T&I Meeting Minutes

April 19th, 2023 – Clearwater Beach FL

Chair: Alex Cochran (Lizardo)
Secretary : Caryn Riley
Meeting: Sheraton Sand Key
Time: April 19th, 2023 10:15AM – Noon (Eastern Daylight Saving Time)

Meeting Minutes

1. **Call to order**

   The meeting was opened at 10:15 am and called to order at 10:20 am EDT.

2. **Introductions of Guests**

   Sign-up sheet was completed.

3. **Attendance**

   11 Members, 19 Guests

4. **Approval of the agenda**

   IEEE TI Spring 2023 Agenda.pdf
   The agenda was approved by consensus.

5. **Patent Slides**

   IEEE patent slides were shared with the attendees with no comments from the group.

6. **Meeting minutes approval**

   F22TImiRev0.pdf
   No revisions.

7. **Chairman's report**

   a. TI Scope review

   b. Review of changes in membership, four new members introduced M. Chhabra, A. Nenning, M. Christian, F. Trichon

8. **Task forces:**

   a. Aging Switchgear: condition assessment and lifecycle management (A. Nenning)

   - 90% complete
   - Added more new members at the task force session
   - Document review by Fall 23

- CEATI Utility survey on Asset Management was successful- got responses from US, Canada, Australia, New Zealand, and France
- Action item: Secretary to work with A. Nenning to get proper template from IEEE PES Resource Center for final document and notify IEEE PES Resource Center that we wish to publish a paper

b. Power Frequency Over-Voltages >= 200% of Rated Voltage Across an Open Gap (M. Chhabra)

- Presentation slides will be included in the minutes.
- Draft is complete and circulated internally for feedback, due by May 5th
- Secretary to get proper template from IEEE PES Resource Center and begin process of getting white paper template to M. Chhabra
- Recommendations for solid insulations – require a partial discharge test, and change the pre-stress and test voltages (examples given for C37.60 and C37.62). This is to account for the long-term condition of having $2.2U_{line\text{-}neutral}$ – comments:
    - Questions about inception and extinction voltages and partial discharge levels, nothing has been specified and the new version of C37.301 will include definitions of inception and extinction voltages
    - For implementing the test: The only components seeing this voltage in the switchgear is over the open gap; to perform the test you will need two separate sources as the components on either side are at line-neutral voltage and should not be stressed at 2.2
- Recommendation #2 – auxiliary and control equipment installed across the open gap, manufacturers are expected to ensure that such equipment is chosen appropriately so as not to be adversely affected by >= 200% line-neutral power-frequency voltage across the gap. No common testing requirement is recommended by the authors.

c. T&D switchgear special applications (M. Christian)

- Began discussions on topics after Fall 2022 meeting
- Will create a survey to send within the Switchgear committee and externally to determine the final topics
- G. Becker involved in writing the PES Roadmap for 2050 also a good source for special applications
- N. Uzelac suggested doing a poster at General Meeting to get more contributors
- G. Becker suggested a panel session to discuss the work at April 2024 T&D Show

9. Updates from relevant organizations:

CIGRE history and general information about the study committees was discussed. N. Uzelac is the chair of the A3 study committee over T&D equipment. Procedures being developed to have joint working groups with CIGRE and IEEE members. Working groups with a time frame of 2-4 years publish a technical report at completion – new working groups are being started. US National Committee for CIGRE – Grid of the Future conference in Kansas City, MO from October 9-12, 2023.

10. Open Topic

a. C. Worthington- Supply Chain and Asset Traceability for Electric (SCATE) program

- Any user along the supply chain can scan the Smart Tag and retrieve the Digital Thread traceability data in a standardized format.
- White paper or potentially a guide coming from this group
- Data models to be created – current list from this group includes reclosers, circuit breakers, and fault interrupters; may be looking for volunteers for a team on developing this for reclosers soon
- Share the slides encouraging other members from T&I committee to participate independently
- Agreed to have C. Worthington continue to present to the T&I meeting

b. High-voltage circuit breaker topic

- ADSCOM advised to ask HVCB if they wish to do the paper or if they wish T&I to work on the topic.

c. Additional suggested topics:

- Physical resilience - Issues with equipment and it's hardening for climate events becoming more common; Task force being started at Substation committee currently, contact G. Becker
- Influence of renewables on switchgear
- Raw material supply chain at end of life for switchgear – danger of our resources being sold to other industries due to higher demand of automotive industries – suggest trying to see if we can organize the recycling of our materials to be sold to our industries

11. Future meetings

Fall 2023 (October 08 – 13), Catamaran Resort, San Diego, CA; T&I meeting on 10/11 at 10:15 am - Noon

12. Adjourn

Meeting adjourned at 11:56 AM EDT.

