Paper 17: Ormen Lange Phase 3: A record-breaking subsea compression system

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Abstract:

One of Norway's most important and innovative subsea gas developments is paving the way for greater step-out distances and depths. The power system is a gamechanger for large-scale subsea processing equipment, having overcome the engineering challenges of powering and controlling high power gas compression at the world's longest step-out distance. A total of four wet gas compressors (WGC), each containing two contrarotating 4.15 MW motors and located at a water depth of 900 m, are supplied from two onshore variable speed drives (VSD) at a maximum frequency of 75 Hz over a 120 km long step-out distance. The qualification work was executed by OneSubsea and its sub suppliers, while assurance was carried out within Shell's Technical Authority (TA) system, based on a technology maturation plan (TMP) finally defined at FID. An extensive qualification programme was completed to close all the technology gaps, with 25 total quality activities (TQP) and guidance from industry practices: API-RP-17Q, API-RP-17N and DNV-RP-A203. The systems are successfully commissioned and started up in June 2025.