CIM Task Force Update:
CIM-61850 Harmonization & CIM Certification Testing +++
Agenda

CIM-61850 Harmonization

CIM Compliance and IOP Testing

Status of Profile TF, ODI TF and OpenADR Harmonization
CIM-61850 Harmonization TF

• Status of TF Team
• Status of IEC current 62361-102 TS
• 62361-102 TS Scope/Content
• New Work Items for Harmonization
• 62361-102-1 Scope
• 62361-102-1 Status and Work in Progress
CIM-61850 task force

• Team - experts from WG13, WG14 and WG10
  – Weekly conference call meeting – every Friday at 10am Central
  – Any contributors welcome
  – Model Manager & Meeting Organizer: Margaret Goodrich
  – IEC Project Manager & Document Editor: Tom Berry

• NWIP status
  – National Committee Country Sponsor: France
  – IEC 62361-102-1 WG Sponsor: WG19
  – Working on Draft NWIP for distribution and approval

• A shared area is set-up (under CIM User group banner)
  – [http://cimug.ucaiug.org/Projects/CIM-61850/default.aspx](http://cimug.ucaiug.org/Projects/CIM-61850/default.aspx)
Status of IEC Current 62361-102 TS

- The initial harmonization document is 62361-102
- The Technical Specification (TS) has been submitted for review, comments have been received and addressed and the final TS has been submitted to IEC
- Waiting for IEC to publish the final TS for this initial effort.
Scope of 62361-102 TS

- Provides mapping to exchange SCL files with SCADA such that SCADA data acquisition could occur from 61850 SCL files.
- Master CIM topological data information from 61850 SCL file.
  - Identify 61850 modeling requirements and add support for any new required elements
  - SCADA configuration from 61850 SCL and subsequent data acquisition
- Mapping exercise made it clear that on-line business functions (like SCADA and network analysis) would share a ‘CIM configuration process’ that would transfer modeling information from 61850 to some CIM modeling application.
Scope of 62361-102 TS

- Install New EMS Configuration
  - Update Transmission Network Model (as constructed)
    - Define non-61850 measurement + source specification
  - Define SCADA measurement processing behavior
  - Install New DMS Configuration
    - Update Distribution Network Model (as constructed)
      - Define/modify scope of import
        - Import 61850 substation model
          - Update 61850 substation configuration
            - Convert 61850 to CIM
              - Install New 61850 Configuration
              - Do reductions / additions
                - Define/modify reductions / additions to import
                  - Replace previous import
                    - Update Transmission Network Model (as constructed)
                      - Extend Define/modify scope of import
                        - Extend Import 61850 substation model
                          - Extend Update 61850 substation configuration
                            - Extend Install New 61850 Configuration
New Work Items 62361-102 Series

• All future harmonization documents will address other use cases and will carry a sub number to 62361-102 document.

• They will be Technical Specifications for mapping each specific use case elements/objects between the CIM and 61850 standards.
62361-102-1 TS Scope

- **Volt Control** (based on state estimation) - Possible actions:
  - Adjust the settings of Transformers (voltage regulating transformers and substation OLTC)
  - Adjust active and/or reactive power injection by the DER units - Energy Storage system?
  - Network topology modification

- **Var control** - Possible actions:
  - Switch shunt capacitors
  - Adjust reactive power injection by the DER units - energy storage system?
62361-102-1 Working Roadmap

• “Align” the modelling where applicable and to precisely define a “mapping”.

