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Construction Management Services

Capability and Experience

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Overview

INTECSEA, headquartered in Houston, Texas was formed in 2008 by the joining of heritage Intec with Heritage Sea Engineering to provide a consolidated floating systems risers, pipelines and subsea engineering and construction management services within the global WorleyParsons Group. INTECSEA has established operating office in Houston, Texas; Kuala Lumpur, Malaysia; Singapore: Delft, the Netherlands; Rio de Janeiro, Brazil; Perth and Melbourne in Australia; and London, UK.

INTECSEA's major areas of expertise include subsea and floating production systems, marine pipeline and riser systems, Arctic pipelines, marine terminal systems, and Arctic structures. Additional areas of expertise include flow assurance and operability, marine surveys, marine operations and offshore equipment design. This document describes INTECSEA's capabilities and experience specific to Construction Management.

Engineering design and construction management of marine pipeline and riser systems has been one of the INTECSEA core business areas since the company was formed in 1984. Although many other engineering disciplines and other business areas such as offshore terminals, subsea and floating production systems, onshore pipelines and facilities have been added to the INTECSEA range of project services, marine pipeline and riser systems remain a major INTECSEA business area.

INTECSEA's primary emphasis has been on pipeline applications in frontier areas, notably deepwater and arctic environments; and for unusual service conditions such as high pressure and high temperature, aggressive fluids and complex fluid rheology. These specialized technologies are firmly established within INTECSEA's extensive project experience including practical design and installation technology required for cost effective completion and operation of marine pipeline facilities in all environments. In addition to deepwater pipeline applications, INTECSEA has also been responsible for many long distance, large diameter transmission pipeline projects and conventional offshore platform-to-platform pipeline projects.

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INTECSEA’s Construction Management Team has a proven track record for providing solutions to problems in the implementation of frontier projects, by providing contract and execution planning, coordination, engineering, interface and offshore execution throughout the lifecycle of the project. This ensures a seamless transition from design through commissioning for our clients.

INTECSEA's Construction Management personnel have experience working as and with the contractors and operators in some of the most challenging and record setting projects in the world. This experience has allowed INTECSEA's Construction Management Services teams to garner expert knowledge in the following areas:

- Offshore Installation Equipment and Marine Vessel Capabilities
- Deck Cargo Barge and Heavy Lift Capabilities
- Contracting, Planning and Implementation
- Contractors Systems and Capabilities
- Contractors Engineering and Management Capabilities
- Contractor Bidding Strategies
- Welding and AUT Systems and Capabilities
- Riser Installation Methods
- Tendon and Mooring System Installation Methods
- Hull Transportation and Integration Methods
- Offshore Construction Risks
- Project Risk Analysis and Uncertainty
- Operator Systems, Cultures and Goals
- Project Quality Assurance Processes
- Field Surveillance Requirements and Personnel
- Implementation and Tracking of Lessons Learned

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INTECSEAs Construction Management Services experience and expert knowledge will ensure that:

- Constructability is performed and implemented throughout the project life cycle
- Construction methods and techniques remain competitive within the design
- Project coordination between the operator and contractor is maintained throughout the project life cycle
- The intent of the design is carried into the construction and execution
- The operator's goals of safety performance, schedule, quality and cost control are not compromised

INTECSEA's Construction Management Teams have experience during the planning and execution of a wide range of frontier projects ranging in scope and type, including:

- Total Field Developments
- Pipeline Installations
- Large Diameter Export Pipelines
- Conventional Flowlines
- Pipe-in-Pipe Systems
- Wet Insulated Pipelines
- Flexible Pipe
- Offshore Arctic Pipelines
- Riser Installations
  - Conventional
  - J-Tube Pulls
  - SCR
  - Flexible
- Shore Approaches
  - Drill Crossings
  - Shore Pull
  - Open Trenches

- Subsea Structures
  - Trees
  - Jumpers
  - Manifolds
  - In-Line Sleds
  - PLETs

- Umbilicals
- Flying Leads
- TLP Tendons and Foundations Installation
- TLP Hull/Tendon Hookup
- Semisubmersible Mooring System Installation
- Semisubmersible Hull/mooring System Hookup
- Free-standing Drilling/Production Risers

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Construction Management Services

INTECSEA's Construction Management Team provides planning, coordination, engineering and interface from concept selection through commissioning, from constructability support in design and construction planning to the execution phase, including installation offshore. INTECSEA's Construction Management Service is there working with our clients to help meet their project goals.

Design Support

During concept selection and detail design, INTECSEA's Construction Management Teams work with the design and engineering team(s) to ensure a design that is construction friendly, with construction problems designed away and to ensure a design that is construction competitive. INTECSEA's Construction Management personnel also ensure procurement; fabrication and delivery of materials and equipment are planned and implemented in order to meet the project construction schedules. These services include:

- Constructability Reviews
- Construction Cost Estimates
- Design and Construction Risk Assessments
- Construction Optimization Review
- Welding and AUT Specifications
- Construction and Installation Specifications
- Material Procurement and Expediting
- Provision and Coordination of Inspection/QC Services
- Equipment Fabrication Support
- SIT Planning and Development

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Construction Planning

During construction planning, INTECSEA's Construction Management Team works with the owner in developing project contracting strategies and assist in contractor selection. In addition, the Construction Management Team works with the owner and contractor in developing construction execution plans that meet the project goals and ensures the intent of the design is maintained. These services include:

- Prepare Construction Strategy
- Shipyard and Fabrication Yard Pre-qualification
- ITB Package Development
- Bid Evaluation (Commercial and Technical)
- Contracting Support (Negotiation Support)
- Contract Administration
- Develop and Maintain Construction Execution Plan
- Develop Construction Assurance Plan
- Construction Procedure Review and Approval
- Welding Procedure Review and Approval
- AUT Procedure Review and Approval
- Construction HAZID and HAZOP Facilitation
- Develop and Maintain Integrated Project Schedule
- Construction Optimization Review
- Load out and Transportation Execution Plan
- Commissioning+ Planning

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Construction Execution

During construction execution INTECSEA's Construction Management Team works with the owner and contractor to ensure construction plans and the intent of the design is maintained during execution. These services include:

- Fatigue Testing Program Management
- Material and Equipment Delivery and Tracking
- Contractor Equipment Audits
- Field Surveillance Procedure Development and Implementation
- Contractor Inspection Test Plan Review and Approval
- Field Surveillance Team Selection, Training and Management
- Installation Contractor Monitoring and Tracking
- On-Site Contractor Interface
- Client representation during execution
- Project Status and Progress Tracking and Reporting
- Management of Change Implementation and Tracking
- Lessons Learned Documentation

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Marine Pipeline Project Experience

Project Name/Location	Client	Project Description	Finish Date
Shenzi Gulf of Mexico	BHP Billiton	INTECSEA's SCR riser scope includes pre-FEED of six initial and four future SCRs from a TLP in 4375 ft water depth. Assisted client in host platform selection with respect to riser design. Also performed umbilical clashing checks and established layout.	Ongoing
Offshore Arctic Pipeline Technology Review	Confidential	Provide review of offshore arctic pipeline design and construction methods and techniques with an emphasis on construction, repair and leak detection; identify technology gaps and establish a work plan to address these gaps. Assumes maximum 24-inch diameter pipeline in water depths less than 100 ft.	Ongoing
Neptune Offshore East Coast USA	Tractebel	Primary Responsibilities included: Definition of fatigue test program for steel catenary risers. Preparation of procurement, fabrication and construction specifications. Support of installation contractor's procurement activities including preparation of a detailed Material Take Off, requisitions and technical bid reviews.	Ongoing

