ADIL – Columbus Development
The scope included the conceptual design of the Columbus subsea system. UPI conducted the field architecture and preliminary pipeline design, manifold definition, controls/umbilical definition and generated the drawing package.

ADIL – Vulcan East Development
Provided study and FEED work for the Vulcan east subsea tie-back development in southern North Sea. Scope included field architecture and protection, preliminary pipeline design, materials and corrosion assessment, functional specifications, isolation and testing philosophy.

ADIL/Premier Oil – Solan Development
Premier Oil is developing the Solan oil field located in UKCS (west of Shetlands) in approximately 135m water depth. The production and injection wells will be tied back to a four leg jacket and topside facilities by flexible flowlines and rigid risers. A piled subsea storage tank, located on the seabed, is used to store crude oil tied-back to the jacket and topside facilities by flowlines and rigid risers. Crude from the storage tank is exported via the off-loading system hose connecting the off-loading system base and off-loading riser.

UPI scope includes pipeline internal corrosion assessment, wall thickness and material grade selection meeting pressure containment, hydrostatic collapse and propagation buckling requirements. Pipeline on-bottom stability analysis conducted to confirm the minimum concrete coating thickness in conjunction with fishing gear impact assessment. The pipeline external anti-corrosion coating selection and cathodic protection design was conducted and the proposed pipeline route assessed for instability. UPI also developed the technical specifications and datasheets.

AGIP – Green Canyon 562 K-2
Pre-Front End Engineering FEED for a twin drilling centre subsea development tied back to a SPAR. Included pipe-in-pipe pipelines, HIPPS, manifolds, PLEM’s and PLET’s, cost estimating and route studies over rough terrain. Principal deliverables included Pre-FEED reports and AFE cost estimate.

Aker Solutions – 3” Vent Line
Flow assurance for the Flyndre/Cawdor project showed that during blowdown, a large quantity of liquids would arrive on topsides so UPI were contracted to perform a feasibility study for the provision of an additional 3inch vent pipeline tie-in system. The scope of work included defining the technical concept, generating an order of magnitude costs and determining the impact on the proposed first oil date or key milestones.

Aker Solutions – Flyndre over Clyde
UPI performed front end engineering and design (FEED) for the Flyndre - Cawdor development which comprised of two drill centres tied back to the Clyde platform. The scope of work included the production piping system from the SSIV to the topsides emergency shutdown valve (ESDV) including the materials and coating selection, cathodic protection, tie-in spoolpiece and mechanical riser design, J-tube selection, SSIV structure and piping design and the SSIV umbilical.

Aker Solutions – Flyndre Procurement Support
UPI provided procurement support for the modifications required to the existing Clyde platform to host production from the Flyndre/Cawdor developments. A technical bid evaluation was performed on the hydraulic SSIV and manual valve, linepipe supply, flexible jumper, SSIV umbilical, small bore valve, conductor mechanical connector and 30 inch casing linepipe supply packages submitted by the vendors invited to tender.
Subsea Experience

Amerada Hess Corporation – Baldpate Export Pipeline System Garden Banks
Conceptual and detail design of 16-inch and 12-inch export pipeline system including two of the world’s first steel catenary risers (SCR’s) and a diverless mid-line tie-in structure. UPI undertook design and project and construction management through to the installation of the system.

Amerada Hess Corporation – Northwest Project Garden Banks
Conceptual and detail design of entire tie-back subsea system. Construction support. Flow Assurance, PLETs, pipelines, control system etc.

Anadarko – Independence Hub MC920
Project Management and technical support from design through construction and commissioning. The independence hub is a floating production system which is the hub to several tie-back subsea developments. UPI has provided key technical specialists to the project for design through project management. Under a separate contract also undertook FEED.

Apache Corporation – Beryl Subsea Support
UPI were contracted by Apache North Sea Ltd to perform subsea pipeline support engineering for the Beryl Field. The scope of work included freespan analysis and developing freespan assessment criteria for rigid pipelines where no criteria previously existed.

Apache Corporation – Support Services
UPI provided Apache with pipeline integrity management support services for its Beryl and Forties pipeline assets. Services provided include pipeline life extension studies; pipeline and riser fitness for service and defect assessments; freespan reviews and fatigue assessments; developing freespan acceptance criteria for rigid risers, pipeline bundles and rigid pipelines; pipeline internal corrosion assessments; FPS topside corrosion assessment and integrity management support.

Asset Development and Improvement Ltd – Orlando Development
UPI were contracted by ADIL to perform a review of the Orlando Development FEED. The scope of work included reviewing the subsea FEED design to identify any major issues that may represent contractual and financial risks to the project and to provide commentary on alternative solutions where applicable; reviewing the FEED flowline design to assess its fitness for purpose and the rockdump requirements and a preliminary design check of proposed super duplex rigid tie-in spoolpieces.

Asset Development and Improvement Ltd – Orlando Engineering Support
UPI was contracted to provide engineering support for the Orlando Development. The services provided included additional front end engineering design of the production pipeline and tie-in spoolpieces including a pipeline sensitivity study to determine the allowable inlet temperatures and acceptable corrosion allowances; the structural and piping design of the SSIV and PLEM and generating specifications and datasheets.

