Power & Energy Society®

Transformers Committee

Fall 2013 Meeting – St. Louis, MO

October 19-24, 2013

Renaissance St. Louis Grand Hotel

Chair: Bill Chiu	Vice Chair: Donald Platts	Secretary: Stephen Antosz
Treasurer: Gregory Anderson	Standards Coordinator: William Bartley	Past Chair: J. Edward Smith

IEEE/PES Transformers Committee

Fall 2013 Meeting Minutes

St. Louis, MO October 19-24, 2013

Unapproved

(These minutes are on the agenda to be approved at the next meeting in Spring 2014)

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1.0 ATTENDANCE -- Summary totals at the end.

	Part 1	Part 2	Last Name	First Name	Company Name	Membership Type
1			Abebe	Benjamin	HICO America	Interested Individual
2	X		Acero	Gustavo	WEG Electric Corp.	Interested Individual
3		X	Ahuja	Raj	SPX Transformer Solutions.	Committee Member
4	X	X	Albers	Timothy	ABB Inc.	Interested Individual
5			Allaway	Dave	NV Energy	Interested Individual
6			Allen	Abbey	Consultant	Interested Individual
7			Allen	Jerry	Metglas Inc.	Active Participant
8	X		Almkvist	Marten	ABB Components	Interested Individual
9	X	X	Amos	Richard	Unifin International	Committee Member
10	X	X	Anderson	Gregory	GW Anderson & Associates	Committee Member
11	X	X	Ansari	Tauhid	ABB Inc.	Active Participant
12	X		Antal	Jeffrey	Cooper Power Systems by Eaton	Interested Individual
13	X	X	Antosz	Stephen	Stephen Antosz & Associates	Committee Member
14	X		Antweiler	James	Schneider Electric/Square D	Active Participant
15	X		Armstrong	James	Siemens Energy	Active Participant
16			Asano	Roberto	ABB	Committee Member
17			Atef	Kahveh	San Diego Gas & Electric	Active Participant
18	X		Averitt	Ralph	Reinhausen Mfg.	Interested Individual
19	X		Ayers	Donald	Ayers Transformer Consulting	Committee Member
20			Bailey	Anne	A-Line E.D.S.	Interested Individual
21	X		Baker	Steve	Serveron	Interested Individual
22	X		Ballard	Robert	ABB Inc.	Committee Member
23	X		Balma	Peter	Peter M Balma Engr Consulting	Committee Member
24			Baranowski	Derek	Baron USA, Inc.	Active Participant
25	X	X	Barnes	Michael	Retired	Interested Individual
26			Bartek	Allan	C-K Composites	Active Participant
27	X	X	Bartley	William	Hartford Steam Boiler	Committee Member
28	X	X	Basel	Dana	ABB Inc.	Interested Individual
29	X	X	Baumgartner	Christopher	We Energies	Interested Individual
30	X	X	Beaster	Barry	H-J Enterprises, Inc.	Committee Member
31	X	X	Beauchemin	Claude	TJH2b Analytical Services	Committee Member
32			Beck	Scott	LakeView Metals, Inc.	Interested Individual
33	X		Behrens	Tammy	SPX Transformer Solutions, Inc.	Interested Individual
34	X		Bercea	Emil	ABB AG	Interested Individual
35			Berler	Zalya	ZTZ Services International, Inc	Active Participant
36	X		Bernesjo	Mats	ABB Inc.	Interested Individual
37			Bertolini	Edward	Richards Manufacturing Co.	Active Participant-IEEE

					Life
38	X	Berube	Jean-Noel	Neoptix Inc.	Interested Individual
39	X	Betancourt	Enrique	Prolec GE	Committee Member
40	X	Bhatia	Neeraj	Bechtel Corp	Interested Individual
41		Bhatia	Paramjit	Moloney Electric Inc.	Interested Individual
42	X X	Bielat	Mark	Public Works Commission Fayetteville, NC	Interested Individual
43	X	Bin	Jackie	Ritz Instrument Transformers	Interested Individual
44	X X	Binder	Wallace	WBBinder Consultant	Committee Member-IEEE Life
45	X	Bischoff	Brannon	N.W. Electric Power Cooperative	Interested Individual
46	X	Blackmon, Jr.	James	Georgia Power Co.	Active Participant
47		Blake	Dennis	Pennsylvania Transformer	Interested Individual
48	X	Blankenbeckler	Nicole	DuPont	Interested Individual
49	X	Boege	Alan	Orto de Mexico	Interested Individual
50	X X	Boettger	William	Boettger Transformer Consulting	Committee Member
51	X	Bolliger	Alain	HV Technologies	Active Participant
52	X	Boman	Paul	Hartford Steam Boiler	Committee Member
53	X	Botti	Michael	Mitsubishi Electric Power Products	Interested Individual
54	X X	Breckenridge	Thomas	TB TCS Ltd	Interested Individual
55	X X	Brender	David	Copper Development Assoc	Committee Member
56	X	Brien	Matthew	SPX Transformer Solutions, Inc.	Interested Individual
57	X	Brinkman	Steve	Cindus Corp.	Interested Individual
58	X X	Britton	Jeffrey	Phenix Technologies, Inc.	Active Participant
59	X X	Brocke	Lars	Haefely Test AG	Interested Individual
60	X	Bromley	Adam	Fort Collins Utilities	Active Participant
61	X X	Brown	Darren	Howard Industries	Interested Individual
62		Brusetti	Robert	Doble Engineering Co.	Interested Individual
63	X	Brush	Edwin	BBF & Associates	Committee Member
64	X	Brzoznowski	Steven	Bonneville Power Administration	Interested Individual
65	X	Buckmaster	David	Transformer Forensics, LLC	Committee Member
66	X X	Bush	Carl	Pemco Corporation	Committee Member
67		Cai	Jim	JSHP Transformer	Active Participant
68	X X	Caldeira	Julio	M&I Materials Ltd	Interested Individual
69	X X	Callsen	Thomas	Weldy-Lamont Associates	Committee Member
70		Caskey	John	NEMA	Active Participant
71	X X	Castellanos	Juan	Prolec GE	Committee Member
72		Castillo	Alonso	EFACEC	Interested Individual
73	X	Cheatham	Jonathan	General Electric	Active Participant
74	X	Cheng	Cheng	Moloney Electric Inc	Interested Individual
75	X X	Cherry	Donald	ABB Inc.	Committee Member

76	X	Chhajer	Dinesh	Megger	Interested Individual
77	X	Chiang	Solomon	The Gund Company	Interested Individual
78		Chiodo	Vincent	HICO America	Interested Individual
79	X	Chisholm	John	IFD Corporation	Active Participant
80	X X	Chiu	Bill	Southern California Edison	Committee Member
81		Cho	Eun	HICO America	Interested Individual
82	X	Christodoulou	Larry	Electric Power Systems	Interested Individual
83	X	Chrysler	Rhett	ERMCO	Interested Individual
84		Chu	Donald	Consolidated Edison Co. of NY	Committee Member
85	X X	Claiborne	C. Clair	ABB Inc.	Committee Member
86	X	Clonts	Jermaine	Power Partners	Interested Individual
87		Coffeen	Larry	LTCoffeen Engineering, LLC	Active Participant
88	X X	Colopy	Craig	Cooper Power Systems by Eaton	Committee Member
89		Comely	Tracy	Warco, Inc.	Active Participant
90		Corsi	Domenico	Doble Engineering Co.	Interested Individual
91		Costa	Florian	Corimpex USA, Inc.	Active Participant
92	X X	Cox Jr	Jerry	EFACEC	Interested Individual
93	X X	Craven	Michael	Mike Craven	Active Participant
94	X X	Crotty	John	ABB Inc.	Committee Member
95	X	Crouse	John	Crouse Consulting Company	Committee Member-IEEE Life
96		Cunningham	Kelcie	EFACEC	Interested Individual
97	X	Cunningham	Michael	Camlin Power	Interested Individual
98	X	Damico	Frank	TAMINI Transformers USA	Committee Member
99	X	Dastous	Jean-Bernard	Hydro-Quebec IREQ	Interested Individual
100	X X	Davis	Eric	Burns & McDonnell	Committee Member
101	X X	Davydov	Valery	Mr. Valery Davydov	Active Participant
102	X	Degeneff	Robert	Utility Systems Technologies	Committee Member-IEEE Life
103	X	Deilami	Sara	Rondar Inc.	Interested Individual
104	X X	del Valle	Yamille	NEETRAC	Interested Individual
105	X	Dennis	Scott	ABB Inc.	Interested Individual
106		DeVries	Derk	Siemens Energy	Interested Individual
107	X X	Dhawan	Anil	ComEd	Interested Individual
108		Diaby	Mohamed	EFACEC	Interested Individual
109	X	Digby	Scott	Progress Energy	Active Participant
110		Dilling	Wayne	Mortenson Construction	Interested Individual
111	X X	Dix	Larry	Quality Switch, Inc.	Committee Member
112	X X	Dohnal	Dieter	Maschinenfabrik Reinhausen	Committee Member
113	X	Dorpmanns	Luc	SMIT Transformatoren B.V.	Active Participant
114	X	Douglas	Daniel	Electric Power Systems	Interested Individual

115	X	Drees	Terry	Cindus Corp.	Interested Individual
116	X X	Drobnick	Jason	Jordan Transformer	Interested Individual
117	X	Duckett	Don	Don A. Duckett, P.E.	Committee Member-IEEE Life
118		Duval	Michel	Hydro-Quebec IREQ	Active Participant-IEEE Life
119		Ebbert	Alexander	HICO America	Interested Individual
120	X	Ebermann	Sabine	SGB USA Inc.	Interested Individual
121	X	Ehmcke	Benjamin	Ehmcke Consulting LLC	Interested Individual
122	X X	Elliott	Fred	Bonneville Power Administration	Committee Member
123	X	Ellis	Keith	Electric Connection, Inc.	Committee Member
124	X	Espindola	Marco	ABB Inc.	Interested Individual
125		Euvrard	Eric	RHM International	Interested Individual
126		Evitts	Henry	The H-J Family of Companies	Interested Individual
127		Evitts	Jeffrey	H-J Enterprises, Inc.	Interested Individual
128	X X	Fairris	James	Nashville Electric Service	Committee Member
129	X	Faulkenberry	Michael	Georgia Power Co.	Committee Member
130	X	Fausch	Reto	Hubbell High Voltage Test	Active Participant
131		Fedor	Ken	SMIT USA	Interested Individual
132	X	Field	Norman	Weidmann Diagnostic Solutions	Active Participant
133		Flores Garcia	Hugo	EFACEC	Interested Individual
134	X	Forrest	George	Delta-X Research USA, Inc.	Active Participant
135	X X	Forsyth	Bruce	Southwest Electric Co.	Committee Member
136	X	Foster	Derek	Magnetics Design, LLC	Committee Member
137	X	Foster	Nanette	Delta Star	Interested Individual
138	X	Franchek	Michael	Weidmann ElectricalTechnology	Committee Member
139	X	Frimpong	George	ABB Inc.	Active Participant
140	X	Frotscher	Rainer	Maschinenfabrik Reinhausen	Interested Individual
141		Gagnon	Jean-Francois	Siemens Transformers Canada	Interested Individual
142	X	Gagnon	Jean-Philippe	Nomos Systems	Interested Individual
143	X X	Galbraith	Shawn	Nuclear Service Organization	Active Participant
144		Galvan	Carlos	Paradoxe Corporation	Interested Individual
145		Ganser Jr.	Robert	OTC Services	Interested Individual
146	X	Gao	Chang Hong	ABB Inc.	Interested Individual
147	X X	Garcia	Eduardo	Siemens	Committee Member
148	X X	Gardner	James	NRECA International	Committee Member
149		Garland	Jimmie	DuPont	Interested Individual
150	X	Gaytan	Carlos	Prolec GE	Committee Member
151	X	Ghafourian	Ali	ERMCO	Committee Member
152		Ghosh	Saurabh	Power Transformers Systems	Committee Member
153	X	Giraldo	Orlando	The H-J Family of Companies	Interested Individual
154	X X	Girgis	Ramsis	ABB Inc.	Committee Member-

					IEEE Life
155		Golarz	Jeffrey	LumaSense Technologies	Interested Individual
156	X	Golner	Thomas	SPX Transformer Solutions, Inc.	Interested Individual
157	X	Gonzalez de la Vega	Jorge	Orto de Mexico	Active Participant
158	X	Gott	James	Associated Electric Cooperative	Interested Individual
159	X X	Graham	James	TRC Solutions	Committee Member
160	X	Greeson	Robert	Federal Pacific Transformer	Interested Individual
161	X	Griesacker	Bill	Doble Engineering Co.	Committee Member
162	X	Griffin	Paul	Doble Engineering Co.	Interested Individual
163	X	Griffith	Steve	NEMA	Interested Individual
164	X	Gromlovits	Mark	Federal Pacific	Committee Member
165	X X	Gross	Detlev	Power Diagnostix	Active Participant
166	X	Guild	Alvin	Phenix Technologies Inc.	Interested Individual
167	X	Haas	Michael	Instrument Transformers, Inc.	Committee Member
168		Haasz	Jodi	IEEE	Active Participant
169	X X	Hachichi	Said	Hydro-Quebec	Committee Member
170	X	Hakim	Shamaun	CG Power Systems UAS Inc	Interested Individual
171	X X	Hancock	Blake	The Gund Company	Interested Individual
172	X	Hanson	David	TJH2b Analytical Services	Active Participant
173	X	Harden	Kenneth	Schneider Electric	Interested Individual
174		Harder	Steven	Siemens Energy	Interested Individual
175		Hardin	Michael	H-J Enterprises, Inc.	Committee Member
176	X	Harley	John	FirstPower Group LLC	Committee Member
177	X X	Harlow	James	Harlow Engineering Associates	Committee Member-IEEE Life
178	X	Hartmann	Thomas	Deltastar	Interested Individual
179	X	Hauschild	Wolfgang	Dr. W. Hauschild	Active Participant
180	X X	Hayes	Roger	ALSTOM Grid	Committee Member
181	X X	Heathcote	Martin	Martin Heathcote Associates Ltd	Active Participant
182	X X	Heinzig	Peter	Weidmann ElectricalTechnology	Committee Member
183		Henault	Paul	IFD Corporation	Interested Individual
184		Heres	Nino	The H-J Family of Companies	Interested Individual
185	X	Hernandez	Ronald	Doble Engineering Co.	Interested Individual
186		Herron	Bill	The H-J Family of Companies	Interested Individual
187	X	Herron	John	High Volt - Reinhausen	Active Participant
188	X	Herz	Josh	Qualitrol	Active Participant
189	X	Hinow	Martin	HIGHVOLT	Active Participant
190	X X	Hochanh	Thang	Alstom	Committee Member
191	X	Hoffman	Gary	Advanced Power Technologies	Committee Member
192	X X	Holdway	Timothy	Intermountain Electronics	Committee Member
193	X	Holifield	Thomas	Howard Industries	Committee Member

194	X	Holmes	Jill	Bureau of Reclamation	Active Participant
195	X	Holsomback	Steve	Southern Company Services	Active Participant
196	X	Hopkinson	Philip	HVOLT Inc.	Committee Member-IEEE Life
197	X	Izquierdo	Jose	Siemens Servicios S.A de C.V	Active Participant
198	X X	Jacob	Nathan	Manitoba Hydro	Interested Individual
199	X	Jacobsen	Dallas	Schweitzer Engineering Labs	Interested Individual
200		Jakob	Fredi	Consultant	Active Participant
201	X	James, Jr.	Rowland	Advanced Power Technologies	Committee Member
202	X X	Jarman	Paul	National Grid	Active Participant
203	X	Jaroszewski	Marion	Delta Star Inc.	Active Participant
204	X	Jauch	Erwin	Beckwith Electric Co.	Active Participant-IEEE Life
205	X	Jensen	Brad	Burns & McDonnell	Interested Individual
206		Jeong	Kyung Tae	Hyosung	Interested Individual
207	X	John	John	Virginia Transformer Corp.	Active Participant
208	X	Johnson	Charles	ABB Inc.	Committee Member
209	X X	Johnson	Derek	Reinhausen Mfg.	Interested Individual
210		Johnson	Keith	The H-J Family of Companies	Interested Individual
211	X	Johnson	Wayne	EPRI	Active Participant
212	X X	Jordan	Stephen	TVA	Committee Member
213	X	Just	Brian	IFD Corporation	Interested Individual
214		Kaineder	Kurt	Siemens AG Oesterreich	Interested Individual
215	X	Kaluzny	Richard	Cooper Power Systems by Eaton	Interested Individual
216		Kampshoff	Ken	Equisales	Interested Individual
217	X	Kazmierczak	Jerzy	ABB Inc.	Interested Individual
218	X	KC	Keshav	ABB	Interested Individual
219	X	Kelley	Robert	N.American Substation Services	Interested Individual
220	X X	Kennedy	Gael	GR Kennedy & Associates LLC	Committee Member
221	X	Kennedy	Sheldon	Niagara Transformer	Committee Member
222	X	Kharel	Rudra	Burns & McDonnell	Interested Individual
223	X X	King	Gary	Howard Industries	Committee Member
224	X	Kinner	Robert	First Power Group LLC	Active Participant
225	X	Kiparizoski	Zan	Howard Industries	Interested Individual
226	X X	Kirchenmayer	Egon	Siemens AG	Interested Individual
227	X	Kirchner	Lawrence	Siemens Energy	Active Participant
228	X	Kirshner	David	Kirshner Konsulting	Interested Individual
229	X X	Klaponski	Brian	Carte International Inc.	Committee Member
230		Knuth	Wesley	Salt River Project	Interested Individual
231	X	Kolehmainen	Harri	ABB Oy, Transformers	Interested Individual
232	X	Kornowski	Marek	Polycast International	Interested Individual

