How smart engineering is helping unlock incremental reserves from a

32-year-old offshore field in India’s East Coast

For decades, the conversation around increasing oil and gas production has often centred on new discoveries, fresh drilling campaigns and large infrastructure investments. Yet some of the most significant gains can come from rethinking how existing assets operate.

A recent engineering intervention at the Ravva Field, located off India's East Coast, demonstrates how advanced production modelling and innovative problem-solving can unlock substantial additional value from mature assets, extending field life and improving recovery at a fraction of conventional development costs.

Ravva field in Andhra Pradesh was the beginning of Cairn’s operations in India, three decades ago. The field has been producing hydrocarbons, since, and has already achieved over 53% oil recovery – a significant milestone for any offshore producing asset. Like many mature fields, however, it faces a common challenge: declining reservoir pressure and increasing constraints on production performance as the asset ages.

Looking Beyond Conventional Solutions

Traditionally, reducing operating pressures in a producing system can involve significant facility modifications, new infrastructure and lengthy execution timelines. For mature assets, such investments are not always commercially attractive.

Instead, the team adopted a data-driven approach centred on integrated production system modelling. Using GAP and PROSPER software, Vedanta Oil & Gas’ engineers developed a comprehensive model linking reservoir performance, well behaviour and the surface network. The model was calibrated against actual production and pressure data and then subjected to extensive sensitivity analysis to evaluate future operating scenarios.

The exercise revealed a compelling opportunity to reduce terminal inlet pressure, which could materially improve deliverability, increase production rates and unlock reserves that would otherwise remain unrecovered. Based on the modelling outcomes, a surface optimisation project was designed to reduce terminal inlet pressure from 7 bar to 3 bar.

Lower backpressure improves the ability of wells to flow efficiently, particularly in mature fields where reservoir pressures are naturally declining. By optimising the surface network

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and removing a key production bottleneck, the project enabled wells to access additional production potential without the need for major redevelopment activity.

The project delivered a production increase of more than ~1,000 boepd, representing approximately 10% growth over existing production levels. More significantly, it unlocked incremental reserves of ~1.5 million barrels.

Compared with conventional development alternatives, the selected solution achieved more than 95% reduction in projected project costs and over 80% reduction in delivery timelines.

These results underline the growing importance of smart brownfield optimisation as the industry seeks to maximise recovery from existing assets while maintaining capital discipline.

An Enabler for India's Energy Security

As India's energy demand continues to grow, enhancing recovery from existing fields is becoming as important as discovering new resources. Mature assets across the country still hold considerable untapped potential, provided operators can identify and remove technical barriers to production.

The Ravva project highlights how digital tools, integrated reservoir and production modelling, and focused engineering interventions can generate meaningful production gains at low cost models. In an industry where marginal gains can translate into substantial resource additions, the ability to unlock 1.5 million barrels through a targeted surface intervention demonstrates the significant opportunities that remain hidden within mature assets.

For producing fields approaching the later stages of their lifecycle, the message is clear: innovation is not always about building something new. Sometimes, it is about seeing existing assets differently and finding smarter ways to get more from what already exists.

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