Role	First Name	Last Name	Company
Secretary	Caryn	Riley	Georgia Tech/NEETRAC
S Chair	Alex	Cochran	Unaffiliated
Member	Mohit	Chhabra	S&C Electric Co.
Member	Michael	Christian	ABB
Member	Kennedy	Darko	G&W Electric Co
Member	Anil	Dhawan	Allegis Group
Member	Jeff	Mizener	Siemens Industry, Inc.
Member	Andreas	Nenning	OMICRON electronics GmbH
Member	Francois	Trichon	Schneider Electric
Member	Nenad	Uzelac	G&W Electric
Member	Charles	Worthington	Hubbell Power Systems
Guest	Edwin	Almeida	Southern California Edison
Guest	Joe	Andreyo	Southern States LLC
Guest	Andreas	Bartels	Powell Industries, Inc
Guest	Andy	Beckel	Xcel Energy
Guest	George	Becker	POWER Engineers Inc.
Guest	Randy	Blake	Schneider Electric
Guest	Kent	Coldsnow	Fort Collins Utilities
Guest	Marc	Foster	Schneider Electric
Guest	Brian	Gerzeny	Powell Industries, Inc
Guest	Jon	Harley	FirstPower Group LLC
Guest	Douglas	Hill	S&C Electric Co.
Guest	Colby	Levins	Federal Pacific
Guest	Peter	Mapp	GE
Guest	Fernando	Ordein	Dominion Energy
Guest	Mark	Peterson	Xcel Energy
Guest	Isaac	Pounders	Meiden America Switchgear, Inc.
Guest	Aaron	Rexroad	Meiden America Switchgear, Inc.
Guest	Paul	Shiller	First Power Group LLC
Guest	Li	Yu	Eaton
Guest	Danish	Zia	UL LLC


T&I meeting
starting
@10:15AM

IEEE T&I Subcommittee Meeting

Alex Cochran(Chair)
Caryn Riley(Secretary)

April 19, 2023

Introductions

1.	Call to Order	Alex C.
2.	In-person meeting etiquette	Alex C.
3.	Introduction of Guests	Caryn R.
4.	Attendance	Caryn R.
5.	Approval of updated Agenda	Alex C.
6.	Patent slides	Alex C.
7.	Approval of Minutes from Fall 2022 Meeting	Caryn R.
8.	Chairman's report:	Alex C.
	a. TI Scope review	
	b. Membership review	
9.	Task forces:	
	a. "Testing for Power Frequency Over-Voltages ≥200% open gap"	Mohit
	b. "Aging Switchgear: condition assessment and lifecycle management"	Andreas
	c. "T&D switchgear special applications"	Mike C.
10.	Open discussion	
	a. Discuss open inquiries.	All
	b. Discuss "call for experts" to participate in Task Forces	Nenad
	c. Any new topics that T&I should discuss	All
11.	Updates from relevant organizations:	
	a. CIGRE A3 update	Nenad
12.	Future meetings	
	a. Fall 2023 (October 08 – 13), Catamaran Resort, San Diego, CA	
	b. Pending confirmation.	
13.	Meeting adjourns	Alex C.

Participants have a duty to inform the IEEE

- Participants shall inform the IEEE (or cause the IEEE to be informed) of the identity of each holder of any potential Essential Patent Claims of which they are personally aware if the claims are owned or controlled by the participant or the entity the participant is from, employed by, or otherwise represents

- Participants should inform the IEEE (or cause the IEEE to be informed) of the identity of any other holders of potential Essential Patent Claims

Early identification of holders of potential Essential Patent Claims is encouraged

Ways to inform IEEE

- **Cause an LOA to be submitted to the IEEE-SA (patcom@ieee.org); or**
- **Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible; or**
- **Speak up now and respond to this Call for Potentially Essential Patents**

If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance, please respond at this time by providing relevant information to the WG Chair

Other guidelines for IEEE WG meetings

- **All IEEE-SA standards meetings shall be conducted in compliance with all applicable laws, including antitrust and competition laws.**
  - **Don't discuss the interpretation, validity, or essentiality of patents/patent claims.**
  - **Don't discuss specific license rates, terms, or conditions.**
    - Relative costs of different technical approaches that include relative costs of patent licensing terms may be discussed in standards development meetings.
      - **Technical considerations remain the primary focus**
  - **Don't discuss or engage in the fixing of product prices, allocation of customers, or division of sales markets.**
  - **Don't discuss the status or substance of ongoing or threatened litigation.**
  - **Don't be silent if inappropriate topics are discussed … do formally object.**

For more details, see *IEEE-SA Standards Board Operations Manual*, clause 5.3.10 and *Antitrust and Competition Policy: What You Need to Know* at http://standards.ieee.org/develop/policies/antitrust.pdf

