

More Faster Less Less the business drivers for IEC 61850

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Challenge

- Utilities embarked in 2008 on a Regulatory Period of 5 years with capital expenditure programs increasing required performance with up to 100% compared to the last one
- Deliver projects more efficiently with lower costs to yield direct benefits to shareholders and stakeholders of their operations




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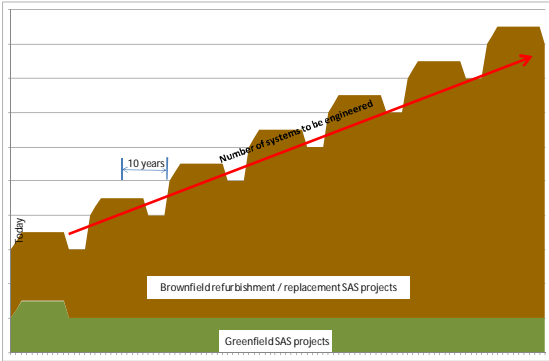
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Challenge



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- Ageing assets
- Shorter operation life spans
- Continuous replacement of several substation secondary systems per year

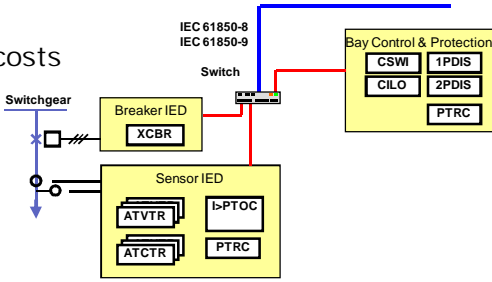


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Approach


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- Innovation in technical and project delivery strategies in a resource constrained market using IEC 61850
- More projects (with enhanced functionality)
 - Faster timeframes
 - Less money
 - Less resources
- Higher reliability
- Lower operational costs




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Approach

- Business Case
- Technical Strategy
- Implementation Objectives
- Project Selection Criteria
- Organisational Consequences





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Business Case


- IEC 61850 to achieve operational goals based on business reasoning
- Initial engineering effort to develop new solutions
 - Initial 2-3 projects enable technology enhancements
- Implement IEC 61850 in a real CAPEX project.
 - Significant upfront investments in engineering, research & development


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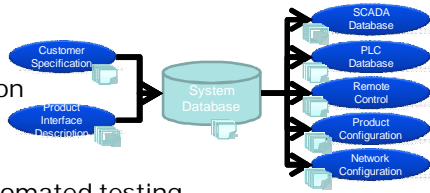
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Business Case


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- Return on investment for first project not in first project, but expect significant savings from the start, even through moderate deployment
- Improve
 - Engineering efficiency
 - Design
 - Commissioning and operation
 - Reduction of wires
 - Reducing of drawings
 - Re-usable solutions and automated testing








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Technical Strategy


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- **Implementation strategy** is the basis for integration and deployment of IEC 61850 based solutions
- But:
 - Is the utility **ready** to implement new technology?
 - Is the new technology **consistent** with the utility's business objectives, vision and balanced score card?
 - Is it **proven** technology that will deliver true benefits to utility?

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Technical Strategy

- Utilities understand the
 - Limitations of piecewise technology development
 - Need for holistic asset technology strategies and deployment to obtain significant reductions in cost and engineering time
- Do it only if the utility has the capability and desire to undertake a new technology implementation
- Utilize new technology, to drive step change improvements in the network

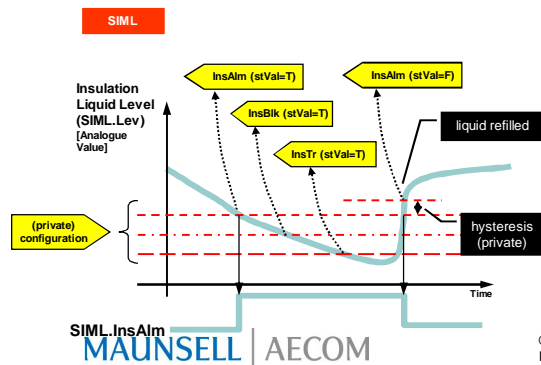
Technical Strategy

- Deal with significant ageing asset problem
- Use IEC 61850 to improve engineering, design, commissioning and operation
- Improve growth by reduction of substation life cycle costs