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Project Name/Location	Client	Project Description	Finish Date
Northern Block G (Okume Complex) Offshore Equatorial Guinea, West Africa	Amerada Hess	INTECSEA riser scope includes FEED and detailed engineering of 8 flexible risers connecting subsea flowlines to two TLPs in water depths of 920 feet and 1640 feet, respectively, and an 12 inch oil export flexible riser connecting to an FPSO in 320 feet of water depth. FEED engineering included configuration design, temporary seabed storage arrangement, minimum riser length requirement and flexible riser specification. Detailed design includes installation analysis, I-tube and hang-off design, static, clashing, fatigue and extreme events dynamic analysis to establish interface loads and bend stiffener requirements, and finalize flexible riser specification. Work scope also includes construction and installation support.	2007
Mardi Gras Project Gulf of Mexico	BP Americas	8 deepwater pipelines ranging in diameter from 16-inch to 28-inch, requiring more than 300 miles of route selection; Water depths at the host locations range from 4,400 ft to 7,300 ft.	2007
Mardi Gras Deepwater Pipeline System Gulf of Mexico	BP	Large diameter oil and gas export pipelines in water depth to 7,200 ft in the Gulf of Mexico	2007
Offshore Arctic Pipeline Cost Estimate Canada Beaufort Sea	Confidential	Offshore arctic pipeline cost study incorporating advancements in pipeline design and installation technology, along with current pricing strategies; Purpose is to develop a methodology for defining costs and schedules for offshore arctic pipeline installation; Addresses design basis, design concepts, flow assurance aspects, route selection, installation method evaluation, cost and schedules.	2005

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Project Name/Location	Client	Project Description	Finish Date
Yoho EPS Project Offshore Angola	ExxonMobil	Performed the following: Design of a bypass line that will connect 8-in and 10-in cold flowlines (hydrotested, filled with seawater) to one 12-in flowlines (in production). Provide procurement assistance and installation planning assistance.	2005
Eastchester Pipeline Extension Project New York, USA	Iroquois Gas Transmission Company	24-inch x 32 mile long offshore pipeline crossing the Long Island Sands to the Bronx area. Installed in an area of significant environmental and cultural sensitivity and extensive existing infrastructure.	2005
Shtokman Field Constructability Study Russia Barents Sea	Confidential	Constructability study for 550 km pipeline from Shtokman field to the Russian mainland with diameters up to 48-inch and water depths up to 375 meters.	2005
K2 Gulf of Mexico	ENI Petroleum	Design and installation support for K2 flowlines, risers, PLETs and subsea structures and umbilicals. The project was to tie-back 3-5 subsea oil wells in approximately 3,900 to 4,500 of water depth of Green Canyon Block 562 of the Gulf of Mexico back to Marco Polo TIP the host facility. The subsea system consists of two well centers tied back to the TIP via dual pipe-in-pipe insulated flowlines in a piggable loop configuration and steel catenary risers (SCRs). One umbilical will be suspended from the host facility in a dynamic catenary configuration	2004
Mobile Bay AB-BSB Offshore Alabama, USA	ExxonMobil	Primary responsibilities included: Cost estimates, schedule and constructability. Bid packages for installation.	2004
Marco Polo Gulf of Mexico	GulfTerra	Primary responsibilities included: Permitting MMS applications	2004
Canyon Express Gulf of Mexico	TotalFinaElf	12-inch x 96 mile gas production pipeline in maximum water depth of 7,250 ft, transversing through challenge terrain.	2003

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Project Name/Location	Client	Project Description	Finish Date
BP Alaska Northstar Alaskan Beaufort Sea	BP Exploration Alaska	Engineering design, permitting assistance and construction management assistance for twin 10-inch pipeline from Prudhoe Bay to Seal Island (approximately 6 miles offshore and 11 miles onshore).	2003
Mobil Bay Pipeline Projects, MB-63.2, MO-822.7 and MB-63.3 Mobile, Alabama, USA	ExxonMobil Production Company (New Orleans)	3-high temperature (300F) and high pressure (7,000) flowline and pipe-in-pipe systems in the Mobil Bay area	2002
Horn Mountain Export Pipelines Gulf of Mexico	BP (Vastar)	1 2-inch oil and 1 0-inch gas pipelines each approximately 42 miles long in maximum water depth of 5,600 ft	2002
Marshall-Madison Flowline Project Gulf of Mexico	ExxonMobil Development Company	Three subsea wells and 6-inch by 10-inch pipe-in-pipe insulated production flowlines in water depths approximately 4,800 ft.	2001
Mica Field Development Project Gulf of Mexico	ExxonMobil Development Company	8-inch and 12-inch pipe-in-pipe flowlines and an 8-inch x 28 mile long flowline in water depths of 1,300 to 4,500 ft.	2001
Diana Development Project Gulf of Mexico	ExxonMobil Development Company	Two 20-inch x 130 mile pipelines at 5,000 ft water depth in the Gulf of Mexico.	2000
Blue Stream Pipeline Project Black Sea	GasProm / PeterGas B.V.	2 x 24-inch x 300 km gas pipelines crossing the Eastern Black Sea between Djubga, Russia and Samsun, Turkey in water depth of 2,100 m with high levels of H2S and extreme gradients in seabed.	1999
Pluto Subsea Development Project Gulf of Mexico	Mariner Energy, Inc.	Detailed Design of 8-inch x 30-mile long flowline from subsea well in 2,700 ft water depth to a host platform.	1999
SPM Marine Terminal Manavgat Water Supply Project Turkey	D.S.I.	Water export project on the Mediterranean coast of Turkey involving two SPM systems and four 48-inch x 3km loading lines for export of fresh water; Total project management including offshore construction supervision.	1998

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Project Name/Location	Client	Project Description	Finish Date
Green Canyon 60 Development Project Gulf of Mexico	Mobil Exploration and Producing US, Inc.	Two 6-inch x 8 mile flowlines in water depth of 760 ft connected to a platform via steel catenary risers (SCRs).	1996
Mobile Bay Flowlines Gulf of Mexico	Exxon USA	Flowline systems for high pressure, high temperature sour gas using special corrosion resistant alloy materials and pipe-in-pipe insulated flowlines and risers.	1994 1996 1998 1999
Mississippi Canyon 401/445 Subsea Development Gulf of Mexico	Oryx Energy	Three subsea gas wells in up to 600m water depth individually tied back to a shallow water platform with flexible flowlines and control umbilical.	1994
Rocky Field Development Project Gulf of Mexico	Shell Offshore	Two 3-inch in 6-inch pipe-in-pipe flowlines, 4 miles long in a water depth of 1,800 ft in the Gulf of Mexico.	1994
Pipeline Replacement Project Taiwan	Chinese Petroleum Corporation	42-inch x 5.2 km crude oil pipeline, PLEM and underbuoy hose system; Detailed engineering design and project management services to supervise and manage EPC contract including construction and survey supervision and management.	1993
Vancouver Island Pipeline Project Offshore Western Canada	Westcoast Energy, acting on behalf of Pacific Coast Energy Corporation	Second deepest pipeline when installed in 1991, ROV operated deepwater mechanical pipeline supports, deepwater survey techniques and vertically drilled shore crossing through rock.	1992
Talinpu SPM No. 3 and No. 4 Marine Terminal Projects Taiwan	Chinese Petroleum Corporation	SPM, 56-inch x 8 km and 16-inch x 8 km pipelines; SPM, two 34-inch x 6 km pipelines; Pipeline design; Management and inspection of pipeline construction, including surveys.	1991