Patent-related information

The patent policy and the procedures used to execute that policy are documented in the:

- *IEEE-SA Standards Board Bylaws*
  (http://standards.ieee.org/develop/policies/bylaws/sect6-7.html#6)
- *IEEE-SA Standards Board Operations Manual*
  (http://standards.ieee.org/develop/policies/opman/sect6.html#6.3)

Material about the patent policy is available at
http://standards.ieee.org/about/sasb/patcom/materials.html

If you have questions, contact the IEEE-SA Standards Board Patent Committee Administrator at patcom@ieee.org

Approval of Minutes

T&I Meeting Minutes

October 19th, 2022 – Burlington, VT

IEEE PES Power & Energy Society™

Chair: Alex Cochran (Lizardo)
Secretary : Caryn Riley
Meeting: Hilton Burlington Lake Champlain, Burlington, VT (Green Mountain B)
Time: Oct 19th, 2022 8AM – 9:45AM (Eastern Daylight Saving Time)

Meeting Minutes

1. **Call to order**

   The meeting was opened at 08:00 am and called to order at 08:03 am EDT.

2. **Introductions of Guests**

   Sign-up sheet was completed.

3. **Attendance**

   9 Members, 22 Guests

4. **Approval of the agenda**

   IEEE TI Fall 2022 Agenda.pdf
   The agenda was approved by consensus.

5. **Patent Slides**

   IEEE patent slides were shared with the attendees with no comments from the group.

6. **Meeting minutes approval**

   S22TImiRev0.pdf
   Minutes were amended. Motion to accept, accepted by consensus. Amended minutes will be submitted for posting.

7. **Chairman's report**

   a. TI Scope review

   b. Introduction of officer rotation, Alex Cochran now chair, Caryn Riley has accepted secretary role.

8. **Task forces:**

   a. Aging Switchgear: condition assessment and lifecycle management (Andreas Nenning)

   - Three portions of the document – Aging section 60% complete, Condition Assessment section – on schedule, Lifecycle Management of aging assets – under development

- Yesterday task force met on site and conducted a brain storming session about the survey questions, plan to do the survey in the first quarter 2023.
- Goal to have the document for review by the subcommittee for Fall 2023 meeting
- Task Force has 20 members, but always seeking more experts.
- Utility members are requested to provide contacts to send the survey. Survey will take approximately 30 – 40 minutes to complete. CEATI contact on the task force to provide way to deliver the survey. Goal is to have an online link to send the survey out. Utility user group at PES Switchgear, Mike Skidmore, chair, will be contacted to distribute the survey link.
- Discussion followed.
  - Are members seeing increased asset management activities? Yes, being asked to do asset management of older GIS equipment;
  - Is lifecycle management based on installation environment, time in service, manufacturer expected life, maintenance practices? This is the most difficult task of our industry especially with the recent supply chain issues corrupting the ability to replace aging equipment.
  - There is a potential request to "standardize" nameplate information for the utility industry. May be submitted as a proposal for T&I once origin of this standardization plan is known.

b. Testing for Power Frequency Over-Voltage >= 200% open gap (Mohit Chhabra)

- Presentation slides will be included in the minutes. Reviewed the scope that is the focus of the white paper. Five contributors are actively assisting with topics of the white paper. TF Chair welcomes additional contributors. Refer to slide for areas where support is needed.
- Discussion of 4.2.5 in the outline: Suggestion that this area may require involvement of the manufacturers; Agree that construction is critical for determining of the ability to survive extended time at 200%; need to have a single test for all devices to prove efficacy
- Sent a utility user group questions, but did not get a response. TF member will follow up with the utility user group chair.
- Goal is to complete document before the Spring 2023 Switchgear meeting.
- Discussion about what to consider – specifically focused on issues of partial discharge across the open gap and the corresponding switchgear components; also why would another test be required besides the existing 1 min dry/10 s wet withstand tests; Shared experience with an issue has been seen on a 38 kV system with degradation of insulation not with the vacuum bottles, at this system voltage level 200% is above the voltage class of the device; should an accelerated life test be added to show performance for the 200% condition?

c. T&D switchgear special applications (Alex Cochran)

- Seeking a volunteer to lead this task force as current leader has not been able to move the work forward (new position within his organization).
- Slides presented from Fall 2021 web meeting of topics and general outline of what would be covered for each topic

IEEE Switchgear T&I sub-committee

- **Facilitates** and **conducts** research related to Switchgear, Circuit breakers and Fuses that are covered under IEEE switchgear standards. The need for innovations arises because of the changing business environment and technology offerings.

- **Develops** technical reports and makes recommendations for further advancement of IEEE switchgear standards.

- **Coordinates** with other technical committees, groups, societies, and associations as required.