233	X X	Kothamasu	Karthik	Olsun Electrics Corporation	Interested Individual
234	X X	Kraemer	Axel	Maschinenfabrik Reinhausen	Active Participant
235	X X	Kraetge	Alexander	Highvolt	Committee Member
236	X X	Kranich	Neil	Jordan Transformer	Interested Individual
237	X X	Kulasek	Krzysztof	ABB Inc.	Interested Individual
238	X	Kurth	Bernhard	Reinhausen Mfg.	Active Participant
239	X	Kyle	Randall	Southern Company	Active Participant
240	X X	Lachman	Mark	Doble Engineering Co.	Interested Individual
241	X X	Lackey	John	PowerNex Associates Inc.	Committee Member
242	X	Ladroga	Richard	Risk Management International	Committee Member
243	X X	Lakhiani	Virendra	Transformers & Rectifiers (India)	Interested Individual
244		Lambert	Brandon	Bruce Power	Interested Individual
245		Landis	Ben	Transformer Protector Corp	Interested Individual
246	X X	Landy	Charles	ESI (Engineering Systems Inc)	Interested Individual
247	X X	Larochelle	David	NDB Technologies	Interested Individual
248	X X	Lau	Michael	Weidmann Diagnostic Solutions	Committee Member
249	X	Lawless	Andrew	Siemens Energy	Interested Individual
250	X X	Lawrence	Matthew	Doble Engineering Co.	Interested Individual
251	X	Lee	Jihyun	Hyosung Corporation	Interested Individual
252		Leslie	Brian	General Electric	Interested Individual
253	X X	Levin	Aleksandr	Weidmann ElectricalTechnology	Active Participant
254	X	Lin	Pin	Baoding Tianwei Electric (BTW)	Interested Individual
255	X X	Livingston	Kerry	Great River Energy	Active Participant
256		Locarno	Mario	Doble Engineering Co.	Active Participant
257		Lopes	Ana	EFACEC	Active Participant
258	X	Lopez-Fernandez	Xose	Universidade de Vigo	Committee Member
259	X	Lowdermilk	Larry	LAL International, LLC	Committee Member-IEEE Life
260	X X	Luo	Shawn	Seattle City Light	Interested Individual
261		Machado Junior	Tamyres	Siemens Ltda	Active Participant
262	X	Macias	Alejandro	CenterPoint Energy	Interested Individual
263	X X	Malliet	Randal	Eaton Corporation	Interested Individual
264	X	Mamtora	Jitendra	Transformers & Rectifiers (India)	Active Participant
265	X X	Manohar	Kalyan	Olsun Electrics Corporation	Interested Individual
266	X X	Marek	Richard	DuPont	Committee Member
267	X	Marquardt	Bryan	AK Steel	Interested Individual
268	X	Martin	Terence	Doble Engineering	Active Participant
269	X X	Martinez	Apollonia	Public Service Co. New Mexico	Interested Individual
270	X	Martinez	Rogelio	GE Nogales Dry Transformers	Active Participant
271	X X	Matthews	Lee	Howard Industries	Committee Member
272	X X	McBride	James	JMX Services, Inc.	Active Participant

273		McCloskey	Scott	Amran Inc.	Interested Individual
274	X	McClure	Phillip	Weschler Instruments	Committee Member
275		McCullough	Douglas	Maxima / Hyundai	Interested Individual
276	X	McIver	James	Siemens Energy	Active Participant
277	X X	McNally	Mark	KCBPU	Active Participant
278	X X	McNelly	Susan	Xcel Energy	Committee Member
279	X	McShane	Charles Patrick	Cargill, Inc.	Committee Member
280	X X	McTaggart	Ross	Trench Limited	Committee Member
281	X X	Mehrotra	Vinay	SPX Transformer Solutions, Inc.	Committee Member
282	X X	Melanson	Joseph	J. Melanson, Inc.	Committee Member
283	X	Melle	Thomas	Siemens Industry	Active Participant
284	X	Metz	Steve	Electric Power Systems	Interested Individual
285		Miano	Christopher	Calumet Specialty Products	Interested Individual
286	X X	Miller	Kent	T&R Electric Supply Co.	Committee Member-IEEE Life
287	X X	Miller	Michael	Siemens Industry, Inc.	Interested Individual
288	X X	Miller	Michael	We Energies	Interested Individual
289	X	Millward	Paul	ITEC	Committee Member
290	X X	Molden	Arthur	AMEESCO	Committee Member
291		Moore	Harold	Harold Moore & Associates	Committee Member-IEEE Life
292	X X	Morales-Cruz	Emilio	Qualitrol	Interested Individual
293	X X	Morgan	Charles	Northeast Utilities	Interested Individual
294	X	Mukerji	Amitav	ABB Inc.	Committee Member
295	X	Mulkey	Daniel	Pacific Gas & Electric	Committee Member
296		Mullikin	John	WEG Electric Corp	Interested Individual
297		Mullikin	Randolph	ABB Inc.	Active Participant
298	X	Muriq	Dardan	Munksjo Paper	Interested Individual
299	X	Murphy	Jerry	Reedy Creek Energy Services	Committee Member
300	X X	Murray	David	Tennessee Valley Authority	Active Participant
301	X X	Mushill	Paul	Ameren	Active Participant
302	X	Naderian	Ali	Kinectrics	Active Participant
303	X X	Narawane	Aniruddha	ABB Inc.	Interested Individual
304		Natale	Anthony	HICO America	Interested Individual
305	X	Nazarko	Jeffrey	Tempel	Interested Individual
306		Neal	Jason	HICO Amercia	Interested Individual
307	X	Neiman	Jeffrey	SPX Waukesha	Interested Individual
308		Niemann	Carl	Niemann Consulting	Committee Member-IEEE Life
309		Nikoley	Ingo	Siemens Energy	Active Participant
310	X	Nims	Joe	Allen & Hoshall	Active Participant
311	X	Nordman	Hasse	ABB Oy, Transformers	Active Participant

312		Nunes, Jr	Jayme	Nynas AB	Interested Individual
313	X	Nunn	Shawn	OTC Services	Interested Individual
314	X	Ocon	Rodrigo	Industrias IEM	Interested Individual
315	X	Ogajanov	Rudolf	ABB Inc.	Active Participant
316		O'Leary	Dermot	Serveron	Interested Individual
317	X	Olen	Robert	Cooper Power Systems by Eaton	Committee Member
318	X	Oliver	William	Hitachi HVB, Inc.	Interested Individual
319	X	Olsson	Tomas	ABB AB	Interested Individual
320	X X	Oppedisano	Vince	Megger	Interested Individual
321	X	Panesar	Parminder	Virginia Transformer Corp.	Interested Individual
322		Panetta	Sergio	I Gard Corporation	Active Participant
323	X X	Papp	Klaus	Trench Austria GmbH	Committee Member
324	X X	Parkinson	Dwight	Cooper Power Systems by Eaton	Active Participant
325		Patel	Dhiru	Hammond Power Solutions Inc.	Active Participant
326	X	Patel	Poorvi	ABB Inc.	Active Participant
327		Patel	Sanjay	Smit Transformer Sales, Inc.	Active Participant
328	X	Patoine	Barbara	Weidmann ElectricalTechnology	Interested Individual
329		Pattison	Mark	H-J International, Inc.	Interested Individual
330	X	Paul	Mathew	Pioneer Power Solutions, Inc.	Interested Individual
331	X X	Payerle	George	Carte International Inc.	Active Participant
332	X X	Penny	Brian	American Transmission Co.	Committee Member
333	X	Perjanik	Nicholas	Weidmann Diagnostic Solutions	Active Participant
334	X X	Perkins	Mark	ABB Inc.	Committee Member
335	X X	Perlichek	Robert	Public Service Co. New Mexico	Active Participant
336		Peterson	Alan	Utility Service Corporation	Active Participant
337	X X	Pezzin	Justin	IFD Corporation	Committee Member
338	X	Pinon	Oscar	WEG-Voltran	Interested Individual
339	X	Pitts	Chris	Howard Industries	Interested Individual
340	X X	Plante	Nicolas	IREQ	Interested Individual
341	X X	Platts	Donald	SPX Transformer Solutions, Inc.	Committee Member
342	X	Ploetner	Christoph	ABB Inc.	Committee Member
343	X X	Pointner	Klaus	Trench Austria GmbH	Committee Member
344	X	Poulin	Bertrand	ABB Inc.	Committee Member
345	X X	Prevost	Thomas	OMICRON electronics CorpUSA	Committee Member
346	X	Prince	Jarrod	ERMCO	Interested Individual
347	X X	Progar	John	Jordan Transformer	Interested Individual
348	X	Provost	Richard	DuPont Co.	Interested Individual
349	X	Pruente	John	SPX Transformer Solutions, Inc.	Interested Individual
350	X X	Puri	Jeewan	Transformer Solutions, Inc.	Committee Member
351	X X	Radbrandt	Ulf	ABB	Committee Member

352		Rahangdale	Ravi	Pennsylvania Transformer	Committee Member-IEEE Life
353		Raines	Summar	Paradoxe Corporation	Interested Individual
354	X	Ramnial	Madhvi	Powertech Labs Inc.	Interested Individual
355		Rasco	Jimmy	Ergon, Inc	Interested Individual
356	X	Rashid	Adnan	Measurement Canada/Industry Canada	Interested Individual
357		Rasor	Robert	S.D. Myers Inc.	Committee Member
358	X	Rave	Martin	ComEd	Committee Member
359	X X	Ray	Jeffrey	JLR Consulting, Inc.	Active Participant
360	X	Razuvayev	Sergiy	Delta Star Inc.	Active Participant
361	X	Recksiedler	Leslie	Manitoba Hydro Int.	Active Participant
362	X	Reeves	Jerry	EFACEC	Active Participant
363	X X	Riffon	Pierre	Consultant	Committee Member
364		Rijnsoever	Frank	SMIT Transformatoren B.V.	Interested Individual
365		Rinks	Timothy	Reinhausen Mfg.	Interested Individual
366	X	Rivers	Mark	Doble Engineering Co.	Interested Individual
367	X X	Robalino	Diego	Megger	Active Participant
368	X X	Rock	Patrick	ATC	Interested Individual
369	X	Ronchi	Rodrigo	WEG-Voltran	Interested Individual
370	X X	Rossetti	John	Memphis Light, Gas & Water	Active Participant
371	X X	Roussell	Marnie	Entergy	Committee Member
372	X X	Rudolf	Lawrence	Indianapolis Power & Light/ AES	Interested Individual
373		Runewicz	John	Weschler Instruments	Active Participant
374		Sahin	Hakan	ABB Inc.	Active Participant
375	X	Saldivar	Juan	Prolec GE	Interested Individual
376		Sandhu	Surinder	Sanergy Consulting	Interested Individual
377	X X	Sankar	Vallamkonda	Power Transformer Services	Committee Member-IEEE Life
378		Sargent	Brett	LumaSense Technologies	Active Participant
379	X	Sarkar	Amitabh	CG Power Systems USA Inc	Interested Individual
380	X	Sarkar	Subhas	Virginia Transformer Corp.	Committee Member
381	X X	Sauer	Daniel	Cooper Power Systems by Eaton	Committee Member
382	X X	Sauls	Roderick	Southern Company Services	Interested Individual
383	X X	Sauzay	Mathieu	JST Transformateurs	Active Participant
384	X	Scardazzi	Alaor	Siemens Ltda	Interested Individual
385	X X	Schleismann	Eric	Southern Company	Active Participant
386	X	Schnider	Bruno	ABB Switzerland Ltd. MICAFIL	Interested Individual
387	X X	Schrammel	Alfons	Siemens AG	Interested Individual
388	X	Schweiger	Ewald	Siemens AG	Committee Member
389	X	Selvaraj	Pugazhenthi	Virginia Transformer Corp.	Interested Individual
390	X X	Sewell	Adam	Quality Switch, Inc.	Active Participant

391	X X	Sewell	Jeremy	Quality Switch, Inc.	Committee Member
392	X X	Sewell	Russell	Quality Switch, Inc.	Interested Individual
393		Sexton	Aron	Kinectrics	Interested Individual
394	X X	Shahrodi	Ebrahim	Transformer Engineering, LLC	Interested Individual
395	X	Shannon	Michael	Rea Magnet Wire	Interested Individual
396	X X	Sharma	Devki	Entergy	Committee Member-IEEE Life
397	X X	Sharp	Michael	Trench Limited	Committee Member
398	X X	Sharp	Ronald	Pacific Gas & Electric	Interested Individual
399		Shekelton	James	H-J Enterprises, Inc.	Committee Member
400		Shekelton	Jay	H-J International	Interested Individual
401	X X	Shem-Tov	Mark	Von Roll Transformers	Interested Individual
402	X X	Shertukde	Hemchandra	University of Hartford	Committee Member
403	X	Shirasaka	Yikiyasu	Hitachi Ltd.	Interested Individual
404	X X	Shteyh	Ibrahim	Olsun Electrics	Interested Individual
405	X X	Shull	Stephen	The Empire District Electric Co.	Committee Member
406		Siebert	Stefan	BROCKHAUS MESSTECHNIK	Active Participant
407		Simonelli	Richard	SPX Transformer Solutions, Inc.	Interested Individual
408	X X	Sizemore	Thomas	ABB Inc.	Committee Member
409	X X	Skinger	Kenneth	CBI	Active Participant
410	X X	Slattery	Christopher	FirstEnergy Corp.	Interested Individual
411	X X	Smith	Edward	H-J Enterprises, Inc.	Committee Member
412	X	Smith	Rebecca	Schneider Electric	Interested Individual
413	X	Smith	Richard	Eaton's Cooper Power System	Interested Individual
414	X X	Snyder	Steven	ABB Inc.	Committee Member
415		So	Eddy	National Research Council of Canada	Interested Individual
416	X X	Sohn	Yong Tae	Hyosung	Interested Individual
417	X X	Solano	William	ABB Inc.	Interested Individual
418	X X	Som	Sanjib	Siemens Industry, Inc.	Committee Member
419	X	Soni	Mahendrakumar	Virginia Transformer Corp.	Active Participant
420	X	Sordo	Salvador	WEG Electric Corp.	Interested Individual
421	X	Sparling	Brian	Dynamic Ratings Inc	Active Participant
422		Speegle	Andy	Entergy Services Inc.	Active Participant
423	X	Spiewak	Erin	IEEE	Interested Individual
424	X X	Spitzer	Thomas	City Transformer Service Co.	Committee Member
425	X	Spurlock	Michael	American Electric Power	Active Participant
426	X X	Stahara	Ronald	Stahara Consulting	Committee Member-IEEE Life
427		Stank	Markus	Maschinenfabrik Reinhausen	Active Participant
428	X X	Stankes	David	3M IPT	Active Participant
429		Stecher	Andrea	Ameren	Interested Individual

430	X	Steineman	Andrew	Delta Star Inc.	Active Participant
431	X	Steineman	Christopher	Meramec Electrical Products	Interested Individual
432	X X	Stiegemeier	Craig	ABB Inc.	Committee Member
433		Stranko	Jennifer	HPN Global	Interested Individual
434	X	Stretch	Kerwin	SGB USA, Inc.	Interested Individual
435		Sullivan	Christopher	Heartland Solutions, Inc.	Active Participant
436	X	Sullivan	Kevin	Duke Energy	Interested Individual
437		Sullivan	Liz	ABB Inc.	Interested Individual
438	X	Sundin	David	DSI Ventures, Inc.	Interested Individual
439	X	Susa	Dejan	Statnett SF	Interested Individual
440		Swansey II	Michael	EDPRenewables, NA	Interested Individual
441	X X	Sweetser	Charles	OMICRON electronics CorpUSA	Committee Member
442	X X	Swinderman	Craig	Mitsubishi Electric Power Products	Committee Member
443	X	Szewczyk	Radoslaw	DuPont Poland Sp. z o.o.	Interested Individual
444	X X	Tanaka	Troy	Burns & McDonnell	Interested Individual
445	X	Tang	Cheng	Baoding Tianwei Electric (BTW)	Interested Individual
446		Taousakis	Anastasios	PHI Inc.	Interested Individual
447	X	Tarlapally	Susmitha	ABB Inc.	Active Participant
448	X	Tellez	Richard	Siemens S.A.	Active Participant
449	X	Tendulkar	Vijay	ONYX Power, Inc.	Interested Individual-IEEE Life
450	X X	teNyenhuis	Ed	ABB Inc.	Committee Member
451	X X	Termini	Giuseppe	PECO Energy	Committee Member
452	X	Thompson	Jim	T&R Service Company	Committee Member
453	X	Thompson	Robert	RST Consulting, P.C.	Committee Member
454	X X	Thompson	William	Allgeier Martin & Associates Inc	Interested Individual
455	X	Tian	Peng	Baoding Tianwei Electric (BTW)	Interested Individual
456		Tikvesa	Taib	KAEC	Interested Individual
457	X X	Tostrud	Mark	Dynamic Ratings, Inc.	Interested Individual
458	X	Tozzi	Marco	Camlin Power	Interested Individual
459	X	Traut	Alan	Power Partners	Committee Member
460	X	Trautmann	Frank	Siemens AG	Interested Individual
461	X	Trivitt	Donnie	Oklahoma Gas & Electric	Active Participant
462	X	Trummer	Edgar	VACE	Committee Member
463		Turvey	Terry	The Specialty Switch Company	Interested Individual
464	X X	Ujhazy	Tyler	Southern California Edison	Interested Individual
465	X	Vailoor	Vasanth	Trantech	Interested Individual
466		van der Kolk	Stefan	SMIT Transformatoren B.V.	Interested Individual
467	X X	van der Zel	Gordon	EPRI	Interested Individual
468	X X	VanderWalt	Alwyn	PacifiCorp	Interested Individual
469	X X	Varghese	Ajith	SPX Transformer Solutions, Inc.	Active Participant

