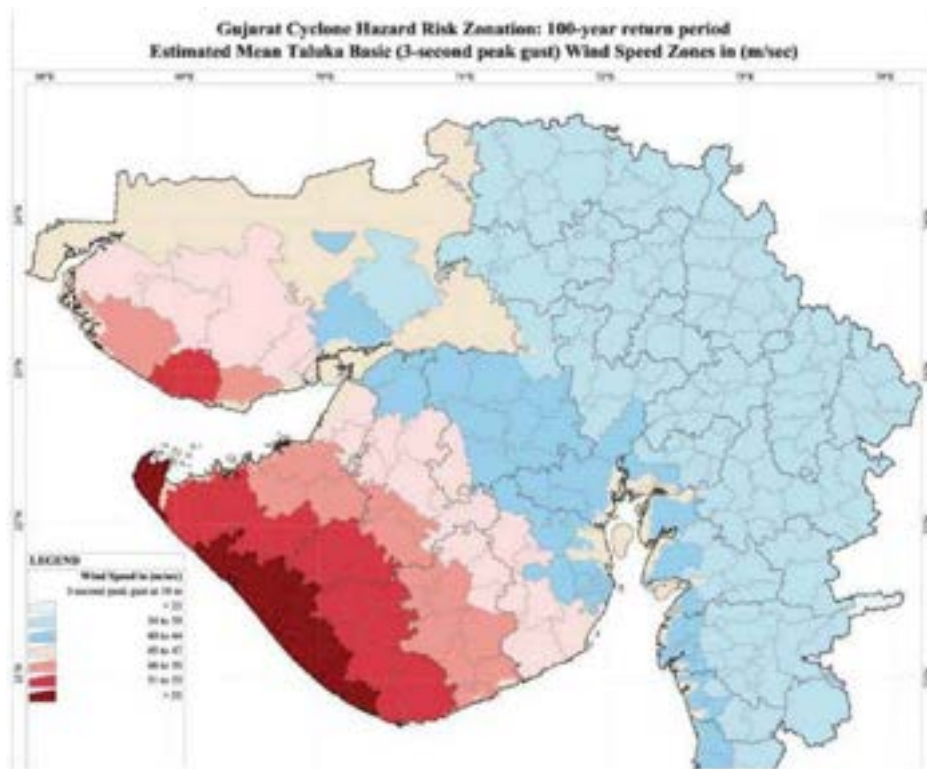
1.	<i>INTRODUCTION</i>	5
2.	<i>PURPOSE</i>	6
3.	<i>SCOPE</i>	6
4.	<i>ORGANIZATION SUPPORT LINKS</i>	7
5.	<i>WEATHER FORECAST INFORMATION</i>	8
6.	<i>MANAGEMENT & CONTROL OF EMERGENCIES</i>	9
7.	<i>MANAGEMENT & CONTROL OF EMERGENCIES</i>	10
8.	<i>External Stakeholder Communication and Support</i>	15
9.	<i>Emergency Contact Details</i>	17

1. INTRODUCTION

Changing patterns of ocean and atmosphere warming are causing more severe cyclones over the eastern Arabian Sea adjacent to India’s west coast and east coast adjacent to Bay of Bengal. Although cyclones affect the entire coast of India, the eastern coast is significantly more prone to cyclones as compared to the western coast. Tropical cyclones are more prevalent just before and at the start of the southwestern monsoon during March–June and after the season in October–December.

The offshore installations and operations are very vulnerable to the cyclone impact and poses extremely high risk to the personnel working in offshore. Taukate incident in Bombay high caused many fatalities, followed by HLC recommendation to strengthen the Emergency response for cyclone.

The Hazard Risk and Vulnerability Atlas prepared by Gujarat State Disaster Management Authority (GSDMA) shows the cyclone hazard zonation along with the basic wind speed.



2. PURPOSE

This purpose of this procedure to define the

- Measures to be taken during cyclone alerts
- Roles and responsibilities of various personnel
- Communication protocol
- Evacuation procedure during cyclone

3. SCOPE

Cairn Oil & Gas, CBOS-2 Asset is committed to properly manage any emergency, which can arise during its operations, to minimize the impact it may have upon personnel, the environment, property, the company's financial position and its reputation. The key to effective response to emergencies is having trained personnel and a pre-established organization on-call capable of mobilizing and responding to the extent required by different levels of emergency.

The scope of this Plan covers the following areas falling under Cairn Vedanta Limited – Suvali Terminal and would be henceforth referred as “**Site**” in subsequent paragraphs:

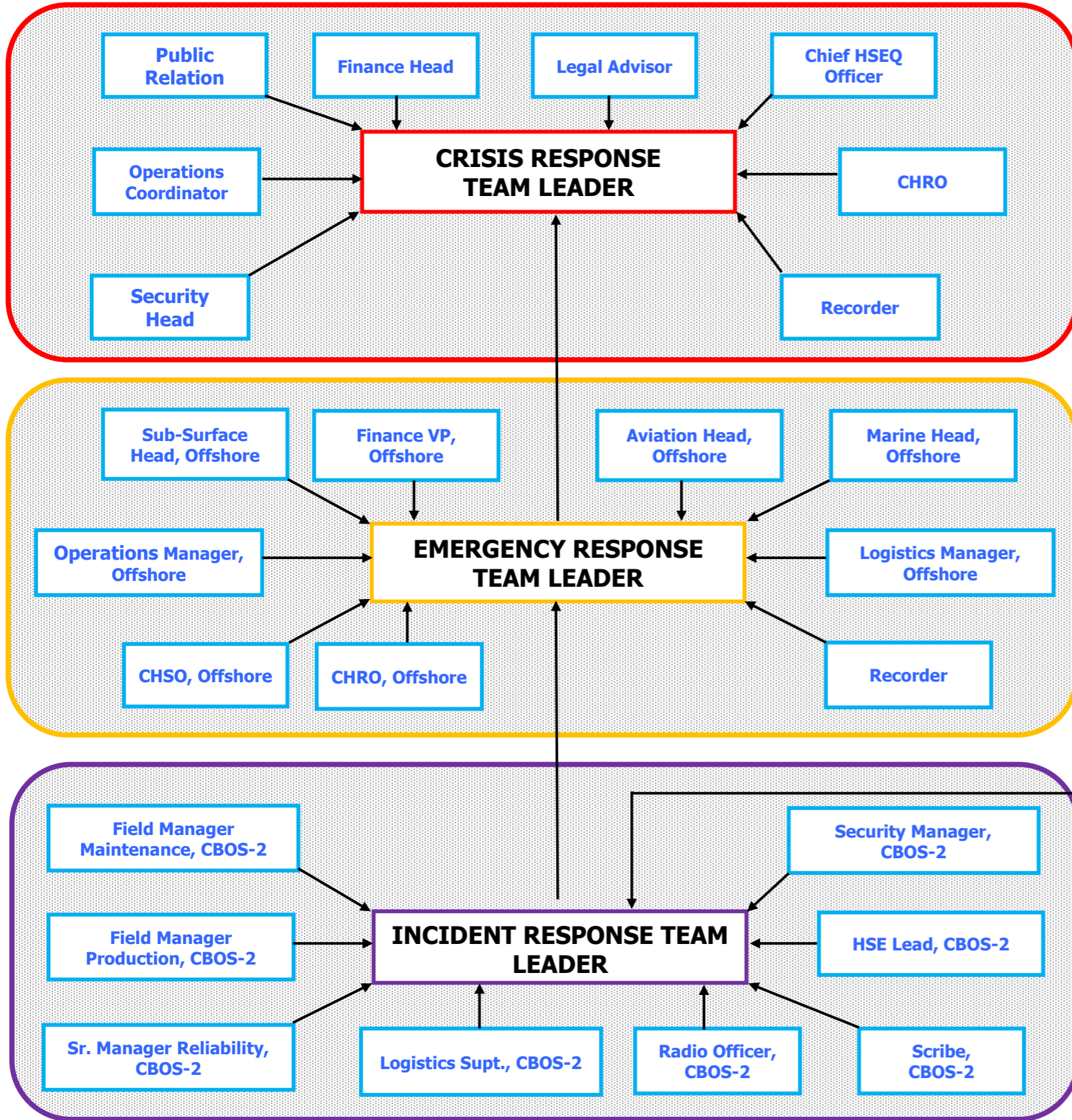
- Lakshmi Alpha (LA), Lakshmi Bravo (LB), Gauri Alpha (GA) Unmanned Offshore Platforms
- Sub Sea Pipelines (24” and 12” respectively)
- Landfall point area including 18” pipeline
- Associated Logistics Operations (Helicopter, Marine and Road Transport Operations)