Asset Development and Improvement Ltd – Victoria Phase 2
UPI provided FEED and detailed design services for the Victoria Phase II development. The FEED scope of work included performing transient flow assurance analysis to confirm the minimum design temperature and well back pressure and generating specifications and data sheets. The detailed design scope of work included the new and replacement seabed spoolpieces, a retrofit control system mounting base and the under tree spoolpieces, cathodic protection and associated spoolpiece supports.

ATP - Cheviot Development
UPI was responsible for the conceptual, FEED and detailed design for the subsea pipeline system, umbilical and controls system definition for this development that had high content of CO2. The scope included option screening, field architecture, materials selection, basis of design, specifications, tender package preparation, tender review and flow assurance. The dynamic flexible riser system design using Orcaflex
that was connected to propose Octabuoy. UPI provided project management support and generated TFQs, tender evaluations and contract management.

**BHPB Angostura – Phase III FEED**
UPI provided engineering services and functional specifications preparatory to bid for fabrication and installation of subsea PLEM, ILS, subsea and topside control systems and one 12 in. nominal flowline for a 3 well tieback to the Angostura GEP.

**BP - Mardi Gras**
UPI provided detail design of 16 unique PLET’s and PLEM’s in the range of 16-inch to 28-inch, many for multiple application. Scope included detail design of structures, pipework, manifolding for operation and installation.

**BP - Marlin**
Installation management of flowlines and umbilicals including offshore installation supervision for Marlin 1 and 2 tie-backs to a TLP. Carried out analysis of TLP SCR’s and umbilicals for clash avoidance using Flexcom 3D software for installation and operation.

**BP (via CSOL) - Schehallion**
UPI provided engineering and design of the riser suction anchor systems including suction pile analysis and configuration and verification of CSOL connection appurtenances.

**BP (via Stolt Comex Seaway) - Foinaven**
Orcaflex dynamic analysis of flexible riser installation and determination of safe installation methodology

**BP (via Subsea Offshore) - Schiehallion**
Detailed installation analysis for the flowline termination assemblies (FT.A’s) integral with the pipelines. The FT.A’s were configured to enable diverless tie-ins to the subsea wells. Using dynamic riser analysis techniques determined for all the flowlines the procedures for diverless installation.

**BWI - Cheviot Field Architecture**
UPI provided engineering design services for the field architecture and platform tie-in of the Cheviot field development. Services included materials selection; flow assurance including definition of chemical injection, gas lift and service requirements; controls, chemical injection and hardware schematics; field layout drawings; riser concept selection and establishing third party tie-in locations, battery limits and interfaces.

**BWI - Cheviot [1st Application of Octabuoy]**
UPI provided concept and detail design of full field development which included four (4) Field centres supporting 16 wells. Scope included system design and specification including requisitions for all equipment and installation services. Detail design of all flowline, export line and umbilical risers. Detail design of subsea architecture and vessel interfaces, well control and chemical injection including services distribution structures. Flow Assurance analysis including start-up and chemical optimization.

**BWI - Cheviot Development**
UPI was responsible for the conceptual/FEED/Detail Design for the subsea pipeline system and umbilical and controls system definition for this development. Scope included option screening, field architecture, materials selection, basis of design, specifications, tender package preparation, tender review and flow assurance. UPI undertook the dynamic flexible riser system design using Orcaflex that will be connected to propose Octabuoy. UPI also provided project management support in relation to generation of TFQs, tender evaluation and contract management.
BWI - Clipper
UPI provided FEED/detailed design. The scope covered the full field development including pipelines, umbilicals, tie-in spools, and field architecture. Also with the FEED scope was the development of a project schedule and associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets. Through to and including execution support.

BWI - Clipper
UPI provided conceptual design and flow assurance for operation and start-up including chemical requirements. Conceptual design of pipe-in-pipe flowline approximately 20 miles long, umbilical and tie-in jumpers for two remote wells tying back to the Front Runner platform. Management and field services support to client.

BWI - Gomez
UPI provided FEED/detailed design and execution of the Gomez Development. The scope covered the full field development including pipelines, umbilicals, risers, tie-in spools, SSIV and field architecture. Also with the FEED scope was the development of a project schedule and associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets. Through to and including execution support.

BWI - GOMEZ Phase 2 and 3 Mississippi Canyon 711
UPI provided detailed design, procurement and construction assistance for additional wells, flowlines, risers, umbilicals and manifold to the ‘Midland’ floating production system based on a converted drilling rig. UPI performed the design of the entire additional wells subsea and flexible riser systems. The Subsea system was configured based on production from 2 extending to 8 wells for oil and gas production.

BWI - LadyBug Garden Banks 409
Definition and detailed engineering of entire two well subsea tie-back system.

BWI - MC711Gomez - Enhanced Production
Gomez reservoir pressure was predicted to reduce late in life and this project was to determine best practical solution to minimize production rate decline. Flow assurance analysis, market survey and comparison leading to recommendations. Investigated, increased riser size, optimized gas lift, down hole ESP’s, surface ESP’s, Cascade ESP’s with gas knock out separation, multiphase pumps and multiphase pumps with separators. Flow assurance models were constructed in OLGA and correlated with suppliers’ equipment specs to establish the most productive enhanced production system. Design of additional flowlines, power requirements and delivery and support structures and tie-ins for new systems was undertaken. Procurement exercises were undertaken for equipment selection.

