

INTECSEA

WorleyParsons Group

Materials and Welding

Capability & Experience



Capability Overview

Materials and welding is a fundamental engineering discipline that supports key decisions through design phases to ensure successful project delivery and ultimate operational integrity. INTECSEA expertise lies in understanding the complex interactions that take place when basic materials are transformed into functional structures or components and joined together in different working environments by numerous processes.

Choosing materials that are cost-effective and fit for purpose is essential to ensure reliable operation and avoid the potential consequences of in-service failure.

INTECSEA material specialists provide material selection support during conceptual engineering through FEED, detail design and installation stages of projects. By introducing the latest insight on new materials and selecting the best material for the level of performance our customers require, INTECSEA offers safety in design and robust engineering which is considered at every stage to maximize customer specifications.

In addition to our material specialists, INTECSEA has fully qualified and chartered European Welding Engineers (EWE) and International Institute of Welding (IIW) engineers to provide written weld procedure specifications according to international and local requirements.

INTECSEA can also provide assistance at any stage of a project; from feasibility studies, to design, implementation, proof of performance, site fabrication and qualification test support.

Successful project delivery

INTECSEA utilizes the full range of materials technology and allied material services for all project phases. By introducing the latest insight on new materials and selecting the best material for the level of performance our customers require, INTECSEA brings safety in design and robust engineering.

Engineering Services

Metallurgical Expertise

Working within the hydrocarbons sector, INTECSEA has extensive metallurgical experience using carbon steel, high strength low alloy steels, austenitic, martensitic (13 Cr) and duplex stainless steels, titanium alloys, clad and lined nickel alloy pipe and other corrosion resistant alloys. In particular, INTECSEA has extensive experience regarding alloying elements, heat treatment, and micro-structures of these alloys, and their application to different product conditions. INTECSEA can provide guidance and advice on some of the most important subject matters highlighted for the above specialized alloys used in the offshore oil and gas industry.

Coatings Technology

Coating systems and cathodic protection systems are a fundamental part of the overall system performance and corrosion mitigation. The coating system is the primary protection against external corrosion and is comprised of mill applied and field joint coatings. A cathodic protection system is also provided as secondary protection to account for any minor defects in the coating following application, or damage caused during transportation, installation, or other coating degradation during operation. INTECSEA has significant experience with both anti-corrosion and thermal insulation coating systems for use at high temperature with direct electrical heating systems and can assist in every aspect of this technology area.

Welding Capabilities

Welding and joining technologies play a major role on all projects. INTECSEA can deploy specialists to aid customers in developing appropriate and effective joining procedures, in particular welding procedures, additionally providing advisory services. INTECSEA can provide fabrication and welding engineering support as customer site representatives. Advanced Engineering Criticality Assessment (ECA) activities are managed from the materials engineering group.

Corrosion Studies and Materials Selection

Corrosion modeling and evaluation studies are conducted to ensure the most suitable material selection for offshore/onshore pipelines, FPSO/FPU topside facilities, Pipe-In-Pipe (PIP) systems, flexible pipes, Steel Catenary Risers (SCR) and floating and subsea systems. Capabilities include evaluation of various forms of corrosion including top of line corrosion and the management of these systems.

Procurement Support Capabilities

The objectives of INTECSEA's procurement support services are to ensure that the selected manufacturers and suppliers have adequate technical integrity and that the various component manufacturing and fabrication processes meet all project requirements to the high technical level demanded by applicable project documents.