IEEE Switchgear T&I sub-committee

- Will not develop standards
- Will cover the projects that are of interest to more than one switchgear subcommittee
- Anyone can write and submit a project proposal
- Subcommittee members will decide which projects to take.
- Initial members are chosen based on nominations, after will follow IEEE attendance rules.

T&I Membership

LVSD:

- Ted Burse
- Carl Schneider
- Jeff Mizener

HVCB:

- Dave Johnson
- Michael Christian
- vacant

RODE:

- Kennedy Darko
- Anil Dhawan
- Nenad Uzelac

SA:

- open
- open
- Albert Livshitz

HVF:

- Sterlin Cochran
- Charles Worthington
- Jim Wenzel

HVS:

- open
- open
- open

Task Force reports

Task Forces

1) "Testing for power frequency over-voltages >200% open gap" (paper) ***Lead: Mohit***

2) "Aging Switchgear: condition assessment and lifecycle management" ***Lead Andreas*** *(tech. report)*

3) "T&D switchgear special applications" **Lead: *Mike Christian*** (TBD)

TF Slides

Power Frequency Over-Voltages of ≥200% of Line-Neutral Voltage Across an Open Gap

Mohit Chhabra

April 2023

Power Frequency Over-Voltages of ≥200% of Rated Voltage Across an Open Gap

Agenda

1. Status of white paper
2. Next step

Power Frequency Over-Voltages of ≥200% of Rated Voltage Across an Open Gap

Status of white paper

Table of Contents	Status
1. Introduction	Under Review
2. Literature Survey	Under Review
3. Scope of Switchgear	Under Review
3.1 Insulating Medium	Under Review
3.1.1 Gas Insulation	Under Review
3.1.2 Liquid Insulation	Under Review
3.1.3 Solid Insulation	Under Review
3.2 Type of Isolating Device	Under Review
3.2.1 Indoor and Outdoor Disconnectors	Under Review
3.2.2 Switch Disconnectors / Load Break Switches	Under Review
3.2.4 Fault Interrupters and Reclosers	Under Review
3.3 Voltage Ratings	Under Review
4. Recommendations	Under Review
5. References	Under Review

Feedback due: May 5th

Power Frequency Over-Voltages of ≥200% of Rated Voltage Across an Open Gap

Recommendations

1. For solid insulation, the authors recommend that the relevant sub-committee(s) consider a partial discharge design test to account for the scenario of switchgear being subject to ≥200% line-neutral power-frequency voltage.

Existing (C37.60 and C37.62): $U_{pre\text{-}stress} = 1.3*1.5* U_{line\text{-}neutral} = 1.95*U_{line\text{-}neutral}$

Existing (C37.60 and C37.62): $U_{measuring} = 1.1 * U_{line\text{-}neutral}$

Existing (C37.74): $U_{test} = 1.05 * U_{line\text{-}neutral}$

Recommended: $U_{pre\text{-}stress} = 2.2 * U_{line\text{-}neutral}$

Recommended: $U_{measuring} = 1.1 * U_{line\text{-}neutral}$

Recommended: $U_{test} = 2.2 * U_{line\text{-}neutral}$

Power Frequency Over-Voltages of ≥200% of Rated Voltage Across an Open Gap

Recommendations

2. For auxiliary and control equipment installed across an open gap, manufacturers are expected to ensure that such equipment is chosen appropriately so as not to be adversely affected by ≥200% line-neutral power-frequency voltage across the gap. No common testing requirement is recommended by the authors.

Power Frequency Over-Voltages of ≥200% of Rated Voltage Across an Open Gap

Authors

Mohit Chhabra (S&C Electric Company)

Azadeh Shadman ()

Nenad Uzelac (G&W Electric)

Henning Milnikel (Siemens)

Li Yu (Eaton)

Power Frequency Over-Voltages of ≥200% of Rated Voltage Across an Open Gap

Next step

1. Publish – process?

Updates from

CIGRE & A3

Open Topics

Discuss inquiries and other topics brought forward.

IEEE SCATE Work Group Kick-Off

Supply Chain and Asset Traceability for the Electric Grid

Agenda

- Attendance
- About IEEE Industry Connections
- Program Scope and Goals
- Program Deliverables
- Work Groups
- Introduction to Use Cases
- Proof of Concept Projects
- Next Steps

Attendance

- Name and company
- Work group roster

INDUSTRY CONNECTIONS (IC) PROGRAM

An economical and neutral environment for building consensus

- Supports incubation of new technologies, standards and related services
- Helps individuals and entities solve shared problems and produce shared results
- Minimal effort, time and expense to begin collaborative work

Two membership models

- Individual-based: Members are individuals with any affiliation. Voting (if needed) is one vote per individual.
- Entity-based: Members are entities. Voting (if needed) is one vote per entity. Entities include corporations, government agencies, academic institutions, trade associations, NGOs, etc.