BWI - Mirage
UPI provided FEED/detailed design and execution of the Mirage Development. The scope covered the full field development including pipelines, umbilicals, risers, tie-in spools, SSIV and field architecture. Also with the FEED scope was the development of a project schedule and associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets. Through to and including execution support.

BWI - Mirage and Telemark, Mississippi Canyon 941
UPI provided FEED, detailed design, procurement and construction assistance for a floating production system based on the MinDoc spar concept. UPI provided the design of the entire subsea and SCR riser systems and the gas and oil export pipelines and their deepwater tie-ins to existing infrastructure at ‘Mars and Gomez’. The Subsea system was configured based on production from remote wells, local dry tree wells and export to existing infrastructure.
Subsea Experience

**BWI - Mississippi Canyon 711**
UPI FEED, detailed design, procurement and construction assistance for a floating production system based on a converted drilling rig. UPI provided the design of the topsides production modules, the entire subsea and flexible riser systems and the gas and oil export pipelines and their tie-ins to existing infrastructure. The Subsea system was configured based on production from 2 to 8 wells for oil and gas production.

**BWI - Octabuoy Semi-Submersible Risers, Caissons and Pull Tubes**
The Octabuoy is ATP’s Semisubmersible Floating Production Unit designed to operate in fields from 500fwd to 5,500fwd. Scope included the detailed design of riser supports, caissons and pull tubes to enable the ‘Octabuoy’ to be deployed to fields in locations with a large range of environmental conditions and water depths. A specification for numbers of risers and their duty was prepared and the appurtenances and their clamping systems were designed by UPI and subsequently fitted to the Octabuoy.

**BWI - Telemark SSTB**
UPI provided FEED/detailed design and execution of the Telemark Subsea Tie-back. The scope covered the full field development including pipelines, umbilicals, tie-in spools, and field architecture. Also with the FEED scope was the development of a project schedule and associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets. Through to and including execution support.

**Conoco Philips – Joanne Life Extension**
UPI provided a life extension study reviewing the current conditions of the Joanne production facility with a view to extend the life of the field. The assessment included the pipelines, well jumpers, manifold piping, tie-in spools, risers and topside pipework, pig launcher/receiver, fittings and valves. The study also considered the control system including all associated topside and subsea components and the subsea umbilical including electrical, hydraulic and chemical injection functions.

**Conoco Philips – Heidrun**
UPI provided basic design of the water injection system including the flowlines, riser and umbilical. Scope encompassed connection systems, marine riser design and analysis and flowlines. Later awarded contract from installation contractor to support the installation.

**Devon Energy – Pecten and Schlitz, Viosca Knoll 739 and 694**
UPI provided engineering and detailed design of the two well subsea tieback. Scope included project and construction Management.

**El Paso – Ewing Banks EW1003**
UPI provided conceptual, definition and detail design of 3 to 5 well subsea tie back system and topsides facilities at Prince TLP. Scope included project and construction management. Also included steel catenary risers (SCR’s), umbilical, PLET’s, in-line side-taps, manifold, trees, control system and topsides facilities.

**El Paso – Front Runner**
UPI provided FEED, detail design, procurement and construction assistance. 12-inch export pipeline from the deepwater development to a shallow water tie-in to SS 332. The pipeline incorporated a Wye and negotiated 6 pipeline crossings.

**Elf (via Cameron) – Dalia**
UPI provided front end study to develop subsea architecture and determine installation methodology and plans.
**Elf (via Udeco; Kongsberg) – Girrassol**
UPI provided assistance to Udeco for development and test of the diverless tie-in spools utilizing vertical connectors.

**ENI – Appaloosa**
UPI provided detailed engineering services to ENI US Operating Co. Inc. (ENI) for the development of the Appaloosa field located in the Mississippi Canyon (MC) area in Block 460 by adding an additional well #3 distant 1.2 miles North from the existing Appaloosa well #1 in the Gulf of Mexico with a corresponding tie-back flowline 1.19 miles long. The field water depth is in the range of 2,660 ft. to 2,840 ft.. UPI provided detailed engineering services for the 8-in flowline, PLEMs and associated jumpers, well control and chemical injection umbilical of 1.23 miles in length from the well #3 to the well #1, SUTAs and associated hydraulic and electrical/optical flying leads. The scope also included the removal and re-installation of existing 5-in umbilical (Segment No. 16233) in the vicinity of existing well #1 to expand the facilities for well #3 control, and 7,600 ft. of existing Appaloosa flowline replacement to remediate the wax deposition. Assisted ENI with regulatory permits assistance, interface management, flow assurance, subsea engineering, fabrication and installation Contractor’s documents review, integrated Appaloosa flowlines pre-commissioning, start-up of well #3 and well #1, and as-built survey data review.

**ENI – Appaloosa II**
UPI provided detailed engineering services for the 8-in flowline, PLEMs and associated jumpers, well control and chemical injection umbilical of 1.23 miles in length from the well #3 to the well #1, SUTAs and associated hydraulic and electrical/optical flying leads. Additionally the scope included the removal and re-installation of an existing 5-inch umbilical. UPI also assisted ENI with regulatory permits interface management, flow assurance and subsea engineering.