470	X	Vedante	Kiran	ABB Inc.	Active Participant
471		Verdell	Joshua	ERMCO	Interested Individual
472	X X	Verdolin	Roger	Teshmont Consultants LP	Committee Member
473		Verner	Jane Ann	Pepco Holdings Inc	Committee Member
474	X X	Viereck	Karsten	Maschinenfabrik Reinhausen	Active Participant
475	X	Vijayan	Krishnamurthy	CG Power Systems Canada Inc	Interested Individual
476	X X	Vir	Dharam	SPX Transformer Solutions, Inc.	Committee Member
477		vonGemmingen	Richard	Dominion	Active Participant
478	X X	Wagenaar	Loren	WagenTrans Consulting	Committee Member-IEEE Life
479	X	Walia	Sukhdev	Brookfield Renewable Power	Interested Individual-IEEE Life
480	X X	Wallace	David	ABB Inc.	Committee Member
481	X X	Wallach	David	Duke Energy	Committee Member
482	X	Ward	Barry	Advantage T&D Consulting, LLC	Committee Member
483		Washburn	Michael	High Purity Northwest, Inc.	Interested Individual
484	X X	Watson	Joe	ZTZ Services	Committee Member
485		Weatherbee	Eric	PCORE Electric	Active Participant
486	X	Websper	Richard	ALSTOM Grid UK Limited	Active Participant
487	X	Werelius	Anton	Megger	Interested Individual
488	X	Werelius	Peter	Megger	Active Participant
489		White	Leon	Serveron	Interested Individual
490	X	Wicks	Roger	DuPont	Committee Member
491	X X	Wilks	Alan	Consultant	Committee Member-IEEE Life
492	X	William Jr.	Edward	IPS Energy USA	Interested Individual
493		Williams	Randy	ABB Inc.	Active Participant
494	X	Wimmer	William	Dominion	Committee Member
495	X	Wood	David	Central Moloney, Inc.	Interested Individual
496	X	Woods	Deanna	Alliant Energy	Interested Individual
497		Wright	Melvin	LICA Consulting LLC	Interested Individual
498	X	Xu	Shuzhen	FM Global	Committee Member
499	X	Yang	Baitun	Pennsylvania Transformer	Committee Member
500	X	Young	Samuel	Reinhausen Mfg.	Interested Individual
501	X	Yu	Jennifer	Pacific Gas & Electric	Committee Member
502	X X	Yule	Kipp	Bechtel Power Corp	Committee Member
503	X	Zazueta	Filiberto	Comision Federal de Electricidad (CFE)	Interested Individual
504	X	Zhang	Jim	Arizona Public Service Co.	Active Participant
505		Zhang	Pengyuan	Baoding Tianwei Electric (BTW)	Interested Individual
506		Zhang	Shibao	PCORE Electric	Active Participant
507	X X	Zhao	Peter	Hydro One	Committee Member

Attendance Summary:

- 393 people attended Part 1 the Monday Opening Session.
- 194 people attended Part 2 the Thursday Closing Session.
- 412 Attended either Part 1 or 2.
- 174 Attended both Parts 1 and 2.
- 219 Attended Part 1 only.
- 19 Attended Part 2 only.
- 95 Attended neither.

These total numbers also include the 19 attendees who signed in on the next page. They did not register in time to make the above main roster.

Transformers Committee Member Summary

There are 198 Members at the start of the meeting week. Committee Members should attend at least once.

- 147 registered to attend St. Louis (74%)
- 135 attended Part 1 the Monday Opening Session (68% - Yes Quorum)
- 90 attended Part 2 the Thursday Closing Session (45% - Quorum not necessary)
- 4 attended Closing but not Opening
- 9 did not attend either session (or did not sign attendance roster)

	People who signed in::		
	Name	Attendance	Company
1	Dhiru Patel	Attended Part 1	Hammond Power Solutions
2	Librado Magallanes	Attended Part 1	Instituto Investigaciones
3	Roberto Linau	Attended Part 1	Instituto Investigaciones
4	Luiz Cheim	Attended Part 1	ABB
5	Abhinav Mitra	Attended Part 1	Siemens
6	Tim Gradnick	Attended Part 1	EIMV
7	Dave Ostrander	Attended Part 1	Ameren
8	Bina Vatanpour	Attended Part 1	Efacec
9	Ryan Thompson	Attended Part 1	Burns & McDonnell
10	Leal Gustavo	Attended Part 1	Dominion
11	Wilson Dorian	Attended Part 1	H-J International
12	Gingi Shertok	Attended Part 1	Duke Energy
13	Min Jea Lee	Attended Parts 1 and 2	HICO Korea
14	Jinho Kang	Attended Parts 1 and 2	Hyundai Heavy Industries
15	So-Young Lee	Attended Parts 1 and 2	Hyundai Heavy Industries
16	Hyun-Kie Chung	Attended Parts 1 and 2	Hyundai Heavy Industries
17	David Zabel	Attended Parts 1 and 2	S&C Electrical Co.
18	Chuck Cumelia	Attended Part 2	NWL Transformers
19	Rudra Kharel	Attended Part 2	Burns & McDonnell

2.0 APPROVAL OF PREVIOUS MINUTES – STEPHEN ANTOSZ

The Minutes from the Munich meeting were approved as written.

3.0 Chair's Remarks & Report – Bill Chiu

3.1 Chair's Opening Remarks

Good Morning Everyone!

A very big welcome to all of you to our Main Committee Meeting to help kick off the week of activities here in St. Louis for our Fall 2013 meeting.

Some of you may have heard that we are very excited about this being our biggest meeting yet, with over 540 attendees plus over 60 spouses/companions. This is good testament to the culture and the reputations that we, the Transformers Committee have built over the years for not only having a top rate technical program, but also balanced with some great social mixers and technical tours through out our meeting week to make this a rich learning environment and a rewarding experience both professionally and personally.

Once again, this rewarding experience is made possible because of our host Ed smith and his dedicated host team from H-J Family of Companies have been hard at work over the past several months, and working in close collaboration with our meeting planning team to create this great program for us this week, starting with the wonderful receptions we had last night. Having been a host myself back in 2004, I know what it takes to pull off a great program and I just want to say thank you again Ed Smith, and also to our meeting planner, Greg Anderson for all of your hard work. I have no doubt that this is going to be another great week!

Since you're my captured audience, I am going to exercise my Chair's prerogative to share few thoughts with you.

Some of you have heard about my story of how I started with a humble beginning after graduating from engineering school. And how my career have benefited tremendously because of my association with IEEE, and specifically because of my involvement with the Transformers Committee. I can honestly say that I would not have reach the level of my career success without IEEE.

Over the past several years, I have reflected and pondered on "What is it that makes IEEE Transformers Committee great?"

And particularly, why is it that many of us in room, have been so tirelessly devoted to this organization, when considering that all of this work is volunteer based. I came to the conclusion that it is the culture of this organization that made us great. And if you think about it some more – about what makes our culture – this elusive word culture – it really isn't one particular thing, but it really is a collection of our core behaviors that we hold near and dear our hearts, and it is also the core mission of IEEE.

Fostering technological innovation and excellence for the benefit of humanity.

There are only 10 words in this tag line. But these are 10 powerful words – that definitely has resonated with me and I hope for you as well.

I also believe that all of us, in the course of being involved in our standards work, while we may be driven by different interests, we, as scientists and engineers, fundamentally strive to make things better, much like the words of the IEEE mission – to ***Foster technological innovation and excellence for the benefit of humanity,*** and that we all of have the highest respect for this organization and for the people that make this organization great.

Beyond these 10 powerful words, there is a set of guiding principles that I thought worth while sharing as a refresher. Because we all come from different backgrounds, various different level of expertise and knowledge, and have different interests. In the course of making these improvements, our actions and behaviors some times could be misinterpreted, and occasionally in our passion to drive towards our goals and objective we could unknowingly veer off the main road once in a blue moon and be perceived differently from our best intentions.

I think this is where our IEEE Code of Ethics comes in – it serves as the guiding light to keep us focused on maintaining and evolving our culture that make this organization great. So, let me read through these quickly.

IEEE Code of Ethics

We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:

1. to accept responsibility in making decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
3. to be honest and realistic in stating claims or estimates based on available data;
4. to reject bribery in all its forms;
5. to improve the understanding of technology; its appropriate application, and potential consequences;
6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
8. to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

Officers Progression
2014-2015

- Chair: *Donald W. Platts*
- Vice Chair: *Stephen Antosz*
- Secretary: Susan McNelly
- Standards Coordinator: *William (Bill) H. Bartley*
- Treasurer: *Greg W. Anderson*
- Awards Chair/Past Chair: *Bill Chiu*

Adcom Report

- IEEE-SA's role
  - Standards development organization that
    - Develops voluntary standards, recommended practices, and guides
    - Uses an accredited process that promotes consensus building among those with material interest in any given technology, and is based on proven imperative principles of openness, consensus, balance, due process, and right of appeal
    - Oversees the process by which consensus is reached
    - Has standards that are adopted by regulatory agencies and international bodies around the world
    - Promotes standards implementation but does not define laws or regulatory requirements
    - Defines technical requirements, not market mechanisms
    - Reviews documents based on technical merit, and established scientific findings

- IEEE-SA does not
    - Test or verify the content of standards
    - Assure health or safety
    - Make guarantees
    - Make warrantees
    - Establish law or regulation
    - Define essential patents, essential patent holders, or licensing terms
    - Define commercial terms or market mechanisms
    - Infer that an IEEE standard endorses products, services, or companies

Press Releases

- Press releases about IEEE standards by outside entities without approval by IEEE
- Cannot claim that the IEEE standard endorses a product, service, or company
- Cannot claim that the standard establishes requirements based on information in informative text (including informative annexes)
- Cannot include marketing text about IEEE or IEEE-SA that may infer endorsement by IEEE or IEEE-SA
- Must clearly indicate that all statements are that of the entity and does not necessarily represent a position or opinion of either IEEE or the IEEE Standards Association

IEEE-SA Disclaimers

- Official Statements
  A statement, written or oral, that is not processed in accordance with the IEEE-SA Standards Board Operations Manual shall not be considered the official position of IEEE or any of its committees and shall not be considered to be, nor be relied upon as, a formal position of IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position of IEEE.

Announcement of Affiliation

- Core objectives of the standard development process - Openness and Due Process
  - Allows for equity and fair play
  - Strive to have balance of interests & not dominated by a single interest category
  - Affiliation Disclosure
  - Not just who you are, but also who is your financial sponsor

TECHNICAL COUNCIL OFFICERS

- Chair - Jeffrey H. Nelson (TVA)
- Vice Chair - S. S. (Mani) Venkata (Alstom) Resigned October 1, 2013
- Secretary - Ken Edwards, (BPA)
- Past Chair - Damir Novosel, (QuantaTechnology)

GMD Task Force Update

- Published P&E Magazine article *Geomagnetic Disturbance – Their Impact on Power grid*

GMD Supersession

- GMD Supersession at PES General Meeting in Vancouver on July 23, 2013
  - Entire session is recorded and available on youtube - http://www.youtube.com/watch?v=gE-H8VSzNXY
- Currently working on finalizing the comment resolution of the Task Force Technical Paper

GMD Super Session Presentation Sequence

1. Bill Chiu – Southern California Edison
   Overview of GMD & PES Tech Council Task Force on GMD
2. David Hilt – Quanta Technology
   Regulatory Update
3. David Boteler – Natural Resources Canada
   Modeling Geomagnetically Induced Currents-The Evolution in Techniques over last 30 yrs
4. Ramsis Girgis – ABB St. Louis
   Methodology for Evaluating Impact of GIC & GIC Capability of Power Transformer Designs
5. Jeff Dagle – Pacific Northwest Labs
   Geomagnetic Storms and Long-Term Impacts on Power Systems
6. Emanuel E. Bernabeu – Dominion Power
   Impacts of GICs on the Dominion Power System

7. John Kappenman – Storm Analysis Consultants
   Low-Frequency Protection Concepts for the Electric Power Grid: Geomagnetically Induced Current (GIC) and E3 HEMP Mitigation – FERC Meta 322 Update
8. Q&A & General Discussions

Endorsement

- IEEE Standards Association does not infer that an IEEE standard endorses products, services, or companies

IEEE Fellows – Individual Contributor

- Application Engineer/Practitioner
  - Responsible for product development, advancement in system, application or operation, project management or construction activity, process development, manufacturing innovation, codes or standards development, or other application of technology
- Educator
  - Responsible to advance electrical engineering and scientific technology through education by the developing curricula and/or courses that are innovative and unique
- Research Engineer/Scientist
  - Responsible for inventions, discoveries or advances in the state of the art technological advances
- Technical Leader
  - Responsible for a managerial, team, or company-wide effort using technical innovation, and resulting in outstanding performance, economic enhancements, or other advantages to benefit society

Fellow Nomination Process

- Nominator
- Any person, including non-members, are eligible to serve as a nominator with the following exceptions:
  - Members of the IEEE Board of Directors
  - Members of the IEEE Fellow Committee
  - IEEE Technical Society/Council Fellow Evaluating Committee Chairs
  - Members of IEEE Technical Society/Council Fellow Evaluating Committee reviewing the nomination, or IEEE Staff.
- Nominee
- Must be an IEEE Senior Member in good standing and he/she must have completed five years of service in any grade of membership. The nominee cannot be a member of:
  - The IEEE Board of Directors
  - The IEEE Fellow Committee
  - IEEE Technical Society/Council
  - Fellow Evaluating Committee Chair
  - A member of IEEE Society/Council Fellow Evaluating Committees reviewing the nomination

Data Non-Disclosure Agreement

- Proposal
  - Setup an input site to allow submission of data to IEEE. Suggest we provide a spreadsheet for the input. Therefore, we could automate the compilation and ensure that the anonymity of the submitter is maintained
  - User will need to click through and agree to the NDA in order to access the compiled data

CHAIR'S CLOSING REMARKS

Special Acknowledgement

Ed Smith & H-J Family of Companies

Erin Spiewak
Program Manager Technical Program Development

Jodi Haasz
Standards Strategist Global Activities

Greg Anderson
Committee Meeting Planner

Sue McNelly
Committee Web Master

Subcommittee Leadership

Sue McNelly (Xcel Energy)
replaced by
David Wallach (Duke Energy)

Resources for Increasing Meeting Effectiveness

- Robert's Rule of Order
- Monday Luncheon – Standards Development
- Plan your meetings ahead of time
- Seek input from members on agenda item
- Seek support from other experienced activity leaders

3.2 CHAIR'S REPORT

1.1 IEEE Power & Energy Society Technical Council

The Technical Council of the IEEE Power Energy Society (PES) is presently composed of the Chairpersons of the PES Technical Committees, plus the Chairpersons of Standing Committees reporting to it. The Power Energy Society is Division VII of The Institute of Electrical and Electronics Engineers (IEEE). For operating functions it is responsible to the IEEE Technical Advisory Board and for technical activities to the IEEE Technical Activities Board.

The PES Technical Committees report to the Technical Council on matters concerning membership, technical publications, recognition, scope and the coordination of the Power Energy Society generated standards. For standards relating to their technical scope, the Technical Committees work directly with the IEEE Standards Board and the Power Energy Society Standards Coordinating Committee.

Please see http://www.ieee-pes.org/technical-activities/technical-council for further details on the Statement of Purpose and Scope of Activities for the PES Technical Council.

1.1.1 Technical Council Officers & Membership

The detail listing of the PES Technical Council Officers was provided in my previous report back in March of 2013. Since that time, Mr. Mani Venkata, the Vice Chair of the PES Technical Council, has announced his resignation effective October 1, 2013. The duties of the Vice Chair are now being handled by the Chair of the Technical Council until the Vice Chair position is filled again in the near future.

The officers and members of the Technical Council are listed below for your reference. Where available, the affiliation of the technical committee chair is also shown in parentheses.

TECHNICAL COUNCIL OFFICERS
Jeffrey H. Nelson, *Chair (TVA)*
~~S. S. (Mani) Venkata, *Vice Chair (Alstom)*~~ *(Resigned October 1, 2013)*
Ken Edwards, *Secretary (BPA)*
Damir Novosel, *Past Chair (Quanta Technology)*

STANDING COMMITTEES
Awards Committee - John Randolph, *Chair (PG&E)*
Meetings & Marketing Committee - Mani Venkata, *Chair (Alstom)*
Organization & Procedures Committee - Ken Edwards, *Chair (BPA)*
Standards Coordination Committee - Bill Bartley, *Chair (HSB)*
Technical Sessions Committee **-** Mani Venkata, *Chair (Alstom)*

COORDINATING COMMITTEES
Emerging Technologies Coordinating Committee - Branislav Djokic, *Chair*
Intelligent Grid Coordinating Committee - Erich W. Gunther, *Chair*
Marine Systems Coordinating Committee - Paul Bishop, *Chair (consultant)*
Wind and Solar Power Coordinating Committee - Richard J. Piwko, *Chair*

TECHNICAL COMMITTEES
Electric Machinery Committee - Mike Sedlak, *Chair (Edison Mission Energy)*
Energy Development and Power Generation Committee - Om Malik, *Chair*
Insulated Conductors Committee - John Smith, *Chair (General Cables)*
Nuclear Power Engineering Committee - S. K (Satish) Aggarwal, *Chair*

Power System Analysis, Computing, and Economics Committee - Sandoval Carneiro, Jr., *Chair*
Power System Communications Committee - Dan Nordell, *Chair*
Power System Dynamic Performance Committee - Nikos Hatziargyriou, *Chair*
Power System Instrumentation and Measurements Committee - R. Arseneau, *Chair*
Power System Operations Committee - William (Bill) Cassel, *Chair (consultant)*
Power System Planning and Implementation Committee - M. L. Chan, *Chair (consultant)*
Power System Relaying Committee – Roger Hedding, *Chair (ABB)*
Stationary Battery Committee - William (Bill) Cantor, *Chair*
Substations Committee – Mike Dodd, *Chair (Sweitzer)*
Surge Protective Devices Committee - Ron Hotchkiss, *Chair*
Switchgear Committee – Ted Olsen, *Chair (Siemens)*
Transformers Committee - Bill Chiu, *Chair (SCE)*
Transmission and Distribution Committee - W. A. Chisholm, *Chair*

1.2 IEEE Standards Association (SA) Requirements

1.2.1 IEEE SA's Role

In the course of developing our standards, we as volunteers while having the best interest of advancing the technical understanding of our industry, are no doubt also influenced by those who sponsored our participation with other interests that potentially could influence our decisions. This is where a good understanding of the IEEE SA's role and its relevant policy and procedures will help in clarifying some of the dos and don'ts in the process of developing our standards.