IC projects are called “Activities”

- Activities are started by submitting an *Industry Connections Activity Initiation Document* (ICAID)

POSSIBLE OUTPUTS OF IC ACTIVITIES

- Proposals for standards
- White papers
- Peer-reviewed guides and position papers
- Workshops and other events
- Databases and registration services
- Software, tools and web services
- Other jointly developed results

Anything **except** “standards”

WHITE PAPER VS IEEE STANDARD

The IEEE publishes 3 types of standards documents which are defined in section 1.2 of the IEEE SASB Operations Manual:

- Standards: documents with mandatory requirements.
- Recommended practices: documents in which procedures and positions preferred by the IEEE are presented.
- Guides: documents in which alternative approaches to good practice are suggested but no clear-cut recommendations are made.

The IEEE SA defines a white paper as a report or guide informing in a concise manner about a complex issue and presenting the issuing body's philosophy on the matter. It is meant to help readers understand an issue, solve a problem, or make a decision.

- A white paper cannot appear to be an *IEEE Standard, Recommended Practice* or *Guide*
- A white paper cannot be commercial in nature and/or represent a sales pitch for a product, service, or company.
- A white paper shall be 20 pages or less
- A white paper shall be associated with standards or standards-related technology

Previously published material such as magazine article reprints will not be accepted as white papers.

RESOURCES

- **Industry Connections Website:**
  - https://standards.ieee.org/industry-connections/index.html://standards.ieee.org/industryconnections
- **Resources for IC Activities:**
  - https://standards.ieee.org/about/bog/iccom/resources/
  - ICAID form, P&P templates, status report templates, document templates, copyright permission templates
- **Activity Initiation Form (ICAID):**
  - https://standards.ieee.org/wp-content/uploads/import/documents/forms/icaid_form.doc
- **Industry Connections Administrator Email Address:**
  - industryconnections@ieee.org
- **Current and Closed IC activities:**
  - https://standards.ieee.org/industry-connections/activities.html
  - https://standards.ieee.org/industry-connections/closed-activities.html

Program Scope and Goals

To support the clean energy transition and build the grid of the future, we are launching the Supply Chain and Asset Traceability for Electric (SCATE) program under the IEEE Industry Connections platform (IC22-009).

The goal of the SCATE program is to develop a framework for creating industry standards and supporting technology to create a **Smart Tags** and a **Digital Thread** for electric grid assets.

Manufacturers apply a **Smart Tag** (barcode, QR, RFID) with a unique ID that contains basic attribute data (manufacturer, serial number, rating) and links the physical asset to its Digital Thread.

The **Digital Thread** includes additional attributes, datasets, and events that tracks the asset throughout its life from design to decommissioning.

Any user along the supply chain can **scan the Smart Tag and retrieve the Digital Thread traceability data in a standardized format**. Users will be able to perform real-time validation and automate the process of populating systems of record with high fidelity data to support risk mitigation and analysis in a Digital Twin.

Program Deliverables

The deliverable of this program will be a **whitepaper that defines the use cases, critical assets, and attribute data models** for SCATE.

The white paper will also provide examples and **case studies** of SCATE implementation in proof-of-concept projects.

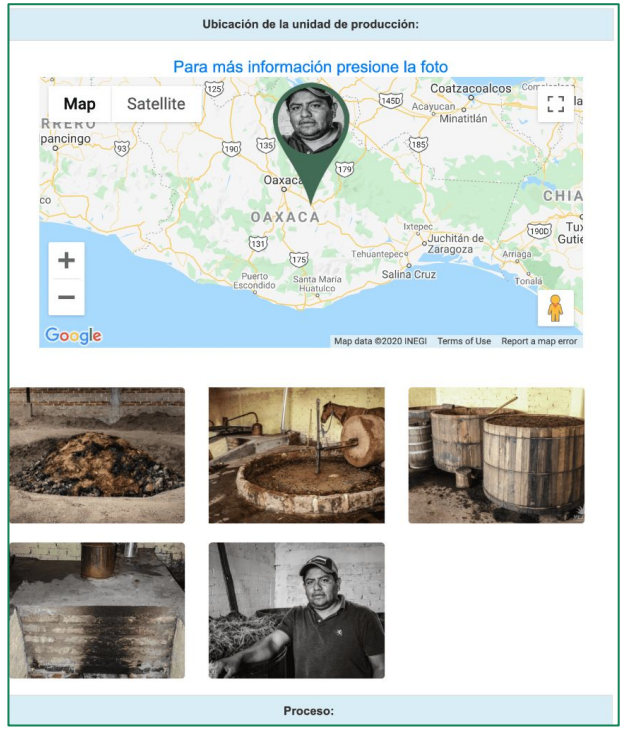
This whitepaper will be the foundation for future work potentially including **IEEE standards development**.