**ENI – Appaloosa II**
UPI provided addition of wells to Appaloosa system. Flow assurance line sizing, transients and chemical requirements. Detailed design of field architecture for additional step out wells tied back by jumpers to new flowlines and into existing pipeline infrastructure. Design of control system and provision of umbilical and chemical injection systems.

**ENI – Devis Tower / Triton**
UPI provided FEED/detailed design and execution of the Devils Tower Development. The scope covered the full field development including pipelines, umbilicals, risers, tie-in spools, SSIV and field architecture. Also with the FEED scope was the development of a project schedule and associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets. Through to and including execution support.

**ENI – Longhorn**
UPI provided conceptual design, FEED, detailed design and project execution support which included planning and cost estimating for a multi-well tie-back with manifold to existing infrastructure. Scope includes subsea architecture, SCR risers, controls, umbilicals and export pipeline system. Later on UPI added a number of subsea tie-backs.

**ENI – Longhorn**
UPI provided FEED/detailed design and execution of the Longhorn Development. The scope covered the full field development including pipelines, umbilicals, risers, tie-in spools, SSIV and field architecture. Also with the FEED scope was the development of a project schedule and associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets. Through to and including execution support.
ENI – Longhorn III
UPI provided FEED, detailed design and execution for the Longhorn III Development. The scope included the full field development including pipelines, umbilicals, risers, tie-in spools, SSIV and field architecture. Additionally the FEED scope was the development of a project schedule and an associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets.

ENI – Mamba FEED
UPI undertook front end engineering design for the Mamba Straddling Resources Project to develop the single upstream subsea pipeline system defined during concept and to define a CAPEX value for the project. The scope of work included the infield and export pipelines to the battery limits at the onshore inlet facilities and the layout and installation studies for the subsea production systems.

ENI – Mamba Straddling
UPI undertook concept selection (pre-FEED) for the Mamba Straddling Resources Project to develop a single upstream subsea concept. The work considered the subsea infrastructure from the wellhead to the valve at the downstream side of the pig launcher and the controls and distribution system covering the onshore in-let facilities with regard to controls and injection, umbilicals and the subsea infrastructure supporting the production system.

ENI – Pegasus 2
UPI provided FEED/detailed design. The scope covered the full field development including pipelines, umbilicals, tie-in spools, and field architecture. Also with the FEED scope was the development of a project schedule and associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets. Through to and including execution support.

Exxon Mobil (via Cameron) – ExxonMobil Lewis 1 development
The scope conducted by UPI covered initial conceptual design of the Lewis 1 subsea system development and then moved into FEED and project management support. The scope was the design of a pipe-in-pipe system and included preliminary design of the pipeline, material selection, generation of technical specifications, field architecture and generation of tender package. Also included in the scope were the definition and preparation of ITT packages for the control of the umbilical systems. At the end of FEED, UniversalUPI took on a project management role, overseeing detail design of the pipe-in-pipe system, including verification and procurement support of 13% Cr production pipe.

Exxon Mobil (via Cameron) - Erha
UPI provided definition engineering of subsea facilities including manifolds and tie-in systems and suction pile foundations. Field architecture development and planning.

Exxon Mobil (via Cameron) – Kizomba
UPI provided Front End Study to develop subsea architecture for 30 well development and to determine installation methodology and plans.

Exxon Mobil (via Cameron) – Kizomba
UPI provided provision of umbilical engineering support including dynamic analysis using Orcaflex.

Exxon Mobil (via Cameron) – Various (Leased Production System)
UPI provided Front End Study to develop subsea architecture and installation methodology for leased production system.

ExxonMobil – Xikomba
UPI provided provision of umbilical engineering support including dynamic analysis using Orcaflex.
Subsea Experience

**ExxonMobil – Zafiro**
UPI provided definition engineering of subsea facilities including manifolds and tie-in systems and suction pile foundations. Field architecture development and planning.

**Fairfield Energy – Darwin Development**
Fairfield Energy contracted UPI to perform a conceptual thermo-hydraulic analysis for the Darwin field subsea development in order to investigate the potential multiphase pump power requirements, production flowline sizing, thermal design and insulation requirements.

**Fairfield Energy - Dunlin Riser Hang-off Module**
UPI undertook a feasibility study reviewing the safety and structural aspects of installing flexible catenary risers on the Dunlin Alpha platform from a new hang off module. The study addressed the safety implications that may impact the platform, the preferred locations for a new riser hang off module, the potential size and weight of a new module, installation feasibility and provided load reactions for assessment of the existing platforms structural integrity to support a new module.

**Fairfield Energy – Merlin Cost Estimate**
UPI were contracted to conduct a cost estimate for a replacing the existing Merlin crossover manifold adjacent to the Dunlin Alpha platform. The scope of the cost estimate included the design, procurement, fabrication and installation costs for the replacement manifold including the isolation, disconnection and retrieval of the existing manifold.

**Fairfield Energy – Osprey Flow Assurance**
UPI provided Fairfield with flow assurance support. Transient hydraulic analysis was performed to predict the feasibility of water flushing the Osprey production pipeline as well as the duration required which water must be injected to ensure complete displacement of oil from the production system.

**Fairfield Energy – Osprey Interim Redevelopment**
UPI performed FEED and detailed engineering design for the Osprey Replacement Interim Development. Services provided included design of the interim manifold structure, piping and foundation, the rigid production tie-in spools, the cathodic protection, the control umbilical/jumper protection and the coating selection. UPI also produced the testing and pre-commissioning philosophy, MTO, cost estimate and developed generic project specifications.