IEEE SA is a standards development organization that:

- Develops voluntary standards, recommended practices, and guides
- Uses an accredited process that promotes consensus building among those with material interest in any given technology, and is based on proven imperative principles of openness, consensus, balance, due process, and right of appeal
- Oversees the process by which consensus is reached
- Has standards that are adopted by regulatory agencies and international bodies around the world
- Promotes standards implementation, but does not define laws or regulatory requirements
- Defines technical requirements, not market mechanisms
- Reviews documents based on technical merit, and established scientific findings

IEEE SA does not:

- Test or verify the content of standards
- Assure health or safety
- Make guarantees
- Make warrantees
- Establish law or regulation
- Define essential patents, essential patent holders, or licensing terms
- Define commercial terms or market mechanisms
- Infer that an IEEE standard endorses products, services, or companies

1.2.2 Press Releases Policy Relating to IEEE SA Work & Products

Press releases about IEEE standards by outside entities without approval by IEEE:

- Cannot claim that the IEEE standard endorses a product, service, or company
- Cannot claim that the standard establishes requirements based on information in informative text (including informative annexes)
- Cannot include marketing text about IEEE or IEEE-SA that may infer endorsement by IEEE or IEEE-SA
- Must clearly indicate that all statements are that of the entity and does not necessarily represent a position or opinion of either IEEE or the IEEE Standards Association

1.2.3 IEEE SA Disclaimers

A statement, written or oral, that is not processed in accordance with the IEEE-SA Standards Board Operations Manual shall not be considered the official position of IEEE or any of its committees and shall not be considered to be, nor be relied upon as, a formal position of IEEE. At lectures, symposia, seminars, or educational courses, an individual presenting information on IEEE standards shall make it clear that his or her views should be considered the personal views of that individual rather than the formal position of IEEE.

1.3 IEEE Code of Ethics

The IEEE Code of Ethics serves as the guiding light to keep us focused on maintaining and evolving our culture that makes the Transformers Committee one of the best technical committees in the Power & Energy Society's area. Below is the excerpt from the IEEE Policies, Section 7 – Professional Activities.

> We, the members of the IEEE, in recognition of the importance of our technologies in affecting the quality of life throughout the world, and in accepting a personal obligation to our profession, its members and the communities we serve, do hereby commit ourselves to the highest ethical and professional conduct and agree:
>
> 1. to accept responsibility in making decisions consistent with the safety, health, and welfare of the public, and to disclose promptly factors that might endanger the public or the environment;
> 2. to avoid real or perceived conflicts of interest whenever possible, and to disclose them to affected parties when they do exist;
> 3. to be honest and realistic in stating claims or estimates based on available data;
> 4. to reject bribery in all its forms;
> 5. to improve the understanding of technology; its appropriate application, and potential consequences;
> 6. to maintain and improve our technical competence and to undertake technological tasks for others only if qualified by training or experience, or after full disclosure of pertinent limitations;
> 7. to seek, accept, and offer honest criticism of technical work, to acknowledge and correct errors, and to credit properly the contributions of others;
> 8. to treat fairly all persons regardless of such factors as race, religion, gender, disability, age, or national origin;
> 9. to avoid injuring others, their property, reputation, or employment by false or malicious action;
> 10. to assist colleagues and co-workers in their professional development and to support them in following this code of ethics.

1.3.1 Affiliation

Given the core objectives of the standards development process to follow the concept of "openness" and "due process" in that it allows for equity and fair play we need to strive to have a balance of interests and not to be dominated by any single interest category. Moving forward, the disclosure of participants' affiliation shall include not just who you are, but also who is your financial sponsor.

1.4 Update on Geomagnetic Disturbance (GMD) Taskforce

The Technical Council Taskforce on GMD is continuing to make progress on the development of the position paper. The task force was able to complete an initial release of an article entitled ***Geomagnetic Disturbance and Its Impacts on the Power Grid*** in the PES Power & Energy Magazine in the July, 2013 edition to coincide with the GDM Super Session planned at the PES General Meeting in July, 2013 at Vancouver Canada. This is a little behind the original schedule set back at the end of last year,

primarily due to the additional scope of further analysis on transformers hot spots based on a recorded GIC profile of the GMD event that occurred during the March 13-14, 1989 solar storm. The entire GMD Super Session is recorded and available on YouTube (http://www.youtube.com/watch?v=gE-H8VSzNXY) with the key word search of "GMD Super Session."

The listing of the GMD SuperSession presenters is shown below in sequential order:

1. **Bill Chiu – Southern California Edison**
   Overview of GMD & PES Tech Council Task Force on GMD
2. **David Hilt – Quanta Technology**
   Regulatory Update
3. **David Boteler – Natural Resources Canada**
   Modeling Geomagnetically Induced Currents – The Evolution in Techniques over the last 30 years
4. **Ramsis Girgis – ABB St. Louis**
   Methodology for Evaluating the Impact of GIC and GIC Capability of Power Transformer Designs
5. **Jeff Dagle – Pacific Northwest Labs**
   Geomagnetic Storms and Long-Term Impacts on Power Systems
6. **Emanuel E. Bernabeu – Dominion Power**
   Impacts of GICs on the Dominion Power System
7. **John Kappenman – Storm Analysis Consultants**
   Low-Frequency Protection Concepts for the Electric Power Grid: Geomagnetically Induced Current (GIC) and E3 HEMP Mitigation – FERC Meta 322 Update
8. **Q&A & General Discussions**

1.5 Transformers Committee Activities

1.3.1 Officers Progression for the 2014-2015 Period

In accordance with the rules set forth in the Transformers Committee Organization and Procedures Manual, the Committee Officers (the Chair, the Vice Chair, and the Secretary) are recommended by the incumbent Chair of the Committee with the concurrence of the immediate Past Chair and are approved by the Chair of the Technical Council and is expected to serve two years a two-year term, and follows the established progression cycle for the next two-year period. As we approach the end of 2013, it marks the end of the two-year officers assignment period from 2012 to 2013. The table below shows the progression of officer's assignment for the next two years.

Officer Role	2012 – 2013 Term	2014-2015 Term
Committee Chair	Bill Chiu	Donald W. Platts
Committee Vice-Chair	Donald W. Platts	Stephen Antosz
CommitteeSecretary	Stephen Antosz	Susan McNelly
Past Chair / Awards Chair	J. Ed Smith	Bill Chiu
Committee Treasurer*	Greg W. Anderson	Greg W. Anderson
Standards Coordinator*	Willam (Bill) H. Bartley	Willam (Bill) H. Bartley

* Treasurer and Standards Coordinator are excluded from the officer progression cycle.

1.3.2 Subcommittee Chairpersons & Technical Editor

Our current roster of the Subcommittee Chairs and Editor are:

- Bushings Subcommittee **Peter Zhao**
- Dielectric Test Subcommittee **Michael Franchek**
- Distribution Transformers Subcommittee **Stephen Shull**
- Dry-Type Transformers Subcommittee **Charles Johnson**
- HVDC Converter Transformers and Smoothing Reactors Subcommittee **Michael Sharp**
- Instrument Transformers **Ross McTaggart**
- Insulating Fluids Subcommittee **Susan McNelly**
- Insulation Life Subcommittee **Bruce Forsyth**
- Meetings Subcommittee **Gregory Anderson**
- Performance Characteristics Subcommittee **Ed teNyenhuis**
- Power Transformers Subcommittee **Joe Watson**
- Standards Subcommittee **William Bartley**
- Underground Transformers & Network Protectors Subcommittee **Carl Niemann**
- Technical Editor **Sanjib Som**

All of them have committed to serve the duration of the calendar year 2013. PES Technical Council was notified of the Subcommittee Chairs and Technical Editor appointments for the calendar year 2013 in accordance with the guideline set forth in our O&P Manual.

1.4 IEEE Membership – Senior Grade

IEEE membership has several categories, with the senior level being the highest grade which a member can apply. IEEE has developed a streamlined process for members to request elevation of their membership status. The process is simple and can be done entirely online. The Chair strongly encourages everyone that has been an active contributor to the industry for at least five years to apply for this elevation in membership status. The basic qualifications are:

- be engineers, scientists, educators, technical executives, or originators in IEEE-designated fields;
- have experience reflecting professional maturity;
- have been in professional practice for at least ten years;
- show significant performance over a period of at least five of their years in professional practice.

Benefits of becoming a senior member include:

- **Recognition**: The professional recognition of your peers for technical & professional excellence.
- **Senior member plaque**: Since January 1999, all newly elevated Senior members have received an engraved Senior Member plaque to be proudly displayed for colleagues, clients and employers. The plaque, an attractive fine wood with bronze engraving, is sent within six to eight weeks after elevation.
- **US$25 coupon**: IEEE will recognize all newly elevated Senior members with a coupon worth up to US$25. This coupon can be used to join one new IEEE society. The coupon expires on 31 December of the year in which it is received.
- **Letter of commendation**: A letter of commendation will be sent to your employer on the achievement of Senior member grade (upon the request of the newly elected Senior member).
- **Announcements**: Announcement of elevation can be made in section/society and/or local newsletters, newspapers and notices.
- **Leadership Eligibility**: Senior members are eligible to hold executive IEEE volunteer positions.
- **Ability to refer other candidates**: Senior members can serve as a reference for other applicants for senior membership.
- **Review panel**: Senior members are invited to review senior member applications.
- **US$25 referral coupon**: Newly elevated Senior members are encouraged to find the next innovators of tomorrow and invite them to join IEEE. Invite them to join and the new IEEE member will receive $25 off their first year of membership.

1.4.1 IEEE Membership – Fellow Grade

The IEEE membership grade of Fellow recognizes unusual distinction in the profession and shall be conferred only by invitation of the Board of Directors upon a person of outstanding and extraordinary qualifications and experience in IEEE-designated fields, and who has made important individual contributions to one or more of these fields. IEEE Fellow nominees are classified into the following four categories:

- Application Engineer/Practitioner
- Educator
- Research Engineer/Scientist
- Technical Leader

IEEE Fellow is a distinction reserved for select IEEE members whose extraordinary accomplishments in any of the IEEE fields of interest are deemed fitting of this prestigious grade elevation.

According to IEEE Bylaw I-305.5, the total number of Fellow recommendations in any one-year must not exceed one-tenth of one percent of the voting membership on record as of 31 December of the year preceding. At the time the nomination is submitted, a nominee must:

- have accomplishments that have contributed importantly to the advancement or application of engineering, science and technology, bringing the realization of significant value to society;
- hold IEEE Senior Member or IEEE Life Senior Member grade;
- have been a member in good standing in any grade for a period of five years or more preceding 1 January of the year of elevation.

For further details please refer to the website
http://www.ieee.org/membership_services/membership/fellows/index.html

1.4.2 Committee Membership

All are welcome to participate in the work of the Transformers Committee. Membership in the Committee provides recognition of your peers and indication to your co-workers and management of your active role in Committee work. If you are presently not a Main Committee Member, and you have been actively participating in our work for at least two full year – and can secure the acknowledgement and sponsorship of at least 3 activity Chairs (WGs, but must include at least one Subcommittee Chair) affirming that participation, the Committee will look forward to welcoming you as a member. Membership requirements and application forms can be found in the Organization and Procedures Manual posted on the Committee website.

As our organization is a 100% volunteer based organization, we are very much in need of all of your continued participation and sharing of your expertise towards our world-class standards development efforts. Many of our long-standing committee members have made tremendous contributions towards our standards development effort over the years and their contributions are greatly appreciated.

Respectfully submitted,
Bill Chiu
Chair, IEEE/PES Transformers Committee

4.0 VICE CHAIR'S REPORT – DONALD PLATTS

4.1 IEEE PES Calendar of Upcoming Events
The table below lists the upcoming PES sponsored conferences and committee meetings. Please check the PES website at www.ieee-pes.org for further details.

2013 IEEE PES Asia-Pacific Power & Energy Engineering Conference
Dec 08 - 11, 2013 Location: Kowloon, Hong Kong

2014 IEEE PES Joint Technical Committee Meeting
Jan 12 -16, 2014 Location: New Orleans LA, USA

2014 IEEE PES Innovative Smart Grid Technologies Conference
Feb 19 - 22, 2014 Location: Washington DC, USA

2014 IEEE/PES Transmission & Distribution Conference & Exposition (T&D)
Apr 14 - 17, 2014 Location: Chicago IL, USA

PES 2014 General Meeting
Jul 27 - 31, 2014, Location: National Harbor, MD (Washington, DC Metro Area)

4.2 Conference Papers Submitted

4.2.1 2013 PES General Meeting (Vancouver, Canada July 21 - 25, 2013)

A total of 22 conference papers were submitted.
After review, 7 papers were scheduled for presentation at the Poster Session, 2 for the Paper Session and 4 for the Paper Forum. A large number -9 were rejected.

In addition, 4 authors of Transactions papers, that have been previously published, requested the opportunity to present their papers. Per the rules set up by the PES Tech Council, they will be scheduled, as requested. The presentation will be a joint session with PSIM, who will chair this session.

The papers that were accepted for presentation are:

ID	Title
GM0015	Impact of High PV Penetration on Distribution Transformer Life
GM0285	Impact of PEV Charging and Rooftop PV Penetration on Distribution Transformer Life
GM0792	Modal Parameters Identification of Power Transformer Winding Based on Hilbert-Huang Transform
GM0886	Simulation Analysis of Geomagnetically-Induced Currents (GIC) Effects on Shell-Form Transformers
GM1119	Study of Transformer Winding Deformation by Frequency Response Analysis
GM1238	A Tank Vibration Model For Online Monitoring of Power Transformer
GM1252	Power Transformer Immune to Geomagnetically Induced Currents
GM1409	Energizing and de-energizing of a 250 MVA transformer of a pumped storage power-plant: Modelling and its validation by on site tests
GM1412	Design and Implementation of Vibration On-line Monitoring System of Power Transformer
GM1415	Impact of the representation of the upstream network on the energization of a 340 MVA transformer: modelling and its validation by on site tests
GM1717	A Topology for Three-stage Solid State Transformer
GM2046	Methodology for Evaluating the Impact of GIC and GIC Capability of power Transformer Designs
GM2135	Impact of Axial Displacement on Power Transformer FRA Signature

4.3 Upcoming Conference Papers and Schedules

4.3.1 2014 IEEE PES Power Systems Conference & Exposition

Chicago IL --The deadline for paper submission was August 19 2013.
The Theme of the conference is *Fifty Years of Engineering Solutions*

A total of 14 conference papers were submitted. They appear in the table below. The review process, and the revise and resubmit evaluations are still in progress. A few have been accepted, a few others will be rejected, and the remaining papers have been sent back to the authors with a request that they be revised and resubmitted.

In addition, 3 authors of Transactions papers, that have been previously published, requested the opportunity to present their papers. Per the rules set up by the PES Tech Council, they will be scheduled, as requested.

4.3.2 2014 PES General Meeting

Jul 27 - 31, 2014, Location: National Harbor, MD (Washington, DC Metro Area)
The deadline for paper submission will be November 30, 2013.

The theme of the meeting is: *Charting the Course to a New Energy Future*. The Super Sessions planned have the following focus:

Cyber and Physical Security
Natural Disaster Preparedness, Planning and Response
Grid Operations: Practices and Challenges
Implementation of Smart Grid Projects: Results and Lessons Learned

2014 T&D Conf Paper Review	
ID	Title
14TD0004	PROBABILISTIC TRANSFORMER FAULT TREE ANALYSIS USING BAYESIAN NETWORKS
14TD0022	Transformer Life Cycle Management
14TD0109	Loss Estimation for Miniaturized AC Reactors Using Amorphous Toroidal Cores in 400-kVA UPS
14TD0118	Large Power Transformers: Changing operating conditions and advanced cooling solutions
14TD0256	Analytic Nonlinear Correction to the Impedance Boundary Condition
14TD0289	Thermal analysis of a three phase transformer by coupled simulation
14TD0295	Combining dry type RIF™ Paperless Solid Insulation Condenser Transformer Bushing With Built-in Novel Insulation Monitoring Function
14TD0298	Practical Aspects of Power Transformer Condition Monitoring
14TD0331	Advanced Transformer Fleet Monitoring System
14TD0332	Contributions to differences between on – site and factory measured noise levels of Power Transformers
14TD0347	Permanent PD Monitoring system for power transformers: is there a chance?
14TD0351	A measurement technique to identify and locate partial discharge in transformer with AE and HFCT
14TD0380	A Process for Evaluating the Degree of Susceptibility of a fleet of Power Transformers to Effects of GIC
14TD0411	The Three-Dimensional Electromagnetic Simulation Analysis of Power Transmission of Loosely Coupled Transformer Based on ANSYS
14TD0455	Advanced Tap Changer Control of Parallel Transformers based on IEC 61850 GOOSE Service
14TD0532	An Innovative Method for Cooling oil-immersed Transformers by Rayleigh-Benard Convection
14TD0557	Transformer Reliability – A Statistical Look

4.4 Changes to IEEE PES Conference Paper Rules

As noted in the Vice Chair reports from the fall 2012 and spring 2013 meetings, many of the rules for authors, and for the presentation of papers at IEEE PES technical conferences have changed. Authors should consult the following website. The IEEE PES explanation of these changes is published and can be reviewed at http://pes-gm.org/2013/index.php/call-for-papers.

