

## **TF Classification and Performance of Dry Type Bushings**

### **Virtual**

**Monday, November 15, 2021**

The Task Force group met virtually on Monday November 15, 2021, at 3:45 PM Central Time session 2.

#### **1. Welcome**

#### **2. Welcoming and Call for Patents**

- The meeting was called to order at 3:45 PM by the TF Chair Art Del Rio.
- The TF Chair, Art Del Rio, did a call for potentially essential patents and copyrights issues. None were reported.

#### **3. Verification of Quorum**

- The TF Chair called for a quorum poll were 10 out of 20 members were present.
- In attendance was 12 guests with 4 requesting membership.
- There was a total of 32 participants out of which 10 were members. Attendance list and status is attached in these minutes.

#### **4. Approval of Agenda**

- There were no objections to approving the agenda.

#### **5. Approval of the minutes of the April 26, 2021 meeting**

- There were no objections to approving the previous minutes.

#### **6. Dry-Type Definitions in existing bushing standards.**

Volunteers reviewed existing C57.19.00 and the guide C57.19.100 and provided feedback on what is considered missing definitions or definitions specific to dry type bushings that should be revised on these documents noting that Poorvi Patel and Eric Euvrard not attending this meeting.

- It is noted that a definition of ‘dry-type bushing’ should be added to the C57.19.00 currently under revision.
- It is noted that a definition of RIS, resin impregnated synthetic, is also missing from the existing C57.19.00 however the WG have already a recommendation for such definition.
- Sebastian Riopel provided the comments, including:
  - Need a definition for RIS (already being discussed in the C57.19.00 WG)
  - Propose to the C57.19.00 WG to add a new definition to C57.19.00: “Dry Type Bushing: A bushing for which the internal insulation does not contain oil

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or other dielectric liquids and consists of any of the following types of bushings: solid cast insulation (3.10), composite (3.11), resin-bonded paper (3.34), resin-impregnated paper (3.35) or resin-impregnated synthetic (new).” This definition would be complementary to definition 3.27 “Oil Filled Bushing”, while also not excluding the use of a porcelain or similar external insulating envelope.

- On the bushing application guide, the existing document is based on OIP bushing insulation and 105C thermal class. The reference to resin impregnated insulation states that the bushing manufacturer should be contacted.

### **7. Scope of TF. Discussion based on draft scope/purpose.**

- Draft TF Scope: Review existing IEEE power transformer and reactor bushing standards, guides, and practices (based on C57.19 series) and determine the industry need for a new standard, guide or technical report for dry-type technologies used in liquid-filled transformer bushings. Such document should determine the classification and performance requirements for dry type transformer bushings and allow the transformer OEMs and end-users to select a dry-type bushing technology. The task force will report their findings to the Bushings Subcommittee with a recommendation on next steps.

Discussion took place around lacking information specific to dry type bushings and what the TF should recommend. As part of the agenda, there were 3 consecutive motions followed by discussions as to decide on further actions and recommendation to the Bushings SC by this TF. Full details are included in the below minutes.

Sebastien Riopel made a motion to create a new document or revise the two existing documents. The motion was not seconded and discussion led to Sebastien withdrawing the motion, in support of the following motions instead.

Mario Locarno made the following motion 1.

Eric Weatherbee made an amendment to make the motion a YES/NO.

Sebastien Riopel seconded the motion 1.

- Motion 1: Move to create a new standard or application guide specific for dry-type bushings.
- Discussion
  - What is the benefit of making this a YES/NO vote. To make a final decision on the need for new documents.
  - Call for vote
- Voting Results - Favor: 2; Against: 7; Abstain: 1. Motion not carried.

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Mario Locarno made the following motion 2.

Sebastien Riopel seconded the motion 2.

- Motion 2: Move to recommend expediting the needed changes to the existing standard and guide (C57.19.00 and C57.19.100) under revision to include dry-type bushing related material.
- Discussion
  - Call for vote
- Voting Results - Favor: 5; Against: 2; Abstain: 3. Motion carried.

Mario Locarno made the following motion 3.

Kurt Kaineder seconded the motion 3.

Mario Locarno amended his motion to include a presentation, as stated below.

- Motion 3: Move to publish a technical paper or white paper on dry-type bushing aspects and complemented with a technical presentation or tutorial at PES or TC level.
- Discussion
  - What is the purpose of the paper and the presentation? To have an informational paper surrounding the repeated questions surrounding the topic.
  - Specific concerns are noted surrounding different technologies and the potential commercial influence.
  - Call for vote
- Voting Results - Favor: 4; Against: 5; Abstain: 0. 1 no response. Motion not carried.