**Fairfield Energy – Osprey Replacement Pipeline**
UPI conducted a study of the potential re-routing and tie-in of the replacement Osprey production pipeline to Leg D on Dunlin Alpha as an alternative to the current location on Leg C. The study considered the tie-in requirements at the platform and subsea facilities, the interface with existing infrastructure, protection requirements, the cost estimate and MTO for installation and routing to Leg D. UPI also produced generic specifications for Fairfield from existing Osprey specifications.

**Fairfield Energy – Crawford Development**
UPI was contracted by Fairfield to provide concept and FEED services for the Crawford development. The objective of the concept stage was to identify possible riser locations on a jack-up rig, feasible riser/J-tube configuration to the manifold, jack-up rig and export/import pipelines. FEED covered the definition of the subsea pipeline system, field architecture, materials selection, specification preparation, cost estimate and schedule, flow assurance including subsea multi-phase pump.

**Fairfield Energy – Fairfield Energy**
UPI conducted concept engineering for the replacement Osprey and Merlin production systems including preliminary pipeline design, field architecture and protection philosophy, basis of design, cost estimate and schedule, materials selection. Also conducted condition assessment study of the existing pipeline to establish fitness for purpose and field life extension.
**Subsea Experience**

**HESS – Akom North**
UPI provided conceptual design, detail design, procurement support, construction support, field services and inspection. Single well tieback to existing TLP. Scope included flow assurance, flowline, PLET, jumpers, topsides control system, subsea control system and umbilical system.

**HESS – Akom North**
UPI provided FEED/detailed design and execution. Scope included construction and inspection support, project Management, technical support, studies and procurement.

**HESS – Ceiba**
Flow assurance, conceptual and detailed design, procurement support, field services and inspection. Scope included upgrading and rebuilding of gas injection systems at 5 field centers. Provision of a replacement flexible including cut-out and reconnection to existing rigid pipeline including installation structure and connectors. Pipe support design and installation for reconnection.

**HESS – Penn State Deep Project VI**
UPI provided subsea engineering, design and installation support for 4,000 ft. heavy oil flowline and controls umbilical subsea tie-back Penn State Deep.

**Iona Energy Company – Engineer Consultancy Services**
UPI provided engineering consultancy services for the Orlando Development. The scope of work included producing functional specifications for the PLEM and SSIV structures; producing a protection philosophy for all Orland subsea infrastructure (SSIV, PLEM, trees, pipelines, spools and umbilical) which considered the risks from dropped objects and trawl gear interaction and generating overall field layout, platform, SSIV and PLEM approach and pipeline crossing drawings.

**Kerr McGee – Atwater Valley**
UPI provided FEED for three (3) subsea developments tied back to a SPAR. Included pipelines, steel catenary risers, umbilicals, manifolds, PLEM’s and PLET’s. Principal deliverables included FEED report, AFE cost estimate and project construction plan.

**Kerr McGee – Garden Banks 244**
UPI provided identification and screening of subsea and surface piercing facilities. Definition of best practical options corresponding to a range of production profiles. Flow assurance and technical analysis leading to AFE level cost estimates.

**Kerr McGee – Red Hawk Garden Banks 877**
UPI provided definition engineering of subsea architecture and tie-back facilities at a number of fixed and floating hosts. Flow assurance, technical definition and full AFE cost estimating.

**Mobil North Sea Limited – Beryl Field**
As part of the development of the Beryl field undertook the conceptual, definition, detail design and installation engineering of subsea hardware for the Beryl field which is suitable for deepwater diverless application on future fields. Development work was directed towards diverless phased developments where equipment is installed only per well as needed. Hardware included rig installable guide base manifolding and protection, retrievable and maintainable controls hardware and distribution systems and specification of diverless trees and equipment including rig deployable diverless tie-in systems.

**Murphy – Dalmation**
UPI provided FEED/detailed design. The scope covered the full field development including pipelines, umbilicals, tie-in spools, and field architecture. Also with the FEED scope was the development of a project schedule and associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets. Through to and including execution support.
Subsea Experience

Murphy – Thunderhawk
UPI provided FEED and detailed design. The scope included the full field development including pipelines, umbilicals, tie-in spools, and field architecture. Additionally the FEED scope was the development of a project schedule and an associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets. Through to and including execution support.

Newfield Exploration – Fast Ball
UPI provided detailed design of subsea flowline and SCR riser and umbilical. Pegasus scope includes full detail design of all subsea equipment including PLETs and the design of the SCR and flowline.

Newfield Exploration – Fast Ball
UPI provided detailed engineering services to Newfield for developing a deepwater gas discovery called Fastball in Viosca Knoll Block 1003 Area of the Gulf of Mexico. The development is comprised of a single subsea well producing gas situated in water depths ranging from 1,123 ft. to 4,850 ft. The subsea well will tie-back via a 6-inch flowline to the Virgo Production Platform located in Viosca Knoll Block 823. The UPI scope included the regulatory permit assistance, interface & engineering support, flowline mechanical design, field layouts, routings & schematics, PLET and jumper design.