CB Installation	
Suvali Onshore Terminal	21°10'13.346"N 072° 39'00.120"E
Gauri Alpha (GA) Platform	21°01'55.18"N 072° 33'17.20"E
Lakshmi Bravo (LB) Platform	21°06'12.39"N 072° 31'01.54"E.
Lakshmi Alpha (LB) Platform	21°03'56.30"N 072° 31'37.41"E

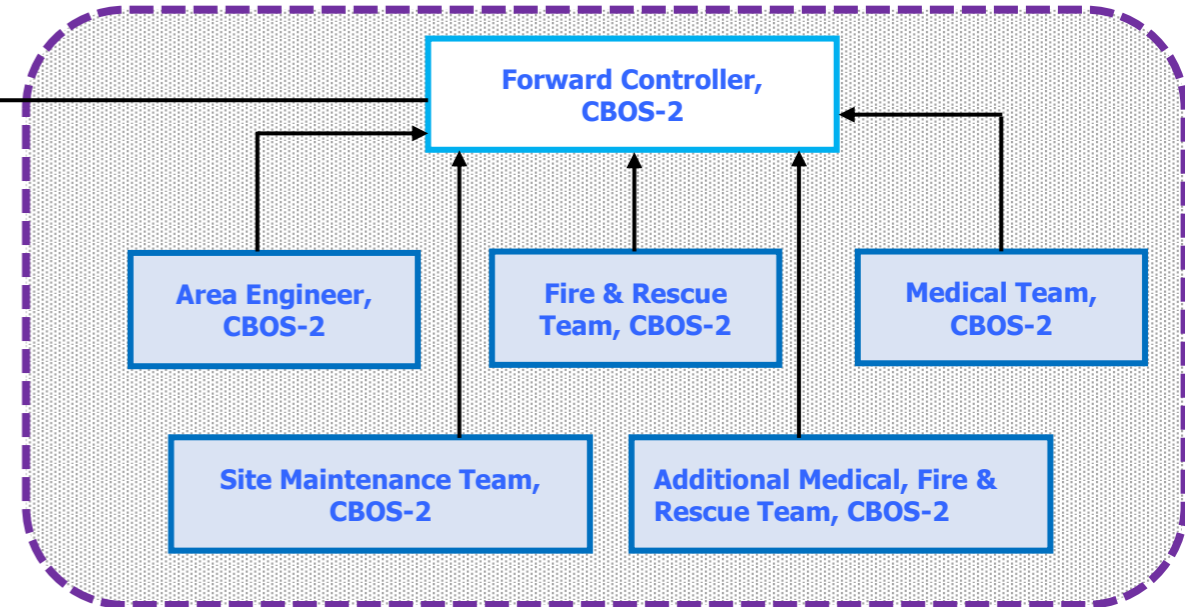


Cyclone SOP pertaining to drilling rig shall be separately prepared in line with this procedure, incorporating roles & responsibilities pertaining to rig personnel and the particular rig specifications/procedure, as and when drilling campaign occurs in the offshore installation

4. ORGANIZATION SUPPORT LINKS



Emergency Level	Tier 1 Regional	Tier 2 Tactical	Tier 3 Strategic
Category	Minor Incident where site does not require external assistance and can control emergency with local resources. Incident Controller must notify duty EMT Leader.	Substantial Incident Duty EMT Leader decision to call out EMT Task Force. Duty EMT Leader must notify duty CMT Leader.	Crisis situation appears likely. Duty CMT Leader decide to Call Out CMT Task Force. Duty CMT Leader must notify CEO.
Response	Incident Response Team	Emergency Response Team	Crisis Response Team
Health & Safety	Minor Injury case; Equipment Damage with loss of production; Minor Fire without injury or plant damage; Rescue of Trapped or injured person.	Fire or Explosion; Injury or Illness require evacuation; Traffic Accident requires external assistance; Marine Incident e.g., Vessel Collision	Incident leading to multiple injuries or fatality(s); Significant loss financial loss due to property damage; Total loss of Marine Vessel; Well Blowout incident leading to Media coverage; Major traffic Incident with multiple casualties
Environment	Minor Oil Spill < 700 Bbls.; Onsite Environment Exposure contained within Internal Efforts; Notification of Cyclone within 72 Hrs.	Oil Spill > 100 Tons but < 1000 Tons; Offshore Environment Exposure contained with Mutual Aid support; Flood or Cyclone warning Blue Alert (within 48 Hrs.)	1000T (7000 bbls) effluent discharge / flaring beyond acceptable limits; Flood or Cyclone warning Yellow alert (within 12 Hrs.); Major Earthquake
Security	Minor Security breach; Theft from site; Local unrest.	Civil unrest or security breach; Major Criminal Activity	Terrorist Activities / Bomb Threat / Major Civil unrest



5. WEATHER FORECAST INFORMATION

Cyclones are intense low pressure areas – from the centre of which pressure increases outwards. The amount of the pressure drop in the center and the rate at which it increases outwards gives the intensity of the cyclones and the strength of winds. The criteria followed by the India Meteorological Department (IMD) to classify the low pressure systems in the Bay of Bengal and in the Arabian Sea as adopted by the World Meteorological Organisation (W.M.O.) are given below:

Sr. No.	Type of Disturbance	Associated Maximum Sustained Wind
1	Low Pressure Area	Not Exceeding 17 Knots (< 31 kmph)
2	Depression	17 to 27 Knots (31 – 49 kmph)
3	Deep Depression	28 to 33 Knots (50 – 61 kmph)
4	Cyclonic Storm	34 to 47 Knots (62 – 88 kmph)
5	Severe Cyclonic Storm	48 to 63 Knots (89 – 117 kmph)
6	Very Severe Cyclonic Storm	64 to 90 Knots (118 – 167 kmph)
7	Extremely Severe Cyclonic Storm	91 to 119 Knots (168 – 221 kmph)
8	Super Cyclonic Storm	120 Knots (\geq 222 kmph)

*Source: IMD, Govt of India

5.1 WEATHER MONITORING SYSTEM

Advanced cyclone warning information is most essential element for early preparations and to make decisions by team to provide the effective response during cyclone emergencies.

Following Information will be referred during the cyclone warning.

IMD: Issues daily weather bulletins and weather forecasts information. Tropical Cyclone Advisory is also issued to the group mail on frequent basis during the cyclone warning.

Internal Cyclone notification by external agencies: Site has engaged with Skymet Ocean and Storm Geo for Weather Forecast information. Daily weather bulletin and weekly forecast is shared by these agencies including the cyclone trajectory forecast, expected wind speed and local weather details at site location, .

Other sources of Information : Websites like windy.com, zoom.earth, cyclocane.com also being used to monitor the trajectory of cyclones, heavy wind gusts, thunderstorms, heavy rains etc.

6. MANAGEMENT & CONTROL OF EMERGENCIES

Cairn's Emergency Response Philosophy provides "reasonable assurance that adequate measures can and will be taken in the event of an incident or emergency."

Depending on where the emergency is, the Site Radio Operator will be the central point of contact for the initial incident notification. If notified of an incident or emergency the Gurgaon Radio Officer shall immediately notify the duty EMT Leader (Refer Emergency Contact details).

Emergency Management Team Room

When the EMT is mobilised, the group members will normally meet in the designated Emergency Co-ordination Centre.