4.5 Panel Sessions

The Transformers Committee has committed to sponsor a panel session at the T&D conferences. We have not yet completed the determination of the presentations, or who the panelists will be. Panelists won't be required to write summary papers to participate in panel sessions. Only PowerPoint presentations are required. Invited panelists are free to submit a conference paper on the topic they are asked to present, if they so choose, but it must be submitted to the on-line submission and review site by the conference paper submission deadlines listed above and it will be reviewed for acceptance under the same criteria as all conference paper submissions. Participation as a panelist does not guarantee that your conference paper submission will be accepted and published

5.0 SECRETARY'S REPORT – STEPHEN ANTOSZ

5.1 Membership Review

Voting Committee Members – Six new committee members were approved and added at the Milwaukee meeting as shown in the table below:

Name	Affiliation	Sponsor #1	Sponsor #2	Sponsor #3	Membership Category
James Bruce Fairris	Nashville Electric Service	Wally Binder WG's C57.117 & C57.125 (2yrs)	Joe Watson WG C57.148 Cont Cab (3yrs)	Joe Watson Power Transformer SC (4yrs)	User
J. Arturo Del Rio	Trench Ltd	Thang Hochanh PD Bushings & IT TF (5yrs)	Bertrand Poulin Low Frequency Test WG (5yrs)	Peter Zhao Bushings SC (5yrs)	Producer
David E. Buckmaster	Shaw Power	Philip Hopkinson WG C57.157 DETC (3yrs)	Peter Zhao Bushings SC (5yrs)	Joe Watson Power Transformer SC (3.5yrs)	User
Charles Sweetser	Omicron Electronics Corp USA	Jane Ann Verner WG C57.152 Field Test Guide (3yrs)	Stephen Shull WG C57.12.70 Terminals (2yrs)	Stephen Antosz PCS SC for C57.149 FRA(8yrs)	Producer
Hali Moleski	S.D. Myers, Inc.	H. Jin Sim IEC/IEEE Cross Reference (3yrs)	Richard Ladroga WG C57.104 DGA (3yrs)	Susan McNelly Insulating Fluid SC (3yrs)	General Interest
David Brender	Copper Development Assoc, Inc.	David Buckmaster TF/WG Wind Xfmrs (2yrs)	Derek Foster C57.12.91 Dry Type Test Code	Jeewan Puri Audible Sound SC (5yrs)	General Interest

The Transformers Committee AMS database of people currently has three general categories of participation in our activities. These are: **Interested Individual**, **Active Participant**, and **Committee Member**. Anyone can join our AMS 123 system as the system is designed for self-registration. A new participant will automatically be assigned the role of Interested Individual when they first sign up. Based on the level of participation, the committee administrative staff will upgrade the participation status to "Active Participant" when appropriate. The Committee Member status however, can only be attained through a formal application with the sponsorship of a minimum of three WG or SC chairmanships. Detail of the application requirements and approval process by the Administrative Subcommittee is outlined in our O&P manual.

The following table contains a count of the participants grouped by the three general categories.

Membership Status	Apr-11	Oct-11	Mar-12	Oct-12	Mar-13	**Oct-13**
Interested Individual	997	1061	1132	1205	1277	**1376**
Interested Individual - IEEE Life Member	2	4	6	7	8	**16**
Total Interested Individuals	**999**	**1065**	**1138**	**1212**	**1285**	**1392**
Active Participant	230	218	232	231	173	**178**
Active Participant - IEEE Life Member	5	5	6	6	5	**5**
Total Active Participants	**235**	**223**	**238**	**237**	**178**	**183**
Committee Member	210	218	182	182	186	**170**
Committee Member - Emeritus Member	1	8	6	6	6	**3**
Committee Member - IEEE Life Member	31	31	29	30	31	**25**
Total Committee Members	**243**	**258**	**217**	**218**	**223**	**198**
TOTAL IN AMS DATABASE	**1478**	**1546**	**1593**	**1667**	**1686**	**1773**

It is the responsibility of each individual to keep his/her profile updated, (except for the category).

5.2 New Member Applications

One new application for Committee Membership has been received since our previous meeting in Munich.

Name	Affiliation	Sponsor #1	Sponsor #2	Sponsor #3	Membership Category
Adam Bromley	**Fort Collins Utilities**	**Guiseppe Termini WG C57.12.24 3 ph Submersible (2yrs)**	**Ron Stahara WG C57.12.34 3 ph Padmount (2.5yrs)**	**Stephen Shull Distribution Trans SC (2.5yrs)**	**User**

The Committee welcomes and encourages active participants to become Members of the Committee. Requirements and application forms can be found in the Organization and Procedures (O&P) Manual, accessible on the Committee website. A copy of the Membership Application is attached as an Annex to this Secretary's Report. Subcommittee Chairs are encouraged to recommend new members, and to communicate the process of attaining membership through **active participation** and **contribution** at the WG and SC level. WG and SC Chairs are reminded also that signing an application sponsoring a new

member signifies their sponsorship that the applicant has met the requirement of membership and active participation for at least one year in the WG or SC they Chair. New member applications may be submitted to the Committee Secretary's attention at any time. Applications will be collected for review and approval in batches at each Administrative Subcommittee meeting.

5.3 Committee, Subcommittees, and Working Group Rosters

In order to provide indemnification to working group and subcommittee members it is crucial that membership lists be maintained. Our AM system has these functions built-in to ease these administration tasks. It is important that each subcommittee and working group chair keep the rosters updated so that this information can be provided to the IEEE SA.

A similar main committee roster has also been developed to track attendance for the Main Committee General Session meeting on Monday & Thursday. The data will be used to update participant's membership profile.

5.4 IEEE/PES and IEEE/SA Membership Requirements

As a reminder, all members of the Transformers Committee must also be members in good standing of the Power & Energy Society (IEEE/PES) and the Standards Association (IEEE/SA). There are a number of Transformers Committee members who have lapsed and must renew their SA and/or PES affiliation. These memberships are renewed annually along with your IEEE Membership renewal, which typically occurs around October/November of each year.

Reminder that WG Chairs must also be a member of the SC, IEEE, PES, and SA.

There are a number of Transformers Committee Members who are not PES or SA members. They will be given a reminder to renew these required memberships. If they do not comply then they will be dropped as Members. It is not fair to the other Members who adhere to this rule and pay the annual fees. Moreover, a person CANNOT participate in any ballot activity if they are not an SA member, and this is one of the basic responsibilities of an active member.

5.5 Committee Membership Maintenance

The committee roster has recently been updated. There were many members not attending, not actively participating, and/or not members of IEEE, PES, or SA, as required. They were notified and their membership status was changed. There were 229 members and now are 198 - see the attached updated membership list.

5.6 Essential Patent Claims

The Transformers Committee asks each participant at the time of meeting registration if they are aware of an essential patent claim, and if so to provide details. An Essential Patent Claim is any Patent Claim the use of which was necessary to create a compliant implementation of the IEEE Standard when there was no commercially and technically feasible non-infringing alternative. In other words, if an IEEE Standard REQUIRES the use

of a product or process that is already patented, then this could be an essential patent claim. If they did, they would be instructed to have the patent holder's legal team file a Letter of Assurance (LOA) with the IEEE-SA Standards Board Patent Committee. There is a link to this information on the transformerscommittee.org website under Patent Disclosure Requirements. For this St Louis meeting most people said No to the Patent question. There were 5 people who answered YES that they were aware of an essential patent claim. 3 of the 5 provided no details and were therefore not considered any further. The other two were reviewed: one referred to PC57.139 DGA of LTC's which said a LOA was signed in Jan 2013; and the other referred to a patent on natural esters but no LOA has been filed. We are reviewing the next steps that should be taken.

5.7 Affiliation

According to the IEEE Standards Board Bylaws, there is a requirement that participants of an IEEE meeting must disclose their employer and affiliation. Consultants must state if they are sponsored, or not. One cannot simply announce that "My name is John Smith, and I'm a consultant." If a client is sponsoring your presence, it must be disclosed. If the consultant does not have a sponsor, the proper introduction is something like....My name is John Smith, I'm a consultant, and I represent myself at this meeting.

5.8 Meeting Minutes

The minutes of the Munich Transformers Committee Spring 2013 meeting were posted to the committee website in May 2013.

Subcommittee Chairs are requested to submit their SC Minutes from the St Louis meeting by December 21, 2013.

The minutes should be submitted via e-mail to the Committee Secretary, Stephen Antosz at [santosz@ieee.org], with a copy to Susan McNelly [sjmcnelly@ieee.org] for posting on the Committee website.

The submittal file should be saved as a Word document formatted similar to this report and the assembled Minutes. The numbering for your report should match the numbering as indicated in the Main Committee General Session Meeting Agenda. Please indicate attendance count for each SC, WG, and TF meeting in your Minutes.

Respectfully,

Stephen Antosz

Secretary
IEEE PES Transformers Committee

IEEE PES
Power & Energy Society®

October 12, 2013

Annex - Membership Application and Eligibility Requirements

Date: _____

Applicant Name _____

Company _____

Address _____

_____

Email Address _____

Telephone _____Fax _____

IEEE Member Grade _____IEEE Member # _____

Member IEEE-PES? ☐ Yes ☐ No Member IEEE-SA? ☐ Yes ☐ No

List principal subcommittee and working group activity you have participated in:

1. _____

2. _____

3. _____

Examples of typical statements you may use to explain your participation:
I participated in the review of the draft of _____ and provided comments.
I participated in the survey of the draft of _____ and provided comments.
I have committed to participate in development of the draft of _____ and the WG Chair concurs.
I wrote (or worked with others to write) section ___ of the draft of _____.

This application is to be signed by the respective chairs as references. At least one reference must be a subcommittee chair, who will sponsor the applicant.

1. _____ _____ _____
Subcommittee/Working Group Duration Chair (Signature)

2. _____ _____ _____
Subcommittee/Working Group Duration Chair (Signature)

3. _____ _____ _____
Subcommittee/Working Group Duration Chair (Signature)

Applicant Name _____

Check the classification most appropriate for your position:

☐ Producer or Manufacturer Interests - Those directly concerned with the production of products which are covered by documents prepared by the Transformers Committee.

☐ Consumer or User Interests - Those who apply or use products which are covered by documents prepared by the Transformers Committee.

☐ General Interest - Those who have interests other than those described above.

Signed_____ Date_____

Approved by Administrative Subcommittee:

_____ _____
Chair Date

Membership Eligibility Requirements

Member in good standing of the IEEE Power & Energy Society and IEEE Standards Association.

a. A demonstrated interest and knowledge of the fields of Distribution, Power and/or Regulating transformers as expressed by working on standards, publishing papers, taking part in discussions of technical papers and presentations thereof.
b. Technical competence in one or more particular branch(s) of engineering as specified in the scope of the Committee.
c. Contributing regularly as a member of Subcommittee(s) and Working Group(s) during a two-year apprenticeship period.
d. Willingness to devote time and effort to contribute to the advance of the art by:

* Regular attendance at meetings and participation at the Subcommittee and Working group level
* Reviewing technical papers for presentation and publication, as may be assigned by the Vice Chair of the Committee.
* Committing to timely return of Committee ballots.

e. Continued participation in Committee functions such as serving as an officer, liaison representative, Subcommittee member, or Working Group member.
f. Actively participating in balloting of Technical Committee issues. SA membership is required for balloting.
g. Regular attendance at meetings.

Transformer Committee Members

as of Oct 21, 2013

1	Ahuja	Raj	51	Foldi	Joseph	101	Marlow	Dennis	151	Sarkar	Subhas
2	Allan	Dennis	52	Forsyth	Bruce	102	Matthews	Lee	152	Sauer	Daniel
3	Amos	Richard	53	Fortin	Marcel	103	McClure	Phillip	153	Schappell	Steven
4	Anderson	Gregory	54	Foster	Derek	104	McNelly	Susan	154	Schroeder	Stephen
5	Antosz	Stephen	55	Franchek	Michael	105	McShane	Charles Patric	155	Schweiger	Ewald
6	Arpino	Carlo	56	Ganser	Robert	106	McTaggart	Ross	156	Sewell	Jeremy
7	Arteaga	Javier	57	Garcia	Eduardo	107	Mehrotra	Vinay	157	Sharma	Devki
8	Asano	Roberto	58	Gardner	James	108	Melanson	Joseph	158	Sharp	Michael
9	Ayers	Donald	59	Gaytan	Carlos	109	Miller	Kent	159	Shekelton	James
10	Ballard	Robert	60	Ghafourian	Ali	110	Millward	Paul	160	Shertukde	Hemchandra
11	Balma	Peter	61	Ghosh	Saurabh	111	Molden	Arthur	161	Shull	Stephen
12	Bartley	William	62	Girgis	Ramsis	112	Moleski	Hali	162	Sim	H. Jin
13	Beaster	Barry	63	Graham	James	113	Moore	Harold	163	Sizemore	Thomas
14	Beauchemin	Claude	64	Graham	John	114	Mukerji	Amitav	164	Smith	Edward
15	Betancourt	Enrique	65	Griesacker	Bill	115	Mulkey	Daniel	165	Snyder	Steven
16	Binder	Wallace	66	Gromlovits	Mark	116	Murphy	Jerry	166	Som	Sanjib
17	Blackburn	Gene	67	Haas	Michael	117	Nguyen	Van Nhi	167	Spitzer	Thomas
18	Blaydon	Daniel	68	Hachichi	Said	118	Nicholas	Ray	168	Stahara	Ronald
19	Boettger	William	69	Haggerty	Norman	119	Nicholas	Ron	169	Stiegemeier	Craig
20	Boman	Paul	70	Hanique	Ernst	120	Niemann	Carl	170	Sweetser	Charles
21	Brender	David	71	Hanus	Kenneth	121	Olen	Robert	171	Swinderman	Craig
22	Brush	Edwin	72	Hardin	Michael	122	Oommen	T.V.	172	teNyenhuis	Ed
23	Buchanan	Paul	73	Harley	John	123	Papp	Klaus	173	Termini	Giuseppe
24	Buckmaster	David	74	Harlow	James	124	Patel	Bipin	174	Thompson	Jim
25	Bush	Carl	75	Harris	David	125	Patterson	Wesley	175	Thompson	Robert
26	Callsen	Thomas	76	Hayes	Roger	126	Penny	Brian	176	Traut	Alan
27	Castellanos	Juan	77	Heinzig	Peter	127	Perco	Dan	177	Trummer	Edgar
28	Cherry	Donald	78	Hochanh	Thang	128	Perkins	Mark	178	Tuli	Subhash
29	Chiu	Bill	79	Hoffman	Gary	129	Pezzin	Justin	179	Vaillancourt	Georges
30	Chu	Donald	80	Holdway	Timothy	130	Pierce	Linden	180	Veitch	Robert
31	Claiborne	C. Clair	81	Holifield	Thomas	131	Pink	Tony	181	Verdolin	Roger
32	Colopy	Craig	82	Hopkinson	Philip	132	Platts	Donald	182	Verner	Jane Ann
33	Crotty	John	83	Iman	Mike	133	Ploetner	Christoph	183	Vir	Dharam
34	Crouse	John	84	James, Jr.	Rowland	134	Pointner	Klaus	184	Wagenaar	Loren
35	Damico	Frank	85	Johnson	Charles	135	Poulin	Bertrand	185	Wallace	David
36	Darovny	William	86	Jordan	Stephen	136	Powell	Paulette	186	Wallach	David
37	Darwin	Alan	87	Kelly	Joseph	137	Prevost	Thomas	187	Ward	Barry
38	Davis	Eric	88	Kennedy	Gael	138	Progar	John	188	Watson	Joe
39	Degeneff	Robert	89	Kennedy	Sheldon	139	Puri	Jeewan	189	Wicks	Roger
40	Del Rio	J. Arturo	90	Khalin	Vladimir	140	Radbrandt	Ulf	190	Wilks	Alan
41	Dix	Larry	91	King	Gary	141	Rahangdale	Ravi	191	Wimmer	William
42	Dr Dohnal	Dieter	92	Klaponski	Brian	142	Rasor	Robert	192	Woodcock	David
43	Duckett	Don	93	Kraetge	Alexander	143	Rave	Martin	193	Xu	Shuzhen
44	Dudley	Richard	94	Lackey	John	144	Raymond	Timothy	194	Yang	Baitun
45	Elliott	Fred	95	Ladroga	Richard	145	Riffon	Pierre	195	Yu	Jennifer
46	Ellis	Keith	96	Lau	Michael	146	Robbins	Kirk	196	Yule	Kipp
47	Fairris	James Bruce	97	Lopez-Fernande	Xose	147	Roussell	Marnie	197	Zhao	Peter
48	Fallon	Donald	98	Lowdermilk	Larry	148	Sampat	Mahesh	198	Ziomek	Waldemar
49	Faulkenberry	Michael	99	Lundquist	Thomas	149	Sankar	Vallamkonda			
50	Feghali	Pierre	100	Marek	Richard	150	Sankarakurup	Dinesh			

6.0 TREASURER'S REPORT – GREGORY ANDERSON

MEMORANDUM

October 20, 2013

To: Bill Chiu
Chair, IEEE/PES Transformers Committee

RE: IEEE/PES Transformers Committee Treasurer's Report
Fall 2013 Meeting
(for reporting period 02/25/2013 to 08/01/2013)

Dear Bill,

The finances of the Committee are in excellent condition. As of 1st of August 2013 (end of this reporting period), the balance was $55,388.96.

