

CASE STUDY

Integrating Risk Assessment in Operating Procedures

Total (UK) Exploration & Production Limited was looking for a procedure to manage plant safety when safety instrumented systems (SIS) were not available due to fault conditions or the need to apply a maintenance override / inhibit. A crucial part in this process is recognising the amount of risk reduction provided by the safety instrumented system and replicating this in temporary measures implemented whilst it was out of service.

Genesis Oil & Gas Consultants developed a procedure that linked the safety instrumented system safety integrity level (SIL) assessment to the Total corporate risk matrix to guide users on the necessary amount of risk reduction to apply. Added to this are examples on valid risk reduction measures for consideration together with the amount of risk reduction credit to claim in each case.

The Challenge

Total (UK) Exploration & Production Limited operates a number of offshore installations in the North Sea environment producing oil and gas for the UK market.

During the normal operation of an installation, it is often the case that a safety instrumented system (SIS) needs to be taken out of service for maintenance. The problem is what protection measures to put in place when this occurs so the plant can continue to operate safely.

Since each SIS has an assigned a safety integrity level (SIL) that represents a certain amount of risk reduction put in place to mitigate a particular hazard, it follows that the temporary measures should provide the same amount of risk reduction if operation is to continue.

Questions like ‘what temporary risk reduction measures are allowable?’, ‘how much risk reduction does the SIS provide?’ and ‘what is the company’s

KEY BENEFITS

- OFFSHORE PERSONNEL HAVE A USEFUL RISK MANAGEMENT TOOL TO APPLY TO SAFETY INSTRUMENTED SYSTEMS
- RISK ASSESSMENTS MORE ACCURATE AND CONSISTENT
- MORE INCLUSIVE HAZARD AND RISK MANAGEMENT PROCESS
- INCREASED HAZARD AND RISK MANAGEMENT AWARENESS

guidance on acceptable risk?’ inevitably arise.

Total recognise that risk analysis is a specialist area and so were looking for an simplified Operating Procedure that offshore operators could use to confidently perform a risk assessment

and choose from a set of appropriate risk reduction measures to put in place during a period of SIS maintenance whilst keeping within the Total corporate tolerable risk guidelines.

Genesis Oil & Gas Consultants were tasked with developing a suitable risk based Operating Procedure to meet this requirement.

The Solution

Undoubtedly the biggest challenge in this project was for Genesis to come up with a risk base Operating Procedure that offshore personnel could apply correctly and consistently, bearing in mind the users were unlikely to be highly trained or experienced in this activity.

Genesis decided the best place to start was with the SIL assessment datasheet which contains all necessary details on likelihood and consequences of the risk together with details of mitigating circumstances. Mitigating circumstances play an important part in the SIL assessment because they account for the possibility of people being in the hazard zone (likelihood of being in the hazard zone and probability of being able to escape the consequences if the hazard occurs). The second element to consider was the Total corporate risk guidelines since this defines what level of risk is acceptable to the company.

Genesis decided that combining these two sources of information was key to what could practicably be done to maintain safe operation of the plant within the Total company framework for safety to ensure all risks remained as low as reasonably practicable (ALARP).

Results / Benefits

After consultation with Total operations and maintenance staff, Genesis came up with a procedure to be used when a SIS is

unavailable because of a fault or when there is a need to apply a maintenance override / inhibit. This takes into account the constraints imposed by the SIS built-in hardware fault tolerance and the mean time to repair (MTTR) assumed in the reliability calculations.

The procedure works by mapping the 'demand rate' and 'consequence severity' onto the corporate risk matrix to illustrate the risk without any mitigation in place. The specified actions to maintain a safe state are then described as 'procedural measures' or 'engineered solutions'. Procedural measures make reference to the 'mitigating circumstances' referred to earlier.

Total accepted the procedure and commented that it clarified the process for the offshore and maintenance staff and increased their confidence in performing risk assessments and selecting appropriate risk reduction measures.

The main benefit to come out of the project is that all concerned now have an understanding of the need for the procedure, how and when to use it, thus promoting a culture of increased hazard and risk awareness. Total have since adopted the procedure as a basis for their own corporate guideline.

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 Total (UK) Exploration & Production

Total E&P UK Limited provides integrated oil and gas services. It engages in exploring and producing oil and gas; refines crude oil and petrochemicals to produce fuel, domestic heating oils, marine fuel oils, lubricants, bitumen, and other products, including polymers that are used to make plastics; and refines crude oil to transform it into finished products, such as petrol, diesel, aviation fuel, liquefied petroleum gas (LPG), and naphtha.

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