Project Experience



Jubilee Phase 1a

CUSTOMER Tullow

LOCATION Ghana, West Africa

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

INTECSEA mobilized a team to the subcontractor’s site for supervision and consultancy support of Duplex stainless steel weld procedure qualification activities. Key support areas were:

- Profile improvement of the flowmeter base material to weld zone, to comply with guidelines for avoidance of HISC
- Welder and NDE technician supervision
- Re-writing of coating specification and method of application, compatible with both C-Mn steel pipe-stubs and the duplex stainless steel



Perenco Slugcatcher Asset Integrity Support

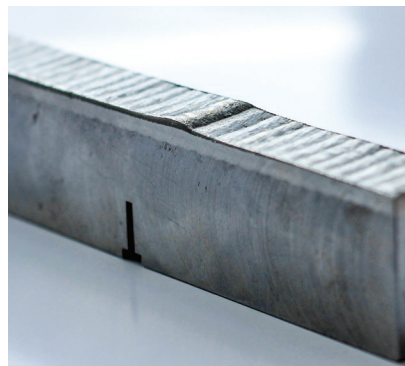
CUSTOMER Perenco UK

LOCATION North Sea, UK

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

After observing severe internal corrosion in sections of their slugcatcher, Perenco approached INTECSEA to carry out corrosion analysis and a Fitness For Service (FFS) assessment.

A 3D model of the slugcatcher was built using Abaqus. The model was used to derive the loads imposed on the different sections of pipe through operation. The same loads were then considered in a BS7910 assessment. The assessment was used to derive tolerable flaw sizes which were later used by Perenco’s inspection team as Quality Control (QC) criteria.



CNOOC PY34-1 Pipeline Corrosion Control Study

CUSTOMER CNOOC Research Center

LOCATION Panyu/Huizhou Gas Fields

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

The study examined pipeline requirements in terms of material grades and wall thicknesses/corrosion allowance having first established the requisite design data. The selection of a combination of carbon steel/inhibitor and the use of Corrosion Resistant Alloys (CRAs) was supported by a life cycle cost analysis and project cost estimates.

INTECSEA defined the philosophy for internal corrosion mitigation of the pipeline and performed the necessary engineering and life cycle cost analysis in order to select materials for the pipeline.



BP Alaska Northstar

CUSTOMER BP Exploration

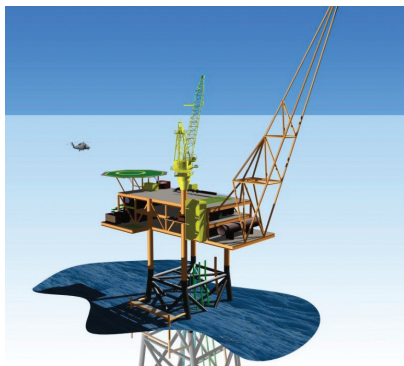
LOCATION Alaska

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

INTECSEA and eight other engineering companies and construction contractors participated in an Alliance Agreement with BP.

INTECSEA’s material group activities included, but were not limited to:

- Specifications, procurement assistance, and inspection services for engineered materials
- Welding and NDT specifications development and procedures qualification support
- Offshore construction procedure technical requirement definition and development support
- Onsite construction engineering support



Wheatstone Development Project

CUSTOMER Chevron

LOCATION NW Shelf, Australia

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

Concept narrowing and selection for all upstream onshore and offshore facilities to process gas from the Wheatstone and Lago gas fields.

- Subsea facilities options (wellheads, manifolds, PLEMs, PLETs and flowlines)
- Pipeline alternatives and studies, including corrosion and stabilization
- Advanced ECA for CRA clad and lined pipe girth welds
- Weld consumable trial management, evaluation and decision support
- Low temperature material evaluation and brittle fracture study



Anadarko Green Canyon 518 Subsea Development

CUSTOMER Anadarko

LOCATION Gulf of Mexico

IDENTIFY EVALUATE DEFINE EXECUTE OPERATE

Detailed design engineering activities were performed by INTECSEA with the materials team being involved in numerous activities under a very demanding schedule. Key activities were:

- First Pipe-In-Pipe to be made up on the firing line
- Flowline engineering and subsea equipment fabrication support
- SCR engineering and fabrication support
- Materials and welding engineering and fabrication support
- Procurement support activities

Success Through Insight