From these motions, the purpose of this TF will shift based on the outcome of motion 2 which may become redundant or duplicate to the work done at WG level on the revision of those documents. If this is the case, the work of this TF should be considered complete and a new TF under the respective WG be set up with the updated scope.

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### **9. Adjournment**

- The Webex meeting was adjourned at 5:10 PM Central Time.

The next meeting:

Spring 2022 – Denver, Colorado USA, March 27 – 31, 2022

Respectfully submitted,

Chair: Art Del Rio (a.delrio@ieee.org)

Secretary: Chris Whitten (christopher.l.whitten@hitachi-powergrids.com)

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### **TF Requirements for Dry Type Bushings – Summary of Chat activity during the Webex meeting**

November 15, 2021 3:45 PM from Fabian "Durand" Stacy to everyone: Fabian "Durand" Stacy-Hitachi Energy

November 15, 2021 3:46 PM from Mario Locarno to everyone: Mario Locarno Doble Engineering

November 15, 2021 3:48 PM from Hugo Flores to everyone: Hugo Flores - Hitachi Energy

November 15, 2021 3:48 PM from William J. Solano to everyone: William J. Solano - ITEC -

November 15, 2021 3:49 PM from Kurt Kaineder to everyone: Kurt Kaineder Siemens Energy

November 15, 2021 3:50 PM from Fabian "Durand" Stacy to everyone: Fabian "Durand" Stacy-Hitachi Energy I would like to request membership.

November 15, 2021 3:50 PM from Kendrick Hamilton to everyone: Kendrick Hamilton - Power Partners (Athens, GA)

November 15, 2021 3:50 PM from Juan Carlos Cruz Valdes to everyone: Juan Carlos Cruz Valdes, PROLEC GE, requesting membership

November 15, 2021 3:50 PM from Hugo Flores to everyone: I would also like to request membership

November 15, 2021 3:51 PM from Huan Dinh to everyone: Huan Dinh, Hitachi Energy, requesting membership

November 15, 2021 3:51 PM from Shibao Zhang to everyone: anybody see screen?

November 15, 2021 3:51 PM from Stephen Shull to everyone: Stephen Shull, BBC Electrical Services Inc.

November 15, 2021 3:51 PM from Juan Carlos Cruz Valdes to everyone: There is nothing on screen

November 15, 2021 3:56 PM from Javier Arteaga to everyone: Javier Arteaga - Hitachi Energy

November 15, 2021 4:25 PM from Shibao Zhang to everyone: waht's the purpose of this task force? are we going to make standard or we are part of C57.19.00?

November 15, 2021 4:50 PM from Steve Brzoznowski to everyone: Steve Brzoznowski, BPA, guest

November 15, 2021 4:53 PM from Shibao Zhang to everyone: Can you write down

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Attendance and membership status

<b>Role</b>	<b>First Name</b>	<b>Last Name</b>	<b>Company</b>
Guest	Edmundo	Arevalo	Bonneville Power Administration
Guest	Javier	Arteaga	Hitachi ABB Power Grids
Guest	Steven	Brzoznowski	Bonneville Power Administration
Guest	Juan Carlos	Cruz Valdes	Prolec GE
Chair	J. Arturo	Del Rio	Siemens Energy
Guest	Brandon	Dent	Memphis Light, Gas & Water
Member	Scott	Digby	Duke Energy
Guest	Huan	Dinh	Hitachi ABB Power Grids
Guest	Feras	Fattal	Manitoba Hydro
Guest	Hugo	Flores	Hitachi ABB Power Grids
Guest	Jose	Gamboa	H-J Family of Companies
Guest	Daniel	Huenger	PCORE Electric
Member	Kurt	Kaineder	Siemens Energy
Guest	Marek	Kornowski	Polycast International
Member	Mario	Locarno	Doble Engineering Co.
Guest	Richard	Marek	-
Member	Robert	Middleton	RHM International
Guest	Juan	Ramirez	CELECO
Member	Sebastien	Riopel	Electro Composites ULC
Guest	Eric	Schleismann	Southern Company Services
Guest	Stephen	Shull	BBC Electrical Services, Inc.
Member	William	Solano	Instrument Transformer Equip Corp
Guest	Fabian	Stacy	Hitachi ABB Power Grids
Guest	Hampton	Steele	TVA
Guest	Dervis	Tekin	Meramec Instrument Transformer Co.
Guest	Jacques	Vanier	Electro Composites (2008) ULC
Guest	Yves	Vermette	Electro Composites ULC
Guest	Krishnamurthy	Vijayan	PTI Transformers
Guest	Loren	Wagenaar	WagenTrans Consulting
Member	Eric	Weatherbee	PCORE Electric
Secretary	Christopher	Whitten	Hitachi ABB Power Grids
Member	Shibao	Zhang	PCORE Electric