Newfield Exploration – Gladden Medusa
UPI provided detailed engineering services to Newfield Exploration Company for the development of a subsea tie-back well Gladden located in Mississippi Canyon Block 800 area of the Gulf of Mexico. The proposed Gladden well is tied-back into the Medusa Spar located in Mississippi Canyon Block 582. The well is located approximately 19 miles South from the Medusa Spar. The water depth at Gladden well is approximately 3,125 ft. and 2,210 ft. at Medusa Spar. The flowline subsea architecture consists of a 4-inch flexible riser pipe that will hang-off from an existing pull-in tube on the Medusa Spar and at Subsea, the flexible riser pipe connects to a Pipe-in-Pipe (PIP) system consisting of a 5.5-inch OD x 0.5-inch WT inner pipe with an 8.625-inch OD x 0.438-inch WT carrier pipe utilizing a specially designed transition bulkhead. The annulus of the PIP flowline will be filled with insulation to provide sufficient heat retention for flow assurance purposes. The PIP flowline will continue from the base of the flexible riser for approximately 19-miles where it will terminate with a Dual Hub PLET near the Gladden Well. An insulated steel rigid jumper assembled with Cameron CVC connectors will connect the PLET to the subsea well. Utilizing a Dual Hub PLET enables the option to assist in pipeline dewatering and commissioning, provide an additional future tie-in point for an additional well, and provide a potential tie-in point for subsea pig launcher for non-routine intervention. UPI assisted the Newfield with the detailed subsea engineering through execution and well start-up.

Noble Energy – Aseng
UPI provided detailed engineering services to Noble Energy for the development of the Aseng field. The scope covered the full field development including pipelines, umbilicals, risers, tie-in spools, SSIV and field architecture. Also with the FEED scope was the development of a project schedule and associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets. Through to and including execution support.

Noble Energy – Raton South
UPI provided detailed engineering services to Noble Energy for the development of the Raton South Development. The scope covered the full field development including pipelines, umbilicals, tie-in spools, SSIV and field architecture.
Subsea Experience

architecture. Also with the FEED scope was the development of a project schedule and associated cost estimate along with development of project design engineering reports, layout drawings, technical specifications and datasheets.

**Noble – Swordfish Project**
UPI provided PLET concept, detailed design and fabrication.

**Noble – Tamar**
UPI provided concept, FEED and detailed design for flowlines, subsea controls system which also included procurement and installation support.

**Norske Shell (via Cameron) – Garn West**
UPI provided concept development for diverless manifold systems

**Norske Shell (via ETPM) – Draugen**
UPI provided detailed design of the gas export trunkline; the SSIV and the PLEM. MPE undertook the entire detail design including the arrangements to effect diverless tie in of the subsea facilities for the 16 - inch system. All diverless tie-ins were effected successfully and the system is configured to enable diverless retrieval and replacement of all valves and equipment.

**NSP Company – MacCulloch Engineering Support**
UPI undertook a life extension feasibility study on the MacCulloch field. The purpose of Phase 1 of the study was to perform an assessment of the main components of the system against the identified design specifications and component limitations in order to identify critical components and any further information, studies, tests, inspections and validation required to be carried out during Phase 2 of the life extension.

**NSP Company – Umbilical Support - Phase 5**
UPI provided project management and engineering services for the MacCulloch Field umbilical replacement project. Services provided included dynamic analysis and detailed engineering design to support the installation of the replacement umbilical over the midwater arch; subsea controls engineering support; structural engineering within the FPSO turret to permit umbilical pull-in; development of the testing, pre-commissioning and commissioning philosophy and interface and technical support.

**Ocean Energy – Umbilical Support - Phase 5**
UPI provided specifications, procurement and installation management of the umbilical system including manufacturing and offshore installation supervision. Additionally UPI undertook verification analysis of the pipeline systems including pipe-in-pipe system.

**ONGC – Vashishta Phase II**
UPI was awarded the concept and FEED contract for the offshore development covering field development concept engineering, FEED and project management contract including onshore terminal, subsea system and well comPLETion system. Scope included concept identification and screening, system flow assurance, field development cost estimate and schedule. Scope also included development of ITT packages, tender evaluation and post award engineering reviews and verification.

**ONGC – Vashishta and S1 Development**
UPI had been contracted by ONGC to provide Consultancy Services for the Development of Vashishta & S-1 Deepwater Fields in East Coast India. The scope covered the concept and FEED engineering stages for both onshore and offshore facilities and well engineering definition. The contract also included post EPC contract award technical and project management support through to project start up.

**PDi – Perenco Pipelay**
UPI undertook detailed design of a pig launcher and receiver for an 8-inch nominal bore pipeline of approximately 9km length from a new subsea well tied back to the Leman gas field, required for flooding,
cleaning, gauging and strength testing (wet end to wet end). Mathcad calculations were performed for the pipeline and padeye designs and an FS2000 model used to assess the bumper frame stress utilization during lifting.

**PDI – Q4-C Re-Routing Pipeline**
UPI undertook detailed design of a pig launcher and receiver for a 10-inch pipeline planned to be installed from the Q4-C platform to the subsea connection point within an existing pipeline at the Q8-A platform, from where it is routed to shore, required for flooding, cleaning, gauging and strength testing (wet end to wet end). Mathcad calculations were performed for the pipeline and padeye designs and an FS2000 model used to assess the bumper frame stress utilization during lifting.

