

# **Subsurface Transformers and Network Protectors Subcommittee**

## **Task force / Working Group Report**

Document #:	PC57.12.53		
Document Title:	C57.12.53 Guide on Mitigating Corrosion on Subsurface Transformers and Network Protectors		
Chair:	Will Elliott	Vice-Chair	Micheal Zarnowski
Secretary	Audrey Siebert-Timmer	Percent Complete	90%
Acting Secretary	Tiffany Lucas		
Current Draft Being Worked On:	Draft 4	Dated:	September 2024
Meeting Date:	October 29, 2024	Time:	4:45 PM CST
Attendance:	Members	19	
	Guests	24	
	Total*	43	

### **Attending Members:**

Nabi Almeida, Prolec GE  
Dave Blew, Consultant  
Thomas Dauzat, AEP - SWEPCO  
Will Elliott, AEP - SWEPCO  
John Harley, First Power Group LLC  
Brian Klaponski, Carte International Inc.  
Tiffany Lucas, Prolec GE  
Tyler Morgan, Duke Energy  
Daniel Mulkey, Mulkey Engineering Inc.  
Vinay Patel, Consolidated Edison Co. of NY

George Payerle, Carte International Inc.  
Pedro Salgado, Electronic Technology Inc.  
Dan Schwartz, Quality Switch, Inc.  
Adam Sewell, Quality Switch, Inc.  
Jeremy Sewell, Quality Switch, Inc.  
Igor Simonov, Toronto Hydro  
James Spaulding, City of Fort Collins  
Reinaldo Valentin, Duke Energy  
Michael Zarnowski, Carte International Inc.

### **Attending Guests:**

Samuel Brodeur, Hitachi Energy  
Stuart Chambers, EPRI  
John Crotty, Ameren  
Jeffrey Door, The H-J Family of Companies  
Gilberto Garza, Prolec GE  
Luke Grandbois, IFD Corporation  
Didier Hamoir, Transformer Protector Corp  
Javier Hernandez, Orto de Mexico  
Ramadan Issack, American Electric Power  
Rebecca Kim, Cheryong Electric  
Kang Jin Lee, Cheryong Electric  
Alejandro Macias, Centerpoint Energy

Nicholas Manske, Oncor Electric Delivery  
Justin Minikel, Eaton  
Ali Naderian, EnerPars  
Ismael Naja, Eaton  
Joel Pacas, IFD Corporation  
Nicholas Post, WEC Energy Group  
Joseph Shumack, Ameren  
Timothy Tillery, Howard Industries  
Fernando Tirado, Prolec GE  
Jeremy VanHorn, IFD Corporation  
Juan Velasquez, Magnetron SAS  
Shelby Walters, Howard Industries

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### Meeting Minutes:

1. Will Elliott called the meeting to order at 4:45 PM CST.
2. Opening remarks and introductions were made.
  - i. AMS system has been discontinued. Attendance was taken electronically using a QR code. Paper rosters were circulated to supplement electronic attendance records.
3. Will Elliott reviewed IEEE SA Copyright Policy, Essential Patent Claims, and Code of Ethics & Conduct. No issues were raised.
4. Membership changes were noted:
  - i. Added: **Javier Arteaga, Jeffrey Brooks, Vinay Patel, Igor Simonov, and Reinaldo Valentin**
  - ii. Changed to Guest: **None**
5. Quorum was verified. The working group consisted of **29** members, requiring **15** for quorum. **16** members were counted at the start of the meeting. Attendance records later confirmed **19** members attended.
6. Will Elliott requested approval of the Spring 2024 Minutes. **Nabi Almeida made a motion to approve the Spring 2024 Minutes. Second by Dan Schwartz. Motion was unanimously approved.**
7. Will Elliott requested approval of the Fall 2024 Agenda. **Dave Blew made a motion to approve the Fall 2024 Agenda. Second by Tom Dauzat. Motion was unanimously approved.**
8. Old Business:
  - i. Will Elliott presented the taskforce's recommended improvements to the draft document.
    - a. Taskforce members included: Tiffany Lucas (chair), Nabi Almeida, Will Elliott, Audrey Siebert-Timmer, Glenn Stark, John Vartanian, and Michael Zarnowski.
    - b. The proposed changes to the draft were reviewed until comments were raised.
    - c. **Dan Mulkey made a motion to remove the word "typically" from the definition for low-alloy steel. Second by Tom Dauzat. Motion was unanimously approved. The definition was revised:**
      1. Low-alloy Steel: A specially designed metal alloy with iron as the principal alloying element with total other alloying elements  $\leq 5\%$  mass percent.
    - d. **Dan Mulkey made a motion to remove the parenthesis from the definition for stagnant. Second by Tom Dauzat. Motion was unanimously approved. The definition was revised:**
      1. Stagnant: Is a descriptor of the velocity of a flowing liquid. Stagnant means there is little to no flow.
    - e. Will Elliott noted that C57.12.80 has some definitions that use common words, but it does not define the same words in this guide. He also noted that this guide has a statement referencing C57.12.80 and ASTM G193 for definitions. This definitions in the draft defines the language particular to this guide.
    - f. Dan Mulkey suggested giving the order of priority as first ASTM G193, then IEEE C57.12.80 and then the standards definitions online if necessary. Will Elliott edited section 3.1 definitions line 12 based on "then if necessary" as suggested by Dan Mulkey for the group to review the suggestion. **Tom Dauzat made a motion to accept the**

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**change to section 3.1. Second by Igor Simonov. Motion was unanimously approved.**

- g. The taskforce recommended an updated Venn diagram for vault submersion (Figure 1). The discussions resulted in multiple motions:
  - 1. **Tom Dauzat made a motion to remove “typically” from the Cyclic area of the Venn diagram. Second by Dan Mulkey. Motion was unanimously approved.**
  - 2. James Spaulding suggested finding a way to align the Venn diagram to Table 3 – Time of Wetness for Corrosion, because the detail in the table should correspond to the Venn diagram. Dan Mulkey suggested the regions should be labelled: Dry Vault with “none to little corrosion”, Cyclic with “some corrosion”, and Immersion with “aggressive corrosion”. **James Spaulding made a motion to revise the Venn Diagram to add the corrosion descriptions. Second by Tom Dauzat. Motion was approved unanimously.**
- h. **Nabi Almeida made a motion to make “environment” plural (change to “environments”) in section 5.6.3. Second by Tom Dauzat. Motion was approved unanimously.**
- i. **Dan Mulkey made a motion to replace “microbiologically influenced corrosion” with the abbreviation MIC in the last sentence in section 5.6.3. Second by Tom Dauzat. Motion was approved unanimously.**
- j. **Dan Mulkey made a motion to replace “continuous submersion” with “immersion service” in the whole document and strike the plural “coatings” (revise to “coating”) at the end of section 6.2.1. Second by Tom Dauzat. Motion was approved unanimously.**
- k. **Nabi Almeida made a motion to approve all changes proposed by the taskforce to the document up to section 6.2.1, which were not already modified and approved by the working group. Second by Igor Simonov. Motion was approved unanimously.**
- l. Will Elliott stated that he will update the draft to reflect all changes in the meeting and send out the latest version to the working group for review. He stated that the working group will review the remainder of the document in the Spring 2025 meeting.

### 9. New Business:

- i. No new business was discussed.

10. The meeting was adjourned at 5:59 PM CST.

11. Next meeting: March 25, 2025 in Denver, Colorado, USA.

- i. The following attendees requested membership and will be added to membership for the Spring 2025 meeting:
  - a. Jeffrey Door, The H-J Family of Companies
  - b. Ramadan Issack, American Electric Power
  - c. Alejandro Macias, Centerpoint Energy
- ii. The following members will have their membership revised to guest for the Spring 2025 meeting, due to not meeting attendance requirements:
  - a. Herton De Oliveira Filo, PSE&G
  - b. Liz Sullivan, Dominion Energy

Submitted by: Will Elliott

Date: 11/9/2024