A **Incident Response Team (IRT)** is first level responder at operational base and comprises Incident Controller, Forward Controller and supported by all other functions, which is responsible for

- Management and control of localized incidents and emergencies.
- Notifying and liaising with the duty Emergency Management Team
- Provide communication to all the relevant stakeholders
- Coordinate with Mutual aid partners and other responders

A **Emergency Management Team (EMT)** is second level responder based at Suvali and comprises EMT leader, Technical personnel, and supported by all other functions, which is responsible for

- providing tactical response, support, assistance and advice to all Tier 2 & 3 incident and emergency situations
- Providing support, advice and off-location assistance to the remote location where a major incident is in progress.
- Notifying next-of-kin, authorities, employees, contractors, national JVs etc Notifying and liaison with Crisis Management Team
- Providing and co-ordinating specialist support.
- Co-ordinating recovery from incident.
- Obtaining clearances for and issuing release to national media

A **Crisis Management Team (CMT)** based in the Company head office in Gurgaon, responsible for:

- Providing strategic response assistance, support and advice to the EMT
- Notifying international authorities, shareholders, JV partners, and financial institutions
- Coordinating and approving all media releases, issuing international media releases
- Authorizing extraordinary expenditure
- Deciding on the course of action in the event of civil unrest or war
- Coordinating response to kidnap and extortion demands
- Providing legal advice and response

This Incident Response Plan details the Incident Response Team's individual roles and responsibilities and provides guidance on how they should provide assistance to others in emergency or incident situations and address the issues arising out of such situations e.g., personnel, environmental, legal and financial.

The Gurgaon Radio Operator will notify the duty EMT Leader that an Emergency has occurred along with the information provided above. Upon receiving notification of an incident or emergency, the duty EMT Leader must make immediate contact with the Location reporting the incident or emergency situation.

7. MANAGEMENT & CONTROL OF EMERGENCIES

7.1 Incident Response Team

Incident Response Team (IRT) shall be activated upon receipt of cyclone warning and Incident Controller shall assume command and control of any emergency. The Site "Incident Control Centre" (ICC) shall be used by the Incident Controller and his team. The ICC will be permanently equipped with communications equipment, an information management system, a copy of this IRP document, drawings, technical and reference documents, procedures and contact lists and any other equipment required by the Incident Controller and team to manage an incident or Emergency situation.

7.2 Emergency Communications

Reliable communications equipment and support are available for use during an emergency. Site has dedicated Radio Room where all communications are bridged between Onshore & Offshore facilities.

Communication facilities available at site include the following:

- VHF / UHF radios
- HF Single Side band (SSB) facility in control room for interfacing with offshore operations.
- Voice Over Internet Protocol (VOIP) phones in all Sub-stations and other office buildings.
- Flameproof Mobile phones (designated places in the offshore / operations sites)
- Public Address and General Alarm (PAGA) System.
- Emergency siren.

Details of emergency numbers and contacts are found in IRP. During any incident, it is essential that the Communications Centre be manned by a competent radio operator, who is responsible for maintaining communications with all sections of the IRT and the EMT and for passing on information as required to the Incident Controller.

All personnel who are issued with communications equipment such as VHF Radios, mobile telephones must be competent in its use and familiar with emergency communications procedures such as usable channels, telephone and alternative systems and procedures if primary system fails to raise help.

Radio Communications for Routine operations are carried out via following channels:

Operations	Radio Channel
Onshore Operations	Channel 01
Offshore Operations	Channel 06

7.3 Key Roles and Responsibilities

Details Emergency response organization and Emergency management guide is provided in the site Incident response plan however the cyclone specific roles and responsibilities is defined under this procedure.

EMT Leader

- Cascade Information on Cyclone Alert to site incident controller.
- Notify and Liaise with CMT Leader.
- Monitor Cyclone threat and related site preparedness at regular intervals.
- Ensure preparedness and actions thereof are taken as per approved site Cyclone SOP.
- Decide on Evacuation of platforms and vessels considering the cyclone path, in consultation with the EMT leader
- Coordinate with External stakeholders, in case support requires from external stakeholders for evacuation of installation

Incident Controller

- To manage and provide overall response to the cyclone emergencies at the Site
- Provide timely information and update to EMT leader during emergency
- Suspend all the offshore activities and secure all loose items in advance of the cyclone warning
- Direct and coordinating the various activities with Incident response team
- Advise EMT leaders on the timely evacuation of Installation and execute all the required action to safely ensure the evacuation of all personnel from platforms
- Evaluate and initiate immediate actions to contain and mitigate effects of the incident or emergency.
- Establish head count and potential whereabouts of any missing personnel, if any.
- Maintain focus on incident to minimize potential for escalation.
- Monitor the situation & determine need for evacuation.
- Identify, request and mobilization of any additional resources required for effective response.
- Ensure emergency procedures are followed, incident log is maintained, check lists are followed and preparation of statutory reporting documents.
- Planning and preparation for relocation of any evacuated personnel.
- Arrange for and if necessary, participate in any investigation resulting from the incident or emergency.
- Ensuring appropriate action is taken to make the incident or emergency site safe before activities allowed to resume.

Chief Health & Safety Officer

- Review cyclone alerts and advise EMT leader and IRT leader on the cyclone trajectory and impact on the installations.
- Ensure dissipation of information to EMT & IRT, related to cyclone warning well in advance
- Ensure to Prepare and Circulate SITREP to all internal and external stakeholders at regular intervals.
- Advise IRT Leader and EMT leader on planning of safe evacuation of personnel from cyclone prone area.
- Coordinate with Mutual Aid Partner, if requires for any assistance.
- Engage with relevant stakeholders in event of any causality or environmental incident during cyclone.
- Furnish required information to statutory body, as and when requested requested during emergency
- Ensure availability of required life saving appliances at platform

Marine Head

- Communicate with Marine Vessel, Tugs and Boats on timely weather monitoring and cyclone trajectory.
- Coordinate with Marine Vessel, Tugs and Boats to ensure safe evacuation to shelter area, away from the cyclone trajectory
- Arrange for required support with port to anchor the boats.
- Laise and coordinate with Port authority, State Maritime Board and DG shipping, for required support and communication

