

Distribution Transformer Subcommittee

Task force / Working Group Report

Document #: PC57.19.02

Document Title: Standard for Design and Performance Requirements for Bushings Applied to Liquid Immersed Distribution Transformers

Chair: Steve Shull Vice-Chair: Ed Smith
 Secretary: Rhett Chrysler Percent Complete: 60

Current Draft Being Worked On: D1.7 Dated: March 2020

Meeting Date: April 27, 2021 Time: 10:50 am – 12:05 pm

Attendance:

NAME	Affiliation	M or G
Adrian Silgardo	IFD Corporation	G
Alan Traut	Howard Industries	M
Alan Wilks	Consultant	M
Albert Sanchez	Knoxville Utilities Board	G
Ali Ghafourian	H-J Enterprises, Inc.	M
Andrew Larison	Hitachi ABB Power Grids	G
Angela Amador	EATON Corporation	G
Barry Beaster	The H-J Family of Companies	M
Carlos Gaytan	Prolec GE	M
Chris Pitts	Howard Industries	G
Christopher Whitten	Hitachi ABB Power Grids	G
Clemens Reiss IV	Custom Materials, Inc.	M
Darren Brown	Howard Industries	M
David Geibel	Hitachi ABB Power Grids	M
David Stockton	Stockton Consulting	M
Diego Rincon	Electroporcelana Gamma	G
Duy Vo	Central Maine Power (AVANGRID)	G
Edward Smith	H-J Family of Companies	VCHR
Eric Weatherbee	PCORE Electric	M

Name	Affiliation	M or G
Fabian Stacy	Hitachi ABB Power Grids	M
Gary King	Howard Industries	G
George Partyka	PTI Transformers	G
Giovanni Hernandez	Virginia Transformers Corporation	G
Hamid Sharifnia	Consultant	G
Huan Dinh	Hitachi ABB Power Grids	M
Jacques Vanier	Electro Composites (2008) ULC	G
Javier Arteaga	Hitachi ABB Power Grids	M
Jeffrey Door	H-J Family of Companies	G
Jerry Murphy	Reedy Creek Energy Services	M
Jose Gamboa	H-J Family of Companies	M
Joshua Verdell	ERMCO	M
Joshua Yun	Virginia Transformer Corporation	M
Juan Ramirez	CELECO	M
Kendrick Hamilton	Power Partners, Inc.	G
Kunal Shukla	PECO Energy Company	G
Lee Matthews	Howard Industries	G
Lee Tyler	Warco, Inc.	M
Marek Kornowski	Polycast International	M

Name	Affiliation	M or G
Martin Rave	ComEd	M
Michael Dahike	Central Moloney, Inc.	M
Michael Morgan	Duke Energy	M
Mubarak Abbas	Siemens Industry	G
Orlando Giraldo	H-J Family of Companies	G
Parminder Panesar	Virginia Transformer Corp.	G
Paul Gabriel Florida	Howard Industries, Inc.	G
Poorvi Patel	Electric Power Research Institute (EPRI)	M
Pragnesh Vyas	Sunbelt-Solomon Solutions	M
Ramadan Issack	American Electric Power	M
Rhett Chrysler	ERMCO	SEC
Robert Reepe	Georgia Power Co.	G
Ryan Hogg	Bureau of Reclamation	G
Said Hachichi	Hydro-Quebec	M
Shelby Walters	Howard Industries	M
Stefan Schindler	Maschinenfabrik Reinhausen	G
Stephen Shull	BBC Electrical Services, Inc.	CHR
Timothy Tillery	Howard Industries	M
Weijun Li	Braintree Electric Light Dept.	M
Yves Vermette	Electro Composites ULC	M

Meeting Minutes:

The chair called the meeting to order at 10:50 am. A quorum was established via WebEx poll with 32/59 (54%) members participating.

Chair presented the agenda. A motion was made to approve by Jerry Murphy, second by David Geibel with unanimous approval.

A motion was made to approve the Fall 2020 minutes (Virtual) by Marty Rave, second by Jerry Murphy with unanimous approval.

The Chair presented the IEEE SA slides for Essential Patent Claims. The Chair asked for any patents that need to be called to the attention of the working group. None were stated. The chair showed the copyright policy for the group and explained its requirements.

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Old Business

Taskforce report – Table 4 – Lee Tyler

- Table 4 draft includes minimum creep distances for light and heavy contamination distribution bushings for nominal system voltages 1.2 kV through 34.5 kV
- Draft included creep distance comparisons between various IEEE standards including C37.100.1, C57.12.20, C57.19.01, and C57.15
- 18 kV class bushings were removed due to inconsistent findings
- Minimum creep values were proposed using 28 mm/kV for light duty and 44 mm/kV for heavy duty applications
- There was a good discussion which included topics such as potential impact on bushing manufacturers, overall transformer height, and basis for various standard recommendations. It was also noted that IEEE requirements differ from IEC requirements where IEEE states an absolute minimum creep distance where IEC states a nominal minimum creep distance.
- A proposal was made to copy the Proposed Maximum Line to Ground Bushing Rating and Nominal System Voltage columns to the minimum creep light and heavy duty requirements respectively. These values would represent the creep inch requirements. These values are also consistent with C57.19.01 creep requirements and methodology.
- A motion was made by David Geibel, second by Lee Tyler to accept these minimum creep values:

Nominal System Voltage	BIL	MINIMUM CREEP DISTANCE	
		Light Contamination mm (in)	Heavy Contamination mm (in)
(kV)	(kV)		
1.2	30	(24) 1	(30) 1.2
2.5	45	(50) 2	(64) 2.5
5.0	60	(100) 4	(127) 5
8.7	75	(165) 6.5	(220) 8.7
15	95	(254) 10	(381) 15
15	110	(254) 10	(381) 15
25	125	(405) 16	(635) 25
25	150	(405) 16	(635) 25
34.5	150	(560) 22	(880) 35
34.5	200	(560) 22	(880) 35

- The motion passed with 27 for, 2 against, and 3 abstained.
- Chair advised that the draft document will be updated with Table 4 including this data. This would be posted on the webpage for final review. It was requested that everyone review this before the next meeting and be prepared to discuss it at the next meeting.

New business

No new business was brought forward.

Meeting was adjourned at 11:56 am.

Next meeting is scheduled for the Fall 2021 Transformer Committee meeting.

Submitted by: Rhett Chrysler

Date: 4/27/2021