Collaborate with EPRI to align project objectives and deliverables.

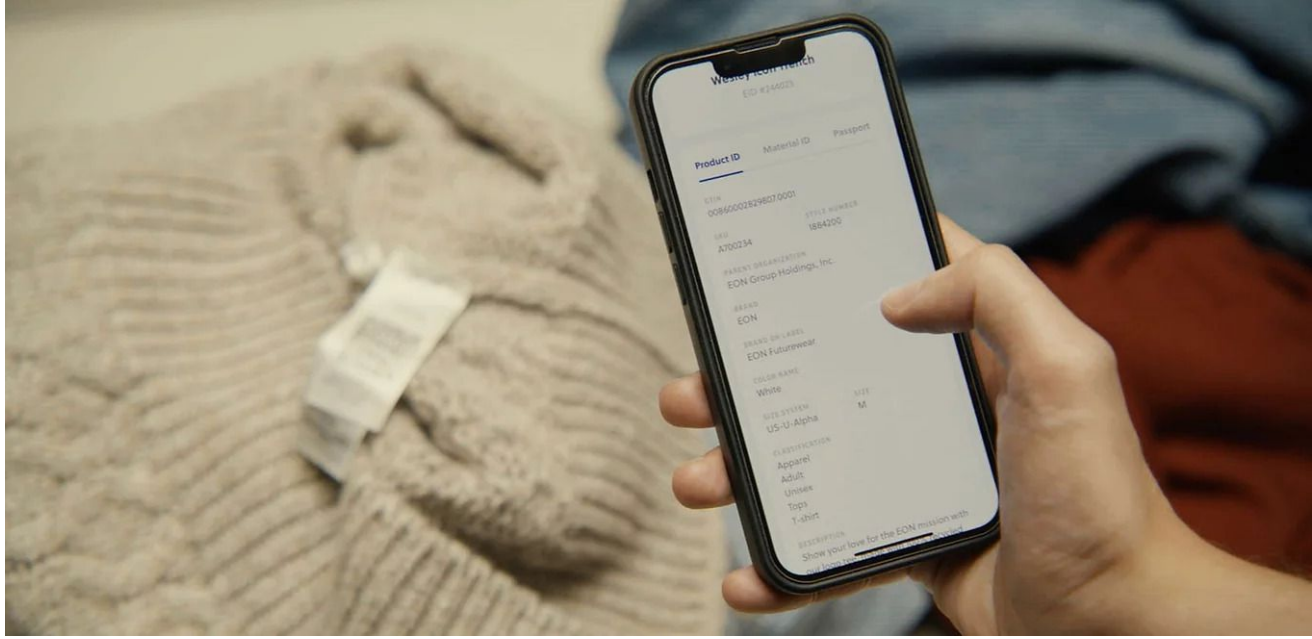
Examples from Other Industries

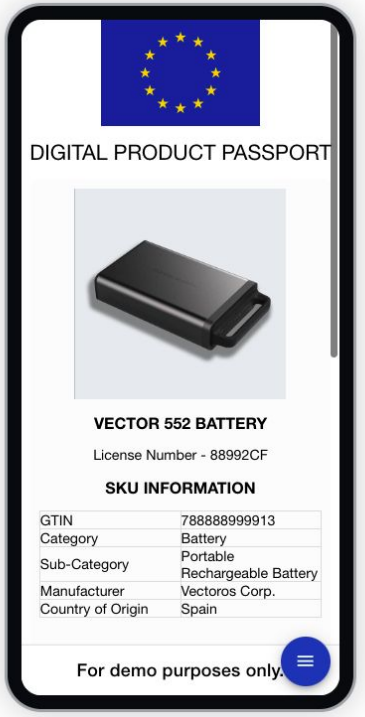
Mezcal makers in Mexico created an industry standard QR code to prove authenticity and traceability of their product.

They also use the QR code to provide end consumers with enhanced product data.



Digital Product Passports in Europe are starting to provide data on carbon footprint and recycling data for clothing, construction, and batteries





Natural Gas Utilities

- ASTM F2897 provides a traceability code for asset type, manufacturer, date, size, material, and lot code

- Use cases include:
  - Regulatory compliance
  - Digital as-builting
  - Material verification
  - Automated project close-out
  - Automated GIS updating

- Full industry adoption in five years

Work Groups

- **Executive Steering Committee** - The executive steering committee will provide **strategic guidance** including defining high value use cases and the associated value proposition for SCATE. Members will also be requested to nominate participants from their companies to participate in work groups. This committee will meet quarterly via web meeting.