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Floating/Drilling Production System Project Experience

Project Name/Location	Client	Project Description	Finish Date
MEPS (Modular Exploration and Production System) Gulf of Mexico	Anadarko	The MEPS uses a near surface completed well system that consists of a riser supported by a submerged buoyancy chamber for drilling and production. Responsible for the onshore and offshore construction management of the prototype MEPS.	2006
Prince TLP Gulf of Mexico	Modec / El Paso Partners	Detail design of the Prince TLP Ewing Bank Block 1003 in 1,490 feet water depth. Responsible for construction management support.	2001
Marco Polo TLP Gulf of Mexico	Modec / Anadarko / El Passo	Detail design of the Marco Polo TLP in Green Canyon Block 608. Responsible for construction management support.	2003
Shenzi TLP Gulf of Mexico	Modec / BHP Billiton	Detail design of the Shenzi TLP in 4,300 feet water depth. Responsible for construction	2008
Oveng/Okume TLP Equatorial Guinea, West Africa	Modec / Amerada Hess	Detail design of the Oveng and Okume TLP's. Responsible for construction management.	2008
West Seno TLP-A Indonesia	Hyundai Heavy Industries / Unocal / Chevron	Detail design and analysis of the West Seno 1 TLP-A facilities in the Makassar Straight in Indonesia. Responsible for construction management.	2003
West Seno FPU Indonesia	Hyundai Heavy Industries / Unocal / Chevron	Detail design and analysis of the West Seno Phase 1 FPU facilities in the Makassar Straights in Indonesia. Responsible for construction management.	2003

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Project Resumes

- Vancouver Island Gas Pipeline Project
- Exxon Diana Pipeline Project
- BP Mardi Gras Deepwater Transportation System
- BP Alaska Northstar Pipeline Project
- Okume Complex Development
- Duke Energy Tasmania Natural Gas

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Project Profile

Project: Okume Complex Development

Client: Amerada Hess Equatorial Guinea

Location: Okume Complex Field, Equatorial Guinea

Scope: Front End Engineering Design (FEED) for pipelines, risers and subsea facilities, Detailed design and engineering of the pipelines, risers and subsea facilities, etc.

Timeframe: September 2004 - March 2008

Project Value: USD 6.7 million

Phases:

1	2	3	4	5
Identify	Select	Define	Execute	Operate

Amerada Hess Equatorial Guinea is developing hydrocarbon reserves in the Okume Complex field, offshore Equatorial Guinea, West Africa. The field consists of the Elon, Okume, Oveng and Ebano reservoirs in water depths ranging from 27 to 500 meters. The development includes two separate mini-TLPs at the Okume/Ebano and Oveng reservoirs and three shallow water wellhead platforms at Elon. A single Central Processing Facility at Elon will handle crude from all four fields. Pipelines in the field will consist of gas lift, water injection, low-pressure gas and produced liquids that vary in diameter from 4.5 to 10.75-inches. Production from the field will be tied back to the existing Sendje Ceiba FPSO via a new 12-inch oil export pipeline system. Flexible risers will be installed at the two mini-TLPs and the FPSO. Tie-in spools will be used to connect the pipelines and the rigid risers on the wellhead platforms. The development also includes a Pipeline End Termination (PLET), a subsea control umbilical and a subsea power cable.

The INTECSEA scope of services entails:

- Conceptual level field layout and design
- Front End Engineering Design (FEED) for pipelines, risers and subsea facilities
- Detailed design and engineering of the pipelines, risers and subsea facilities
- Procurement support for equipment and services
- Construction, survey, and project management support
- Mechanical design of pipelines and rigid riser
- Tie-in spool design and Flexible riser global analysis
- Flow assurance engineering and offshore support
- Preparation of project specifications and development of AFC drawings
- Assist in bid package preparation and subsequent bid evaluation
- Provide procurement support and general expediting for all subsea components, including line pipe, flexible risers, flanges, anodes, control umbilical, power cable and PLET
- Interface with pipeline installation contractor and platform and TLP engineering contractors
- Survey support and liaise with survey contractor
- Generate offshore work installation and commissioning packages that fall outside the scope of the pipeline installation contractors
- Co-ordinate document control of all design, vendor and installation contractor

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Project Profile

Project: Exxon Diana Pipeline Project

Client: Exxon Company, USA

Location: Hoover and Diana Fields, Gulf of Mexico

Scope: INTECSEA was responsible for detailed engineering design and fabrication and construction support for the infield flowlines, production trunklines and export pipelines.

Timeframe: September 1997 - December 1999

Project Value:

Phases:

1	2	3	4	5
Identify	Select	Define	Execute	Operate

Exxon Company, U.S.A. is developing the Hoover and Diana Fields in the Gulf of Mexico at Alaminos Canyon Block 25 and 26 and East Breaks Block 945, 946 and 989, respectively. The Hoover and Diana Fields are located in a water depth of 4600 ft to 5000 ft, approximately 150 miles south of Galveston, Texas.

The fields are being developed with three subsea production templates in the Diana Field and a Deep Draft Caisson Vessel (DDCV) floating production system in the Hoover Field. There are two infield flowlines and three production trunklines to transport the Diana production to the Hoover DDCV. Two export pipelines from the Hoover DDCV will be built to transport the processed oil and gas. The gas export pipeline will tie into a manifold platform located at High Island 573, one of the ANR operated High Island Offshore System (HIOS) Platforms. The oil export pipeline will transport the oil to an existing facility in Freeport, Texas.

SCOPE OF SERVICES:

INTECSEA was responsible for detailed engineering design and fabrication and construction support for the infield flowlines, production trunklines and export pipelines. The engineering services included the following:

- Project design basis memorandum
- Route option evaluation
- Route survey support
- Wall thickness selection
- Buckle arrestor design
- On-bottom stability analysis
- Allowable span length determination
- Corrosion protection design
- Installation/construction analyses
- Diana project team interface
- Procurement assistance
- Welding procedure qualifications
- Welder qualifications
- Fabrication and construction procedure review

The work was performed between 1997 and 1999 with installation in the 4th quarter of 1999.

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Project Profile

Project: BP Alaska Northstar Pipeline Project

Client: BP Exploration, Alaska

Location: BPXA Northstar Oil Field, Alaska

Scope: Concept selection, procurement design, permitting support, specifications, procurement assistance, inspection services, offshore and onsite construction support and start-up support.

Timeframe: June 1996 - November 2001

Project Value: USD 1.08 million

Phases:

1	2	3	4	5
Identify	Select	Define	Execute	Operate

The BPXA Northstar Oil Field is located in 37 ft water depth, six miles offshore the Alaskan Beaufort Sea coast. It was developed by expanding the exploratory gravel island to accommodate wells, production facilities and living quarters. Produced oil is exported through a 10-inch pipeline to the Trans Alaska Pipeline System. A 10-inch gas pipeline also connects Northstar to existing Prudhoe Bay facilities. This is the world's first offshore arctic project to transport oil through a trenched subsea pipeline. The pipeline design utilized limit state strain criteria to meet the challenges of an arctic environment and marginal field economics.