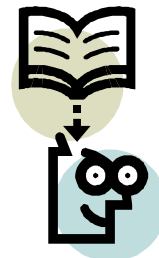
Technical Strategy

- Add value through increased functionality with access to asset performance data and further ongoing innovation
- By implementing proven state-of-the-art technology, utilities will be recognized as major thought leaders



Technical Strategy

- Real implementations
 - life cycle cost reductions of 10-30%
 - project lead times reduced by 6 – 12 months
- Amount of information available better than current solutions.
- Information available virtually for free and integral part of IEC 61850
 - enable new applications
 - enhance asset management
 - speed of fault location and restoration
 - integration of embedded generation
 - demand side management
 - loss reduction




Technical Strategy

- Structured approach:
 - **Design** – integrated specification and standard design elements reduces effort for development of Substation Automation Systems with benefit of automated documentation
 - **Implementation** – automatic generation of validated configuration files
 - **Construction and installation** – elimination of wiring and potential errors throughout the substation through use of optical fiber connections
 - **Commissioning** – automatic test programs and ability to model and simulate systems reducing on site testing
 - **Documentation** – on line access to “as operating” documentation without the need to continually re-create as built documentation and eliminate database issues


Implementation Objectives

- Based on business cases and technical strategy implementation objectives of IEC 61850 are:
 - integration of IEC 61850 into utility design standards
 - training, simulation and development capabilities within the utility
- IEC 61850 strategy to achieve the following:
 - Develop essential knowledge and **intellectual property** within the utility
 - Select a **real** project to focus key R&D effort
 - Identify a **regime** for integration of IEC 61850 in future substation projects as a **migration** process
- Develop expertise to engineer, deploy, commission and operate IEC 61850 systems

Project Selection Criteria


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- For the 1st IEC 61850 project look for a project with a reasonable time frame for development of the IEC 61850 solution and the essential training of the utility
- The first substation using IEC 61850 should serve as a basis for further projects
- Criticality in the network?
- Green-field development or the need to develop interface solutions for legacy systems?



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Project Selection Criteria



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- Common approach:
 - Start with IEC 61850 is to retain conventional high voltage system
 - Identify future scheme enhancements without major impact on operations
 - Expand implementation to full IEC 61850

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Organisational Consequences

- Implementation of IEC 61850 requires specialists and new engineering processes
- Development of internal intellectual property and skills needed
- Knowledge from experienced IEC 61850 sources crucial for introduction and deployment
- Segregation of SA system from traditional D&C arrangements and appointment of an experienced IEC 61850 specialist organization responsible for the SA specification & design



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Organisational Consequences

- **Integrated engineering and configuration** process, reduces risks of network and safety risk due to design, wiring and commissioning errors
- Achieve **enhanced operational reliability** through pre-engineered fall back states in the event of equipment failure or isolations of equipment
- **Selection and training** by experienced engineers to mitigate risks from possible lack of competent resources to final implementation not providing required functionality

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Organisational Consequences

- Service providers, contractors and suppliers must be up-skilled and equipped
- Fall back scenario for deployment of the first project including agreements with contractors, service providers and vendors to deliver alternate solutions if required

Conclusions

- Bringing IEC 61850 to the substation allows the utility to have more agile and better manageable networks
- IEC 61850 sexes up the industry making it cutting edge thus giving back the engineer its status and associated compensation
- IEC 61850 will enable utilities to deal with the commercial imperatives to deliver projects more efficiently and with lower costs to yield direct benefits to the shareholders and stakeholders of their operations or in other words "More, Faster, Less, Less, Higher, Lower"



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Thank you for your attention!

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