• Step 1: Use case analysis
  – Use cases that address Volt Var Control are under discussion and in work.
  – We have 2 Use Cases Identified so far – one for VVC Operations and one for VVC Simulation

• Step 2: Mapping
  – identify overlap and duplication of CIM and 61850
  – Identify what is missing in 61850 that is required by CIM to provide the data for VVC analysis
  – Identify what is missing in CIM that is required by 61850 to provide the data for VVC analysis
62361-102-1 Work in progress

• Have drafts for 2 use cases complete with actor list and descriptions.
• The VVC Operations Use Case has the Actors identified and the initial draft of the descriptions as well as a draft sequence diagram.
• The VVC Simulation Use Case has the Actors identified and the initial draft of the descriptions.
• Working to identify the data and control flows for both Use Cases.
Network Model Management (past, present and future views of the system as a whole)

Control Center Configuration Artifacts

Planning and operations planning apps

RTO, TSO, DSO, DERMS, Aggregator, Customer Control Centers

Grid Power Carrying Elements

Other Field Automation Intelligence

Other System

* - Will Align with 61850 Terminology when it is finalized.
<table>
<thead>
<tr>
<th>61850 Decomposed Functions (From Grid local controls and sensors Visio Diagram)</th>
<th>61850 Logical Node</th>
<th>CIM</th>
</tr>
</thead>
<tbody>
<tr>
<td>V, I, P, Q Measurements (Common to all)</td>
<td>MMXU</td>
<td>Measurement</td>
</tr>
<tr>
<td>On-load tap changing transformers</td>
<td></td>
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<tr>
<td>Transformer direct tap-changer control</td>
<td>YPTR &amp; YLTC (Load Tap Changer functions)</td>
<td>Power Transformer TapChanger</td>
</tr>
<tr>
<td>Transformer Tap Settings</td>
<td>YPTR &amp; YLTC (Load Tap Changer functions)</td>
<td>Power Transformer TapChanger</td>
</tr>
<tr>
<td>Transformer voltage regulation (Enable/Disable Signal) Without schedule</td>
<td>YPTR, YLTC &amp; ATCC (Load Tap Changer Controller)</td>
<td>Power Transformer TapChanger</td>
</tr>
<tr>
<td>Transformer Scheduled Voltage (What voltage needs to be maintained, maybe by time of day)</td>
<td>YPTR, YLTC &amp; ATCC ASEQ</td>
<td>Power Transformer TapChanger</td>
</tr>
<tr>
<td>Capacitor/reactors</td>
<td></td>
<td></td>
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<tr>
<td>Capacitor direct control</td>
<td>CSWI, XSWI, ZCAP, XCBR</td>
<td>ShuntCompensator/SeriesCompensator Switch (must be restricted to a controllable switch in the Profile; i.e, Breaker, LoadBreakSwitch, etc.) (This should be modeled in some way in the CIM – that is to define what type of switch can be controlled)</td>
</tr>
</tbody>
</table>
CIM Compliance & IOP Testing TF

- Objectives
- Members
- Current Status and Logistics
- Future Topics & Work Items
- Resources & Alignments
- Want to Play?
CIM Compliance & IOP Testing TF Objectives

- Define a CIM Compliance and Interoperability Certification (CCIC) Program
- Define the artifacts for the CCIC Program
- Define a process to implement the CCIC Program
## CIM Compliance & IOP Testing TF Members

<table>
<thead>
<tr>
<th>Margaret Goodrich</th>
<th>Kay Clinard</th>
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</thead>
<tbody>
<tr>
<td>Henry Dotson</td>
<td>Kurt Hunter</td>
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<tr>
<td>Martin Bass</td>
<td>Michael Johnson</td>
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<tr>
<td>Luen Heng</td>
<td>Chris Kardos</td>
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<td>Gowri Rajappan</td>
<td>Bert Taube</td>
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<tr>
<td>Robert Ward</td>
<td>Frank Wilhoit</td>
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<tr>
<td>Gerald Gray</td>
<td>John Gillerman</td>
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CIM Compliance & IOP Testing TF
Status & Logistics

• CIM Compliance and IOP Testing (CCIT) Task Force will meet weekly on Mondays, 1600 GMT – 1700 GMT
• Will be providing status reports to the industry and socializing the program to get it moving and established
• CCIC Program must be self-sustaining
• Work on CIM compliance first then interoperability
• A CIM Testing website (www.cimtesting.org)
• CCIT Task Force members must either be members of UCA or IEC
• First task: Work on definition of CIM compliance
CIM Compliance & IOP Testing TF
Future Topics & Work Items