INTECSEA and eight other engineering companies and construction contractors participated in an Alliance Agreement with BP. This agreement incorporated bonus/penalty incentives based on a target price and a fast-track schedule. The gas pipeline was placed in initial service supplying fuel gas to the island during 2000 and oil production started in November 2001.

SCOPE OF SERVICES:

- 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
- Regulatory agency and non-governmental organization interface support
- Preparation of operations, maintenance, and repair procedures
- Preparation of commissioning and start-up procedures
- As-built drawings and documentation preparation
- Evaluation of buried pipeline vertical movements and wax control during pipeline warm-up period

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Project Profile

Project: BHP Billiton Shenzi Field Development

Client: BHP Billiton

Location: Shenzi Field, Gulf of Mexico

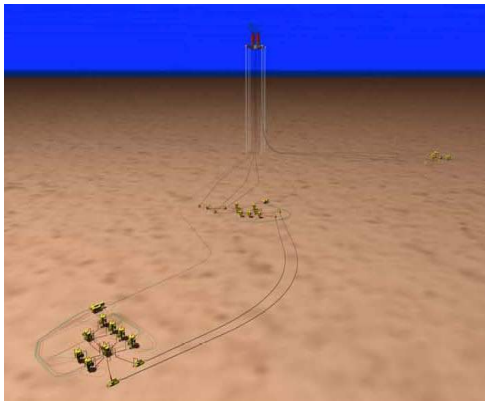
Scope: INTECSEA assisted BHPB in evaluating field development options and supported their steps through the concept selection process

Timeframe:

Project Value:

Phases:

1	2	3	4	5
Identify	Select	Define	Execute	Operate



BHP Billiton (BHPB) Shenzi field is located in Green Mississippi Canyon Blocks at a water depth of approximately 4,000 ft. Shenzi is an oil system with delivery capacity of 100M BOPD and 50 MMCFPD of associated gas production. The overall development consists of three remote drill centers flowing back to a Tension Leg Platform (TLP) where the production steam will be processed to sales quality product.

SCOPE OF SERVICES:

INTECSEA assisted BHPB in evaluating field development options and supported their steps through the concept selection process. Following concept selection, INTECSEA worked as part of BHPB's FEED team to develop the technical requirements for the Shenzi subsea system. INTECSEA is now providing support as part of the Client Team, managing detailed design and construction. INTECSEA provided:

Throughout pre-FEED, the team narrowed the flowline, riser and subsea systems options and operational requirements.

During FEED selection, INTECSEA identified viable field development options and developed these options for detailed cost estimates and development schedule. Also, during FEED the team supported the BHPB Production Operations Group through HAZOP.

During final design engineering, INTECSEA developed functional and technical requirements for the subsea systems, flowlines and risers and provided bid support during bid evaluations.

In the execution phase, INTECSEA is providing technical support, package management, and construction oversight.

INTECSEA's scope of work includes all subsea systems: trees, manifolds, controls, umbilicals, jumpers, PLETs, flowlines and risers.

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Project Profile

Project: BP Mardi Gras Deepwater Transportation System

Client: BP Exploration

Location: Holstein, Mad Dog, and Atlantis Fields, Gulf of Mexico

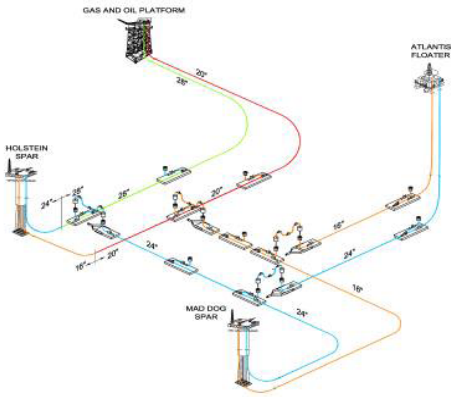
Scope: INTECSEA is responsible for the Design Engineering, Procurement and Project Management Services, Preliminary Engineering, etc.

Timeframe: August 2001 - July 2008

Project Value: USD 64.4 million

Phases:

1	2	3	4	5
Identify	Select	Define	Execute	Operate



In May of 2000, BP awarded INTECSEA a contract for the provision of Design Engineering, Procurement and Project Management support services for deepwater pipelines, steel catenary risers (SCRs), piggable wye sleds and associated jumper systems, for BP's Gulf of Mexico deepwater developments. BP was developing the Mardi Gras Transportation System (MGTS), which is a system of large diameter pipelines that will transport gas and oil from its deepwater fields to shore. The areas being developed included the Holstein, Mad Dog and Atlantis fields in Southern Green Canyon, which will transport oil through the Caesar Pipeline System and gas through the Cleopatra Gas Gathering System; and Thunder Horse in Mississippi Canyon, with the Proteus Oil System and Okeanos Gas Gathering System lateral.

The export system consists of gas and oil steel catenary risers that are connected to host spars or semi-submersibles through flexjoints, which are connected together on the seabed through piggable wye sleds with associated jumpers. Water depths range from 4,300 to over 7,000 ft in deepwater sections and as shallow as 400 ft at the conventional platforms. Pipeline diameters and associated jumpers, connectors, valves and piggable wyes range from 16 to 28 inches. Total pipeline length is approximately 330 miles. Scheduled completion is 2005.

Scope of Services:

INTECSEA is responsible for the Design Engineering, Procurement and Project Management Services through Conceptual Engineering (EVALUATE), Preliminary Engineering (DEFINE), and Detailed Engineering and Construction Support (EXECUTE).

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Project Profile

Project: Vancouver Island Gas Pipeline Project

Client: West Coast Energy acting on behalf of Pacific Coast Energy Corp.

Location: Vancouver Island, Canada

Scope: INTECSEA's services for this project included preliminary design and cost studies through detailed engineering and construction supervision.

Timeframe: October 1988 - April 1992

Project Value:

Phases:

1	2	3	4	5
Identify	Select	Define	Execute	Operate

A 530 km gas transmission system was installed to transport natural gas to Vancouver Island, British Columbia. The system includes several marine crossings of the deep channels of the Strait of Georgia and Malaspina Strait. All crossings are dual 10.75-inch pipelines, with a total length of 92 km in water depths to 425 m.

SCOPE OF SERVICES:

INTECSEA's services for this project included preliminary design and cost studies through detailed engineering and construction supervision. The project started with a feasibility study in 1988, followed by permitting assistance in early 1989. Upon project approval in mid-1989, INTECSEA, as prime contractor, undertook a comprehensive route survey program, and subsequently started detailed design. The design included stress and stability analyses, material selection, installation studies, design of the shore crossings including a drilled crossing in solid rock. The design was completed early 1990.

Services further included procurement assistance, contractor prequalification, preparation of tender documents, bid evaluation and contract negotiations. Construction started mid-1990, and INTECSEA supervised all construction activities including drilling and excavation of shore approaches, pipe makeup, pipeline installation by reel ship, tie-ins, span corrections, hydrostatic testing and commissioning. INTECSEA provided complete project management services including cost control, scheduling, progress reporting and quality assurance. The project was completed in spring 1992.

