ESD System Reclassification

- Elias Mansour, Senior Control Systems Engineer

Major UK Gas Provider

Inspec Solutions Ltd were contracted by a UK offshore operator with achieving a cost-effective upgrade of a significant legacy ESD system installed in the 1980s. The system was based on dual redundant GEM80 PLC's and had in excess of 1500 plant instrumentation signals.

Inspec Solutions initially facilitated a HAZOP & LOPA evaluation and considering current operating conditions analysed how many Safety Instrumented Functions (SIF's) requiring risk reduction at SIL 1 or above were required. By re-assessing the whole system, only 20 loops were re-classified at SIL 1 or 2, reducing the ongoing safety maintenance regime requirements whilst ensuring the same safety levels.

To handle the identified SIF's, Inspec Solutions re-engineered the loops into a new fully independently certified Safety Instrumented System (SIS), based on a Triconex Tri GP SIL 2 logic solver. The new SIS was in effect connected in parallel with the existing ESD thereby minimising modifications to the ESD and retaining existing HMI functionality. The existing GEM80 system was subsequently declassified to a Process Shutdown System (PSD) containing no Safety Critical loops and therefore not subject to the modification and proof-testing requirements of IEC 61511. The reclassification reduces ongoing costs associated with maintaining the PSD and makes any future modifications simpler to implement.

The new ESD system was implemented with minimum disturbance and impact on the existing GEM80 system or the offshore infrastructure.

A full replacement of a large legacy ESD of this nature with a fully certified, modern ESD system, designed to the requirements of IEC61511 would be uneconomical. With the approach undertaken on this project, Inspec Solutions were able to deliver a fully compliant system to the Customer for a fraction of the cost, in a short timescale, with minimum impact on production providing long term benefits in operational and maintenance costs.

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