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Extending asset life

Many process facilities are engineered with a nominal design life, typically 15 to 25 years. However, there is increased business pressure to keep assets operating longer, whilst maintaining safety, environmental and integrity standards. In addition, operators seek to improve the asset's reliability and availability. But how can they assure the continued use of ageing assets when maintenance budgets are already being squeezed?

The challenge facing operating companies is summarised in this typical quote from a reliability manager: *"Our reliability improvement project has helped improve plant uptime. But that looks at historic equipment performance - the 'bad actors'. How do we prevent the one-off 'unforeseen' equipment failures that can have catastrophic consequences?"* Stakeholders (such as owners' consortia) and regulators are increasingly looking for a formal review to justify the continued service of these assets.

The HSE's ageing plant guide sets out the main factors to consider, particularly the need to consider the full range of likely deterioration mechanisms. However, the decisions involved in asset life extension usually involve economic factors as well as the technical ones. For example, it is not sufficient to determine the remaining life of an item of equipment. It is also necessary to identify the repair or replacement options. Obsolescence, reliability of technical support and availability of spares also need to be considered.

In addition, the expected life of an item is determined not only by its present condition – it is equally dependent on how the item is operated and maintained, alongside the changing business and operations requirements. Because there are so many factors to consider and there is a need to learn from operating experience elsewhere, some companies find it beneficial to engage an independent specialist to carry out an asset life study.

The outcome is a coherent view of what the future holds - a shared vision inside the company of priorities for repair or replacement, a robust justification for investment and increased confidence in the continued operation of the assets. ■



Taking site integrity and performance to an even higher level

The current global markets for food, feed for farm animals, and bio-fuels are good news to UK crop protection manufacturer Syngenta, which is seeing a rise in demand for its insecticides and herbicides.



Syngenta manufacturing facility, Huddersfield

At its site in Huddersfield Syngenta is implementing a programme to further improve the integrity and performance of its facilities to support this business growth. One element of this programme has focussed upon managing ageing plant issues. Working closely with Syngenta personnel, ABB Engineering Services have completed the first stages of an Ageing Plant Study. The study identified the critical areas for HSE and production of a range of equipment including vessels, storage tanks, piping and machines.

This approach not only assessed the long term deterioration mechanisms, but also identified practical actions to assess and demonstrate long term fitness for service, as well as providing valuable information for future plant development.

The methodology of the study was based upon ABB's established asset life process and used the recent HSE guidance on Ageing Plant, which ABB Engineering Services helped to produce. Based on the success of the study, the Huddersfield site management are extending the approach across the site.

Power station risk assessment

Scottish & Southern Energy (SSE) recognised the need to carry out detailed process safety risk assessments at their Peterhead power station. They wanted to identify potential hazardous events and assess the adequacy and robustness of their risk reduction measures.

This information and the associated action plan has provided a platform for improvement across the power station and helps with development of key risk control procedures within the Process Safety Management (PSM) system. A major concern was the time required using a familiar technique such as HAZOP and the fact that busy operations staff would need to be heavily involved.

SSE talked to ABB Engineering Services about their unique Process Hazard Review (PHR) technique that was developed for the rapid assessment of process safety hazards on existing plants. PHR has been used extensively on plants throughout the process industries and particularly in recent years for sites coming under the COMAH regulations. It provides a detailed yet high level assessment of the whole process, focussing on areas of concern and helping to demonstrate continuous improvement in process safety.

ABB provided a PHR leader and a consultant to work with a team of SSE staff over a 4 week period covering all process systems on the Peterhead site. The SSE team consisted of knowledgeable operations and technical staff with day to day experience of the systems under review and a wider understanding of standards at Peterhead. Following an initial site tour, to gain an understanding of the scale of operations, a scoping meeting explored the nature of process safety hazards on the site and identified shortfalls in the overall management arrangements.