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Project Profile

Project: Tasmania Natural Gas Pipeline - Offshore Section

Client: Duke Energy

Location: Bass Strait, Australia

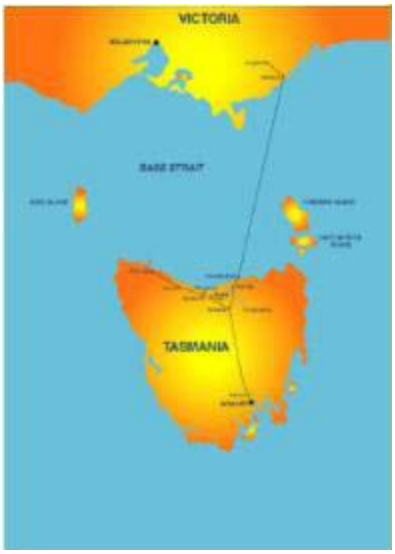
Scope: FEED, Procurement, Construction Management, Engineering, Detailed Design & Engineering, Engineering & Procurement, EPCM

Timeframe: 1998 - 2002

Project Value: AU$ 5M

Phases:

1	2	3	4	5
Identify	Select	Define	Execute	Operate



Duke Energy International (DEI) constructed a 14-inch pipeline to transport gas from the Longford Gas Plant in Victoria across Bass Strait to Tasmania. In addition, a Tasmanian gas pipeline network was developed to supply industrial, commercial and residential customers.

The offshore section of the Tasmania Natural Gas Pipeline (TNGP) runs for an approximate length of 300 km from Seaspray in Victoria to Five Mile Bluff in Tasmania. Maximum water depth along the route is around 70 meters.

Both shore crossings were constructed using the Horizontal Directional Drill (HDD) method, the crossing in Victoria through silty sand, the crossing in Tasmania through basalt rock.

WorleyParsons had worked closely with DEI on the TNGP since 1998.

SCOPE OF SERVICES:

Longest subsea pipeline in Australia at the time. Activities carried out included:

- Preliminary engineering - pipeline sizing and routing
- Development of detailed cost estimates and preparation of “Fatal Flaw” report to support project sanction
- Selection of pipeline route and tendering of survey contract
- Management of offshore route survey, geotechnical investigations and benthic surveys
- Advice on regulatory issues affecting offshore pipeline
- Detailed design of offshore pipeline, including optimization of concrete coating thickness
- Identification of shore crossing locations and engineering analysis of crossings
- Selection of tenders for offshore installation
- Preparation of tender package and construction specifications
- Evaluation of tenders and assistance in contract award
- Ongoing engineering and construction management support during project implementation phase

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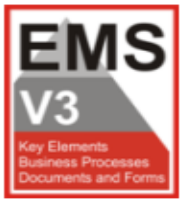
Project Management

WorleyParsons maintains a comprehensive suite of tools to manage projects at the highest level around the world. WorleyParsons employs a consistent, proven suite of group-wide processes, systems and tools supported by functional managers (Business Process Owners, or BPOs) and Business Systems Groups (developers, trainers, start-up support, help desk, commercial agreements, etc) scalable for any size project.

Enterprise Management System (EMS) web enabled repository of policies, directives, standard workflows, procedures, guidelines, forms, and checklists content controlled by BPOs EMS is easily accessible in any of our offices and is company standard enabling the more than 30,000 staff in 110 offices to share work on a common platform. The supporting systems are tailored to apply in each of the following stages of a project: Identify, Select, Define, Execute, and Operate.

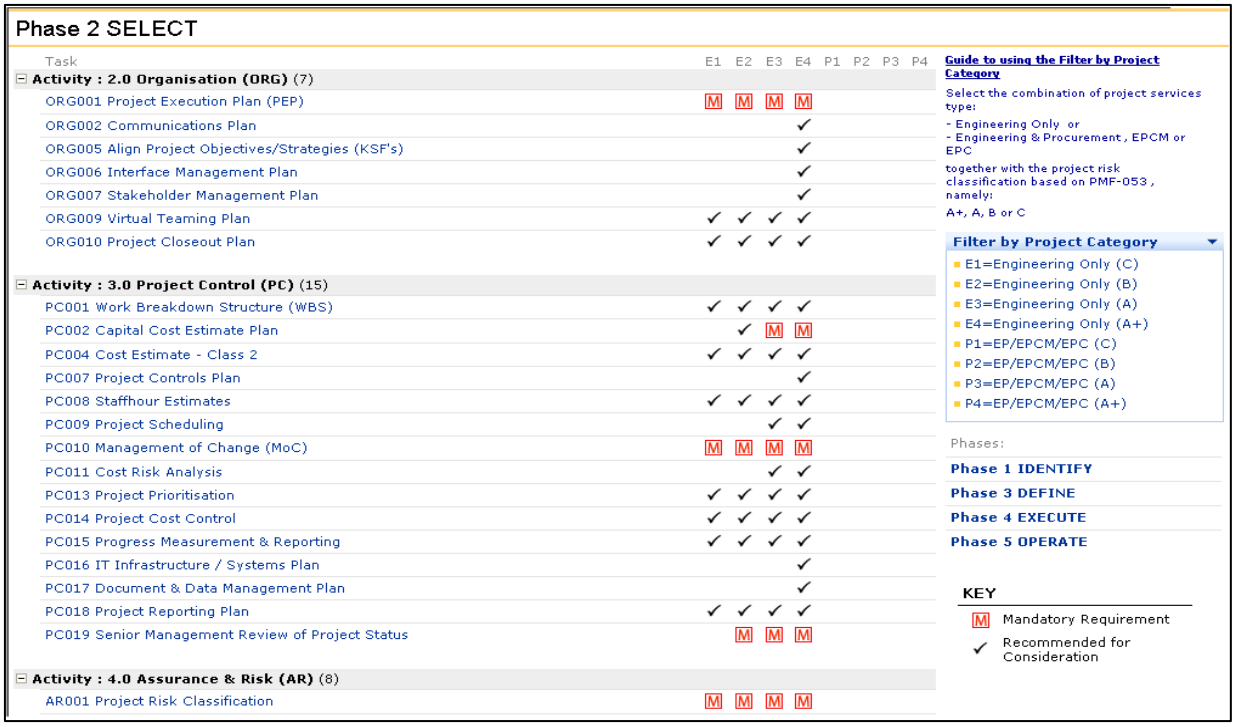


WorleyParsons Project Management Process (WPMP) is our scalable, risk based framework for project execution – some content mandatory, most is advisory.

