Operators require their assets to be worked harder and longer. Around 40% of all major plant losses are attributed to piping, therefore maintaining the integrity of pipework is paramount to ensuring safe and efficient plant operations. Historically, companies have tended to spend little on preventative maintenance or inspection of pipework. Consequently the true condition of pipework and the risks to safety and reliability are not well understood. Ageing piping systems may have deteriorated significantly and a comprehensive integrity approach is needed.

Ensuring pipework integrity in a cost effective way is not easy, the sheer volume of piping presents a major challenge. Even knowing where corrosion occurs is not easy - generalised corrosion can be predicted reasonably, but there will be plenty of localised corrosion that experience shows is almost impossible to predict. The breakdown of coatings and the presence of local moisture - due to insulation, localised leaks, debris, trapped moisture etc. are all unpredictable factors.

Even when defects are found they are often difficult to action so a backlog builds up. Difficulties arise from:

- Costly or physically difficult access to pipework
- The practicalities of working on live systems
- Justifying the spend as part of tight maintenance budgets

Successful programmes will run for several years, for major plants. There is no single ‘right solution’ as the optimal approach depends on business objectives and current conditions. Operators have to determine the most appropriate end condition and objectives for a programme - this could be a front end loaded refurbishment programme or a steady inspection led approach.

Other decisions to be made include:

- Which other equipment to include in a programme
- Whether to work on systems or geographic areas
- Ongoing data management
- Project management systems
- Management commitment

Successful programmes will only be delivered by a robust and rigorous approach.

“Maintaining pipework integrity may be more of a logistical, economic, and management challenge, than a technical one.”

HSE SPC/33
What we offer

ABB offers a complete solution to pipework integrity from an initial assessment through to project management of remediation work. Our approach is flexible and caters for different starting points and business situations.

The aim of the initial assessment is to gain an overall view of the condition of the piping systems and the level of risk this presents. Risks are assessed against the business objectives in order to set broad priorities for improvement. The next stage is to agree the overall policies for the programme.

During implementation planning the detailed execution plans. These include:

- Schedules and estimates
- Detailed procedures
- Inspection
- Lifting and on-line refurbishment
- Emergency procedures
- Fitness for service assessments
- Standards, repair criteria etc.
- Detailed scope documents

The final and longest stage is the ongoing execution of the work. Work management and efficiency are key during this stage. The optimum way to execute the work will depend on the existing site arrangements for maintenance and project work. ABB can supply one or all of project management, technical engineering, repair specification, task management, inspection and design services.

Measuring effectiveness

Execution will involve on-line refurbishment, work in shutdowns and ongoing inspection, all of which needs co-ordinating. Overall monitoring of progress, confirming the reduction of risk and maintaining commitment are key aspects of ABB’s approach. One useful way of assessing the reduction in the overall risk level is to monitor ‘risk density’ in a plant area. ‘Risk density’ is a function of individual pipeline risks and the concentration of piping in an area.

Benefits

- Targeted, risk based approach to remediation of ageing pipework
- Managed one stop service for the inspection, assessment and remediation of pipework
- Procedures for doing work on-line where possible – typically 90% of the work can be done on-line
- Pragmatic approach based on technical judgement for cost effective solutions
- Compliance with ageing assets legislation

Why ABB?

ABB offer the complete solution; we can provide the assessment, manage the implementation, provide ongoing inspection services and management of resulting actions to ensure the pipework is fit for its extended life.

We have extensive knowledge of all aspects necessary to manage complex remediation programmes. We have working procedures, risk assessment processes, estimating methods, data management expertise etc. as well as the project management and piping functional expertise

Our team of experienced specialists with operational heritage will use their experience to make pragmatic technical judgements and offer solutions that are cost effective.

Our experience of such programmes will enable you to get started on this major project with confidence and ABB can be with you each step of the way to ensure the benefits are realised.

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Stage

Deliverables
- Initial risk level
- Scope of issues
- High level priorities
- Condition overview
- Aims - compliance / rejuvenation
- Online / offline approach
- Overall plan - cost & time
- Inspection policy
- Working methods
- Detailed schedule and budget
- Working procedures
- Detailed work scope
- Refurbishment
- Repair and replace
- Ongoing inspection
- Online and shutdown working

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A typical programme will follow the stages shown above.

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