- **Core Working Group** - The core working group will be responsible for **defining the detailed use cases** for SCATE. This working group will also identify the assets and attributes to be included in the selected use cases. The core working group will meet monthly via web meeting.

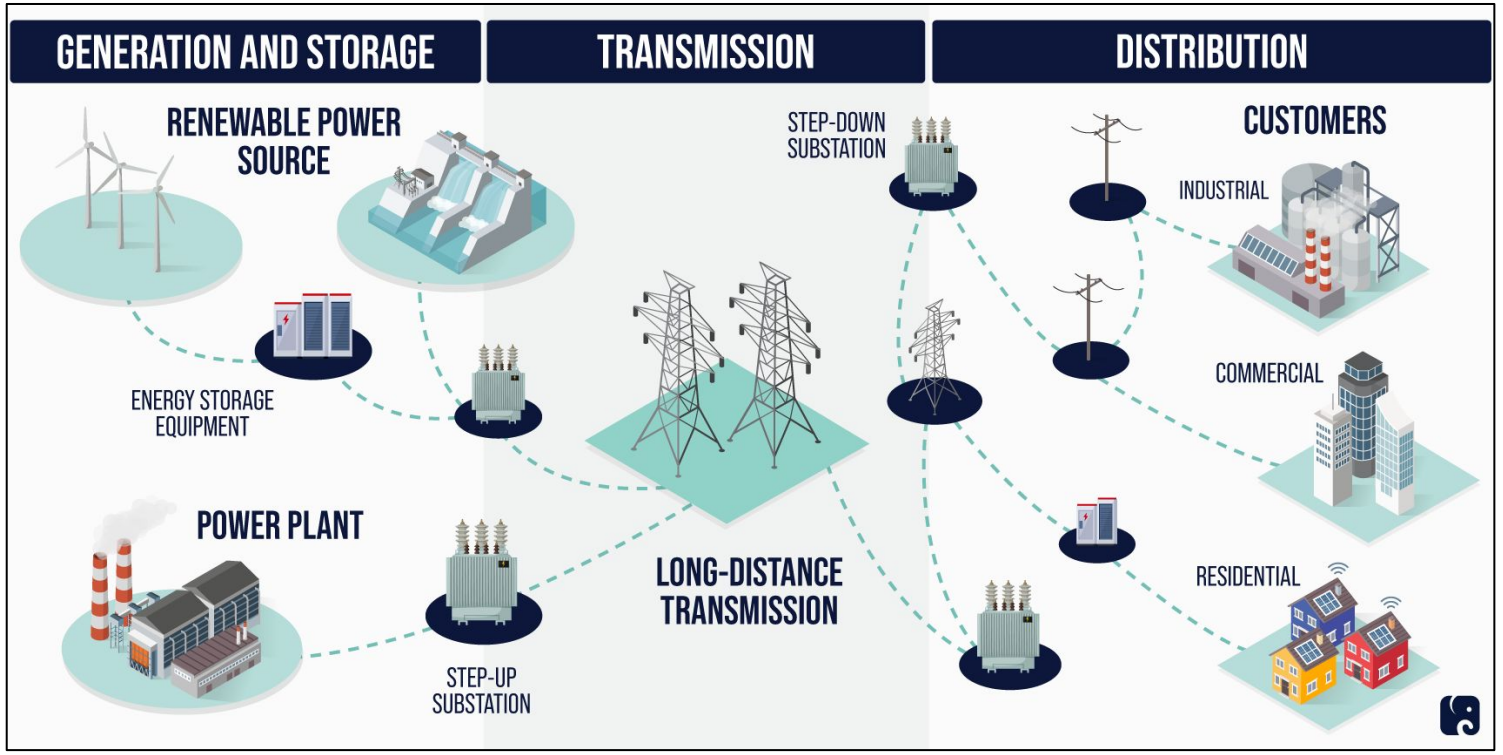
- **Use Case Working Groups** - For complex use cases that require domain specific knowledge, special working groups will be created to **define the assets and attributes** to be included. These work groups will meet more frequently for a shorter period of time to accomplish specific goals.

Use Cases

- Supply Chain
- Chain of Custody
- Engineering
- Emergency Response
- Construction
- As-Builting
- Digital Twin, GIS, and ADMS
- Asset Management
- Cyber Security
- Environmental and End-of-Life

Asset Types

- Meters
- Distribution
- Transmission
- Substations
- Generation
  - Fossil
  - Renewables
- Batteries
- EV Infrastructure
- Behind the Meter



Source Link

Data Model and Attributes

- Define the critical attributes required to meet the use case goals
  - Supply chain history (country of origin, manufacturer, production date)
  - Engineering properties (rating, polarity, connection type)
  - Asset management data (batch and serial number)
  - Embedded software, firmware, and sensors (SBOM)

- Leverage existing standards from IEEE and EPRI’s CIM
- Build on GS1 platform

Proof-of-Concept Projects

- Splice kit with Richards Manufacturing
- Terminations with 3M Electrical Markets Division
- Others?

