V.8.4.0

CAPABILITY STUDY

Whether it's extending the life of an existing subsea asset or adding new tie-backs, power and communications are predominately the highest risk services to your well.

Verlume has been at the forefront of alternatives to subsea umbilicals for over a decade and thus has a unique capability to evaluate full system architecture and implementation of mitigation strategies to ensure power and communications will not impede future well production.

REV VER01

Website
verlume.world

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STANDBY – ID: 3B-19 – LOAD: 41%
WARNING – TEMP: 64°C
PROCESSING – ID: 2A-89 – LATENCY: 14ms

Contact
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01 ENGINEERING SUBSEA ENERGY & CONTROL SYSTEM RESILIENCE

Verlume provides specialist concept, feasibility and FEED study support for offshore subsea systems, integrating power, communications, and control systems to deliver reliable, resilient and optimised solutions.

We ensure systems are designed for real-world operability, not theoretical performance.

02 ENGINEERING INSIGHT: POWER + COMMUNICATIONS ARE INTERDEPENDENT

Offshore subsea systems depend on:

- Reliable power delivery
- Continuous communication and control
- Integrity of the surface-to-subsea link

Failure of shared infrastructure (e.g., dynamic cables) can result in:

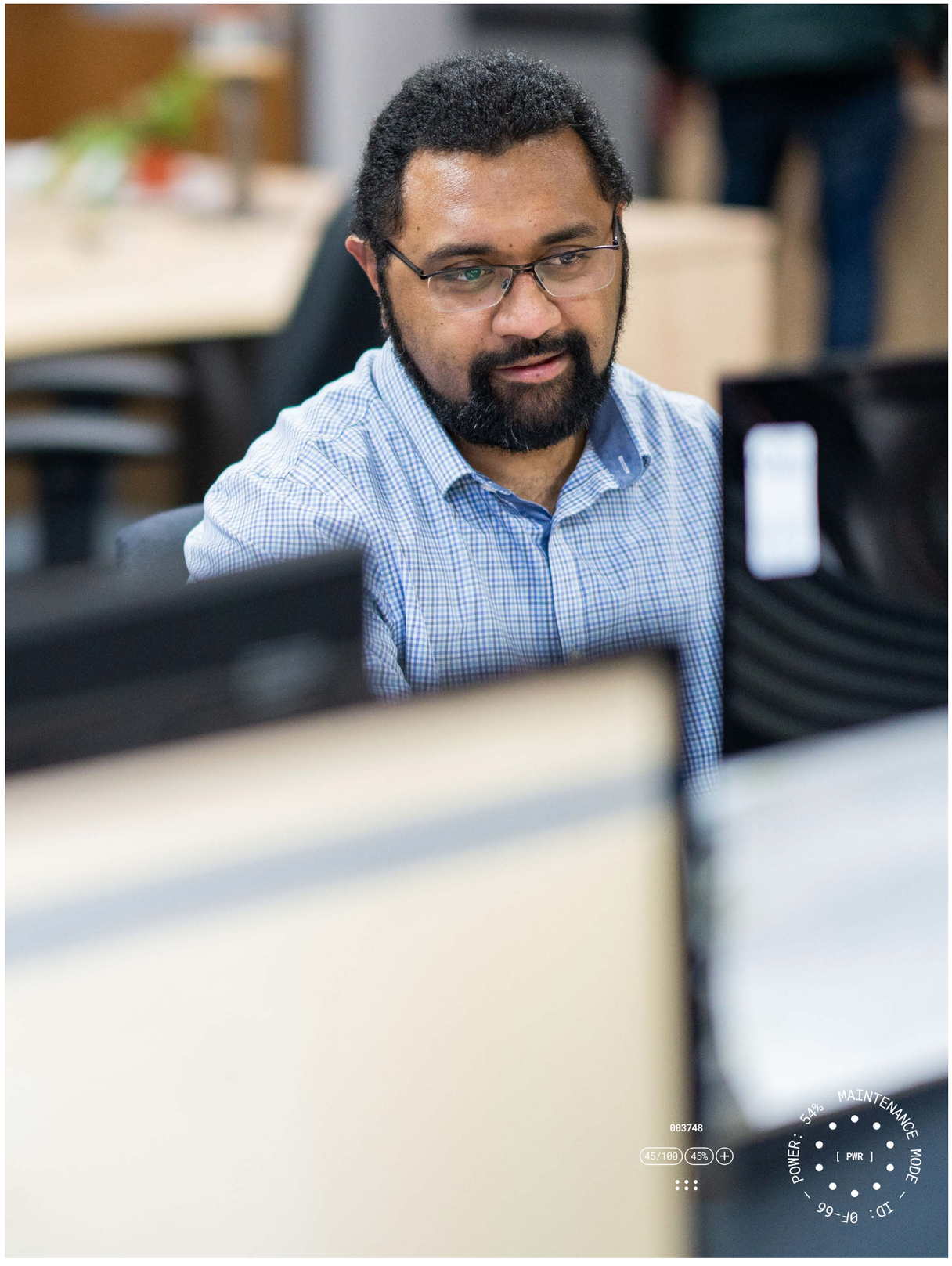
- Loss of power
- Loss of communications
- Loss of control

Integrated system design is therefore critical.