Scottish & Southern Energy, Peterhead power station

The main part of the PHR involved a structured review of each process system on the power station, starting with the high pressure gas supply. A set of guide words were used to help the team identify credible ways in which hazardous events could occur, mostly related to loss of containment or sudden release of energy. For each event the severity of the possible consequences was assessed, considering harm to people, the environment, or damage to SSE assets / reputation. The full range of measures to prevent, control and mitigate each event were then assessed to ensure that they were robust and fit for purpose.

This stage gave the opportunity to identify any key concerns with the existing layers of protection and make recommendations for improvement. Each scenario identified on the PHR was rated for severity and likelihood using the SSE standard word models and risk matrix calibrated to SSE corporate tolerability of risk criteria.

SSE is now working through a prioritised action plan for the Peterhead site that will provide an assurance that process safety risks are under control. ■

Changing environmental legislation - Impact on process operations

Following on from a detailed review of existing European legislation relating to the control of environmental impacts arising from industrial operations, the European Commission has proposed a new directive on industrial emissions (integrated pollution prevention and control) 2007/0286 (COD).

The directive will simplify current legislation by combining and simplifying the following existing directives:

- The Integrated Pollution Prevention and Control (IPPC) directive
- The large combustion plant directive
- The waste incineration directive
- The solvent emissions directive
- Three directives concerning the titanium dioxide industry



The aim of the proposed directive is to strengthen the provisions already in force and to reduce further industrial emissions throughout the European Union (EU) by:

- Strengthening the application of Best Available Techniques (BAT) across all member states by ensuring that industrial operators use the most cost-effective techniques to achieve a high level of environmental protection
- Creating a level playing field across the EU
- Tightening permitted emission limits in certain industrial sectors, including large combustion plant
- Introducing minimum standards for environmental inspections of industrial installations and allow more effective permit reviews
- Extending the scope of existing provisions to cover other polluting activities, e.g. medium sized combustion plants

The directive is proposed to enter into force on 1st January 2011 with UK legislation expected to be in place by June 2012. Phased compliance will then take place between 2014 and 2016.

The changes proposed by the industrial emissions directive will inevitably result in a review of existing domestic legislation and require amendments as appropriate. Operators will be required to review their existing permitted activities against the new requirements.



The areas of particular concern for most operators will be:

- The need to review and update BAT assessments against the revised ref. notes currently being prepared;
and
- The potential impacts that the revised emission limit values could have on the operability and viability of existing plant

ABB has a thorough understanding of the changes proposed by the industrial emissions directive. We also have extensive experience in reviewing and developing BAT justifications along with providing environmental and technical reviews of process plant to ensure compliance with environmental benchmarks. ■

ABB to support major biotechnology research initiative in Ireland

A recently announced government, university and life science industry collaboration aims to improve the production of biopharmaceutical medicines. This will provide expertise, technology and support to help advance the manufacturing of new biopharmaceutical medicines, as part of the \$3.3 million Enterprise Ireland research programme.



The programme's goal is to deliver more efficient, reliable and cost effective processes for manufacturing biopharmaceutical medicines. Biopharmaceuticals are medical drugs produced using biotechnology; they are created through the alteration of molecules, genes and cells - the basic building blocks of life - to develop useful products, processes or services such as new medicines and therapies.



From right: Enda Mimmagh, PIPS LBU manager, Dublin. Minister Conor Lenihan, Minister of state with special responsibility for Science, Technology, Innovation and Natural Resources. Members of the academic research team.

The ABB life sciences centre of excellence has been appointed as project technology partner. xPAT, ABB's Process Analytical Technology (PAT) data management solution, is the technology platform for this project, facilitating the provision by ABB of expertise to help develop improved production practices and systems for biopharmaceutical manufacturing. These leading-edge process control and developments will provide precise quality control throughout the manufacturing process, to monitor and improve product quality and raw material use in real-time.

The academic research team will be led by University College Dublin. This highly innovative project includes the demonstration of the robustness, capability and performance of a fully integrated and tested BioPAT solution for which commercial outputs have been identified, appropriately packaged and protected. ABB Engineering Services has secured two key roles on this project and Joan Evans of ABB will lead the commercialisation team.