The main principles of WorleyParsons Management Processes are:

- It is s a matrix of mandatory or potential tasks applicable for each project phase. Mandatory tasks kept to a minimum
- Project Value Objectives are clearly documented, and Maximum Value identified and realized
- Decision support package requirements are fundamental to what is planned for and delivered in each phase
- Value Improving Practices (VIPs) are used as appropriate
- Each of the tasks is summarized in an overview task sheet, supported as required by:
  - Procedures
  - Corporate Guidelines
  - Template Project Plans
  - Go-Bys

The system includes prompts and go-bys easily available for each phase of the work, illustrated by the following examples for Select Phase projects:



Phase 2 SELECT

Task	E1	E2	E3	E4	P1	P2	P3	P4
Activity : 2.0 Organisation (ORG) (7)								
ORG001 Project Execution Plan (PEP)	M	M	M	M				
ORG002 Communications Plan				✓				
ORG005 Align Project Objectives/Strategies (KSF's)				✓				
ORG006 Interface Management Plan				✓				
ORG007 Stakeholder Management Plan				✓				
ORG009 Virtual Teaming Plan	✓	✓	✓	✓				
ORG010 Project Closeout Plan	✓	✓	✓	✓				
Activity : 3.0 Project Control (PC) (15)								
PC001 Work Breakdown Structure (WBS)	✓	✓	✓	✓				
PC002 Capital Cost Estimate Plan		✓	M	M				
PC004 Cost Estimate - Class 2	✓	✓	✓	✓				
PC007 Project Controls Plan				✓				
PC008 Staffhour Estimates	✓	✓	✓	✓				
PC009 Project Scheduling			✓	✓				
PC010 Management of Change (MoC)	M	M	M	M				
PC011 Cost Risk Analysis			✓	✓				
PC013 Project Prioritisation	✓	✓	✓	✓				
PC014 Project Cost Control	✓	✓	✓	✓				
PC015 Progress Measurement & Reporting	✓	✓	✓	✓				
PC016 IT Infrastructure / Systems Plan				✓				
PC017 Document & Data Management Plan				✓				
PC018 Project Reporting Plan	✓	✓	✓	✓				
PC019 Senior Management Review of Project Status		M	M	M				
Activity : 4.0 Assurance & Risk (AR) (8)								
AR001 Project Risk Classification	M	M	M	M				

Guide to using the Filter by Project Category

Select the combination of project services type:

- Engineering Only or
- Engineering & Procurement, EPCM or EPC

together with the project risk classification based on PMF-053, namely:

A+, A, B or C

Filter by Project Category

- E1=Engineering Only (C)
- E2=Engineering Only (B)
- E3=Engineering Only (A)
- E4=Engineering Only (A+)
- P1=EP/EPCM/EPC (C)
- P2=EP/EPCM/EPC (B)
- P3=EP/EPCM/EPC (A)
- P4=EP/EPCM/EPC (A+)

Phases:

Phase 1 IDENTIFY

Phase 3 DEFINE

Phase 4 EXECUTE

Phase 5 OPERATE

KEY

M Mandatory Requirement

✓ Recommended for Consideration

InControl is our CTR based project cost and resources control tool - for small or large projects. It is WorleyParsons proprietary, but interfaces with third party applications plus selected third party applications under global agreements – Intergraph (PDS, Marian and SmartPlant Foundation), Primavera, Oracle, Quest, etc.

Other supporting systems include:

- Primavera Project P3
  - Project planning and control
- Cost Management System (CMS)
  - Estimating cost and schedule impact due to project changes
- Scorecard
  - Engineering progress measurement and productivity
- Project Portal (EDMS)
  - Secure, web-based, integrates closely with Microsoft Office 2003
  - Data, schedules, and documents can be accessed from a central location by project teams, clients and vendors worldwide
- Encompass®
  - Total project management information tool
  - Up-to-date and accurate information not only in the home office, but at the job site and at select partner or customers sites as well
  - Information can be shared worldwide by project teams

Interface Management is one of the most critical management practices that must be performed to an excellence-in-execution result. Interface Management is core-defined as eliminating "the gaps and the overlaps." In principle, Interface Management is clearly recognized by INTECSEA as a key active component of our Project Execution Plan.

The key is to recognize what information is required at what time by whom and where and to handle the constant flow of information, decisions, and requirements between all the stakeholders in the project. To this effect a common interface management process needs to be established among all parties; this requires that the interface management process is clearly identified as a contractual obligation between all parties.

There are multiple levels of information exchange:

Internal:

- Between individual disciplines within Client team
- Between Client team and contractors,

External:

- Between the internal groups within the contractor
- Between vendors, subcontractors, and 3rd parties and the main Contractor

Based on the experiences gained by INTECSEA, a methodology has been developed that suits most projects and applies to both internal and external interface management. The purpose of the IMS will be to maintain lines of communication between different stakeholders and Contractor(s) and, ensuring that technical details are consistent, schedule delivery dates are achieved and costs are kept within an agreed budget, as well as providing early warning to interfacing conflicts and tracking the effects of change.

The objectives of our Interface Management process are to:

- Define the Information Exchange Requirements throughout all Phases of a Project
  - General Project Information
  - Equipment Interfaces
- Information Required by Who and When
  - Project Schedule and Milestones
  - Deliverables
  - Contractor Workscopes
- Monitor the Exchange of Information
  - Take Corrective Action through an Early Warning System

Excellent communication is of course an essential ingredient, but it needs to be accomplished in a systematic way to ensure interfaces are handled most effectively. Typically managing, coordinating and resolving interfaces are the role of an Interface Manager who reports directly to the Project Manager. His role is to systematically track the information exchange and its impact on progress.

INTECSEA's Interface Management Process is a proven system tool to support the tracking, management, and effectiveness of the exchange of important project information.

Our IM system provides the following reports:

- General Interface Information Reporting (general interface physical properties)
- Interface Schedule Information Reporting (inter-related activities associated with search)
- Interface Clarification Register (listing issues, date raised, due date, resolution)
- Change Report (documenting the changes and the responsible parties)
- Document and Drawing Register (listing project and 'shadow' document status)

INTECSEA personnel have been responsible for interfaces on a number of recent projects, such as the ChevronTexaco Agbami project. This major undertaking requires the management of over 85,000 interfaces between disciplines and contracts. The system was established during the FEED phase to coordinate the design effort and will continue throughout project execution phase to support management of the vendors and contractors.

The INTECSEA Interface Management System (IMS)

General interface information is organized on three working levels with increasing detail. It reports general interface physical properties for attributes, components and tasks. The system links with the project scheduling tools to identify impacts and monitor status. The Interface Clarification Register lists issues, dates raised and due, resolution, responsible party and resolution team. The change report documents changes to interfaces, tasks and milestones. The Document and Drawing Register lists current document and "shadow" document status.

A graphical interface, an example of which is shown in Figure 1 below, enables ease in finding related interfaces and facilitates coordination among the project participants.