In summary . . . .

Smart Tags provide a link between the digital and physical worlds

A Digital Thread is a comprehensive dataset of an asset's attributes, datasets, and events throughout its life that digitally transfers from one phase to the next from design to decommissioning

New technology allows manufacturers to use Smart Tags to provide access to the product's Digital Thread

Next Steps

- Formalize work group participants
- Send invitation for IEEE work space
- Schedule recurring meetings
  - Second Thursday of the month at 11 AM EST?
- Send comment sheet for use cases and asset types
- Identify and coordinate with other related activities

Thanks!

EPRI - IEEE SCATE Work Group

March Meeting

Agenda

- Underground Cable POC
- Transformers POC
- SCATE Primer Document
- EOY Goals
- Work Groups
- Smart Tag Technologies

Underground Cable POC

Universal CatID:	01A02121325739												
Unique Asset ID:	01A02121325739.01.0084B5679												
												Universal Catalog Attributes	
Asset Type		**Conductor Size**		**Voltage Rating**		**Conductor Material**		**Conductor Construction**		**Cable Configuration**		**Installation Type**	
2		1		2		1		1		1		1	
Underground Cable	01	14 AWG - 1.63 mm	1	600 V	01	Aluminum	1	Solid	1	Concentric Nuetral	1	Direct Bury	
Overhead Wire	02	12 AWG - 2.05 mm	2	1000 V	02	Copper	2	Stranded	2	Duplex	2	Conduit	
Pad Mounted Transformer	03	10 AWG - 2.59 mm	3	1.2 KV	03	Steel	3	Concentric	3	Triplex	3	Direct Bury or Conduit	
Pole Mounted Transformer	04	8 AWG - 8.4 mm	4	2 kV	04	Other	4	Compact	4	Quadraplex	4	Other	
Vault Transformer	05	6 AWG - 13.3 mm	5	2.4 kV	05			Compressed	5	Other	5		
Substation Transformer	06	4 AWG - 21.2 mm	6	2.5 kV	06			Sector	6				
Splice	07	3 AWG - 7.35 mm	7	3.5 kV	07			Segmented	7				
Termination	08	2 AWG - 33.6 mm	8	4.16 kV	08			Other	8				
Recloser	09	1 AWG - 42.4 mm	9	5 kV	09								
Circuit Breaker	10	1/0 AWG - 53.5 mm	A	6 kV	10								

- Defined Universal Catalog ID attributes
- Defined Unique ID attributes
- Defined Additional Attributes
- Defined Linked Datasets
- Created a data model with domain values for each attribute
- Created an alpha-numeric encoding algorithm

- Outstanding issues:
  - Units of measure - separate field?
  - Link to CIM - not all attributes in CIM
  - Duplex, triplex, and quadplex - how to track and label
  - GS1 structure
  - Smart tag type

Transformer POC

- Starting with distribution pad and pole mounted
- In-progress defining attributes
- Reviewing product brochures, CIM, and utility GIS schemas

SCATE Primer Document

- Document that describes the standards and technology required to enable supply chain and asset traceability for electric grid operators
- The standards = data models for Universal Catalog IDs, Unique Asset IDs, Additional Attributes, and Linked Datasets
- The technology = smart tag types (barcodes, QR codes, RFID, NFC) applied by manufacturers

EOY Goals

- Data model and smart tag recommendations for:
  - Cable
  - Wire
  - Splice
  - Terminations
  - Transformers
  - Voltage Regulators
  - Reclosers
  - Circuit Breakers
  - Fault Interrupters

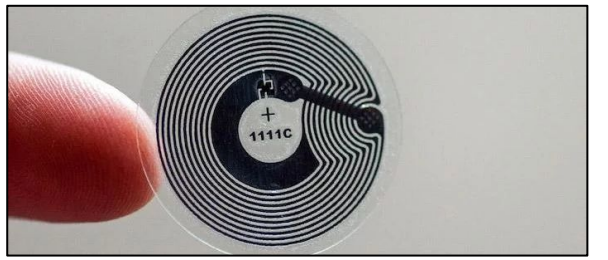
Action Plan

- Form working groups for each asset type
  - 4-5 utilities
  - 2-3 manufacturers
- Form data model work group
- Develop draft data models
  - Attribute selection
  - Supply data to build domain values (GIS/ERP data model extract)
- Submit draft to entire working group for review and comment
- Publish final data model

Smart Tag Types

- Working Group to recommend smart tag type for each asset and use case
  - Manufacturers, smart tag vendors, and utilities

- Requires field testing



Thanks!

Next Meeting


That's all Folks!