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To: IEC SMB Smart Grid Strategy Group 3 (SG3)
cc: Gabriel Barta
     Keith Brannon

The JTC 1 approved new work item for "Sensor Networks and Interface for Smart Grid Systems" has been suspended in accordance with SMB decision 137/18. In discussions with the IEC SMB SG3 Secretary, Peter Lanctot, JTC 1 was instructed to provide additional information to SG3 in order that an informed IEC decision can be made about this new work item and other Smart Grid activities. While far more information will be available once JTC 1's newly formed Special Working Group on Smart Grid (SWG-Smart Grid) begins their studies, the information contained below has been gathered expediently such that timely removal of the suspension can take place and the JTC 1 work can continue promptly.

One must remember that JTC 1's scope is Information Technology. As a joint committee of both IEC and ISO, JTC 1 develops information and communication technologies for business and consumer applications. One of JTC 1's unique roles is to provide the standards environment for the integration of very diverse and complex ICT technologies. These fundamental information and communication technologies are instrumental in providing the "smart" in any smart grid. Electricity generation, distribution, use, and storage will be controlled by information technology. Intelligence will move to the periphery of the grid (to homes, buildings, and appliances), as it did in communication networks and IT will be a key factor.

In the instructions from SG 3, JTC 1 was asked to provide feedback to the ten SG3 decisions made in Annex B of the SG3 November 2009 meeting report. Additionally, JTC 1 was asked for an initial identification of standards, existing or under development, that JTC 1 would recommend become part of a Smart Grid Framework. The information provided below is a very preliminary response gathered together from several of the JTC 1 SC and WG Chairs.

JTC 1 SC Chairmen Responses to SG3 Decisions ---
SG3 DECISION 1: TCs will provide practical guidelines to increase current usability of standards
JTC 1's SWG-Smart Grid and many of the JTC 1 SC's will be able to provide valuable input to SG 3 on increasing the use of identified JTC 1 standards in Smart Grid applications.

SG3 DECISION 2: Fast-track new standards to close the gaps
In JTC 1, the SWG-Smart Grid has the task to determine information technology standard gaps for development of the Smart Grid. The various JTC 1 SCs and WGs will respond with technologically sound solutions to the SWG-Smart Grid analysis. JTC 1 makes significant use of the JTC 1 fast track process and successfully adopts consortia specifications as international standards via its unique JTC 1 PAS Transposition Process. In both these procedures, issues such as IPR and maintenance are addressed. It is important that fast track standards are well considered and contribute to the integration of technologies used to implement the Smart Grid. An inappropriate "fast" standard may have long term

negative impacts.

SG3 DECISION 3: Set up a Feedback process for continuous improvement
JTC 1 SCs and WGs are eager to actively provide feedback via a mechanism such as a wiki and ask that when such tools become available, that JTC 1 committees be given access. Additionally, the JTC 1 SC Chairmen recommend that the process be open such that liaisons and non-IEC bodies can also provide feedback.

SG3 DECISION 4: Across the IEC Smart Grid Framework, the Application Domain TCs must use the methods delivered by the "horizontal" TCs included in the Framework.
Without fully appreciating the scope of a horizontal TC, there is some concern that limiting the IEC Smart Grid Framework elements to only those methods delivered by the horizontal TCs will greatly limit the use of existing standards and technology. There is, however, an appreciation that the coordination of the work within IEC should be viewed in a system-oriented way. JTC 1's SWG-Smart Grid will be identifying similar horizontal work from within the JTC 1 program and that information can be shared with the SG3 effort. Some JTC 1 SC Chairs suggest that with further understanding, JTC 1 may be considered a horizontal TC and several of the SCs (such as SC 25) should appropriately be identified as application domain TCs.

SG3 DECISION 5: The Application Domain TCs must develop their own Data Models and Test Cases
JTC 1 has considerable experience and expertise developing and implementing data models in many application areas. The appropriate JTC 1 standards will be available to application domain TCs. SWG-Smart Grid will identify application domain SCs within JTC 1 that should be considered within this Decision. The work of SC 25 on premises automation application domain is clearly a strong candidate. Several of JTC 1's SCs encourage a liaison relationship with IEC TC 57.