INTECSEA IMS Concept Presentation

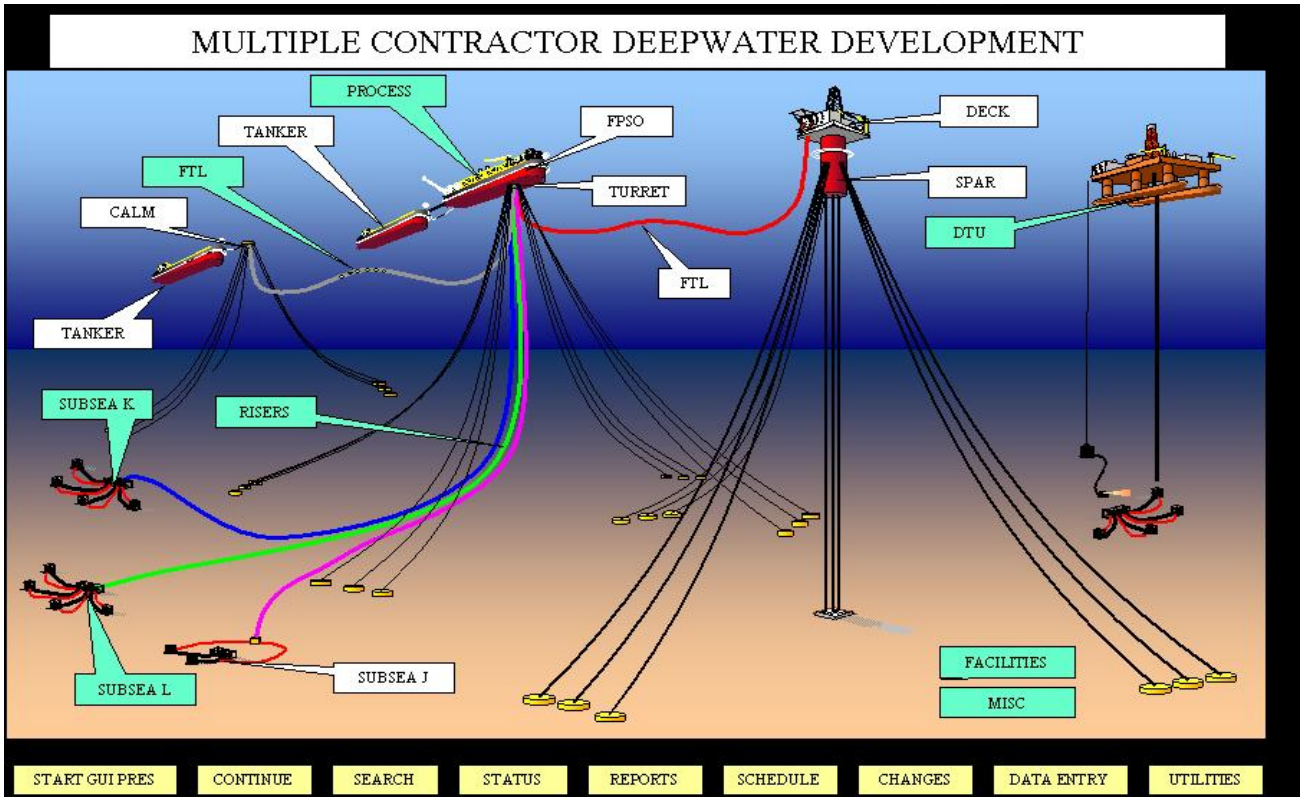


Figure 1: Graphical Interface on Typical Multi-Faceted Development

Effective interface management is key to the successful delivery of FEED and Detailed design. An Interface Management System (IMS) will be established during the FEED phase to identify and define design and disciplines interfaces and then continue through project execution to coordinate multiple contracts and suppliers.

The purpose of the IMS will be to maintain lines of communication between different disciplines, groups, companies, and contractors to ensure that technical details are consistent, schedule delivery dates are achieved, and costs are kept within an agreed budget, as well as providing early warning to interface issues and a mechanism for resolving.

Interfaces are either internal (within a defined component, assembly, or work scope) or external (between components, assemblies, work scopes, or organizations). As the project advances into the FEED, detail design, and execution phases, the management of external interfaces becomes more important and complex.

INTECSEA has developed an Interface Management System (IMS) methodology consisting of procedures, work processes and computer tools. The model is applicable to both internal and external project interfaces and can be adapted to suit any size or type of single or multi-faceted project. The Interface Management System (IMS) was developed by INTECSEA and incorporates the necessary procedures, work processes and computer tools to aid in the management of project interfaces. INTECSEA is currently providing complete interface management of ChevronTexaco's Agbami project, a major project including an FPSO, subsea, flowlines and offloading. Initially, the system was applied to the substantial engineering tasks and will continue into management of the multiple EPC contract elements of the project.

The Interface Management Tool (IM Tool) is a robust database application accessible worldwide though the intranet. It stores and manages project interface information as well as interface links and key dates. Parties receive notifications of interface queries and actions by email, and can use the web interface to respond.

INTECSEA will offer Client the Interface Management System (IMS) modified to suit the particular needs of the project, including both internal and external interface management, and with suitably experienced engineers. The full IMS package will ensure that interface issues are identified and discussed between all affected parties.

The IMS will control the following aspect of the project:

- Contractual responsibilities and requirements
- Engineering tasks and activities
- Design reports issue and revision dates
- Interface physical properties
- Project milestones

- Procurement
- Construction
- Installation and commissioning
- Operation and Maintenance

Interface Management Process

The Interface Management Process ensures effective management of functional, physical, schedule and cost interfaces within the project. The Interface Management System will be the basis for all parties to communicate on interface issues to ensure that interface issues are identified and discussed between all affected parties and to develop agreed mechanisms, responsibilities, and completion dates for resolution of issues.

The Interface Management Process for the project will be periodically updated to account for revisions to the working process accounting for CLIENT requirements. Figure 2 below, shows the key elements in the IMS Work Process.

