Neptune: Development of Design and Operations Safety Cases

Services Performed

IRC completed Design and Operations Safety Cases for the Neptune development. The work included multiple safety assessment studies and determination of overall project risk via quantitative risk analysis; and integration of performance standards and major hazard information into Operational and Maintenance procedures. The development of the *BRANE*© database facilitated practical use of hazard information by facility personnel.

Objectives

- Influence and verify the adequacy of the design based upon outputs from Formal Safety Assessment (FSA) studies
- Prepare Design and Operational Safety Cases demonstrating that risks are managed to ALARP
- Ensure company HSE requirements are met for project sanction and pre-start up
- Document major hazard management information in a practical and concise manner for Operations

Project Description

BHP Billiton is developing the Neptune field in the Atwater block, deepwater GoM. The facility comprises a single-column Tension Leg Platform with main, production, and cellar decks in approximately 4,300 ft of water.

IRC performed detailed engineering FSA studies and developed both Design and Operations Safety Cases.

FSA studies completed included fire and explosion analysis; dropped object, ship collision and helicopter transportation analyses; safety critical system analysis (escape, evacuation and rescue, emergency systems survivability); and quantitative risk analysis.

Subsequent to the Design Safety Case, an Operations Safety Case was developed. Major hazard information and performance standards for Safety Critical Systems were integrated into supporting operational and maintenance procedures for practical access by Operations.

A web based major hazard information system, *BRANE*©, was developed for Neptune, which links work activities and tasks to a live hazard register. *BRANE*© outputs include checklists to help ensure safeguards are operational before potentially hazardous work is performed.

Key Benefits to Client

- The Design Safety Case prepared by IRC facilitated project sanction with minimal issues and no delay
- Changes to design were made to reduce risk to personnel and to help ensure personnel could evacuate to a place of safety for any credible major accident event
- Safety Cases were delivered in electronic format containing all supporting information
- Maintenance strategies were developed in accordance with safety critical system performance standards; thus maximizing safety critical system reliability and availability, reducing risk, and optimizing maintenance expenditure
- *BRANE*© links to Neptune's hazard register; facilitating live access to, and understanding of, hazard management information

Protecting life by shaping design and operation of hazardous facilities

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