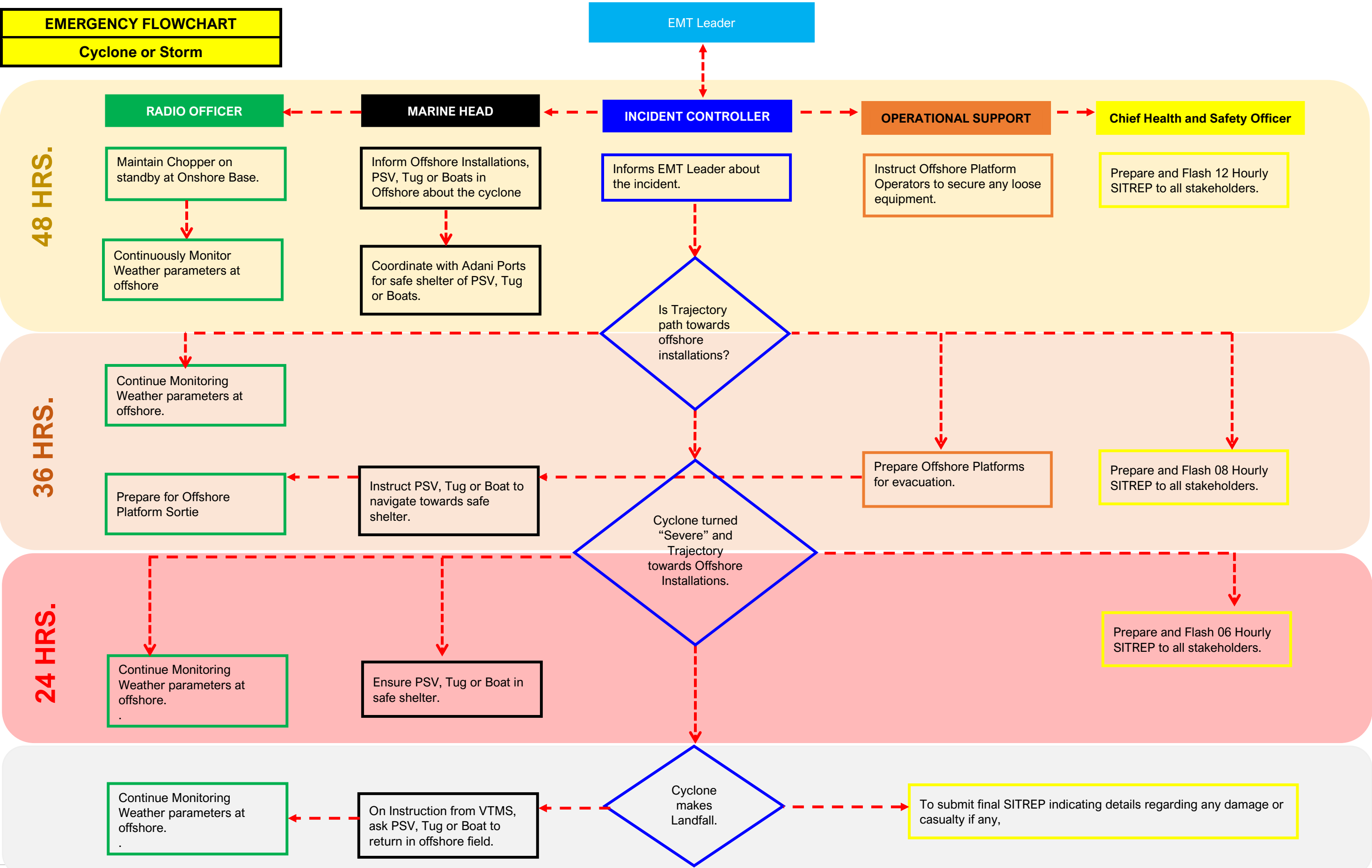
Radio Officer

- Maintain continuous communication with Offshore Installations and Marine Vessel / Tugs or Boats.
- Monitor 04 Hourly weather condition at offshore.
- Liaise with Aviation Coordinator for chopper sortie
- Log all events and actions until cyclone threat is subside
- Provide communication with GGN Radio Room on status update

Vessel Master

- To follow and carry out marine vessel operations as per directions from Marine Head and IRT leader.
- Update Radion room with Offshore Weather conditions and location of vessels.
- Provide evacuation support to offshore personnel in case chopper sortie cannot be arranged
- Monitor other Tugs or Boats or any unknow vessel movements near offshore installations.
- On clearance from Marine Head, navigate to identified safe shelter and provide regular updates to Radio room on

EMERGENCY FLOWCHART
Cyclone or Storm



8. EXTERNAL COMMUNICATION AND SUPPORT

External communication with nodal agencies is critical part of the plan to receive the timely support during cyclone emergency. Following nodal agencies are identified for regular communication during cyclone emergency.

Nodal Agencies:

- a. **Oil Industry Safety Directorate (OISD):** OISD is technical directorate under the Ministry of Petroleum and Natural Gas and is nodal agency for the offshore safety. Periodic SITREP shall be shared with OISD during cyclone alert.

Intimation to Director (E and P), OISD
Intimation to Executive Director, OISD

- b. **Directorate General of Hydrocarbons (DGH):** DGH is a governmental regulatory body under the Ministry of Petroleum and Natural Gas. Periodic SITREP shall be shared with OISD during cyclone alert. Request to DG, DGH and Nodal Officer for the Block (E and P), DGH would be made on an immediate basis. dg@dghindia.gov.in

Intimation to DGH Control cell / Nodal Officer

- c. **Offshore Defense Advisory Group (India) ODAG:** ODAG is nodal agency for the security of offshore installations. For requiring any support for rescue or evacuation, ODAG shall be contacted.

Intimation to Flag Officer, HQODAG

- d. **Indian Coast Guard (ICG):** Indian Coast Guard ships and aircraft operations mitigate the effect of maritime accidents, and help in ensuring safety and security from natural or man-made disasters. Intimation and request for support to ICG on Immediate basis.

- e. **DG Shipping:** Intimation and request for support to Directorate General of Hydrocarbons (DGH). { dgship-dgs@nic.in}

- f. **State Maritime Board:** regulates the movement of vessels and boats in the offshore. Intimation and request for support to maritime board on Immediate basis.

- g. **District Collector:** Intimation to District Collector of the Base location and the Rescue location as per ERP.



Emergency Declaration and Support Request Distribution List:

Emergency shall be declared as per the Emergency Response Plan or Government Directive and all nodal and government agencies would be intimate and notified as per above list.

In case any support is required form any government agency then following distribution list and protocol would be followed. This is mainly for rig / vessel / Platform abandonment.

Government agencies to be kept informed well in advance to receive support in case of escalation of emergency and such a need arise.

Note: Government may setup control room to handle such emergencies and as such would be included in all SITREPS and distribution plan.

9. Emergency Contact Details

Position	Appointed Person	Landline Extension	Mobile
Suvali Radio Room (24x7)	On Duty Radio Officer	0261-2292450	9909941774
YNM Radion Room (24x7)	On Duty Radio Officer	-	9849623600
GGN Radio Room	On Duty Radio Officer	0124 -4593030	9818174676
Installation Manager	Samarth Kaji	0261-2292530	9687687771
Head HSE	Vijay Kansagra	0261-2292434	9099994566
Suvali Process Control Room	On Duty CCR Engineer	0261-2292500	----

Rev. 02

GOVERNMENT AGENCIES			
Authority	Contact Person	Email id	Contact Details
Gujarat Maritime Board (GMB)	Control Centre	----	0261- 2470533/2463781
INDIAN COAST GUARD (ICG)	Control Room	mrcc-west@indiancoastgurad.nic.in	022-24316558/022-24383146
ODAG	Control Room	----	022-22181424/022-22151906
MRCC Mumbai (Bombay) COAST GUARD REGIONAL HQ – West	Control Room	mrcc-west@indiancoastguard.nic.in	91-22-243-88065

WEATHER FORECAST SERVICES		
Service Provider	Contact Person	Contact Details
SKYMET	CONTROL ROOM	0120 - 4094500
STORMGEO	CONTROL ROOM	+ 4755706170



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INDIA NON JUDICIAL Government of Gujarat Certificate of Stamp Duty

Tr. No. 58/2026
Date 6 MAR 2026

IN-GJ65589183321394Y

Certificate No.	: IN-GJ65589183321394Y
Certificate Issued Date	: 12-Jan-2026 11:14 AM
Account Reference	: IMPACC (SV)/ gj13105704/ SURAT/ GJ-SU
Unique Doc. Reference	: SUBIN-GJGJ1310570472145099765984Y
Purchased by	: VEDANTA LIMITED CAIRN OIL AND GAS
Description of Document	: Article 5(h) Agreement (not otherwise provided for)
Description	: MEMORANDUM OF UNDERSTANDING
Consideration Price (Rs.)	: 0 (Zero)
First Party	: VEDANTA LIMITED CAIRN OIL AND GAS
Second Party	: RELIANCE INDUSTRIES LIMITED AND OTHERS
Stamp Duty Paid By	: VEDANTA LIMITED CAIRN OIL AND GAS
Stamp Duty Amount(Rs.)	: 300 (Three Hundred only)



₹300



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Statutory Alert

1. The authenticity of this Stamp certificate should be verified at www.ahlicstamp.com/ or using e-Stamp Mobile App of Stock Holding. Any discrepancy in the details on this Certificate and as available on the website / Mobile App renders it invalid.
2. The onus of checking the legitimacy is on the users of the certificate.
3. In case of any discrepancy please inform the Competent Authority.

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MEMORANDUM OF UNDERSTANDING

This Memorandum of Understanding (hereinafter referred to as "MoU") is made and executed at SURAT on this 01 day of Nov 2025 (hereinafter referred to as "Effective Date").

BETWEEN

Reliance Industries Limited (CIN L17110MH1973PLC019786), a company duly incorporated and registered under the provisions of the erstwhile Companies Act, 1956, having its registered office at 3rd floor, Maker Chambers - IV, 222 Nariman Point, Mumbai, Maharashtra - 400 021 and having one of its manufacturing division styled as "**Hazira Manufacturing Division**", situated at Village - Mora, P. O. - Bhatha. Surat - Hazira Road, District - Surat, Gujarat - 394 510, represented herein through its Power of Attorney holder **Mr. Amardeep Desai** (hereinafter referred to as "**RIL**"), which expression shall, unless repugnant to the meaning or context thereof, be deemed to mean and include its successor(s)-in-title and permitted assign(s).