SG3 DECISION 6: Accelerate the harmonization of IEC 61850 and CIM
Nothing to comment.

SG3 DECISION 7: Deliver generic Use Cases
JTC 1's WG 7 on Sensor Networks desires to utilize the output of IEC TC 8, the generic use cases, along with use cases from other Smart Grid SDOs and Consortiums, for example, CENELEC CWA on IFRS Interoperability Framework Requirement Specification, SGIP, IEEE P2030, and OpenSG. JTC 1/WG 7 will seek a liaison relationship with IEC TC 8 to ensure good coordination of the respective work programs. Additional JTC 1 SC liaisons should also be identified.

SG3 DECISION 8: Establish a new TC or SC on "connecting the consumer applications"
JTC 1 is extremely concerned by SG 3's Decision 8. JTC 1 believes it is essential that consumer applications be connected and in fact, has been working on such systems in JTC 1, especially in SC 25, for over two decades. Establishing a new TC or SC for this item will directly overlap the work of JTC 1 SC 25 and will not aid in moving the industry forward. SC 25's program of work in the premises automation space should be leveraged by the IEC work. The mentioned KNX standards identified in the SG 3 report as needing a new TC are actually published by JTC 1 SC 25 as ISO/IEC 14543-3-x. Even though other SC 25 international standards have been recognized by some national and regional activities, they are not mentioned in the SG 3 report. Additionally, SC 31 WG 6 has existing sensor and actuator standards for monitoring and action. JTC 1 strongly believes there is no need for a new TC or SC.

SG3 DECISION 9: Add a Smart Grid certification process to the IEC System family
JTC 1 believes that this decision should be postponed. Greater consideration must be given to consider appropriate input and/or collaboration on the definition of such a smart grid certification process.

SG3 DECISION 10: Add operational management of the IEC Smart Grid Framework
JTC 1 supports this decision and would ask that JTC 1 be invited to be a contributing party.

JTC 1 Standards for Smart Grid

The following information is very preliminary and requires further analysis to ensure proper categorization of JTC 1's standards work. JTC 1 SWG-Smart Grid will be compiling a full accounting of JTC 1 standards that are essential for the Smart Grid Framework. However, referring to the mapping provided in the figure on page 18 of SG3's revised report, the following JTC 1 (or ISO) standards should be considered.

Applications and Databases
• SC 6– ISO/IEC 8824 (Abstract syntax notation one ASN.1)
• SC 6 - ISO/IEC 8825 (Encoding rules for ASN.1)
• SC 24– ISO/IEC 18025 (Environmental data coding specification)
• SC 24– ISO/IEC 18026 (Spatial reference model)
• SC 24 - ISO/IEC 19775 (X3D)
• SC 29– ISO/IEC 21000 (MPEG 21 – Multimedia)
• SC 32– ISO/IEC 9075 (SQL)
• SC 32– ISO/IEC 13249 (SQL multimedia and application packages)
• SC 34– ISO 8879 (SGML (language behind HTML, XML, etc.))
• ISO TC 211– ISO 19125 (Simple feature access)
• ISO TC 211– ISO 19136 (Geographic Mark-up Language (GML))

Common Information Model (CIM)
• SC 32 - ISO/IEC 11179 (Metadata registries)
• SC 32 - ISO/IEC 14957 (Notation of format for data element values)
• SC 32– ISO/IEC 19763 (Metamodel framework for interoperability)
• SC 32– ISO/IEC 20944 (Metadata Registries Interoperability and Bindings)
• ISO TC 211 - ISO CD 19156 (Observations and Measurements) - used in OGC, see page 7 of
http://bit.ly/aVFlUM)

GID (Generic Interface Definitions)
• input from JTC 1 SC 22 would be relevant

Object Models
• SC 7 – ISO/IEC 15476 (CDIF semantic metamodel)
• SC 7 – ISO/IEC 17450/2/3 (Open distributed processing (ODP))