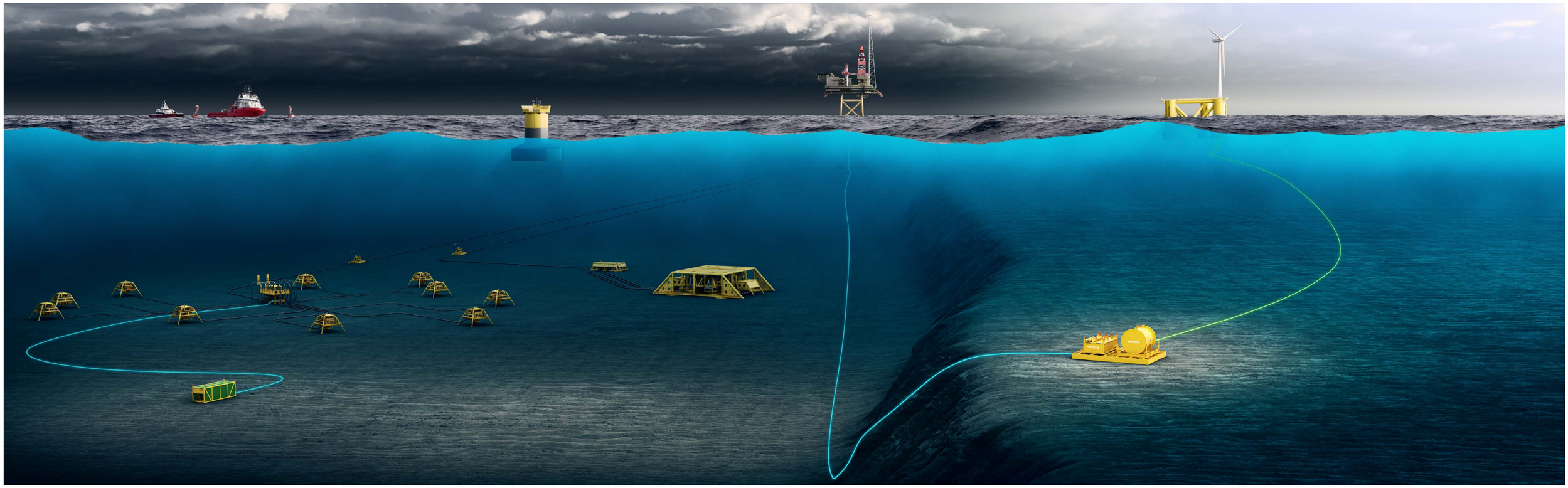
03 PROVIDING RESILIENCE THROUGH STUDIES

Verlume acts as the power and communications systems experts within multi-disciplinary teams, supporting operators, consultancies, and partners to:

Avoid costly umbilical replacements by extending the operating life of existing assets, while unlocking field extensions where infrastructure would otherwise constrain growth. Through effective management of peak power demand, reduce strain on umbilical power cores and enable rapid reinstatement of subsea power following failures. This approach strengthens the reliability of both power and communication networks, while optimising lifecycle performance and intervention strategies. It also supports the implementation of alternative power solutions, including the integration of renewables and power buoys, with systems designed to seamlessly integrate and package client hardware to meet specific application requirements.



VERLUME: CAPABILITY STUDY



End to end subsea system capability covering architecture, power and energy modelling, communications , and advanced reliability and safety analysis to deliver scalable, resilient performance.

04 SYSTEM ARCHITECTURE & INTEGRATION

Integrated power and communications system design is delivered through a structured approach to functional architecture development, both top down and bottom up, ensuring every element is aligned from concept to deployment. This is supported by modular system definition, enabling scalable and reliable solutions that can adapt to evolving operational requirements.

05 POWER & ENERGY MODELLING

Power and energy budgeting is underpinned by proprietary data, supporting detailed electrical system design and analysis alongside advanced modelling of power interruption and system autonomy, ensuring resilient performance under real-world operating conditions.

06 COMMUNICATIONS & CONTROL ARCHITECTURE

- Subsea communications system design (topside ↔ subsea)
- Interface definition between power, communications, and control
- Data availability and system uptime modelling
- Integration with subsea control systems

07 RELIABILITY, AVAILABILITY & FAILURE ANALYSIS

FMECA (Failure Modes, Effects and Criticality Analysis) is applied across both concept and FEED stages through functional assessment, and at detailed design level through hardware-specific analysis. This is supported by reusable, structured modelling approaches that ensure consistency, rigour and efficiency across projects.