AND

AMNS Ports Hazira Limited (CIN: U13100GJ2004PLC043477), a company duly incorporated and registered under the provisions of the erstwhile Companies Act, 1956, having its registered office at AMNS House, AMNS Township, 27th K.M., Hazira Road, Surat, Gujarat, India- 394270 represented herein through its Power of Attorney holder **Capt. Rituparn Raghuvanshi** (hereinafter referred to as "**APHL**"), which expression shall, unless repugnant to the meaning or context thereof, be deemed to mean and include its successor(s)-in-title and permitted assign(s).

AND

Sun Petrochemicals Private Limited (CIN : U24219GJ1995PTC028519), a Company duly incorporated and registered under the provisions of the erstwhile Companies Act, 1956, having its registered office at 4th Floor, R K Centre, Fatehgunj Main Road, Vadodara, Gujarat - 390 002 and having its site at Village & P.O. Hazira, Surat, Gujarat - 394 270, represented herein through its Power of Attorney **Mr. Hitendrasinh Atodariya** (hereinafter referred to as "**SunPetro**"), which expression shall, unless repugnant to the meaning or context thereof, be deemed to mean and include its successor(s)-in-title and permitted assign(s).

AND

Hazira Port Private Limited (CIN: U63010GJ2000PTC038781), a company duly incorporated and registered under the provisions of the erstwhile Companies Act, 1956, having its registered office at Office No. 2008, The Address, Westgate - D Block, Nr. YMCA Club, S. G. Highway, Makarba, Ahmedabad, Gujarat, India - 380051, represented herein through its Power of Attorney holder **Capt. Ankur Basu** (hereinafter referred to as "HPPL"), which expression shall, unless repugnant to the meaning or context thereof, be deemed to mean and include its successor(s)-in-title and permitted assign(s).

AND

Adani Hazira Port Limited (CIN: U45209GJ2009PLC058789), a company duly incorporated and registered under the provisions of the erstwhile Companies Act, 1956, having its registered office at Adani Corporate House, Shantigram, Near Vaishno Devi Circle, S. G. Highway, Khodiyar, NA, Ahmedabad, Ahmedabad- 382421, Gujarat, India, represented herein through its Power of Attorney holder **Capt. Pankaj Kumar Sinha** (hereinafter referred to as "AHPL"), which expression shall, unless repugnant to the meaning or context thereof, be deemed to mean and include its successor(s)-in-title and permitted assign(s).

AND

Vedanta Limited (Cairn Oil & Gas) (CIN: L11101MH2006PLC163934), a company duly incorporated and registered under the provisions of the erstwhile Companies Act, 1956, having its registered office at 101, 1st Floor, C Wing, Business Square, Andheri Kurla, Andheri (E), Mumbai, Maharashtra - 400 059 and having its corporate office at Vedanta Limited, Cairn Oil & Gas, Plot 362, 363, ASF Center, Jwala Mill Road, Phase-4, Udyog Vihar, Sector-18, represented herein through its Power of Attorney holder **Mr. Samarth Kaji** (hereinafter referred to as "CIL"), which expression shall, unless repugnant to the meaning or context thereof, be deemed to mean and include its successor(s)-in-title and permitted assign(s).

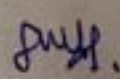
RIL, APHL, SunPetro, HPPL, AHPL, and Vedanta Limited (Cairn Oil & Gas) may hereinafter be collectively referred to as "Parties" and individually as "Party".

PREAMBLE

WHEREAS RIL owns and maintains captive jetties at its Hazira Manufacturing Division and a SPM within the limits of Magdalla Port for loading and unloading of raw material and final products through vessels;

AND WHEREAS APHL owns and maintains Captive Deep-Water Bulk Terminal Facility at Hazira, within the limits of Magdalla Port for loading and unloading of raw material and finished good products through vessels.

AND WHEREAS SunPetro- India is operating an offshore oil and gas platform "Alfa Bob" at Gulf of



Cambay, Land Based Drilling Platform (LBDP), and four 12" sub-sea pipelines running to oil & gas processing facilities at Hazira which is in close vicinity of the facilities of AHPL and HPPL;

AND WHEREAS HPPL owns and maintains a Port Facility at Hazira which includes an LNG jetty;

AND WHEREAS AHPL owns and maintains a multipurpose terminal (including bulk terminal & liquid terminal) and container terminal at its port at Hazira;

AND WHEREAS Vedanta Limited (Cairn Oil & Gas) is operating offshore oil & gas platforms "Lakshmi Alpha, Lakshmi Bravo & Gauri Alpha" in the Gulf of Cambay and 24"/12" sub-sea pipeline running to oil & gas processing facilities at Suvali, Hazira;

AND WHEREAS there is likelihood of oil spillage due to large number of ships being handled by the Parties, in the Response Area, to meet their respective operational requirements;

AND WHEREAS as per requirements of Indian Coast Guard, each of the Parties is under an obligation to prepare oil spillage contingency plan and submit the same to the Coast Guard for its approval;

AND WHEREAS the equipment possessed by the Parties in their individual capacity are not sufficient to cater the requirement as stipulated by the Indian Coast Guard;

AND WHEREAS Coast Guard has provided its guidance that Parties may enter into a Memorandum of Understanding with any other oil handling agency so as to meet the requirements stipulated by the Indian Coast Guard;

AND WHEREAS for the aforementioned purpose, the Parties have agreed to enter into this Memorandum of Understanding.

NOW THEREFORE Parties agree as follows:

1. OBJECTIVE

1.1 The objective of this MoU is to provide co-operation, co-ordination, and mutual assistance to the Party responding to oil spillage contingency in Response Area.

2. EFFECT OF MoU

2.1 This MoU merely constitutes a statement of mutual intention of the Parties and does not create an obligation for any Party to provide Oil Spillage Response Assistance to the Requesting Party.

2.2 Notwithstanding Article 2.1 above, if the Party agrees to provide Oil Spillage Response Assistance to the Requesting Party, the provisions of this MoU shall govern the relationship between the Requesting Party & the Providing Party and shall be binding to each other.

3. DEFINITIONS

In this MoU, the terms listed below shall, unless the context requires otherwise, have the meanings attached to them. These terms may be identified by the capitalisation of the first letter



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of each principal word thereof:

- 3.1 "Cost of Assistance" shall have the meaning given to it under Article 7.1.
- 3.2 "Confidential Information" shall have the meaning given to it under Article 9.1.
- 3.3 "Equipment" shall include the vessels, equipment, materials, etc., more particularly described in the Equipment Schedule, which each Party intends to keep in readiness for providing Oil Spillage Response Assistance.
- 3.4 "Designated Representative" shall have the meaning given to it under Article 5.1.
- 3.5 "MoU" shall mean this Memorandum of Understanding.
- 3.6 "Oil Spillage Response Assistance" shall mean the assistance which the Providing Party has, at the request of the Requesting Party, agreed to provide to meet the contingencies arising out of oil spillage in the Response Area.
- 3.7 "Providing Party" shall mean the Party which, at the request of the Requesting Party, agrees to provide the Oil Spillage Response Assistance.
- 3.8 "Requesting Party" shall mean the Party who shall request the Providing Party to provide the Oil Spillage Response Assistance.
- 3.9 "Response Area" shall mean the area within the limits of Hazira & Magdalla Port.

4. OIL SPILLAGE RESPONSE ASSISTANCE

4.1 Oil Spillage Response Assistance

A Party may, in its discretion, agree to provide Oil Spillage Response Assistance to the Requesting Party in the event of any contingency arising out of oil spillage in the Response Area.

4.2 Manner of Assistance

In case a Party agrees to provide Oil Spillage Response Assistance to the Requesting Party in terms of Article 4.1(a), both the Parties i.e., Requesting Party & Providing Party shall promptly agree upon the manner and method upon which such assistance shall be provided.