Service Models
• SC 7 – ISO/IEC 17450/2/3 Open distributed processing (ODP)
• SC 29 – ISO/IEC 15444 (JPEG) Visualization, Rendering, etc
• ISO TC 211- ISO 19128 (Web Map Server interface) offers dynamically rendered maps in encodings such as JPEG, GIF etc. The service requestor issues an HTTP GET request with
multiple parameters including the bounding coordinates to be rendered. Example WMS
from NASA http://bit.ly/aT14Sc
• ISO TC 211 – ISO/DIS 19142 (Web Feature Service) offers an interface for retrieving location referenced data from databases over HTTP. Example WFS at http://bit.ly/cDxVAH

• OGC Sensor Observation Service Interface Standard for accessing observations from any sensor
• OGC Sensor Planning Service Interface Standard for requesting a sensor to change its mode for performing an observation.
• OGC Sensor Model Language (SensorML) Encoding Standard is an XML vocabulary that is designed for describing the characteristics of any sensor type.

Profiles & Mapping
•
System Configuration Language
• SC 7 - ISO/IEC 14750 (ODP Interface Definition Language)
Security
• SC 27 – Privacy and Security Frameworks standards - Information Security Management System Family of Standards

Published
ISO/IEC 27000 - introduction to the family of standards plus a glossary of common terms
ISO/IEC 27001 - standard for the establishment, implementation, control and improvement of the Information Security Management
ISO/IEC 27002 - code of practice providing good practice advice on ISMS
ISO/IEC 27005 - designed to assist the satisfactory implementation of information security based on a risk management approach
ISO/IEC 27006 - a guide to the certification/registration process
ISO/IEC 27011 - information security management guidelines for the telecommunications industry

Draft
ISO/IEC 27003 - an ISMS implementation guide - publication expected by the end of 2009 or early 2010
ISO/IEC 27004 - a standard for information security management measurements - publication expected by the end of 2009 or early 2010
ISO/IEC 27007 - a guideline for ISMS auditing (focusing on the management system)
ISO/IEC 27008 - a guideline for Information Security Management auditing (focusing on the security controls)
ISO/IEC 27013 - a guideline on the integrated implementation of ISO/IEC 20000-1 and ISO/IEC 27001
ISO/IEC 27014 - an information security governance framework
ISO/IEC 27015 - information security management guidelines for the finance and insurance sectors
ISO/IEC 27031 - a specification for ICT readiness for business continuity
ISO/IEC 27032 - a guideline for cybersecurity (essentially, 'being a good neighbor' on the Internet)
ISO/IEC 27033 - IT network security, a multi-part standard based on ISO/IEC 18028:2006
ISO/IEC 27034 - a guideline for application security

Network and System Management
• JTC 1 - ISO/IEC 7498-4 (Open system interface – Basic reference model – Part 4: Management Framework)
• SC 6 - ISO/IEC 8824 (Abstract Syntax Notation (ASN.1))
• SC 6 - ISO/IEC 12139-1 (High Speed power line communications medium access control (MAC) and physical layer (PHY) protocols)

SA - Substation
•
DER – Distribution Resources
•

DA – Distribution Automation

•

CUS – Customers

•

GEN – Generation

•

Additional standards

Until further work can take place within JTC 1 to determine the proper placement of additional JTC 1 standards, the standards below have been identified as having a role in the Smart Grid.

SC 25:

ISO/IEC TR 15067-3 is under development in JTC 1/SC 25/WG 1 to be converted to an international Standard ISO/IEC 15067-3. Title: Information technology — Interconnection of information technology equipment — Home Electronic System — Application models — Part 3: Model of an energy management system for HES --- This standard focuses on products and services that can manage energy consumption dynamically. Dynamic adaptation is important because the supply and cost of electricity may vary over time. The model presented here for energy management is intended to be generic and representative of a wide range of situations. This standard applies to the customer interface portion of the electricity smart grid.

ISO/IEC 15045-1:2004 Information technology -- Home Electronic Systems (HES) gateway -- Part 1: A Residential Gateway model for HES **--** A premises gateway standard that complements the series in the premises-to-distribution grid boundary.

