Offshore process efficiency improvement

Poor production efficiency or reliability are common problems during late life production - validated process improvements can help reduce the problems.

Changing production rates, changing composition (water / sand / H₂S content) and ageing equipment can all lead to reductions in production efficiency and reliability. These changes can cause equipment to operate outside of its original design envelope causing operating inefficiencies, equipment failure or spurious process trips unless proactive action is taken to identify and resolve resultant, underlying production problems. Common process or equipment performance issues can result in poor separation efficiency, gas compression problems (surge, excess flaring, inadequate liquid knockout), incomplete gas removal, oil storage and pumping inefficiencies, produced water contamination, unreliable utilities and general production problems arising as a consequence of slugging, waxing, scaling or corrosion.

Carrying out a process review, be it for a specific item of equipment, a complete system or one which encompasses the total asset, will generally identify areas for improving both reliability and operating efficiency. However, the identification of technically feasible improvements is only part of the story.

A realistic cost / benefit analysis must also be completed to understand which improvements are worth implementing for any particular asset, with consideration to both its current performance and future production plans. Higher production rates through enhanced reliability form an important part of this calculation.

What we offer
ABB can undertake a rapid process assessment of the complete topside processing operation, individual process systems or specific items of equipment. The assessment will identify areas that can be justifiably upgraded, taking into account current business priorities for the asset. We understand the need to make improvements rapidly and as such our assessment process is designed to identify improvements quickly, selecting only those that can be implemented swiftly with a short payback.

ABB’s approach is designed to identify at an early stage any areas which do not offer a substantial saving, thereby minimising wasted effort and retaining focus on the opportunities which are of most financial benefit.
The assessment is carried out in two stages:

- **Stage 1** is a rapid, holistic assessment to identify potential improvements - and equally importantly clarify those improvements which don’t offer sufficient benefit. A typical assessment can be completed in 2 weeks
- **Stage 2** entails more detailed engineering studies to define solutions for the selected improvement areas. The solutions are clearly defined with a robust cost. Benefit analysis completed for each. Typically this stage will take 2 months for a total topsides review; subsets for process systems or specific equipment items take less time to complete

The outputs from this process are clearly defined specifications for each of the solutions complete with an initial total installed cost estimate plus the projected financial benefits that have been verified by the operator.

Examples of efficiency / reliability improvements include:

- Updating control schemes to improve reliability
- Changing pump operating conditions to improve efficiency
- Minor modifications to separator internals to improve separator efficiency
- Isolation of redundant and mothballed systems to reduce maintenance
- Reducing oil storage to meet revised production rates
- Providing riser slug mitigation control

ABB can assist in implementing the improvements or hand over a process package to the operator to be implemented in-house.

**Benefits**

- Reduced trips
- Increased production
- Reduced penalties e.g. from excess gas flaring
- Reduced maintenance costs and tasks
- Lower operating costs
- A low cost and comprehensive improvement plan for the asset

**Why ABB?**

ABB has a strong track record of investigating and resolving the kind of technical issues which can result in unreliable and inefficient operations.

The consultants performing the assessment are able to pull on ABB’s wide ranging, specialist expertise which covers areas including static and rotating equipment trouble shooting, maintenance management, control and safety system upgrades, process safety, decommissioning and asset life extension.