4.3 Termination of Oil Spillage Response Assistance

While providing Oil Spillage Response Assistance, if any sort of contingency arises to the Providing Party, the Providing Party shall have the right to terminate Oil Spillage Response Assistance and recall any or all personnel and/or equipment deployed to provide Oil Spillage Response Assistance.

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4.4 Obligations of Requesting Party on Demobilization

- a) When Oil Spillage Response Assistance is no longer required by the Requesting Party or when Providing Party ceases to provide/terminates its Oil Spillage Response Assistance pursuant to Article 4.3(a) above, the Requesting Party shall, in addition to payment of cost in accordance with Article 7.1, at its expense:
- i) co-ordinate with the Providing Party in return of deployed personnel and Equipment to their or its original mobilisation location as the Providing Party directs. If the personnel and Equipment are directed to a location other than their or its original mobilisation location, appropriate adjustments shall be made to the demobilisation cost.

4.5 Illegal, Unsafe or Improper Instructions

- a) If the Requesting Party instructs the Providing Party to act under this MoU in a manner that would, based on the reasonable judgement of the Providing Party:
- i) be illegal;
- ii) endanger the safety of any employee, agent, contractor or sub-contractor of the Providing Party, or any third party or property thereof, or jeopardise the safety of Equipment of Providing Party in a manner not reasonable given the nature of oil spillage response industry;
- iii) be against the object of this MoU; or
- iv) cause Providing Party to incur non-contractual liability to any third party.

then Providing Party may refuse to follow such instructions by giving Requesting Party verbal notice of such refusal.

5 REQUEST FOR ASSISTANCE

5.1 List of Authorised Individuals

- a) Within the period of 10 days from the date of execution of this MoU, each Party shall designate, by a written notice to the other Parties, an individual who shall be designated as sole representative (hereinafter referred to as "**Designated Representative**") for the purpose of this MoU. Such designation does not prevent customary operating communications with the Party's personnel in the course of providing Oil Spillage Response Assistance. If a Party changes its Designated Representative, it shall forthwith notify the other Parties of such change and shall also provide the contact details of newly Designated Representative.
- b) The Requesting Party shall also designate an on-site incident controller who will be in control and overall in-charge of the situation. The on-site incident controller shall be familiar with the contingency response strategies and response plans and will solely be responsible for the Requesting Party's on-site emergency management.

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5.2 Request for Assistance

- a) Only Designated Representative shall be authorised to request for Oil Spillage Response Assistance.
- b) Request for Oil Spillage Response Assistance shall be made and accepted, in writing, by the Designated Representatives of the respective Parties.
- c) Request for Assistance must specify the:
 - i) approximate location and size of the spill;
 - ii) approximate quantity of the oil spilled;
 - iii) type of oil spilled; and
 - iv) nature and extent of Oil Spillage Response Assistance required.
- d) If a Party confirms to the Requesting Party of its intention to provide Oil Spillage Response Assistance, both the Parties shall promptly agree to the manner and method upon which such assistance shall be provided.

6 RESPONSE EQUIPMENT & MATERIAL

6.1 Equipment

- a) Parties have agreed on an **Equipment Schedule (Annexure - 1)** which sets out the Equipment with their respective quantities that each Party intends to keep in readiness for providing Oil Spillage Response Assistance;
- b) Requesting Party shall exercise due care and diligence and provide direction consistent with the care and protection of the Equipment.
- c) Requesting Party agrees that the Equipment of the Providing Party shall be utilised in existing condition of the equipment.

6.2 Mobilisation of Equipment

All Equipment shall be moved from its original mobilisation location and returned to such location by and at the sole risk and expense of the Requesting Party.


6.3 Each Party shall share/disclose, on yearly basis, to other Parties the Equipment (along with quantity) so as to ensure that it maintains, at all times during the validity of this MoU, the Equipment which it has agreed to keep in readiness to provide Oil Spillage Response Assistance.

7 COST OF ASSISTANCE

7.1 Cost of Assistance shall mean the expenses incurred by the Providing Party against Oil Spillage Response Assistance provided pursuant to this MoU, which shall include:

- a) Cost of material

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- i) Requesting Party shall, within 30 days from the date on which the Providing Party ceases to provide Oil Spillage Response Assistance including termination of Oil Spillage Response Assistance in terms of Article 4.3, return all materials supplied to it by the Providing Party or reimburse the equivalent replacement value of the material, as the case may be.

b) Cost of equipment

- i) While providing Oil Spillage Response Assistance, if:
- A) any equipment of the Providing Party is lost or becomes unfit for further use; or
 - B) any equipment of the Providing Party is damaged,

due to any reason of whatsoever nature, the Requesting Party shall, within 30 days from the date on which the Providing Party ceases to provide Oil Spillage Response Assistance including termination of Oil Spillage Response Assistance in terms of Article 4.3, provide a new equipment of the similar nature/description or reimburse the equivalent replacement value of the equipment or get the equipment repaired up to the satisfaction of the Providing Party.

c) If the Requesting Party fails to:

- i) return all material used in providing Oil Spillage Response Assistance or reimburse the equivalent replacement value of the same, in the manner prescribed under Article 7.1(a)(i); or
- ii) provide a new equipment of the similar nature/description or reimburse the equivalent replacement value of the equipment or get the equipment repaired up to the satisfaction of the Providing Party, in the manner prescribed under Article 7.1(b)(ii)

The Providing Party shall be at liberty to purchase the new material/new equipment or get the damaged equipment repaired, at its own cost, and in that case, the Requesting Party shall, within 10 days of the demand from the Providing Party, reimburse the Requesting Party towards the cost of purchase of new material/new equipment or the cost of repairing of equipment, as the case may be.

- d) Where the equipment's are covered by insurance, the Providing Party shall not be obliged to seek reimbursement under any insurance policy as a condition precedent for invoking Requesting Party's obligation to pay under this Article 7.1(b) above.
- e) For the purpose of abovementioned Articles 7.1(a) & 7.1(b), the Providing Party shall, immediately on cessation of Oil Spillage Response Assistance including termination of Oil Spillage Response Assistance in terms of Article 4.3, provide the Requesting Party the list of materials along with quantity supplied and consumed and list of equipment's damaged or lost, while providing Oil Spillage Response Assistance.

f) Personnel Charges

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- i) The Requesting Party shall, within 10 days of demand from the Providing Party, pay the charges for manpower (hereinafter referred to as "Personnel Charges") supplied to the Requesting Party for providing Oil Spillage Response Assistance.
- ii) Personnel Charges shall be paid @ 1.5 times of the hourly charges which the Providing Party pays to their personnel.

g) Cost of mobilisation and demobilisation

- i) The Requesting Party shall, within 10 days of demand from the Providing Party, pay all expenses, if any, incurred by the Providing Party towards mobilization and demobilization of the Equipment
- h) any other charges which have been specifically mentioned in the Equipment Schedule. Such charges shall be paid within 30 days from the date on which the Providing Party ceases to provide Oil Spillage Response Assistance including termination of Oil Spillage Response Assistance in terms of Article 4.3.

8 EXCHANGE OF INFORMATION & JOINT DRILLS

8.1 Parties intend, as far as reasonably practical, to disclose and exchange all relevant information with regard to its contingency response plan to each other.

8.2 The Parties intend to conduct periodical joint drills at such times and place as may be agreed by and between the Parties from time to time.

9 CONFIDENTIALITY

9.1 Providing Party shall keep confidential all information that pertains to amount of oil spilled, the cause of incident, or other information which the Requesting Party notifies the Providing Party as being confidential, subject to the following specific exceptions where the Confidential Information will no longer be subject to such obligations of confidentiality:

- a) where the Confidential Information was already in possession of the Providing Party;
- b) where the Confidential Information becomes generally available to the public other than as a result of an unauthorised disclosure by the Providing Party;
- c) if the Providing Party is required to disclose Confidential Information to comply with applicable laws or any order or decree of court, regulatory, statutory, or other authority, the Providing Party shall, as soon as reasonably practicable, notify (if permitted by law) the Requesting Party in writing of the particulars and shall cooperate with the Requesting Party's efforts to prevent or limit any required disclosure such as by obtaining a protective order. If the Requesting Party is unable (or declines) to obtain relief from the disclosure requirement, the Providing Party may make such disclosure.
- d) where the Confidential Information becomes available to the Providing Party on a non-confidential basis from a source other than the Requesting Party;
- e) where release of Confidential Information is authorised by the Requesting Party.