There were no assets (PC projectors, etc.) purchased during this reporting period.

Expenses associated with the Munich Meeting were "as anticipated" (see comment in previous Treasurer's Report).

See attached summary for balances for this reporting period and the previous periods. Let

me know if you have any questions or concerns.

Sincerely,

Gregory W. Anderson, Treasurer IEEE/PES
Transformers Committee

IEEE/PES TRANSFORMERS COMMITTEE

Treasurer's Report - Fall 2013

(for reporting period 02/25/2013 to 08/01/2013)

AAAAA	**Balance before Fall 2011 Meeting , as of 09/27/2011**	**$60,022.97**
AAAA	**Balance before Spring 2012 Meeting , as of 02/22/2012**	**$47,864.80**
AAA	**Balance before Fall 2012 Meeting , as of 09/01/2012**	**$56,563.01**
AA	**Balance before Spring 2013 Meeting , as of 02/25/2013**	**$83,852.95**
	Misc Income, not meeting related	
	-- interest, approx 6 months	$119.45
	-- misc income (polo shirt sales, CD-ROM sales, book sales, etc.)	$0.00
B	Total Misc Income, not meeting related	$119.45
	Misc Expenses, not meeting related	
	-- 123Signup subscription fee, for 2 quarter(s)	$1,758.00
	-- awards	$189.91
	-- equipment purchases, major assets (projectors & cases, etc.)	$0.00
	-- technology (mobile app, WiFi equip, cables, etc)	$0.00
	-- conferences, remote meetings, etc.	$630.00
	-- other misc expenses (polo shirts, CD-ROMs, books, etc.)	$51.75
C	Total Misc Expenses, not meeting related	$2,629.66
	Fall 2012 Meeting	
	-- late income, meeting registrations (rolling reserve paybacks)	$0.00
	-- misc late income (incentives, late sponsor contributions, etc.)	$0.00
	-- late meeting expenses	$0.00
D	Total Late Income/(expenses), Spring 2012 Meeting	$0.00
	-- reported prelim. gain/(loss), as of 02/25/2013, from previous Treasurer's Report	$28,889.80
	Actual Gain/(Loss), Fall 2012 Meeting	$28,889.80
	Spring 2013 Meeting	
	-- income, meeting registration	$136,341.30
	-- income (coffee break sponsors)	$4,025.00
	-- meeting expenses	$166,320.08
E	Subtotal Income, Spring 2013 Meeting, between 02/25/2013 and 08/01/2013	($25,953.78)
	-- meeting expenses, before 02/25/2013, from previous Treasurer's Report	$0.00
	Preliminary Total Gain/(Loss), Spring 2013 Meeting	($25,953.78)
	Expenses, Future Meetings (deposits, etc)	
	-- meeting expenses, Fall 2013 Meeting	$0.00
	-- meeting expenses, other future meetings	$0.00
F	Total Expenses, future meetings, paid between 02/25/2013 to 08/01/2013	$0.00
G	**Net Income (loss), between Spring 2013 and Fall 2013 meetings (B - C + D + E -**	**($28,463.99)**
A	**Balance before Fall 2013 Meeting , as of 08/01/2013 (AA + G)**	**$55,388.96**

7.0 AWARDS REPORT – JAMES EDWARD SMITH

7.1 Committee Certificates of Appreciation
Transformers Committee Certificates of Appreciation have been obtained, with approval of the PES Awards & Recognition Chair, for the following Award recipients:

7.1.1 General Service Awards

James Edward Smith	Host-Fall 2013 Meeting, St. Louis, Missouri USA
The H-J Family of Companies	Host-Fall 2013 Meeting, St. Louis, Missouri USA
Bill Chiu	2012 – 2013 Transformers Committee Chair
Jerry Corkran	Certificate of Appreciation-For the many years of Outstanding Contributions to the Transformers Committee

7.1.1.1 Special Awards

Dr. Ramsis Girgis	IEEE PES GM in Vancouver Best Paper Award from the Equipment and Load Characteristic category. "The Methodology For Evaluating The Impact of GIC and GIC Capability of Power Transformers"
Dr. Ramsis Girgis	Transformers Committee recognition for the IEEE SA's Standards Medallion Award
Philip Hopkinson	Transformers Committee recognition for the IEC's Executive Committee's IEC 1906 Award
Axel Kraemer	Transformers Committee recognition for the IEC's Executive Committee's IEC 1906 Award
Hasse Nordman	Transformers Committee recognition for the IEC's Executive Committee's IEC 1906 Award

7.1.1.2 Membership Certificates-For distribution at the Fall 2013 St. Louis Meeting

No new members were reported for recognition at the Fall 2013 St. Louis Meeting

7.1.2 Task Force Service Awards

Taskforce on Geomagnetic Disturbance
The taskforce members, including industry experts outside of the Transformers Committee, pull together to develop a comprehensive industry paper that presented a broad perspective on the subject of GMD and its impacts on the power system. The final deliverable is a published article in the July/August, 2013 edition of the Power & Energy Magazine entitled: :
"Geomagnetic Disturbances and Its Impacts on Power Grid"
Bill Chiu – Chair
Dr. Ramsis Girgis – CoChair
Dr. Randy Horton – Vice Chair
Stephen Antosz – Secretary
Donald W. Platts – Technical Editor
William H. Bartley – Special Editor
Gary Hoffman - Special Editor
Dr. Luis Marti – Special Editor
James McIver - Special Editor
Jane Ann Verner – Special Editor
Mohamed Diaby - Significant Contributor
Thomas G. Lundquist - Significant Contributor
Loren Wagenaar - Significant Contributor

7.1.3 IEC's 1906 AWARD-The Transformers Committee is please to recognize Mr. Philip Hopkinson, Axel Kraemer & Hasse Nordman for receiving the IEC (International Electrotechnical Commission) 1906 Award. The IEC's 1906 Award recognizes exceptional current achievements of experts. Created in 2004 by the IEC Executive Committee, the 1906 Award commemorates the IEC's year of foundation and honors IEC experts around the world whose work is fundamental to the IEC. The Award also recognizes exceptional and recent achievement - a project or other specific contribution - related to the activities of the IEC and which contributes in a significant way to advancing the work of the Commission.

7.2 IEEE SA Standards Board Awards

In addition to the Committee Awards above, the IEEE SA SB presents its own Award to the WG Chair upon publication of a new or revised document, and offers the WG Chair the opportunity to nominate significant contributors to the project for an IEEE SA SB Certificate of Appreciation. All Working Group Chairs chose to have their awards sent direct to their residence or place of business. No awards will available for distribution at the Fall 2013 St. Louis meeting the list below should be called forward for recognition only.

IEEE SA Award Recipients:

C57.12.35 Standard for Bar Coding for Distribution Transformers and Step-Voltage Regulators
Lee Matthews – Chair, C57.12.35
Giuseppe Termini – Vice Chair, C57.12.35
Robert Olen - Significant Contributor, C57.12.35

C57.12.60-2009/Cor 1-2013 Standard Test Procedure for Thermal Evaluation of Insulation System for Dry-Type Power and Distribution Transformers, Including Open-Wound, Solid-Cast, and Resin-Encapsulated Transformers – Corrigendum 1 6/14/2013.
Roger Wicks – Chair, C57.12.60-2009/Cor 1-2013
Casey Ballard – Significant Contributor, C57.12.60-2009/Cor 1-2013

C57.152 Guide for Diagnostic Field Testing of Fluid-Filled Power Transformers, Regulators and Transformers
Jane Ann Verner – Chair, C57.152
Kipp Yule - Co-Chair, C57.152
Loren Wagenaar – Vice Chair, C57.152
Wallace Binder – Significant Contributor, C57.152
Mario Locarno – Significant Contributor, C57.152
Charles Sweetser – Significant Contributor, C57.152
John Herron – Significant Contributor, C57.152
Peter Balma – Significant Contributor, C57.152

*** * * * * REQUESTED RECOGNITION AT THE FALL 2013 ST LOUIS MEETING * * * * ***

C57.17 IEEE Standard for Arc Furnace Transformers
Robert G. Ganser Sr. - WG Chair, C57.17
Robert G. Ganser Jr. - Secretary, C57.17
Peter Balma - Significant Contributor, C57.17
William Bartley - Significant Contributor, C57.17
Dominico Corsi - Significant Contributor, C57.17
Frank Damico - Significant Contributor, C57.17
Thomas Lundquist - Significant Contributor, C57.17

*** * * * * REQUESTED RECOGNITION AT THE FALL 2013 ST LOUIS MEETING * * * * ***

7.3 IEEE Standards Association (SA) Awards and Recognition
The IEEE SA sponsors additional awards besides the WG Chair Awards reviewed above. Discussion of these awards can be found on the IEEE SA Awards web pages (http://standards.ieee.org/sa/aw/). Note particularly the IEEE SA Standards Medallion. Excerpting from the website: "The Standards Medallion is awarded for major contributions to the development of standards. Examples of such contributions may include leadership in standardization of new technologies, assuring achievement of standards development goals, identifying opportunities to better serve the needs of standards users or other such contributions viewed as deserving of this award…" Please review, and if you have suggestions for nominations see our Committee Awards Chair.

2013 Standards Medallion Award Fall 2013 St. Louis Meeting
On behalf of the IEEE we are very pleased to recognize Dr. Ramsis Girgis with an IEEE Standards Medallion award for his many accomplishments and years of dedicated service to the Transformers Committee, IEEE, PES and our industry as a whole.

7.4 PES Transformers Committee Distinguished Service Award
We will continue to present our PES Technical Committee Distinguished Service Award each year to one of our members who is recognized by his peers as having contributed significantly and consistently to Committee Standards activities. Excerpting from the PES Awards website: "Each Technical Committee is encouraged to make one award for outstanding service. This personal recognition acknowledges the efforts of those individuals whose sustained performance, over many years, has contributed to the advancement of the committee technology." Please see the Awards Chair if you have suggestions for future recipients. We are seeking nominations for this award.

7.5 PES Working Group Recognition Awards
In addition to the Technical Committee distinguished service Awards, PES sponsors Working Group Recognition awards. The awards are related to "outstanding and timely" publications of technical reports, or of standards and guides. Excerpting from the PES website (http://www.ieee.org/portal/site/pes/) Awards pages:

"The PES Working Group Recognition Awards recognize "the most outstanding and timely publications" by a PES Working Group (or Committee or Subcommittee) from among the nominations. The PES Recognition Award is divided into two categories: 1) for technical reports; 2) standards and guides. Each Technical Council Committee may nominate one report from each category, published by IEEE, during the previous three year period." This award consists of a plaque which will be presented to the Working Group Chair at the PES Summer Meeting Awards Luncheon. A framed certificate will be presented to each Working Group member at a designated meeting of the parent Technical Committee.

7.6 Transformers Committee Meritorious Service Awards
There is also a process of additional recognition for Meritorious Service and Outstanding Contributions to the Committee. Suggested qualifications have been developed from a review of similar awards presented by other IEEE Technical Committees or Societies. General examples for qualification for the awards include the following:

- To recognize continuing exemplary service in notable technical contributions to multiple Committee projects/documents over a sustained period of time

- To recognize an achievement of major value and significance to the Committee. The achievement can be a specific, concisely characterized accomplishment, as opposed to a collection of different efforts.
- As with the IEEE Education Society Meritorious Service Award – "to recognize pioneering contributions to the administrative efforts of the Society over a period of years, as evidenced by dedication, effort, and contributions."

If you have any additional thoughts on qualifications for Meritorious Service Awards, and if you have potential nominees to suggest, please contact me. Award nominees will be reviewed by the Awards Chair and the SC Officers.

7.7 Member Certificates

The Transformer Committee Membership Certificates were finalized and distributed at our Fall 2012 Milwaukee meeting. Those that were not handed out or picked up in Milwaukee and/or Munich will be available for pick up at our St. Louis, Missouri meeting. Any Transformers Committee member who has not received his/her membership certificate should make an effort to do so at our St. Louis meeting.

This program is one small way of recognizing your support for the Committee. The Certificates represent the appreciation of the Committee, and of your Committee Officers, for your service to the Committee, to IEEE, and to our Industry. We hope you will display your Membership Certificate proudly at your place of business, and encourage others to join us in our work. See section 6.1.1.2 of this report for the new membership certificates approved since the last meeting.

7.8 Nominations for IEEE, PES, and Technical Council Awards

Regarding IEEE Fellow Nominations, we need to think about nominations for 2013. Borrowing from the IEEE Awards web page . . . (http://www.ieee.org/web/membership/grade_elevation/grade_elevation.html): "The grade of Fellow recognizes unusual distinction in the profession and shall be conferred only by invitation of the Board of Directors upon a person of outstanding and extraordinary qualifications and experience in IEEE-designated fields, and who has made important individual contributions to one or more of these fields." Nominations, including references by at least five present IEEE Fellows and optional additional endorsements, must be completed and submitted by March 1 of each year for the following year's Class of Fellows.

Respectfully submitted,
James Edward Smith
Chair, Awards Subcommittee

8.0 ADMINISTRATIVE SC MINUTES – STEPHEN ANTOSZ

Introductions

The attendees were asked to introduce themselves. The chair asked each attendee to state his/her affiliation. If the attendee is a consultant, the attendee must state if he is representing a company other than his own consulting interest. Introductions were made by members and guests.

Attendance

Members present:
Gregory Anderson
Stephen Antosz
William Bartley
Ed teNyenhuis
Bill Chiu
Ross McTaggart
Susan McNelly
Donald Platts
Michael Sharp
Stephen Shull
Bruce Forsyth
Michael Franchek
Joe Watson
Peter Zhao
Charles Johnson
Edward Smith
Carl Niemann (& Dan Mulkey)

Members absent:
none

Guests present:
Erin Spiewak
Jodi Haasz
Peter Balma

8.1 Approval of Previous Meeting Minutes

The Chair asked for comments from the Munich Administrative Subcommittee meeting minutes. Hearing no comments or requests to change the draft minutes, the Chair asked for a motion to approve. Vote Approved.

8.2 Approval of Agenda

The Chair reviewed the draft agenda with the attendees. There was one comment from Jodi Haasz that she will report on the IEC meeting from last week in Milwaukee. The Chair declared the agenda approved.

Meeting Call to Order 2:00 pm

1.	Introduction of Members and Guests (:05)	All
2.	Approval of Spring 2013 Minutes from Munich (:03)	B. Chiu
3.	Additions to and/or Approval of the Agenda (:02)	B. Chiu
4.	Chair's Report (:05)	B. Chiu
5.	Vice Chair's Report (:05)	D. Platt
6.	Secretary's Report & New Committee Membership Approval (:10)	S. Antosz
7.	Treasurer's Report (:05)	G. Anderson
8.	Awards Report (:05)	E. Smith
9.	Standards Report (:30)	B. Bartley
10.	IEEE Staff Update (:10)	E. Spiewak/J. Haasz
11.	Meeting Planning (:10)	G. Anderson
	11.1. St. Louis Meeting Update	
	11.2. Future Meetings	

Break & Time Check – 3:30 pm

12. Old Business
    - 12.1. WG Data – Confidentiality, Storage, Access, & Use (:15) — S. McNelly/E. Spiewak
    - 12.2. Committee P&P (:05) — P. Balma
    - 12.3. GMD/GIC Position Paper (:05) — B. Chiu
    - 12.4. Meeting Improvement Initiative (:15) — D. Platts/B. Bartley
13. New Business
    - 13.1. Request from NERC SPCS Re: Sudden Pressure Relay (:05) — B. Chiu
    - 13.2. Energy router coordination (:05) — B. Bartley

Time Check – 4:30 PM

14. Subcommittee Reports - Roundtable
    - 14.1. Bushings (:03) — P. Zhao
    - 14.2. Dielectric Test (:03) — M. Franchek
    - 14.3. Distribution Transformers (:03) — S. Shull
    - 14.4. Dry Type Transformers (:03) — C. Johnson
    - 14.5. HVDC (:03) — M. Sharp
    - 14.6. Instrument Transformers (:03) — R. McTaggart
    - 14.7. Insulating Fluids (:03) — S. McNelly
    - 14.8. Insulation Life (:03) — B. Forsyth
    - 14.9. Performance Characteristics (:03) — E. teNyenhuis
    - 14.10. Power Transformers (:03) — J. Watson
    - 14.11. Underground Transformers & Network Protector (:03) — C. Niemann

15. Adjourn

8.3 Chair's Report – Bill Chiu

See section 3.0 of the Main Transformer Committee Minutes.

8.4 Vice-Chair's Report – Don Platts

See section 4.0 of the Main Transformer Committee Minutes.

8.5 Secretary's Report – Stephen Antosz

See section 5.0 of the Main Transformer Committee Minutes.

8.6 Treasurer's Report – Greg Anderson

See section 6.0 of the Main Transformer Committee Minutes.

8.7 Recognition and Awards Report –James Edward Smith

See section 7.0 of the Main Transformer Committee Minutes.

8.8 Standards Report – Bill Bartley

See section 9.0 of the Main Transformer Committee Minutes.