INTECSEA IMS Work Process

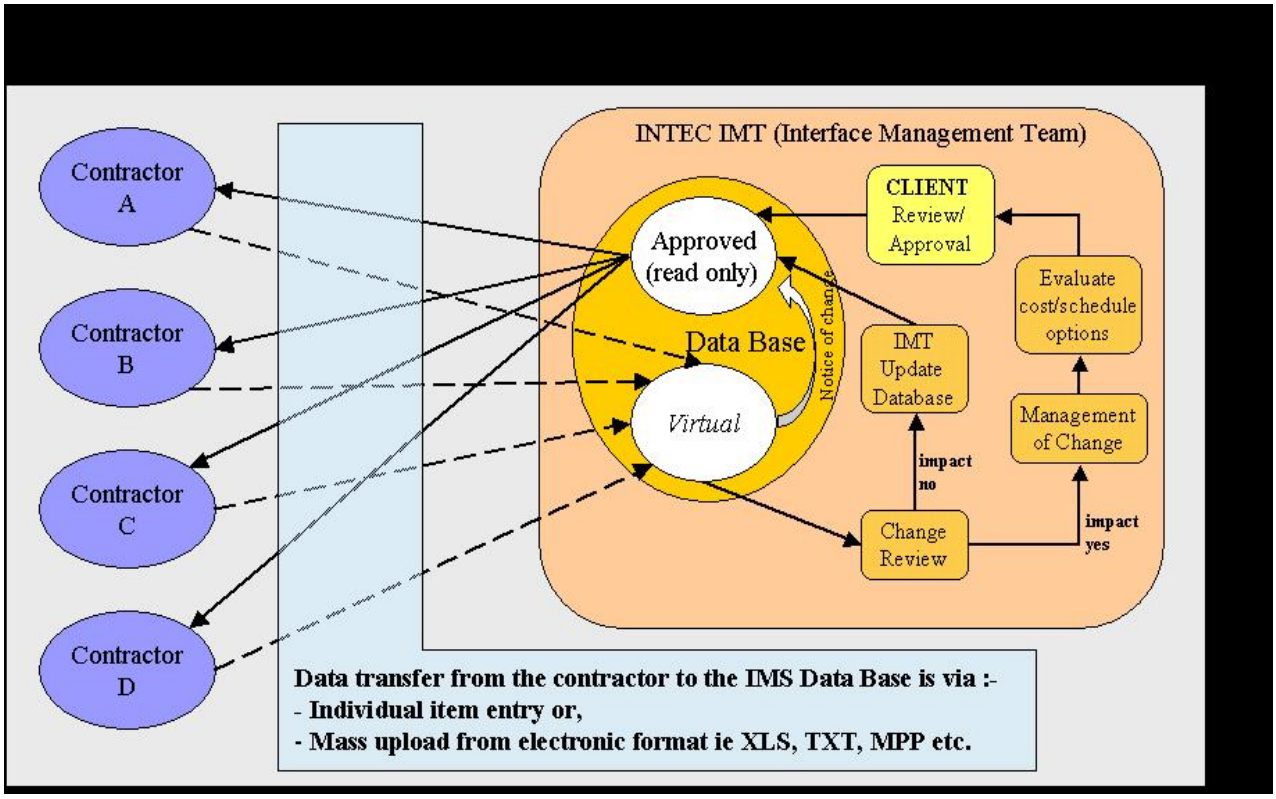


Figure 2: IMS Work Process Flow

Integration management will be a key element in ensuring the successful outcome of the project and will avoid costly delays during fabrication, hook-up, installation and commissioning activities.

The Interface Manager will be responsible for the following:

- Chair regularly scheduled project-wide Interface Meetings. Chair and/or attend other meetings as required and appropriate.
- Ensure that technical interfaces (both functional and physical) and contractual interfaces (cost and schedule) within its own scope of supply and between itself and other relevant parties are identified, recorded, understood, agreed upon by all parties, and reported to the IMS.
- Review Client and Contractor interface documentation to ensure that appropriate responsible parties have been informed of and have been provided input to interface issues and that issues have been properly identified, resolved, and documented.
- Review all Change Requests and significant non-conformance reports and dispositions to assure that interface issues are appropriately identified and resolved.
- Maintain an Interface Register and Interface Database.
- Identify and report progress, concerns and actions to resolve problems and any impact to other areas of the development.
- Manage the resolution and timely closeout of relevant interface issues.
- Provide relevant information or data to those groups within the Client, own organization and other contracting parties, which may have need of, or be impacted by, the subject information.
- Coordinate review and approval for all procedures, data, instructions, drawings, etc. at relevant work interfaces.
- Coordinate review and approval of Change Requests to ensure that interface issues are recognized and addressed.
- Coordinate review and approval of all significant non-conformance reports and dispositions to ensure that interface issues are recognized and addressed.
- Communicate (via appropriate documentation) issues and resolutions to all affected parties.
- Inform the Client and INTECSEA IMS Team of all inter-organization interface meetings at the time they are organized. Client and INTECSEA may attend these meetings as necessary or appropriate.

Each of the managed (EPC) contractors will be made responsible for implementing an interface management system within its own organization and shall participate in operation of the PMT Interface Management System. Each managed contractor will appoint an Interface Coordinator who will coordinate

issue resolution activities within their organization and will communicate these resolutions to the PMT Interface Manager. The Interface Coordinator shall be a single-point-of-contact on the managed contractor's interface issues. Each contractor shall establish within its own organization an interface management system to:

- Ensure that technical interfaces (both functional and physical) and contractual interfaces (cost and schedule) within its own scope of supply and between itself and other relevant parties are identified, recorded, understood, agreed upon by all parties, and reported to the IMS.
- Manage the resolution and timely closeout of relevant interface issues.
- Provide relevant information or data to those groups within the contractor's own organization, which may have need of, or be impacted by, the subject information.
- Provide relevant information or data to other contracting parties and to the IMS, which may have need of, or be impacted by, the subject information.
- Coordinate review and approval for all procedures, data, instructions, drawings, etc. at relevant work interfaces.
- Coordinate review and approval of Change Requests to ensure that interface issues are recognized and addressed.
- Coordinate review and approval of all significant non-conformance reports and dispositions to ensure that interface issues are recognized and addressed.

Reporting

Following resolution of an interface issue, the resolving party will provide appropriate documents, including Change Request and significant non-conformance review and actions, to the affected parties and to the Interface Manager for the record. The Interface Manager will record all agreements and actions in a suitable form and other appropriate documentation, as required. Systems Interface information shown in the form(s) will also be tracked in a database to provide ready access to the data developed. A sample of typical IMS report is shown below.

Interface Name	FTL-04 Production FTL Connection at SPAR			INTECSEA WorleyParsons Group
System:	Water Injection		Interface No.	Data Sheet No.
Interface Description	FTL Attachment to the DTU		FTL 153-01	FTL-153-01-01
Interface Location			Revision / Initials / Rev. Date	
Interfacing Parties	FPSO	FPSO engineering contractor	A / NH / 19/03/02	
	SUB-SEA	Sub-Sea engineerig & installation contractor		
	SPAR	SPAR engineering contractor		
	FAC	Client Facility management		

General Interface Information / **Interface Specific Document**

No.	Description	Value	UOM	Responsible	STATUS R	A	G	B	Document No.	Rev.	Document No.
1	Nominal Dia	6.6"	inch	SUB_SEA			G		AGB-C-00-009		Subsea Installation Scope of Work (Volume 4)
2	Design Flow Rate	80	kbwd	FAC				B	DSG-RI-3890		*Riser Loads for FPSO Mooring System Design*
3	Length (Approx)	586	m	FAC			G		AGB-C-00-009		Subsea Installation Scope of Work (Volume 4)
4	Weight/meter Length	tba	kg/m	SUB_SEA		A					
5	Minimum Bend Radius	tba	m	SUB_SEA		A					
6	Design Pressure	5000	psi	FAC			G		AGB-C-00-009		Subsea Installation Scope of Work (Volume 4)
7	Maximum Operating Tension	40	Te	SUB_SEA			G		DSG-RI-3890		*Riser Loads for FPSO Mooring System Design*
8	Maximum Operating Side Load	27	Te	SUB_SEA			G		DSG-RI-3891		*Riser Loads for FPSO Mooring System Design*
9	Vertical Approach Angle for Max Op Ten'n	43	deg	SPAR			G		DSG-RI-3892		*Riser Loads for FPSO Mooring System Design*
10	Pull-In Load	tba		SUB_SEA	R	A					
11											
12											
13											

General Notes:

The general information included on this form is for interface management only and is given in good faith.
For engineering purposes the reader must refer to the appropriate drawings and specifications for details.

IMS Tool

The INTECSEA IMS is a Web based application, accessible from all project locations through the Internet. The interface database resides on INTECSEA's server in Houston, where the program is maintained periodically updated when new features become available. The application will provide:

- WEB based Interface Management System for remote job site access and secure access from anywhere in the world;
- Unbiased procedures to formally assess, resolve and document interface issues and conflicts;
- IMS Team defined Fabricator(s), Contractor(s) and Sub-contractor(s) access rights;
- A high level Graphic User Interface (GUI) for quick location of project interfaces;
- Early warning of interface clashes, reduced schedule float, and notification of change;
- Reporting of schedule and cost issues;
- "Traffic Light" status to clearly present interface, management and contract issues;
- General data, e.g. interface liaison personnel details, interface matrices etc.;
- Single item data entry by each user to a "Virtual Database";
- Mass data file upload via IMS tools using industry standard application files (e.g. Excel, Primavera, MS Project, etc.); and
- Adaptable search tools for database Interrogation and Reporting.