ABB is also responsible for facilitating on-going liaison with regulatory authorities and multinational life sciences companies to ensure that research efforts

are appropriately focused to deliver project outputs which have been appropriately validated and with high returns on investment.

ABB has established expertise and has been at the forefront of developing solutions and standards for the implementation of PAT, integrated control and automation systems, as well as other innovative technologies that improve the pharmaceutical development and manufacturing process for Life Sciences customers.

As a collaborator in the Enterprise Ireland research programme, ABB will work closely with all programme participants to further develop next generation biopharmaceutical production processes that will improve product quality and safety, reduce time to market while optimising the production process and meeting international regulatory requirements.

Risk Based Inspection at Hydrocarbon Resources Ltd

Hydrocarbon Resources Ltd, a wholly owned subsidiary of Centrica Plc, awarded ABB a contract to derive detailed inspection requirements for pressurised equipment. The work covers the Barrow onshore processing terminals and associated condensate storage facility required to process gas from the Morecambe Bay and associated satellite fields prior to entry to the national grid.

This follows on from a very successful pilot study to derive inspection requirements for critical equipment at onshore and offshore facilities.



Rivers Terminal, Morecambe Bay

ABB is using its Risk Based Inspection (RBI+) process to ensure that the equipment will be safe and reliable in operation with inspection requirements proportional to the risks presented.

By using the latest techniques some inspections can be carried out with the equipment on line. The study will identify the optimum time to carry out all the inspections.

The cost of the study is recovered quickly as the inspection programme has less impact on production than a traditional approach. ■

ABB Power and Automation World 2009

ABB Engineering Services attended the ABB Power and Automation World 2009 in the US. The conference, which comprises of training, seminars and equipment exhibition, is ABB's premier Americas regional customer event with some 3000 attendees.



The ABB stand at Power and Automation World 2009

Due Diligence conference

Brian Hudson, ABB gave a presentation on some of the critical aspects of Technical Due Diligence at a major conference on acquisitions and divestiture held in London. There were delegates from various companies including BP, Total & British Gas.

Abu Dhabi Asset Integrity conference

ABB were the key sponsor of the Abu Dhabi Asset Integrity conference. During the week ABB presented a paper and delivered a workshop on extending the life of ageing offshore assets.



Peter Hunt and Alan D'Ambrogio, ABB with delegate from the conference

Risk, Reliability and Life-extension of Ageing Offshore Structures

Brian Hudson, ABB, gave a presentation entitled 'North sea mature field asset life studies' at the Risk, Reliability and Life-extension of Ageing Offshore Structures, at the Aberdeen exhibition and conference centre. There were over 120 delegates at the event, organised by the IMechE and included BG Group, BP Exploration and ConocoPhillips.

HazardEx 09

ABB took an exhibition booth at HazardEx 09 held in Harrogate. Around 500 people attended the event and companies represented included BP Exploration, Shell, GlaxoSmithKline, AstraZeneca and AWE.



ABB's Carl Watson and John Walkington at ABB's exhibition stand

Bio Innovation leaders conference

Owen Bonner, ABB presented a paper to a recent Bio Innovation Leaders conference in London. The paper outlined the consulting role of the validation group in a project in Ireland to act as industry liaison partner with a view to identifying and removing barriers to adoption of novel technologies in bio manufacturing. The paper was well received and positioned ABB as an early stage partner in PAT technologies and manufacturing improvement.

IMechE conference

Andy Hollins, ABB presented at the IMechE conference in Aberdeen on 'The challenges of extending the life of topside equipment - It's not just corrosion related'. There were over 100 delegates including representatives from BP, ConocoPhillips, Maersk Oil (North Sea) Limited and BG Group.



