

CASE STUDY

Safety Instrumented System Compliance Review

When EnQuest took over the duty holdership of its North Sea assets from Petrofac, it needed assurance that the installed safety instrumented systems (SIS) met the requirements of functional safety standards, IEC 61508 and IEC 61511. EnQuest commissioned Genesis Oil & Gas Consultants to review the current status of the installed systems and provide the necessary analysis to verify compliance. Where there were shortfalls, Genesis was tasked with producing a plan of action to ensure future compliance. Genesis responded to this challenge by developing a strategy and suite of documentation to systematically review the installed systems and create safety integrity level (SIL) dossiers for each platform to document compliance and record remediation measures for shortfalls in a recommendations report.

The Challenge

In 2013 the duty holdership of the EnQuest owned Heather, Northern Producer and Thistle North Sea platforms transferred from Petrofac to EnQuest Britain Limited. During the transfer process, EnQuest carried out a preliminary assessment of the safety instrumented systems (SIS). The outcome pointed to the need for a more detailed assessment and for assurance that the installed systems complied with the requirements of IEC 61508 and IEC 61511.

At this stage, EnQuest defined the goal as a comprehensive safety integrity level (SIL) dossier for each of the three platforms and tendered the work out to local consultants and contractors.

Genesis successfully bid for the SIL dossier work tendered by EnQuest. Shortly after the award, Genesis received the available project information and quickly set about reviewing it to determine the current state of the safety system documentation. Following this, Genesis arranged a kick-off meeting with

KEY BENEFITS

- A SUITE OF DOCUMENTS TO DEMONSTRATE FUNCTIONAL SAFETY MANAGEMENT
- EXPERT ADVICE ON ANALYSIS OF CURRENTLY INSTALLED SYSTEMS
- EXPERT ADVICE ON UPDATING OF SYSTEMS TO MEET CURRENT STANDARDS
- ROADMAP FOR FUTURE DEVELOPMENT

EnQuest to discuss and agree the scope of work and a schedule for completion.

During the meeting EnQuest described their overall goal as

‘A SIL dossier for each platform, containing the respective hazard and risk analysis together with SIL verification. The dossiers must demonstrate the installed systems are ‘fit for purpose’ and are in compliance with the

requirements of IEC 61508 and IEC 61511.'

Genesis considered these requirements against the available project documentation and proposed the following strategy for each platform.

- Develop a master SIL register
- Conduct SIL targeting (by Risk Graph)
- Conduct SIL targeting (by LOPA)
- Conduct SIL verification
- Develop a safety requirements specification
- Compile a SIL report dossier
- Compile a SIL recommendations report to identify shortfalls and propose a remediation plan.

The challenge came in first identifying the total number of safety instrumented systems (SIS) installed on each platform and then assessing the degree of completion for each SIS against the proposed strategy.

The Solution

The main part of the solution was to carry out a comprehensive review of each asset's safety instrumented systems against the requirements of current standards, IEC 61508 and IEC 61511.

The previous incumbent of the duty holdership completed some parts of the work but this was paused at the time of transfer to EnQuest. Because of the number of unknowns in the remaining scope of work, Genesis proposed to complete the work in two phases.

Phase 1 reviewed work completed to date for each platform to identify safety critical systems and confirm if the methodology used for SIL determination was consistent with the requirements of IEC 61508 and IEC 61511. The Phase 1 study deliverables included a preliminary SIL dossier for each platform and a scope of work / study execution plan for Phase 2.

Phase 2 focused on developing the agreed strategy documents for each platform.

Results / Benefits

The methodology and strategy developed by Genesis successfully identified all SIS for each platform and gave a detailed account of the degree of compliance with IEC 61508 and IEC 61511.

With older installations, it is inevitable that some systems will be obsolete or not meet current standards. When this was encountered, Genesis gave EnQuest a detailed plan for remediation in the recommendations report.

As a result of completing the project, EnQuest now has a clear picture of the status of the SIS on each platform. This provides a sound basis for future management of functional safety.

The combination of the SIL dossiers and recommendations reports enable EnQuest to demonstrate to the Regulator (the Health and Safety Executive - HSE) that functional safety was being managed on each platform and that there was a plan for improvement for areas where compliance was currently incomplete.

About Genesis

Genesis is a wholly owned Technip company operating on a global stage providing clients with leading edge Engineering solutions in the oil & gas market sector.

Genesis has more than 1000 employees operating from 15 locations around the world. Its aim is to add value to Client projects by applying world class expertise to each assignment.



About EnQuest

EnQuest is an independent oil and gas development and production company, focused on turning opportunities into value by targeting maturing assets and undeveloped oil fields.

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