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10 INDEMNITY

10.1 The Requesting Party shall be liable for, and shall defend, indemnify and hold the Providing Party, its directors, officers, shareholders, employees, agents, contractors, or sub-contractors harmless from and against any claims, losses, damages, actions, proceedings, costs, expenses, and liabilities in connection with:

- a) loss of or damage to third party's property; or
- b) death of or injury to any person belonging to any third party, or the Providing Party, or the Requesting Party, as the case may be arising out of or in connection with Oil Spillage Response Assistance pursuant to this MoU, regardless of the fact that such damage, loss, injury, or death occurs due to negligence, omission, or default of the Providing Party its directors, officers, shareholders, employees, agents, contractors, or sub-contractors.

10.2 Notwithstanding anything contained in this MoU, under no circumstances, whether under tort or contract, and regardless of any omission, fault, negligence, error, or mistake, shall the Providing Party be liable to the Requesting Party for any acts of omission or commission under this MoU, including while providing Oil Spillage Response Assistance.

10.3 The Providing Party shall not be required to exhaust its resources against any insurance policy or third party as a condition precedent for claiming indemnification under this Article.

11 EXCLUSION OF LIABILITY

11.1 The Providing Party shall, in no way, be made responsible for loss or damage of any of the properties of the Requesting Party while providing Oil Spillage Response Assistance.

12 PRESENTATION BEFORE GOVERNMENT AUTHORITIES

12.1 Each Party to this MoU shall, till this MoU is in force, be at liberty to submit this MoU before any Government Authority as a part of its Oil Spillage contingency response requirements

13 STATUS OF PROVIDING PARTY

13.1 For the purpose of this MoU, neither the Providing Party nor its employees, agents, contractors, or sub-contractors shall be considered as employees of the Requesting Party.

13.2 Nothing in this MoU shall create a partnership, joint venture, or association of the persons between the Parties. No Party shall, by virtue of this MoU, have the power or authority to enter into any agreement or execute any other document, to act on behalf of or otherwise bind the Party as to any matter or thing, to be done in relation to this MoU.

14 TERM, EXIT, AND TERMINATION

14.1 Term

a) This MoU shall come into force on Effective Date and shall, unless terminated earlier, continue

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to remain in force for the initial period of 5 years.

- b) On expiration, this MoU may be renewed on such revised terms and conditions and for such further period as may be mutually agreed by and between the Parties at that time.

14.2 Exit

- a) Each Party shall, at any time, have right to exit from this MoU by giving 15 days advance written notice to the other Parties.
- b) Exit of a Party from this MoU shall not affect the existence and validity of this MoU between the remaining Parties and remaining Parties shall continue to be governed by this MoU.
- c) Exit of a Party from this MoU shall not affect the right of any Party to recover the Cost of Assistance, if any, for the Oil Spillage Response Assistance provided before exit.

14.3 Termination

- a) This MoU can, at any time, be terminated with the written consent of all the existing Parties to this MoU by issuing a written letter of termination duly signed by each existing Party.
- b) Termination of this MoU shall not affect the right of a Party to recover the Cost of Assistance, if any, for the Oil Spillage Response Assistance provided before the termination.

15 NOTICES

- 15.1 Any notice required to be served under this MoU shall be in English and shall be deemed to be properly, sufficiently and effectually served if dispatched by hand delivery, registered post acknowledgement due, or by any other recognised means of recorded delivery, to the addresses of the respective Designated Representatives.

16 GOVERNING LAW & DISPUTE RESOLUTION

16.1 Governing Law

- a) The validity, construction, and performance of this MoU shall be governed and interpreted in accordance with the laws of India with competent Courts at Surat having exclusive jurisdiction in this regard.

16.2 Dispute Resolution

- a) In the event of a dispute, controversy, or claim arising out of or relating to this MoU, or the termination or invalidity thereof (hereinafter collectively referred to as "Dispute"), the Parties shall use their best efforts to settle promptly such dispute through direct negotiation.
- b) Any dispute that is not settled within sixty (60) days from the date a Party has notified the other Party of the nature of the dispute and of the measures that should be taken to rectify, it shall be resolved through consultation between the executive heads of the Parties. Each Party shall give full and sympathetic consideration to any proposal advanced by another to settle amicably any

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matter for which no provision has been made or any controversy as to the interpretation or application of this Memorandum of Understanding.

- c) Any dispute, which could not be settled by the Parties through the process mentioned in the abovementioned Article 16.2(a) & (b), shall be finally settled by arbitration, to be conducted in accordance with The Indian Arbitration and Conciliation Act, 1996. Such arbitration shall, unless otherwise agreed between the Parties in writing, be held at Surat, Gujarat, India and arbitration proceedings shall be conducted in English language only. The award given by the arbitrator or shall be final and binding upon the Parties.

17 INCLUSION OF NEW PARTY

- 17.1 Subject to prior written approval/confirmation of each Party, the Parties shall be at liberty to include any new party to be part of this MoU.

18 AMENDMENTS

- 18.1 This MoU may be altered or modified by the Parties by agreement in writing but not otherwise.

19 COUNTERPARTS

- 19.1 This MoU may be executed in any number of counterparts, each of which together shall constitute a single MoU.



















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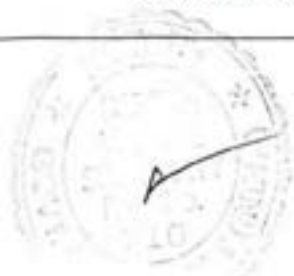
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IN WITNESS WHEREOF, this MOU has been executed on the day and year first above written.

SIGNED, SEALED, AND DELIVERED FOR :

Signature	Photo	Thumb Impression
<p>For Reliance Industries Ltd.</p>   <p>Mr. Amardeep Desai</p>		
<p>For AMNS Ports Hazira Limited</p>   <p>Capt. Rituparn Raghuvanshi</p>		
<p>For Sun Petrochemicals Pvt. Ltd.</p>   <p>Mr. Hitendrasinh Atodariya</p>		
<p>For Hazira Port Private Ltd.</p>   <p>Capt. Ankur Basu</p>		



For Adani Hazira Private Ltd.



Capt. Pankaj Kumar Sinha



For Vedanta Limited (Cairn Oil & Gas)



Mr. Samarth Kaji



WITNESSES :

SIGNATURE	THUMB IMPRESSION
1. 	
2. 	

BEFORE ME

DIPESH V. DAVE
NOTARY
SURAT CITY
State of Gujarat

My Commission
Expires On
15 February 2029

Sr. No. 58/2026
Date.. 6 MAR 2026



**Annexure-I
(Equipment Schedule)**

[A.] RIL Equipment List

Sr. No.	List of Equipments/ Materials	Quantity	Mode of Recovery	Time Limit	Remarks
	Inflatable Boom	3 Nos. x 100 Mtr.	As per Article 7	As per Article 7	To use the Boom, one tug and boat are minimum requirements
2	Skimmer (20 TPH)	1 No. x 20 TPTI	"	"	Tug and Boat are required
3	Sorbent Boom	400 Mtr.	"	"	To use the Boom, one tug is required
4	Sorbent Pads	1000 Nos.	"	"	-
5	Shore Clean-up Mini Vacuum Pump	2 Nos. x 24 M ³ /hour	"	"	-
6	Tanks on Tugs Reltug Three	1 No. x 2.11 M3	"	"	-
7	Tanks on Tugs Reltug Four	1 No. x 2.11 M3	"	"	-
8	OSD Spraying System	2	"	"	Installed on Reltug Three and Four
9	Oil Spill Dispersant	2000 Ltrs.	"	"	Rochem Type -III (1000 Ltrs. each on Reltug Three and Reltug Four.
10	Shoreline Response Equipment Diaphragm Pump	1 No. x 0.4 M ³ /hour	"	"	-
11	Shoreline Response Equipment Sorbent Pads	100 Nos.	"	"	-
12	Oil Spill Response Craft	Reltug Three and Reltug Four	Rs. 2,00,000/- Per Day	"	Tugs provided with Spray Facility
13.	Oil Spill Response Craft	Reltug One / Reltug Two or equivalent substitute	Rs. 1,00,000/- Per Day	"	-