Offshore Europe 2009

ABB Engineering Services exhibited on the main ABB stand and presented two papers at Offshore Europe in Aberdeen. The papers were on 'Process safety KPIs' and 'Life extension of an offshore facility' by Ian Herbert and Brian Hudson. Offshore Europe is the biggest oil and gas conference and exhibition in Europe and attracts 40,000 visitors from across the world. ■



The ABB stand at Offshore Europe 2009

Academy first for ABB engineering

ABB Engineering Services is one of the first industrial based providers to achieve accreditation, and also the first to allow the National Skills Academy to look to address continuous professional development for chartered engineers in the process industries.



ABB is now an Academy Centre of Excellence in technical competencies, and its successful accreditation will see the company bring its short course programme to the academy, and support Continuing Professional Development (CPD) for chartered engineers in our sectors.

Humber Chemicals Focus Dinner

ABB hosted a table at the Humber Chemicals Focus (HCF) Dinner and presented the ABB Engineering Services' sponsored Innovation Award.



Kate Hedge and Glyn Hughes, HCF with Peter Hunt, ABB

ABB and DSM cycle around Arran

Muir Porter, Bob Donaldson, Dick Parsons and Gavin Lindsay from ABB East Kilbride joined clients from DSM Nutritional Products in Dalry for the annual cycle around the island of Arran. All 15 completed the 56 mile route with only one puncture, some unacceptable lycra and stunning weather.



The ABB East Kilbride team with clients from DSM

Project management training

ABB Engineering Services' operational improvement team have gained the contract to deliver project management training for Bombardier for the 3rd year in succession. Amanda Eyles, Nigel Chapman and Gerhard Crossman are accredited trainers, delivering a selection of modules, from basic awareness to

Project Management Institute approved PM training, across Europe with particular focus on the UK, Germany, Sweden, Spain and France.



Attendees at project management training course in Madrid

CIA process safety

ABB sponsored a process safety regional road show run by the Chemical Industries Association (CIA) and the HSE, held at the Wynyard Rooms on Teesside. Presentations from the HSE outlined the regulator's expectations, performance indicators for major hazard sites plus some sharing of best practice.



A presentation by Huntsman Tioxide detailed their process safety KPIs. It was an excellent programme and the feedback received from delegates - including representatives from Rohm & Haas, Croda, Artenius and Kemira - has been very positive.

Control systems obsolescence management workshop

ABB life science consultants Joan Evans and Per Olsson delivered a 'Control systems obsolescence management' workshop in ABB Ireland's new office at Blackpool, Cork. The session was attended by representatives from GSK, Pfizer, Merck and Janssen and was very well received.

IChemE safety compliance

ABB presented a joint paper with Artenius, entitled 'Compliance with DSEAR throughout the lifecycle of mechanical equipment.' at the IChemE safety compliance event on Teesside. The paper received excellent feedback.



Institute for International Research's (IIR) annual RBI masterclass

Tony Musgrave and Nick Burnham of ABB chaired and presented at the IIR's Annual Risk Based Inspection (RBI) masterclass in Johannesburg, South Africa. Tony ran a workshop on the practical aspects of implementing RBI which has resulted in follow up communication with delegates from Sasol, Engen (Petronas), PETROSA and ESKOM. The IIR's organisers stated "Your participation added immeasurable value to our delegates." ■



Conferences are major industry forums focusing on key topic areas.

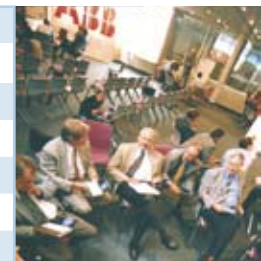
Conferences - December 2009 to March 2010		
8th - 9th December 2009	Shutdowns and Turnarounds	Edinburgh
25th February 2010	Improving Business Performance	Cheshire



Seminars

Seminars are focused on industry 'hot topics' and include inputs from external speakers.