**Petrobras (via Consub) – Enchova Oeste**
UPI provided detailed design and installation engineering for the 'Mac Manifold' with its shared actuation system. Designed for eight wells in very deep water, the first deployment was in relatively shallow water. Up to 50 deepwater applications for the Petrobras sponsored system had been identified in deepwater locations.

**Petrobras (via DSND; GMC) – Marlim/Roncador**
UPI provided span assessment for the 122 km of pipelines including the detail design and diverless implementation of span support arrangements for DSND. In Houston installation design for the P60 steel catinery riser system for GMC.

**Reliance Industries (Sub-Contract to Bechtel) – ‘KGD6’ Field Development**
UPI provided technical advisors, project and construction managers for subsea scope. Represented Client for FEED review, design contract, hardware supply contract, subsea infrastructure and export system construction. This project was one of the worlds largest deepwater gas subsea developments, comprising 6 manifolds each with up to 8 tiebacks and infield flowlines and umbilicals back to a shallow water platform and pipelines and umbilicals to a shore crossing.

**Statoil – Logan**
UPI provided feasibility study to develop subsea system equipment requirements, subsea architecture and cost estimates for three tie-back options to a) Buckskin (20 miles), b) Hadrian (10 miles) and c) Logan Stand Alone (5 miles). The study included Gas Lift versus Multiphase Pump, flow assurance, controls and equipment schematics and hardware, pipeline and subsea facilities analysis and selection. Scope also included risk assessments, planning and cost estimating.

**Statoil (via Cameron) – Asgard**
UPI provided development of concept for riser base manifold system utilizing Camerons diverless connection system.

**Statoil (via Subsea Offshore) – Asgard**
Following failures of flexible risers during installation on other deepwater projects (eg Foinhaven) MPE was commissioned to develop a safe installation procedure for multiple risers confirmed by analysis. The procedure was a success and has become an industry standard.

**Subsea 7 – Brynhild Over Pierce**
UPI was subcontracted to provide engineering design support for the development of the Brynhild field subsea tie-back to the Pierce FPSO. The scope of work included the design modifications required to the horizontal lay system (HLS), HLS frame sea fastenings, vessel outrigger, reel drive and product reel sea fastenings, quadrant, winch and grillage sea fastenings and the spoolpiece lift rigging and deployment assessment.
Subsea Experience

Statoil – Logan Canyon
UPI provided concept and feasibility engineering study for multiple subsea tieback development scenarios. The prospect included six to nine wells at two drill centers located in about 8,000 ft. water depth in blocks WR 925 & 969. Potential hosts included existing platforms and new build floating hosts. Key study points included pipe-in-pipe design, multiphase pumping and gas lift systems to enable efficient exploitation of the reservoir; Class B cost estimate, Level 2 project execution schedule and a detailed project risk assessment and mitigation plan.

Talisman – Arkwright Riser Study
UPI was requested by Talisman to assess the feasibility utilizing some or all of the WaGE caisson riser components to facilitate a new caisson riser for the Arkwright field, located on the Arbroath platform.

Talisman – Beauly Field Development
Talisman was developing a cluster of subsea wells at Beauly with flowlines tied back to the existing Balmoral facilities. UPI undertook a dropped object study to demonstrate that risks to Beauly subsea equipment from objects dropped from drilling and production vessels met established acceptance criteria.

Talisman – Buchan Alpha Redevelopment
UPI reviewed the cathodic protection requirements for additional manifolding, replacement flexible risers and the existing system, the objective of the work was to determine anode types, number and locations such that anodes could be procured and a work scope provided to an installation contractor for their fitment.

Talisman – Burghley Development
UPI was awarded the Burghley conceptual and follow-on FEED study for the Burghley development. The initial development concept comprised the tie-back of a five well development through a subsea manifold to two alternative host facilities, the Balmoral FPV and the Global Producer III on the Dumbarton field. Pegasus subsequently conducted a second phase study/ FEED and the detail design. The pipeline had an insulated coating.

Talisman – Flyndre Cawdor Development
Aker Solutions (Aker) was the main contractor for delivery of front end engineering design (FEED). UPI had been subcontracted by Aker to provide FEED services for the subsea scope elements, principally the production piping system from the SSIV to the topsides emergency shutdown valve (ESDV) and the SSIV umbilical. The scope included the identification and review of riser options, SSIV layout, field architecture and specifications.

Talisman – Hannay Development
UPI provided assistance to Talisman with the review of technical aspects of EPIC contractor tender documents for the Hannay step out development. Scope included: Review of ITT document, prepare bid tab against ITT scope of work, identified terms of reference for rating and weighting the key areas, reviewed tenders against the bid tabs, prepared narrative, identified technical clarifications.

Talisman – Hannay Development
UPI was awarded the subsea engineering contract by Acergy to conduct the detail design of the Hannay development. The scope covered the follows:
- Detailed design of production flowline and tie-in spools.
- Detailed design of piggyback gas lift flowline and tie-in spools.
- Detailed design of Hannay manifold assembly.
- Detailed design of Buchan Alpha SSIV assembly.
- Detailed design of Buchan Alpha tie-in and replacement spools.