Tugs Charges : Rs. 2 Lac/day + Fuel Cost

Work Boat : Rs. 1 Lac/day + Fuel Cost

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[B.] AMNS Ports Hazira Limited (A PHL) Equipment List

Sr. No.	List of equipment / Materials	Qty	Mode of Recovery	Time Limit	Remarks
1	Inflatable Boom (Meters) with accessories	300 Mtrs	As per Article 7	As per Article 7	To use the Boom, one tug and boat are minimum requirements
2	Skimmer (20 TPH)	1 No	"	"	Tug and Boat are required
3	Sorbent Pads- 20 inch*20 inch (Nos)	150 Nos	"	"	Tug and Boat are required
4	Portable oil temporary storage capacity-5 m3	2 Nos	"	"	-
5	Work Boat	1 No	"	"	-
6	Tug	1 No	"	"	-
7	Gloves	10 Pairs	"	"	-
8	Coveralls	10 Nos	"	"	-
9	Safety Glasses	10 Nos	"	"	-
10	Gum Shoes	10 Pairs	"	"	-
11	Fire Hose RRL - 25 mtr each - 38 mm (With 63 mm couplings)	5 Nos	"	"	-

Tugs Charges : 2 Lac/day + Fuel Cost

Work Boat : 1 Lac/day + Fuel Cost



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[C.] SunPetro Equipment List

Sr. No.	List of Equipments / Materials	Quantity	Mode of Recovery	Time Limit	Remarks
	Support Vessel - TUG Falaknazz I	1 Nos	As per Article 7	As per Article 7	Will be away from the plant to the minimum time possible
2.	Foam Compound (AFFP 3%)	2000 Ltr	"	"	-
3.	Foam Trolley (with towing arrangement)	600 Ltr.	"	"	300 Ltr each x 2 Nos.
4.	Oil Dispersant (Type II and Type III)	400 Ltr.	"	"	-
5.	Clinical Facilities	1 No.	"	"	Only for Stabilization of the patient
6.	Deflection Boom (Vikoma 10 X Sentinel 750 PU Boom (20 m Section) total 200 meters. Can be mounted on tug laid with the help of boat.	200 Mtrs. Length	"	"	To use the Boom, one tug and boat are minimum requirements
7.	Security Personnel	As Available	"	"	-

Tugs Charges : 2 Lac/day + Fuel Cost

Work Boat : 1 Lac/day + Fuel Cost



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 SHHudaya

(D.) Hazira Port Pvt. Ltd. (HPPL) Equipment List

Sr. No.	Description	Quantity	Mode of Recovery	Time Limit	Remarks
1	Inflatable Booms with accessories (Material: Neoprene /rubber/Neoprene rubber)- meters	600 m	As per Article 7	As per Article 7	-
2	Power packs for boom - numbers	2nos	"	"	-
3	Fence boom (Material: Neoprene/rubber/Neoprene rubber/ PU/ PV)	200 m	"	"	To use the Boom, One Tug and Boat are minimum requirements
4	Skimmer - (20TPH)	2 Nos	"	"	-
5	OSD Applicator with Spray arms type along with 02 Nozzles system and 02 hand lancers (No.)	1 nos	"	"	-
6	Oil Spill Dispersant (Chemical Dispersant) (litres)	1000 Ltrs	"	"	-
7	Flex Barge 10 Tons (no.)	2 nos	"	"	-
8	Integrated containment cum recovery system with power pack and accessories (nos)	1 nos	"	"	-
9	Sorbent pads	500 nos	"	"	-
10	Sorbent booms	100 m	"	"	-
Shore Clean-up equipment					
11	Mini Vacuum pumps capacity 25 m3	1 nos	"	"	-
12	Portable Oil temporary storage facility capacity 10 m3	2 nos	"	"	-
13	200 metres Shoreline sealing boom with power pack and accessories (material: Neoprene/rubber/Neoprene rubber) (nos.)	2 nos	"	"	-

For Oil Spill Dispersant, HPPL would need about 6 hours to load the OSD on tugs. This period shall be included in the on-hire period for the Tugs.

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[E.] Adani Hazira Port Limited (AHPL) Equipment List:

Sr. No.	List of Equipments / Materials	Quantity	Mode of Recovery	Time Limit	Remarks
1.	Inflatable boom with accessories (Material: Neoprene/ Neoprene Rubber/ Rubber) with 04 power pack (Meter)	600	As per Article 7	As per Article 7	-
2.	Fence Boom (Material: Neoprene/ Neoprene Rubber/ Rubber) with freeboard of 450mm and over all height of 1200mm and length of 100m etc. complete as per specifications (Meter)	600	"	"	-
3.	Drum/ brush type oil skimmer 50 m ³ /hr capacity oil recovery free floating skimmer, along with suitable pump and hydraulic Power Pack complete with all accessories etc. complete as per specifications. (Nos.)	2	"	"	-
4.	OSD Applicator with spray arm type along with 02 Nozzles and 02 hand lancers (Nos)	5	"	"	-
5.	Oil Spill Dispersant, concentrate type-3 combined, approved by the Indian Coast Guard (liter)	11000	"	"	-
6.	Bioremediation (Liter)	1000	"	"	-
7.	Flex Barge of about 10 tons. along with its accessories. (Nos.)	4	"	"	-
8.	Sorbent Boom size (Min. Dia -5-inch, Min Length - 5 feet) (Nos.)	20	"	"	-
9.	Sorbent pads 1. 20-inch x 20 inch(nos), 2. 19-inch x 16 inch(nos), 3. 40-inch x 50 inch(nos)	800	"	"	-
10.	Mini Vacuum Pump Capacity 25 m3 (Nos.)	1	"	"	-
11.	VOC Portable Monitor (Nos.)	4	"	"	-

Answer *checked: A. S. Mani* *July 24/2019*
CH/Indigo

Sr. No.	List of Equipments / Materials	Quantity	Mode of Recovery	Time Limit	Remarks
12.	Tugs usage charges	4 Tugs	2 Lac/day	"	-

*For Oil Spill Dispersant, AHPPL would need about 6 hours to load the OSD on tugs. This period will be included in the on-hire period for the tugs.

Tugs Charges : 2 Lac/day + Fuel Cost
 Work Boat : 1 Lac/day + Fuel Cost



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[F.] Vedanta Limited (Cairn Oil & Gas) Equipment List:

Sr. No.	List of Equipments / Materials	Quantity	Mode of Recovery	Time Limit	Remarks
1.	Production Support Vessel	1 No.	As per Article 7	As per Article 7	-
2.	Helicopter (Bell412-Twin Engine)	1 No.	"	"	-
3.	Shore Sealing Boom	200 Mtrs.	"	"	-
4.	Deflection Boom	1200 Mtrs.	"	"	-
5.	Oil Skimmer	1 No.	"	"	-
6.	Foam Trolley (without Forklift)	1200 Ltrs.	"	"	-
7.	AFFF (3%) Foam	1400 Ltrs.	"	"	-
8.	SCBA Sets	3 Sets	"	"	-
9.	Breathing Air Cylinders for SCBA sets	3 sets	"	"	-
10.	DCP Fire Extinguisher - 10 Kg Capacity	15 Nos.	"	"	-
11.	Fire Hose RRL - 15m each - 63 mm	10 Hoses	"	"	-
12.	Fire Hose RRL - 25 m each 38mm (with 63mm couplings)	10 hoses	"	"	-
13.	Hand Gloves, Safety Glasses, Helmets, Safety Shoes	5 each	"	"	-

please.
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Sr. No.	List of Equipments / Materials	Quantity	Mode of Recovery	Time Limit	Remarks
14.	Oil Spill Dispersant (litres)	3000 Ltrs	"	"	-

Tugs Charges : 2 Lac/day + Fuel Cost
 Work Boat : 1 Lac/day + Fuel Cost



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 Date: ...
 S.H. ...