8.9 Meeting Planning Report – Greg Anderson

See section 10.0 of the Main Transformer Committee Minutes.

8.10 IEEE Staff Update – Erin Spiewak

IEEE-SA Public Review

AdHoc in place

- Approved at the SASB – Standards Association Standards Board
  - A Public Review that shall start simultaneously with the opening of the initial ballot and last for 65 days.
  - Any person may purchase the initial ballot draft for information only, and have the ability to submit public review comments on said draft without vote.
  - All public review comments shall be submitted electronically through the IEEE Standards Association public review tools
  - Implementation and training prior to roll out. Potentially July 2014

IEEE-SA Training Videos

In progress

- Training Initiatve
  - Two editorial videos are in the final stages of completion. Short, few minutes, to walk the user through steps of the process
  - Goal is to continue to develop additional videos. Suggest we link to Transformers Website once complete.

Non-Disclosure Agreement - NDA

Pending review and approval from legal

- Proposal
  - Setup an input site to allow submission of data to IEEE. Suggest we provide a spreadsheet for the input. Therefore, we could automate the compilation and ensure that the anonymity of the submitter is maintained
  - User will need to click through the NDA in order to access the compiled data

8.11 IEC TC14 Report – Jodi Haasz

See attached.

8.12 Old Business

8.12.1 WG on data integrity – Sue. Not much done yet. Working on a formal agreement for contributor of data and TC to sign, a spreadsheet for submission of data in a common format, and a non-disclosure for people who use it.

Housed on an IEEE server.

8.12.2 P&P – Peter. We are very close to having the P&P completed. Will submit for approval.

8.12.3 GMD/GIC position paper … is covered by Bill Chiu in the Chair's report.

8.12.4 Meeting Improvement Initiative – Don. Still working on it. 2 parts being considered;
Part 1. IEEE-SA Procedures reminders.
Part 2 How to conduct effective meetings

8.13 New Business

8.13.1 Request from NERC SPSC about sudden pressure relay settings. Bill Chiu will draft a reply and circulate it to Admin SC.

8.13.2 Energy router coordination with the Power Electronics Committee. Solid state transformer. ICC Industry Connections Committee is trying to identify emerging technologies and develop new standards. Bill Bartley is taking care of this.

8.14 Subcommittee Reports

Subcommittee	Report	Hot Topic
Bushings – P. Zhao		Arturo del Rio stepped down
Dielectric Test – M. Franchek		Wrapping up Class I/II redefinition Working with Phil to clean up the dielectric test table problems One slight change to the last minutes Need new Secretary
Distribution Transformers – S. Shull		Request from WG Chair Craig Colopy to move Regulators C57.15 to Power Transformers SC
Dry Type Transformers – C. Johnson		No Hot Topics
HVDC – M. Sharp		Comparison of IEEE & IEC Standards is being done. And dual logo status is being sought.
Instrument Transformers – R. McTaggart		New PAR at Standards Board for station service voltage transformers
Insulating Fluids – S. McNelly		Need new Chair and some WG Secretaries. C57.147 Natural esters should we continue the revision work due to the patent issues?
Insulation Life – B. Forsyth		Seeking dry-type insulation expert on what degrades insulation
Performance Characteristics – E. teNyenhuis		No Hot Topics
Power Transformers – J. Watson		Made motion to accept the move of C57.15 from Dist Trans. No second. C57.15 – 60076-21 C57.131 – 60214-1
Underground Transformers & Network Protector – C. Niemann		No Hot Topics
Standards SC – Bill Bartley		No Hot Topics

8.15 Adjourn Yes

IEC Report from Jodi Haasz, IEEE Standards Strategist

IEEE Transformers Committee
Report of the IEC TC 14 Meeting
Milwaukee, WI
Oct 20, 2013

IEC TC 14 Meeting Attendance

- 36 Participating Members
  - 18 Participating Members Attended the Meeting
- 10 Observing Members
- IEEE
  - Don Platts, IEEE Transformers Committee Vice-Chair
  - Jodi Haasz, IEEE Standards Strategist
- CIGRE
  - Representative from SC A2
- 51 total meeting attendees
  - 15 IEEE and IEEE-SA Members
  - 1 IEEE Member
  - 1 IEEE-SA Member (interested in joining IEEE)

Items Discussed

- Paul Jarman's Term as Chair ends 30-Nov-2014
  - Paul's term may be extended until 30-Nov-2017
- IEC 60076-4 - Power transformers - Part 4: Guide to the lightning impulse and switching impulse testing - Power transformers and reactors
  - IEEE has a similar document (IEEE C57.98-2011 – IEEE Guide for Transformer Impulse Tests). IEC TC 14 may be interested in harmonizing their document with IEEE's document
  - TC 14 agreed to circulate IEEE C57.142-2010 (IEEE Guide to Describe the Occurrence and Mitigation of Switching Transients Induced by Transformer, Switching Device, and System Interaction) for comment with the potential for adoption under the IEC/IEEE Dual Logo Agreement.
- Discussion of adoption of IEEE PC57.155 (Guide for Interpretation of Gases Generated in Natural Ester and Synthetic Ester Immersed Transformers) by IEC TC 10
- Interest in adding the tutorial information in Annex E of IEEE C57.131-2012 (IEEE Standard Requirements for Tap Changers, into the revision of IEC 60214-1, Tap changers - Part 1: Performance requirements and test methods)
- After the meeting, Craig Colopy indicated interest in having IEEE adopt the IEC standard
- Adoption of IEEE C57.143-2012, Guide for Application for Monitoring Equipment to Liquid-Immersed Transformers and Components

- Spanish National Committee indicated an interest in adopting the IEEE standard
- Spanish National Committee not present at the meeting
- Document not compatible with IEC 60076-1, Power transformers - Part 1: General
- Mention of “adapting” the IEEE standard
- Decision was made that IEC TC 14 needed more time to review it
- A joint revision may be possible in the future
- Discussion of Geomagnetic Induced Currents (GIC)
- CIGRE SC A2 (Transformers) mentioned work in this area
- IEEE (Don) mentioned a Power & Energy Society paper undergoing development
- It was noted that IEEE, CIGRE SC A2 and IEC should coordinate so that there is consistent messaging
- Mention of providing input into CIGRE SC A2 of IEC 62032 Ed.2 (2012-06) (IEEE Std C57.135™-2011), Guide for the Application, Specification and Testing of Phase-Shifting Transformers
- Appropriate copyright permission will be required

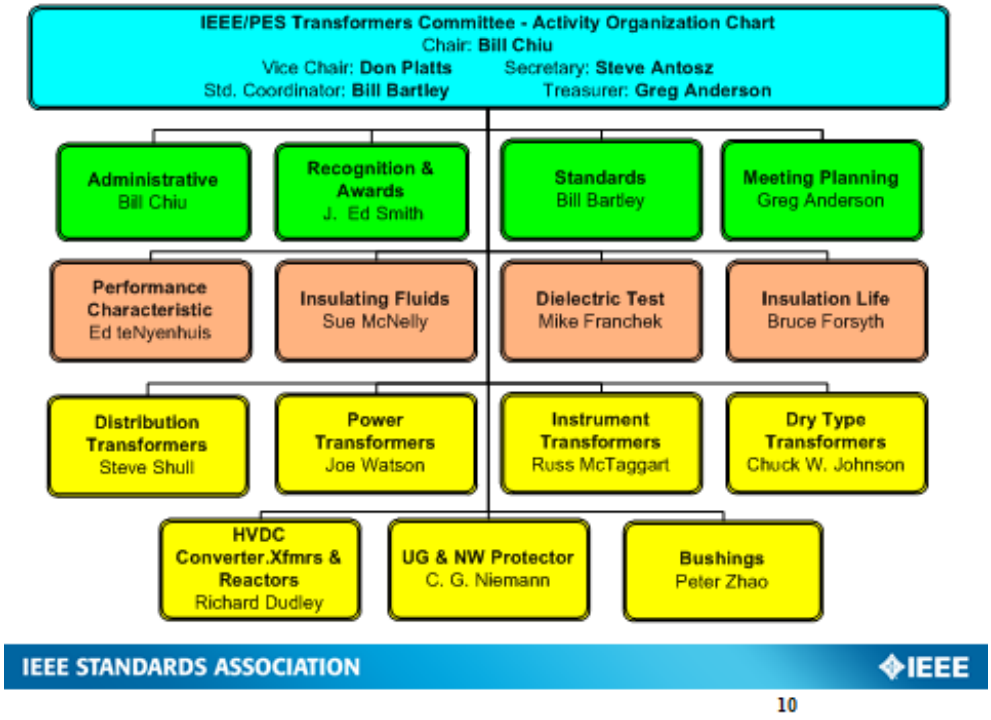
Current and Future Potential Projects

- IEC 60076-7 - Loading guide for oil immersed power transformers
  - May be interest from IEC TC 14 on merging this with IEEE C57.91-2011, Guide for Loading Mineral-Oil-Immersed Transformers and Step-Voltage Regulators
    - Lack of utility participants in IEC.
- IEC/IEEE 60076-16 – Standard Requirements for Wind Turbine Generator Transformers
  - There is confusion on this joint project, both on the part of IEC and IEEE. Further discussions will be needed this week to get this project back on track.
- IEEE C57.15-2009 (IEC/IEEE 60076-21) – Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators
  - IEC TC 14 agreed in principle to revise the document with IEEE. A Document for Comment (DC) will be issued to ensure that there is interest for this revision.
- Merger of IEEE C57.129-2007 (Standard for General Requirements and Test Code for Oil-Immersed HVDC Converter Transformers) and IEC 61378-2 (Convertor transformers - Part 2: Transformers for HVDC applications)
  - TC14 confirmed Mr. Anders Lindroth (Sweden) as the convenor of MT and agreed joint work with IEEE and noted the joint working arrangements. They agreed to issue a DC and to await the IEEE PAR. Subject to agreement of IEEE, IEC would issue a Review Report (RR) to establish the project.

IEEE Transformers Committee
Information for IEC TC 14
Don Platts, Vice-Chair
IEEE Transformers Committee
17-18 October 2013

Items of Interest

- IEEE Transformers Committee Organizational Chart
- IEC Adoptions of IEEE Standards
- IEC/IEEE Joint Projects
  - Current Projects
  - Potential Future Project
- IEEE Transformers Committee – Projects Under Development



IEC Adoptions of IEEE Standards

- IEC 60076-21 Ed. 1 (2011-12) (IEEE Std C57.15™-2009): Power Transformers — Part 21: Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators
- IEC 62032 Ed.1 (2005-03) (IEEE Std C57.135™-2001): Guide for the Application, Specification and Testing of Phase-Shifting Transformers
- IEC 62032 Ed.2 (2012-06) (IEEE Std C57.135™-2011): Guide for the Application, Specification and Testing of Phase-Shifting Transformers

IEC/IEEE Joint Projects

- Current Joint Projects
  - IEC/IEEE 60076-16 Ed.2: Power Transformers — Part 16: Transformers for Wind Turbine Applications
  - IEC/IEEE 60076-57-1202 Ed.1: Liquid Immersed Phase Shifting Transformers
- Potential Future Maintenance Project

Revision of IEC 60076-21 Ed.1: Power transformers - Part 21: Standard requirements, terminology, and test code for step-voltage regulators (IEC adoption of

IEEE Transformers Committee – Projects Under Development

- P1276 - Application Guide for Hi-Temp Insulation Materials in L.I. Power Transformers (2016)
- P60076-16 - Standard Requirements for Wind Turbine Generator Transformers (2016)
- P60076-57-1202 - Standard Requirements for Liquid Immersed Phase-Shifting Transformers (2016)
- P65700-19-03 - Standard for Bushings for DC application (2013)
- PC57.104 - Guide for the Interpretation of Gases Generated in Oil-Immersed Transformers (2014)
- PC57.106 - Guide for Acceptance and Maintenance of Insulating Oil in Equipment (2015)
- PC57.116 - Guide for Transformers Directly Connected to Generators (2015)
- PC57.12.00 - Std Gen Requirements for L.I. Distribution, Power, and Regulating Transformers (2015)
- PC57.12.01 - Standard for General Requirements for Dry-Type Distribution and Power Transformers (2015)
- PC57.12.20 - Std for Ovrhd-Distribution Transformers <500 kVA HV <34 500v; LV, 7970/13 800Y V (2016)
- PC57.12.24 - Standard for Submersible, 3-ph Transformers, <3750 kVA, HV <34 500 LV < 600 Volts (2015)
- PC57.12.28 - Standard for Pad Mounted Equipment - Enclosure Integrity (2014)
- PC57.12.29 - Standard for Pad Mounted Equipment - Enclosure Integrity for Coastal Environments (2014)
- PC57.12.31 Std for Pole-Mounted Eqpt - Enclosure Integrity - Corr 1: SCAB Corrosion Test /4.5.6 (2017)
- PC57.12.34 Std for Req’s-Pad-Mounted, Compart'l Self Cooled, 3 ph Dist Transformers, <10 MVA (2015)
- PC57.12.36 Standard Requirements for Liquid-Immersed Distribution Substation Transformers (2015)
- PC57.12.37 Standard for the Electronic Reporting of Distribution Transformer Test Data (2015)

- PC57.12.38 Std for Pad-Mounted-Type, Self-Cooled, 1ph Dist Transformers; <250 kVA (2014)
- PC57.12.39 Standard Requirements for Distribution Transformer Tank Pressure Coordination (2016)
- PC57.12.40 Standard for Network, 3-ph Transformers, <2500 kVA; Subway and Vault Types (2016)
- PC57.12.44 - Standard Requirements for Secondary Network Protectors (2014)
- PC57.12.59 - Guide for Dry-Type Transformer Through-Fault Current Duration (2015)
- PC57.12.90 - Std Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers (2015)
- PC57.120 - Guide for Loss Evaluation of Distribution and Power Transformers and Reactors (2014)
- PC57.121a - Guide for Acceptance & Maint of Less Flammable Hydrocarbon Liquids - Amendment a (2017)
- PC57.125 - Guide for Failure Investigation, Analysis, and Reporting for Pwr Transformers & Reactors (2015)
- PC57.13 - Standard Requirements for Instrument Transformers (2014)
- PC57.13.7 - Standard for Current Transformers with a Maximum mA Secondary Current of 250mA (2014)
- PC57.130 - Trial-Use Guide for the Use of DGA Applied to Factory Temp Rise Tests (2014)
- PC57.13- C 1 - Std Req for Instrument Transformers - Corrigendum 1: Figure 3 Correction (2014)
- PC57.136 - Guide for Sound Level Abatement and Determination for L.I. Power Transformers > 500 kVA (2014)
- PC57.138 - Recommended Practice for Routine Impulse Test for Distribution Transformers (2015)
- PC57.139 - Guide for Dissolved Gas Analysis in Transformer Load Tap Changers (2015)
- PC57.140 - Guide for Eval and Reconditioning of Liquid Immersed Power Transformers (2015)
- PC57.147 - Guide for Acceptance & Maintenance of Natural Ester Insulating Fluids in Transformers (2016)
- PC57.153 - Guide for Paralleling Power Transformers (2014)
- PC57.155 - Guide for Interpretation of Gases Generated in Ester Immersed Transformers (2014)
- PC57.156 - Guide for Tank Rupture Mitigation of Liquid-Immersed Pwr Transformers and Reactors (2015)
- PC57.157 - Guide for Conducting Functional Life Tests for DETC Contacts (2015)
- PC57.158 - Guide for the Application of Tertiary & Stabilizing Windings in Powr Transformers (2016)
- PC57.159 - Application Guide for Transformers in Photovoltaic Power Gen Systems (2016)
- PC57.160 - Guide for the Electrical Measurement of Partial Discharges in High Voltage Bushings (2017)

- PC57.161 - Guide for Dielectric Frequency Response Test (2017)
- PC57.162 - Guide for Interpretation of Moisture Parameters in Dry, Gas Insulated and L.I. Transformers (2017)
- PC57.19.01 - Std Performance Characteristics and Dimensions for Outdoor Apparatus Bushings (2014)
- PC57.19.04 - Std Perf Characteristics & Dimensions for High Current Bushings w/ Cont. Current >5000 A (2015)
- PC57.32 - Std Requirements & Test Procedures for Neutral Grounding Devices (2015)
- PC57.637 - Guide for the Reclamation of Insulating Oil and Criteria for Its Use (2014)
- PC57.93 - Guide for Installation and Maintenance of Liquid-Immersed Power Transformers (2016)
- PC57.94 - Guide for Installation & Maintenance of Dry-Type Distribution & Power Transformers (2015)

9 STANDARDS SC MINUTES & REPORT – WILLIAM BARTLEY

9.1 STANDARDS SUBCOMMITTEE MINUTES

The Chair opened the meeting calling a show of members to establish quorum which was met.

Bill then requested a review of the Agenda; after a couple of minor changes Dan Sauer moved for approval and Don Cherry seconded then the agenda was approved by unanimous vote.

1. Meeting Attendance

The Standards Subcommittee met on Wednesday, October 23, 2013, at 4:30 PM. A role call showed 28 of 50 members in attendance achieving quorum at the meeting. Overall there were 87 attendees, 28 members, 59 guests, including 6 that requested membership upon tabulation of the circulated rosters with 4 meeting the established criteria.

2. Approval of previous meeting minutes

The Chair asked if there were any comments or corrections to the previous meeting minutes of the Fall 2012 meeting in Milwaukee, Wisconsin and the Spring 2013 meeting in Munich, Germany. There were no comments to the meeting minutes; Steve Shull moved for approval and Don Platts seconded then the minutes were approved by unanimous vote.

