ABB were asked to carry out a retrospective Hazard and Operability (HAZOP) study on a gas processing asset in Tunisia.

The onshore gas processing facility and LPG production facility came on-stream in December 2009, and together with another operation, supplies over 60% of Tunisia’s domestic gas production.

The HAZOP study resulted in over a thousand recommendations for improvements. These were classified to give a clear priority for the close out of recommendations. There was an urgent need to provide risk reduction of the safety related actions to provide process safety assurance.

ABB were asked by asset owners to support them in the close out of the most significant recommendations quickly and efficiently. The scope was later increased to include a further 100 recommendations.

**Solution**

ABB have a long track record of successfully closing out actions resulting from HAZOP studies. This along with their deep technical knowledge of the facility and considerable manpower enabled the plant to be available for safe operation within 4 months.

To achieve this ABB adopted a flexible, multiple location work approach. We worked closely with the operational management team in Tunisia and with the engineering group management team in the UK to develop, review and approve actions. A site visit was conducted to kick off the process, then the work was driven from our Teesside office.

The owners and ABB recognised early in the programme of work that for many of their recommendations it was appropriate to implement a two stage response. Some actions we identified as being necessary to be fully completed before plant start up; whereas other less urgent actions should be completed within a defined period after start-up.

Many of the recommendations close out sheets had defined actions to be completed pre start up and post start up.
This risk driven approach is fully consistent with best practice in process safety management. It allowed resource to be focused to enable safe start-up as soon as possible.

To close out HAZOP actions the ABB team had to fully understand the concern or risk that had been identified by the HAZOP team, and then to develop a response which fully addresses the issues. In many cases, this could mean simply carrying out the necessary calculations to confirm that the plant design and operation was safe. In other cases in order to ensure that the plant could operate safely in the long term, some changes to equipment or operational / maintenance practice were required. These changes were implemented by the plant in-line with agreed priorities.

Short term actions included verifying relief streams and other safety systems. Longer term solutions required work included minor plant modifications and changes to operational practices.

**Benefits**
- Plant start up as soon as safely possible
- Confidence that high priority risks have been addressed
- Enabling the asset owners to retain its license to operate by providing a safer plant in the long term
- Compliance with the owners corporate safety requirements
- Meeting industry best practice for process safety