ZFDP Phase 1 - Pipelines and Structural Scope

Owner	Gemsa Petroleum Company (GEMPETCO)
Client	Petroleum Marine Services (PMS)
Location	Gulf of Suez, Egypt
Year / Status	2025 / In Progress
Project Type	Detailed Engineering and Procurement Support
Keywords	Subsea pipeline design, Flow assurance, Material selection, Structural analysis

Scope of Work

The Zaafarana Field Development Project – Phase 1 involves modifying the WARDA platform to integrate gas-fired power generators supplying up to 4 MW. UNEPP was commissioned by PMS to perform full engineering for new subsea sealines, covering process and mechanical design. The scope included process simulations for line sizing, wall thickness and material grade selection, MTO preparation, and structural and stability analyses (spool stress, on-bottom, free-span, upheaval buckling). Additional tasks include seabed irregularity assessment, protection and cathodic design, shore approach methodology, riser analysis, topside EPCI document review, and vendor evaluations.

Technical Challenges

- Balancing hydraulic performance, structural integrity, and installation feasibility under variable seabed conditions.
- Optimizing wall thickness and material grade.
- Controlling free spans and ensuring on-bottom stability against hydrodynamic forces.
- Managing thermal expansion and mitigating upheaval buckling risks.
- Protecting pipelines from fishing gear and dropped object impacts in a busy marine zone.

Execution Strategy

Project execution strategy followed a phased EPCI approach to ensure safe, efficient offshore integration with minimal downtime. It included detailed engineering and prefabrication during pre-TAR, critical tie-ins and commissioning within a 10-day TAR window, and post-TAR reinstatement and testing. Emphasis was placed on modular fabrication, strict HSE and QA/QC compliance, and continuous coordination to optimize schedule and safety.

Strategic Outcome

The phased EPCI plan delivers new gas-fired power at WARDA via a subsea tie-in and prefabricated E&I module, with generators configured for 100% availability. The project targets 95–96% operability and full commercial operation within 12 months, with MWS certification, enhanced HSE compliance, corrosion protection, and lower emissions - securing reliable platform power and production continuity.

Photos / Diagrams