• Define what we mean by CIM compliance and certification
• Define the set of CIM compliance artifacts to be produced
• Produce Compliance Artifacts
• Define what we mean by CIM interoperability
• Define the set of CIM interoperability testing artifacts to be produced
• Produce IOP artifacts
• Define the process to implement the CCIC Program
• Execute the process to implement the CCIC Program
Resources

• Call to Action: CIM Certification Testing

• SGIP – Interoperability Process Reference Model (IPRM)
  – Definitions/FAQs relative to the ITCA
CIMUG as ITCA

• CIM User’s Group is... (Under the auspices of UCAIUG)
  – www.cimug.org
  – Source of draft IEC documents
  – Source of the CIM data class UML
  – Access to this site requires a username/password and there is no cost to obtain a guest login; however, to get to the draft IEC documents, membership in the CIM User’s Group is required.
  – The UML is not owned by anyone and can be obtained from the CIM User Group site with a Guest Login (which is free).

• ITCA is...
  – Interoperability and Testing Certification Authority
  – ITCA certifies the tests and lab
  – Lab that performs the test issues certificates of compliance
  – The Testing Committee within the CIMug will be an ITCA
Alignment with IEC WG19

• WG19 within the IEC Technical Committee for the Utilities (TC57)
  – responsibility to provide an IOP framework for the IEC Utility community (both the CIM and 61850 standards).
• A standard is currently in process to provide best practices and define the IOP framework for the IEC CIM Working groups.
• WG19 has initiated a project to define a standard for IEC profiling that will provide the guidelines for profile development within the IEC.
  – This standard will define the guidelines for both message and model profiles.
• The IOP Testing Committees will use these WG19 standards and best practices in the development of the IOP Testing Organization.
Testing Resources

• CIMTesting.org
  – Repository of meeting agendas, minutes
  – governance decisions
  – test scripts
  – Meeting schedule
  – Repository of example XML that validates against restricted XSD
  – Other messaging artifacts
  – Organized by certification category, e.g. meter reading & control
Want to Play?

• Put in a request to join CIMTesting.org
  – Margaret Goodrich, margaret@j-mgoodrich.com
  – Gerald Gray, ggray@epri.com

• Review testing resources at the CIMug testing site.

• Join the Weekly meetings
  – Schedule, agenda and call info will be posted on CIMTesting.org

• Working toward a testing event...
  – Spring or Summer of 2017
**Status of Profile TF**

- Heiko of the IEC, in conjunction with WG19, has an ongoing initiative to generate a Profile Guideline Standard for all IEC profiles, including 61850 and CIM.
- This work is proceeding but it is not providing a standard that defines how Profiles will be generated or the rules that must be adhered to for Profile generation in WG13, WG14, WG16 & WG21.
- We still need this and I have proposed a TF to WG19 and have tentative approval to start this effort.
- Plan to have a kick-off meeting after the first of the year.
Status of ODI TF

• ODI as a TF has completed all the modeling and profile work for now

• Model changes have been incorporated into the WG14 package in the Outage model (61968CIM13v09)

• Profiles have been generated and tested and will in the next Part 3 release

• Meetings and testing are still happening with the US team to get the messages and training to all the US utilities.

• Will need to update the XSDs based on the UML updates that are occurring now
Status of OpenADR Harmonization

- OpenADR is working and moving forward with their work and that is being submitted into OASIS and NAESB as a standard.
- The TF work between CIM and OpenADR is no longer meeting but as use cases and messages are obtained from OpenADR, they are incorporated into the CIM UML as part of the WG21 standards work.
- As new messages are completed in OpenADR, the CIM team will generate equivalent messages in the CIM WG16/WG21 models and standards.
Q & A