ISO/IEC 18012-1:2004 Information technology -- Home Electronic System -- Guidelines for product interoperability -- Part 1: Introduction **--** An application interoperability standard that directly addresses many of the issues of establishing interoperability across the premises-to-distribution grid boundary.

SC 31:

ISO/IEC/IEEE 21450 [IEEE 1451.0], Information technology Smart Transducer Interface for Sensors and Actuators Common Functions, Communication Protocols, and Transducer Electronic Data Sheet (TEDS) Formats

ISO/IEC/IEEE 21451-1 [IEEE 1451.1], Information technology Smart Transducer Interface for Sensors and Actuators Network Capable Application Processor (NCAP) Information Model

ISO/IEC/IEEE 21451-2 [IEEE 1451.2], Information technology Smart Transducer Interface for Sensors and Actuators Transducer to Microprocessor Communication Protocols and Transducer Electronic Data Sheet (TEDS) Formats

ISO/IEC/IEEE 21451-4 [IEEE 1451.4], Information technology Smart Transducer Interface for Sensors and Actuators Mixed-Mode Communication Protocols and Transducer Electronic Data Sheet (TEDS) Formats

ISO/IEC/IEEE 21451-7, Information technology Smart Transducer Interface for Sensors and Actuators - Transducers to Radio Frequency Identification (RFID) Systems Communication Protocols and Transducer Electronic Data Sheet Formats

ISO/IEC/IEEE 8802-15-4 [IEEE 802.15.4-2006], Information technology Local and metropolitan area networks Specific requirements, Part 15.4: Wireless Medium Access Control (MAC) and Physical Layer (PHY) Specifications for Low-Rate Wireless, Personal Area Networks (WPANs) Also known as Zig-Bee which serves as a fundamental piece of AMI and HAN services identified in the document

ISO/IEC/IEEE 21451-5 [IEEE 1451.5], Information technology Smart Transducer Interface for Sensors and Actuators Wireless Communication Protocols and Transducer Electronic Data Sheet (TEDS) Formats Corrigendum for Zig-Bee reference from IEEE 802.15.4 2003 to ISO/IEC/IEEE 8802-15-4 [IEEE 802.15.4 2006]

ISO/IEC/IEEE 21451-3 [IEEE 1451.3], Information technology Smart Transducer Interface for Sensors and Actuators Digital Communication and Transducer Electronic Data Sheet (TEDS) Formats for Distributed Multi-drop Systems

Further, the Smart Home and Smart Appliances will have the need to provide an interface to ISO/IEC 18000-3, Information technology -- Radio frequency identification for item management -- Part 3: Parameters for air interface communications at 13,56 MHz

ISO/IEC 18000-6, Information technology -- Radio frequency identification for item management -- Part 6: Parameters for air interface communications at 860 MHz to 960 MHz

SC 37:
ISO/IEC 19794-x multi-part standard: Biometric data interchange formats for a number of modalities

ISO/IEC 19784-x multipart standard: Biometric application programming interface – BioAPI specification

ISO/IEC 19785-x multipart standard: Common Biometric Exchange Framework Format -- Biometric technical interface standards

ISO/IEC 19795-x multi-part standard: Biometric performance testing and reporting methodologies

On-going development of technical reports associated with the usability and accessibility of biometric systems (under development in JTC 1/SC 37 WG 6 – Cross Jurisdictional and Societal Aspects of Biometrics) and well as possible development of specific biometric application profiles for aspects of smart grids or sensor networks may also apply.

Conclusions

JTC 1 has a significant number of standards published or under development that are required for the Smart Grid. JTC 1 will be pleased to work with IEC SG3 to collaboratively bring the information technology aspects of ISO and IEC to the IEC Smart Grid work. JTC 1 is eager to progress the JTC 1 work "Sensor Networks and Interface for Smart Grid Systems" and will coordinate with SG3 to ensure that the work product contributes positively to the IEC Smart Grid activity.

Karen Higginbottom
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