In addition, UPI also provided fabrication site support.
Talisman – Hanney Development
UPI was contracted by Talisman to provide detailed engineering design services for the additional subsea equipment required for the second phase of the Hanney development. This included design of the production and gas lift tie-in spools, field architecture, retrofit Hanney manifold pipework and associated drawings.

Talisman – Hanney Pipeline Replacement
UPI conducted the detail design of the Hanney replacement pipeline including mechanical design (wall thickness, stability, freespan etc), material selection, datasheets, MTO's drawings and produced technical RFQ package input.

Talisman – Highlander Template Well Reconfiguration Project
UPI designed three spools connecting new production tree to existing template manifold. UPI also produced the specifications.

Talisman – Kildrummy Development
Talisman was considering the development of the Kildrummy field as a tie-back to the Pipe Bravo Platform. UPI was awarded the contract to identify and evaluate possible tie-back option at the Piper Bravo platform. The scope included identification of riser options, locations, seabed infrastructure and cost estimates.

Talisman – Kildrummy Development
UPI was contracted by Talisman to provide detailed engineering design services for the subsea system, including production and gas lift flowlines and tie-in spools, subsea distribution skid (SDS), SSIV structure, field architecture and retrofit riser system. The development was cancelled however the detailed design was completed.

Talisman – Orion Field Development
UPI was awarded the design contract by Acergy and was responsible for the initial definition of the Orion facilities. The scope of work then moved on to detail design of all subsea, pipeline and riser components to AFC status. This included:
- Structural, foundation and piping design of manifold structure.
- Thermo-hydraulic analysis.
- Subsea controls and umbilical design.
- Mechanical pipeline design, including cathodic protection, stability, free spans, upheaval buckling, spoolpieces and crossing.
- Mechanical design of riser J-tube pull.
Design of pull-in ramp at Clyde - design to initiate plastic definition of rigid line.

Talisman – Renee/Rubie Development
UPI was contracted by Bibby to provide front end engineering design and support for the investigation into the pigging options for both P1 and P2 production lines. The scope of the FEED study was to initially investigate the options with regards to the internal inspection of the production line P1 and define the additional work required to inspect production line P2.

Talisman – Ross Development
UPI was awarded the subsea engineering FEED and detailed design contract by Technip for the Ross development. The scope included the development of the field architecture, materials selection, specifications, manifolds design, SSIV design, gas export system design, infield flowline design and preparation of input to authorities submissions.

Talisman – Ross RP12 Development
UPI provided verification of the engineering design for the single Ross RP12 well tied back to the existing DCD subsea manifold.
Talisman – Talisman Beatrice Production Pipeline Repair
UPI provided the development configuration which was based on a single gas lifted well (15/16a-23) tied back to the platform via piggybacked flowlines. An umbilical to control the well and supply chemicals will also be routed from Tartan A.

Talisman – Talisman Drum Development
Talisman Energy (UK) Limited (TLM) planned to develop the Tartan North Terrace (TNT) field in block 15/16 via a subsea tie-back to the Tartan ‘A’ platform. TNT was located 3.2km north east of the Tartan A platform at a depth of approximately 141m. TNT was located 11.6km south west of the Piper Bravo platform.

Talisman – Talisman Hanney Development
The Hannay field was developed as a single well tie-back to Buchan Alpha. UPI was contracted by Talisman to undertake the detail design of the subsea facilities, including an overtrawlable template manifold, interconnecting flowlines, SSIV and associated tie-ins and the rigid riser pull-through the existing 16 inch J-tube.

For the Hannay Phase II development, Talisman contracted UPI to undertake the detail design of modifications to the piping and control system within the existing template manifold to accommodate a second production well.

Talisman – Talisman Tartan Development
Talisman Energy (UK) Limited planned to develop the Tartan North Terrace (TNT) field in block 15/16 via a subsea tie-back to the Tartan ‘A’ platform.

Development configuration was based on a single gas lifted well (15/16a-23) tied back to the platform via piggybacked flowlines. An umbilical to control the well and supply chemicals was also be routed from Tartan A. UPI was contracted by Talisman to undertake an options screening study to define the preferred riser tie-in options at the Tartan A platform.

Talisman – Tartan Hot Sand and West Graben Development - Subsea Screening Study
UPI was contracted by Talisman to carry out conceptual engineering design of the facilities required, including the umbilical, flowlines and riser system on Tartan Alpha.

Talisman – TNT B Development
UPI conducted verification of the engineering design for the TNT-B well development including pipeline and riser system design. Moving forward, UPI conducted option screening study to review available tie-in options at Tartan for the TNT development and recommended the basis for subsequent FEED / detailed design. Additionally, UPI conducted independent design verification for the TNT pipeline system design, riser system and caisson structural design.

Talisman – Tweedsmuir Development
UPI assessed the feasibility of installing a cooling spool downstream of the J1 manifold to reduce the pipeline operating temperature to below 90 degC and developed a high level subsea configuration.

Talisman – WAGE Riser Project
UPI was contracted by Talisman to provide engineering services for the concept study and follow on detailed design of a riser caisson structure taking into account the necessary reconfiguration of the flexible risers between platform and existing subsea isolation valve (SSIV) assembly.

UK Government – Various Atlantic Margins
UPI established the technical feasibility or otherwise of an export system infrastructure to support multiple developments West of Britain. Study focused on riser, spur line connection and installation issues in the deepwater harsh environment. The objective was to determine where technology is inadequate.