Seminars - December 2009 to March 2010		
10th December 2009	Automation System Upgrade	Grimsby
2nd February 2010	Mechanical Legislation Awareness - PSSR/PED & PUWER	Edinburgh
9th February 2010	Automation System Upgrade	Cardiff
11th February 2010	Demolition and Remediation	Grangemouth
16th March 2010	Maintenance and Reliability in Practice	Cardiff
25th March 2010	Inspection Workshop	Grimsby



Webinars

Webinars are focused on industry 'hot topics' and are accessed over the web.

Webinars - January 2009 to March 2010		
24th February 2010	Corrosion Under Insulation	
24th March 2010	Boiler Care	



Technical training

Training courses provide in-depth knowledge on key subjects as part of an engineer's professional development.

Technical training courses - November 2009 to March 2010		
25th November 2009	SIL Awareness for Control / Electrical Technicians *	Leeds
3rd December 2009	Working with CDM Regulations	Dartford
9th December 2009	The Organisation Workshop	Durham
20th January 2010	Hazard Study Awareness *	Manchester
27th January 2010	An Understanding of Process Safety Management	York
28th January 2010	SIL Awareness for Control / Electrical Technicians *	Grimsby
2nd - 4th February 2010	Human Factors in the Workplace	Manchester
10th - 11th February 2010	Alarm Management *	Norwich
23rd - 24th February 2010	Maintenance & Reliability Improvement - FMECA & RCA	Grimsby
3rd - 4th March 2010	IEC 61508 / 61511 and SIL Determination *	Frodsham
9th - 11th March 2010	Pressure Relief *	Cork
17th - 18th March 2010	Essentials of Pressure Systems *	York
23rd March 2010	Organisation Workshop	York
23rd March 2010	The Leader's Role in Process Safety Management	Grimsby
24th March 2010	Working with CDM Regulations	Manchester

* IChemE approved course.

All of the above events are organised and delivered by ABB Engineering Services.

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ABB Engineering Services' team wins health and safety prize in the UK

An ABB team in the UK has won a top safety certificate awarded by the country's Royal Society for the Prevention of Accidents (RoSPA) for the rigorous standards applied in 2008 on a project for ExxonMobil. The ABB / ExxonMobil Demolition and Remediation project team received confirmation in 2009 that they have been awarded a RoSPA Gold for 2008, and as such this is the second year running that the team have received the award. This is a fantastic achievement by the project team who, through their ongoing attention and commitment to delivering safety excellence, are classed by ExxonMobil as delivering best practise and setting the standard for others to aspire to. The team has been working since 2003 on demolishing 550 petrol stations in the UK and Ireland, and clearing the sites of any environmentally harmful material. It won a health and safety Merit award from RoSPA in 2004 and Silver awards in the following two years, before achieving Gold in 2007.



Steve Andrews, ABB receiving the RoSPA Gold Award from RoSPA Vice President Lord Brougham & Vaux.

"The RoSPA Gold award is recognition for all involved in the project for their continued hard work and commitment in helping achieve an excellent safety performance working in the potentially hazardous environment of demolition and land remediation." said Steve Andrews, leader of the project team. ABB regards occupational health and safety as a top priority and aims to eliminate work-related incidents in which employees are hurt. The criteria for the RoSPA Gold award include that no fatalities or major injuries occurred on a project. In the project ABB has overall responsibility for decommissioning selected ExxonMobil petrol stations. These are predominantly in city centres, where reducing petrol retail margins and rising land prices have made the sale of land financially attractive. To enable the land to be sold, it needs to be remediated to eliminate any environmental issues.

This builds on the excellent feedback from Judith Hackitt (Chair of the Health and Safety Executive) who visited another Demolition and Remediation project managed by ABB. *"The approach I saw being taken by ABB to dealing with health and safety issues in demolition and remediation was impressive,"* said Hackitt to an audience of ABB, ExxonMobil and contractor employees. *"Not only was the site a first class example of safe demolition, it was also clear that the work was being done more efficiently because of the way it had been organised."*

If you have any comments or feedback in the ABB Engineering Services Newsletter please contact: Graeme Collings - graeme.collings@gb.abb.com



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ES/So/Aut09/SNL005a

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