Operations & Maintenance Optimization for Smart Grids using CIM.

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Alstom & IBM: two major actors of Smart Grid

At IBM, we are:

- Accelerating the adoption of SG worldwide through the Global Intelligent Utility Network Coalition.
- Aiding utilities in the development of SG by creating the Smart Grid Maturity Model.
- Collaborating in the GridWise Alliance and similar organizations around the world to promote SG
- Participating in the DoE Advisory Committee and its SG Subcommittee to help modernize the U.S. electric system
- Exploring how to turn millions of electric vehicles into a distributed storage system.
- Delivering SG solutions around the world:

At AG, we are:

- Contributing to Smart Grids standardization convergence efforts worldwide
- A world leader in critical Grid Power Electronics, Automation & Control Room IT
- Participating to several demonstration projects across the world
- Want to make Smart Grid a reality today
- Are sharing a Joint IT architecture with IBM SAFE
Need to accelerate Standardisation Convergence
Good CIM Adoption in Europe / Transmission Utilities

- First IEC-ETSO Meeting (Market)  April 2006
- Beginning of CIM ETSO Convergence  March 2007
- Issue of first draft CME Europe ETSO Profile  June 2007
- First IEC-UCTE Meeting (Load flow)  April 2008
- Acceptance by UCTE to join IEC approach  June 2008
- Paper at next CIGRE D2-C5  September 2008
- Finalisation of New Work Item Proposal  October 2008
- Interop test – UCTE Model Exchange  March 2009
- Official ENTSO-E adoption  December 2009
- Interop Test  March 2011

Convergence methodology established and demonstrated
### IBM / Alstom Grid joint Value Proposition

#### Customer Issues
- Increasing operational challenges related to the management of their network assets
  - Optimizing the use of current assets
  - Maintaining and replacing ageing assets
  - Managing the aging workforce and knowledge retention
  - Improving responsiveness to outages and customer complaints
- High cost due to equipment failure and maintenance

#### Key Features of joint approach
- Combine Alstom Grid state-of-the-art solutions in condition monitoring and grid management with IBM best-in-class asset management solutions
  - Leverage the available condition monitoring data to improve grid operations and asset management
  - Optimize grid operations and asset management by exchanging information between both systems
  - Work jointly with the utilities to design most valuable use cases

#### Benefits for Transmission and Distribution Utilities
- Business process improvements
  - Increase consistency and integration between business processes
  - Enforce safety rules
  - Improve data management scheme
  - Improve visibility

- Operations efficiency
  - Reduce the number of unplanned outages and minimize the impact of all outages
  - Maximize the use of assets (push to the limits)

- Financial gain
  - CAPEX reduction: a few percents improvement represent a huge saving for TSO
  - OPEX and inventories reduction thanks to optimized maintenance
Solution Architecture Overview

Network Operations

- Alstom Grid e-terra DMS/EMS
- IEC 61970 / 61968

CIM (*)

WebSphere ESB

IBM Maximo EAM

Asset & Work Mgmt

(*) IEC 61970 / 61968
How EAM can be used to improve Grid Operations

**Use Case 1:** A Transformer Buchholz Alarm is raised at SCADA level
Operator has to decide whether the Transformer needs to be put out of Service or not

- **Benefits:**
  - Optimized Reaction to abnormal Conditions
  - Reduced Outages
  - Lower operational Cost
  - Consistent and up-to-date Information across Grid Operations and EAM

- **Sequence:**
  1. A Transformer Alarm is reported
  2. Operator retrieves Work History, planned Work and/or Asset Information from EAM
  3. Operator decides to de-energize the Transformer and to request Work into EAM
  4. A Tag with Work Order Information is placed on DMS/EMS screen
  5. Maintenance is carried out
  6. EAM notifies DMS/EMS on ongoing Work progresses
  7. DMS/EMS generates an Alarm when Work completed.
  8. Operator re-energize the Transformer
Demonstration is available at the IBM La Gaude E&U Solutions Center
Thank You