08 RAM ANALYSIS (RELIABILITY, AVAILABILITY, MAINTAINABILITY)

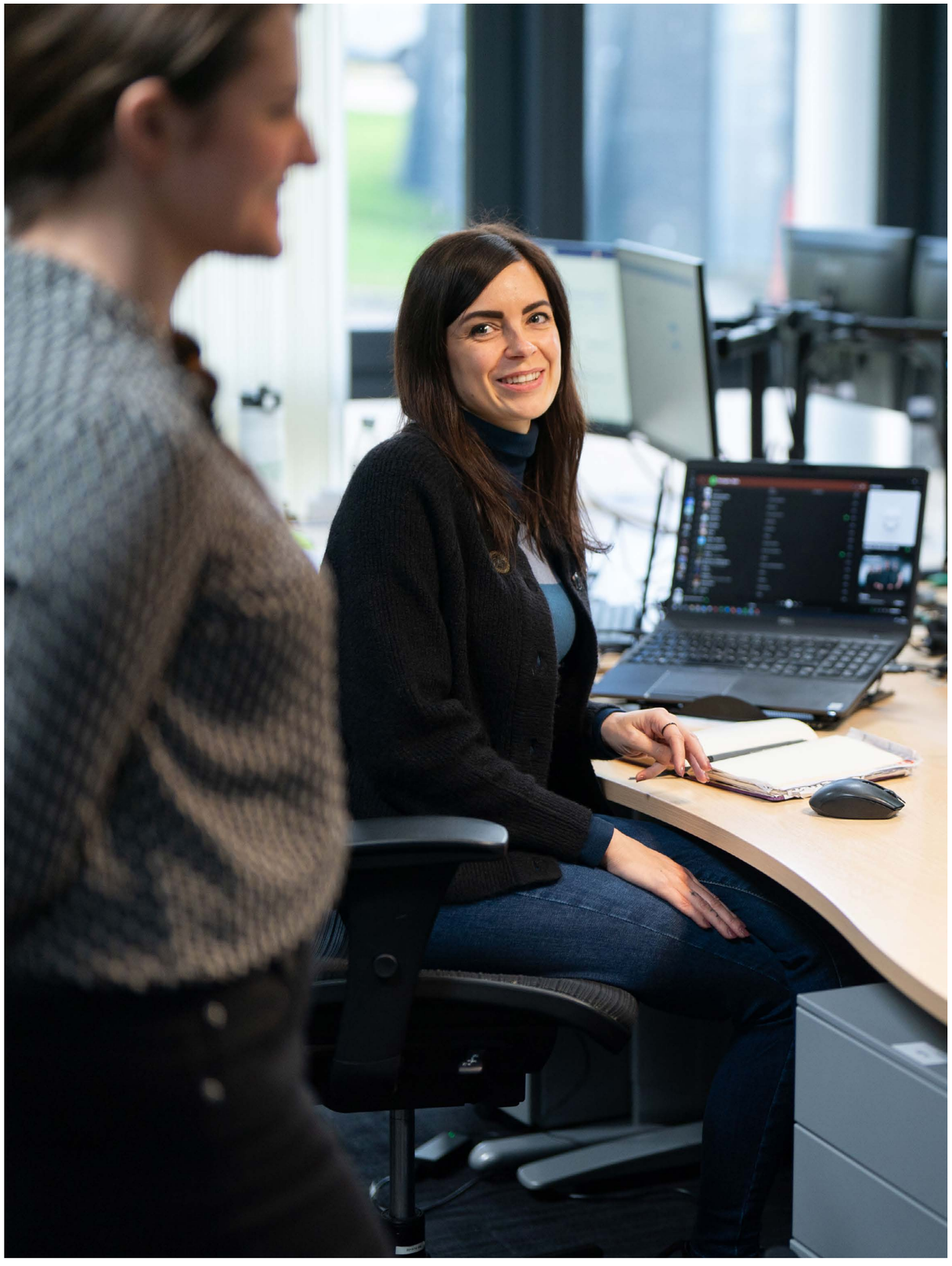
- Reliability block diagram modelling (RBD tools)
- Use of industry databases (e.g. OREDA)
- System uptime and intervention modelling

09 HAZID & SYSTEM SAFETY

- Early-stage hazard identification
- Integration of safety into system architecture decisions

10 SYSTEM PERFORMANCE & ENVIRONMENTAL ANALYSIS

- Combined power + communications failure scenarios
- Dynamic cable and infrastructure risk analysis
- Thermal analysis



Verlume approaches subsea engineering as a system, not a collection of parts. By combining functional architecture development with component level reliability modelling, every design decision is grounded in how the system will actually behave offshore, not how it performs in isolation.

10 ENGINEERED FOR REALITY

Power and communications are treated as core engineering disciplines, fully integrated into the system from the outset rather than layered in later. This ensures control, uptime and resilience are designed in, not retrofitted.

Operating independently, Verlume focuses on defining and delivering the right architecture for the challenge, free from vendor bias or constrained solutions.

This approach allows us to define the real problem early, apply specialist modelling often missing from traditional studies, and optimise power and communications as a unified system. The result is reduced intervention risk, improved uptime, and a clear path from concept through FEED to deployment.

We support this through flexible engagement, from early concept and feasibility studies through to FEED support, joint studies with partners, and focused concept workshops.

In short, Verlume ensures offshore systems are built to maintain power, communication and control when it matters most, under real-world conditions, not theoretical ones.

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