3. Chair's Remarks

Bill summarized the recent activities of the Transformer Standards activity for the six-month period March 15 to September 30, 2013. In the last five months, no new Standards, one Revision and one Corrigenda were approved by Standards Board. In this same period, Standards Board approved two PARs for new standards and one PAR for an amendment. The Transformer Committee is responsible for almost 100 standards, plus over 55 PARs, projects for new standards and revisions. The full Standards Report is available on the Transformers Committee website at the following link:

http://www.transformerscommittee.org/meetings/F2013-StLouis/Minutes/F13-StandardsStatus.pdf

The Chair reminded everyone that there are all the due dates for submittal to NESCOM and REVCOM along with past tutorials, presentations and instructions on the process, links to MyBallot with instructions, references and templates for preparing standards that can be found by a link from the Standards subcommittee page of the Transformers Committee website or directly at:

http://www.transformerscommittee.org/subcommittees/standardsc/StdsDevelopment.htm

The Chair reminded everyone that a standard has a validity period of ten years from the date of Standards Board approval and an overview for revising standards can be found at:

http://standards.ieee.org/develop/revisestds.html

Bill reviewed some items for the TC Adcom

a. WG internal ballots must achieve 2/3 approval before proceeding to a formal ballot
b. A Mandatory Editorial Compliance (MEC) Review and Legal Review is required.

Richard Marek asked what needed to be submitted?

Dan Sauer asked if this will be in the Committee rules?

Sanjab Som asked on the 2/3 approval how was that determined; Gary Hoffman said, it is 2/3 of respondants

4. Working group reports.

a. Continuous Revision of C57.12.00

The purpose of this WG is to compile all the work being done in various TF/WG/SC's for inclusion in the continuous revision of C57.12.00 in a consistent manner. This WG coordinates efforts with the companion Standard C57.12.90 so that they publish together. The goal is to issue new Standards every 2 to 3 years.

Standard C57.12.00 was published September 2010. A new PAR was requested in April 2011 and approved June 16, 2011 to cover the ongoing work for the continuous revisions. This PAR is good through December 31, 2015.

At this point several changes / additions to the standard have been approved by the respective subcommittees and are ready to go into the document. The Dielectric Tests Subcommittee is finishing work on revisions to Tables 4 and 5, which I deem critical to have included in this next revision. There also is still an outstanding issue concerning a possible equation error (pointed out to me at Milwaukee meeting) that I need to investigate. Once these steps are completed, I will solicit input from all subcommittees for any additional changes they may have ready for inclusion in the next ballot.

Subject to the successful outcome of the preceding statements, I expect in early 2014 to form the ballot pool and launch the ballot.

Respectfully submitted, by Steven L. Snyder, WG Chair, on October 23, 2013

b. Continuous Revision of C57.12.90-2006

This is essentially a working group of one person. There was no meeting held. The purpose of the WG is to keep track of the work being done in various TF / WG / SC for inclusion in the continuous revision of C57.12.90 in a consistent manner.

Summary

The new PAR was approved on June 15, 2011. It is valid until Dec 31, 2015.

Future Revisions

Changes *already approved* for the next revision:

- New subclause 10.2.5 Connection of neutral terminal during switching impulse tests by Pierre Riffon's WG Revision to Impulse Test in Dielectric Test Subcommittee. Submitted on 4/27/09.
- Revisions to Clause 12 Short-circuit tests and new Annex on Connections diagrams for testing three-phase transformer using alternate single-phase source by Marcel Fortin's Task Force in the Performance Characteristics Subcommittee. Submitted in Fall 2009.
- Revision to subclause 10.3.2.4 Tap connections during lightning impulse test by Pierre Riffon's WG Revision to Impulse Test in Dielectric Test Subcommittee. Submitted on 10/28/10.
- Revisions to subclauses 10.2.1,10.3 and 10.3.3 which increases the number of full wave impulse waves applied from one to three. This is the same as IEC
- Revisions to Clauses 6 & 7 Polarity & Phase-relation and Ratio tests from Mark Perkins' PCS WG for Revision of C57.12.90. Final survey circulated in Sept 2011.
- Revisions to Temperature-rise tests by Paulette Payne Powell's WG in the Insulation Life Subcommittee

- Subclause 11.1 which reversed the order of appearance of the two methods of simulated loading for temperature test. Submitted in January 2013.
- Subclause 11.2.2 which revised items "a" through "f" of the hot resistance measurement procedure for temperature test. Submitted in January 2013.
- Subclause 11.1.2.2 Loading back method. Added text and Revised Figures 28 & 29. Submitted in September 2013.

pending work

- Revision to Clause 13 Audible Sound by Ramsis Girgis' TF in the Performance Characteristics Subcommittee.
- Other possible revisions to subclauses 10.2-10.4 from Pierre Riffon's WG for revision of impulse tests.
- Other possible revisions to subclauses 10.5-10.10 from Bertrand Poulin's WG for revision of low frequency tests. Maybe some change due to Class II PD test on 69 kV, xfmrs >15 MVA.
- Other possible revisions to subclause 9.5 Zero Phase Sequence Impedance from Mark Perkins PCS WG for Revision of C57.12.90.

Respectfully submitted by Stephen Antosz, WG Chair, on October 2013

c. WG on Revision of IEEE PC57.152 (old 62) – Loren Wagenaar

The Working Group has completed its work and the standard has been published.

d. Task Force for Comparison of IEEE & IEC Standards for Cross Reference

The task force for IEEE-IEC cross reference did not meet at the St Louis meeting. Since the last time comparison of IEC and IEEE standards were taken up IEC standards 60076-1, 60076-2 and 60076-3 were revised and published.

Ajith Varghese (SPX Transformers) has agreed to compare the test requirements in the IEEE and the IEC standards and Hasse Nordmann (ABB transformers) agreed to compare the temperature rise requirements in the IEEE and IEC standards. Vinay Mehrotra (SPX transformers) will compare the requirements in the IEC 60076-1 standard and the c57.12.00 standard.

The comparisons of these standards will be presented at the next task force meeting.

Respectfully submitted by Vinay Mehrotra on October 23, 2013

e. TASK FORCE on Recommendations to the IEEE Transformer Committee (TC) on Recommended Changes, Deletions, and Insertions Related to Normalizing the References of Insulating Liquids Throughout the IEEE TC Standard Series – P. McShane–TF Chair

Patrick McShane reported the task force did not meet as too many assignments were outstanding.

5. Old Business

a. None

6. New Business

a. None

7. Adjournment

The meeting was adjourned by Chair without objection; the meeting adjourned around 5:10pm.

Respectfully submitted by Jerry R. Murphy, Standards SC Secretary

9.2 STANDARDS REPORT

The Standards Report is a separate document, and is usually posted on the transformerscommittee.org website. An extra copy is attached here at the end of these minutes. It is titled “F13 Standards Report”.

10 Meetings Planning SC Minutes & Report – Gregory Anderson

10.1 Meetings Subcommittee Minutes

No written report.

10.2 Meetings Report

No written report.

11 MINUTES OF TECHNICAL SUBCOMMITTEES

11.1 PERFORMANCE CHARACTERISTICS SC – ED TENYENHUIS

11.1.1 Performance Characteristics Subcommittee – Chair: Ed teNyenhuis; Vice-Chair: Craig Stiegemeier; Secretary: Sanjib Som

Introduction / Attendance

The Performance Characteristics Subcommittee (PCS) met on Wednesday, October 23, 2013 at 3pm with 145 people attending. Of these, 49 were members and 96 were guests. Prior to this meeting, the total membership of PCS was reduced from 108 to 68, as 40 members were not regularly attending meetings. With 72% of the current membership in attendance, a quorum was achieved. The assumption made for removing members was that if they missed 2 of the last 3 meetings (Nashville, Milwaukee & Munich), they lost membership status and were moved to guest status. At the next meeting, they may request membership again and if criteria in effect are met, they will be reinstated as PCS members

There were 10 guests requesting membership at the meeting. For those that requested membership, if they had attended 2 of the last 3 meetings (Milwaukee, Munich & St. Louis), they were granted membership. The new PCS members are:

Emil Bercea
Cheng Cheng
Jinho Kang
David Murray
Brian Penny
Jarrod Prince
Vijay Tendulkar
Sukhdev Walia
Kipp Yule

Krishnamurthy Vijayan also requested membership, but he did not qualify as he did not attend the Milwaukee or Munich meetings.

Approval of Agenda

The Chair presented the agenda. This was proposed by Steve Synder to be accepted as presented. Sheldon Kennedy seconded it. It carried by unanimous vote.

Approval of Last Meeting Minutes

The chairman presented the minutes of the last meeting in Munich, Germany – March, 2013. This was proposed by Sheldon Kennedy to be accepted as is, which was seconded by Alan Traut. The minutes were passed by unanimous vote.

Chairman's Remarks

The chair requested volunteers to lead the below standards that expire in 2018:

C57.105 - IEEE Guide for Application of Transformer Connections in Three-Phase Distribution Systems
C57.109 - IEEE Guide for Liquid-Immersed Transformers Through-Fault-Current Duration

C57.110 - IEEE Recommended Practice for Establishing Transformer Capability When Supplying Non-sinusoidal Load Currents
C57.136 - IEEE Guide for Sound Level Abatement and Determination for Liquid- Immersed Power Transformers and Shunt Reactors Rated Over 500 kVA
C57.21 - IEEE Standard Requirements, Terminology, and Test Code for Shunt Reactors Rated Over 500 kVA

For C57.110, Rick Marek has agreed to Chair with Co-Chair Raddslaw Szewczyk

Various WG and TF reports were present as detailed later.

Unfinished (Old) Business

No old business.

New Business

Phil Hopkinson approached the chair to state as below:

"I want to make a motion to the Performance Characteristics Subcommittee that language be placed in IEEE C57.12.00 and IEEE C57.12.01 that states:

"Switching of vacuum and or SF6 breakers may result in transformer failures and needs careful consideration as is identified in IEEE C57.142."

I am constantly reviewing transformer failures that have the common denominators of:

1. Breaker on either the source or load side of the transformer.
2. Shielded cables on either side of the transformer.
3. Light currents within the chopping current of the breaker.
4. Very low power factor circuits at the point of switching.

It is always the transformer that fails. The customer never seems to understand that the C57.142 document exists to describe interaction and asks "Why didn't you tell me that the transformer is vulnerable"?

The question is appropriate. In the main document of IEC TC 14 (IEC 60076-1), we spell out the existence of C57.142. I believe that we need to do it here."

After this, the following discussion took place. Don Platts opined that this may not fit into C57.12.00 or C57.12.01 since those are for electrical and mechanical characteristics. Another member opined that then we should warn about ferro-resonance, Geo-magnetically induce current, etc. Craig Stiegemeier opined should the profile for the switching impulse be reviewed. Sanjib mentioned that such transients actually caused resonance which cannot be always predicted but bad effects are preventable by RC circuits (snubber). David Buckmaster warned that we should not be sending the wrong message. Phil accepted that the snubber is a good idea because in 18 years when he started recommending snubber there has not been a single failure on those. Dhiru Patel opined that the BIL for design should be changed.

Finally a vote was taken with 14 for, 18 against and 1abstaining. The motion did not pass.

Meeting was adjourned at 4.15 pm.

Working Group (WG) and Task Force (TF) Reports (all unapproved)

10.4.1 PC57.120 LOSS EVALUATION GUIDE FOR DISTRIBUTION AND POWER TRANSFORMERS AND REACTORS

Tuesday October 22, 2013
Al Traut, Chair, Don Duckett, Vice-Chair, Dave Harris - Secretary
PAR Status: PAR Approved
PAR expiration Date: 12/31/2014
Current Draft Being Worked On: D13

- Attendance
  - 69 Total
  - 17 of 27 Members
  - 49 Guests
  - 3 Guests requesting membership
- The meeting was called to order at 11:00 am on Tuesday, October 22, 2013.
- Attendance of membership was taken and a quorum was established.

Chair Report

Al Traut outlined the PAR status and expiration and noted that we need to go to ballot no later than immediately after the Spring 2014 meeting.

Old Business

Minutes of the Fall 2012 Milwaukee and Spring 2013 Munich meetings were unanimously approved as submitted.

Discussion regarding uncertainty resulted in an action to look into incorporating a statement on uncertainty of the assumptions and impact on the A factor and B factor calculations.

Need to make sure the document reflects the correct designations for cooling classes, eg, ONAN vs OA, etc.

A Task force was formed to prepare the document for ballot and present to the WG at the Spring 2014 meeting in Savannah. Members are Alan Traut, Don Duckett, Wally Binder, Don Platts, Mike Miller, and Ulf Radbrandt

New Business

None

11.1.2 **Working Group on PCS Revisions to C57.12.90**

October 21, 2013, 11:00am-12:15pm

Mark Perkins, Chairman; Craig Stiegemeier, Secretary

1. Introduction of members and guests

   Mark Perkins presided over the meeting at Chair. Craig Stiegemeier was secretary. Attendance rosters were circulated for those in attendance to record their presence and confirm their membership or guest status.

   An introduction of members was conducted.

   A roll call of members was taken, and 37 of the 63 active members of the WG were in attendance. This resulted in a quorum of 59% of the membership, making this meeting "official."

2. Minutes of the Munich meeting

   At the Spring 2013 Munich meeting there was not a quorum present, so the previous meeting minutes were approved by email vote. Information from the Munich meeting is incorporated into the minutes from this St. Louis meeting.

3. Old Business

   The main task of the working group was to develop revisions Clause 9.5 - Zero Sequence Testing. At the Munich meeting a draft of the changes to this section was circulated and discussed, and lacking a quorum, it was necessary to conduct a survey of the working group for approval and comments on the draft. The survey was emailed to the working group members and there were 38 of 63 members that returned the survey for a return percentage of 60%. The approval was unanimous with four members returning comments.

   - Baitun Yang commented that we should include YYY transformer without delta winding. The group considered this suggestion and decided by vote of the working group to leave the section as it was in the survey.
   - During the discussion, the chair presented information regarding figure 25 that a 1997 transactions paper by Chen and Venkata had researched this circuit model and in effect found that moving the Z3 branch from the tee point to terminal 1 was more accurate. The group pointed out that the zero-sequence diagram shown in Figure 1 has been used for many decades and has been published in all of the applicable literature, so making any change would require further research. So the chair agreed to include a copy of the Chen and Venkata paper in the minutes so the members could review and comment.
   - Comments by Polo Rodriguez suggesting that the text in sections 9.5.1, 9.5.2 and 9.5.3 could be clarified were discussed. The group voted to leave the text as it had been surveyed.

- Comments by Shamaun were discussed suggesting that the standard stipulate that three measurements be required at different current levels when the zero sequence impedance is expected to be non-linear. Again the group voted to leave the text as it had been surveyed.
- Ajith Varghese suggested that the warning to not exceed the maximum neutral current be added to item b on section 9.5.1. The group unanimously accepted this suggestion.

Having considered all comments, the group unanimously agreed to send the changes in zero sequence testing to the working group on continuous revision to C57.12.90.

The chair then mentioned that there was no further new or old business for the working group to consider and asked the group if there was any suggestions for the group to consider. Unless further suggestions come from the review of minutes of this meeting, it will not be necessary for the working group to meet at the next meeting.

4. New Business - There was no new business

5. Attendance roll call – Before the meeting, the Working Group had 67 members, broken down as the following:
   63 Members
   4 Corresponding Members
   >300 Guests
6. Adjournment – Motion made and passed to adjourn at 12:11 pm

11.1.3 PCS WG on "General Requirements C57.12.00" – Steve Snyder, Chairman; Enrique Betancourt, Secretary

The PCS Working Group on General Requirements for C57.12.00 met on Monday, Oct.21, 2013 at 4.45PM with **43** members and **77** guests present. As the current Working Group membership stands at **71** members, we did have a quorum and were able to conduct official business. The following **13** guests requested membership, which will become effective only after attending two (2) consecutive meetings:

Ali Naderian	Kinectrics
Marnie Roussell	Entergy
Soni Mahendrakumar	Virginia Transformer Corp.
Roger Verdolin	Teshmont Consultants LP
John K. John	Virginia Transformer Corp.
Mark Lachman	Doble Engineering
Shawn Luo	Seattle City Light
Jeewan Puri	Transformer Solutions, Inc.
Hemchandra Shertukde	University of Hartford
Kiran Vedante	ABB Inc.
Emil Bercea	ABB Inc.
Cheng Cheng	Moloney Electric
Ewald Schweiger	Siemens

The Chairman opened the meeting by stating the purpose of the Working Group, that is to address matters pertaining only to performance characteristics in standard C57.12.00. Following introductions and circulation of the attendance sheets, the proposed Agenda was approved (**Raj Ahuja** and **Loren Waagenar**).

As there was not a quorum at the previous meeting held in Munich, the minutes from that meeting could not be approved. However, the unapproved minutes were posted on line and circulated for the membership. No comments were made regarding the records from that meeting.

Discussion on Old Business topics

WG Item **87**, Approval of a New Version for Table 15 in C57.12.00, Short Circuit Apparent Power of System to be Used Unless Otherwise Specified. (Addresses negative comment from 2006 ballot.)
A Task Force studied the Table and provided new recommended short circuit power values, and explanatory text. The item had already been subjected to survey twice, the last time with 81% approval. The Chairman proposed to send the new proposed Table and text to the Standards Committee as part of a new version of C57.12.00. The motion was presented and supported by **Mark Perkins** and **Bruce Forsyth**. The Working Group approved the motion with **25** Members in Favor and **4** Members Opposed.

WG Item **96**, Request for "Routine" Resistance Measurements on Class II Power Transformers with LTC in all tap positions. The proposal was made by Joe Foldi (negative ballot from 2009) and has been a subject of discussion for the last three meetings, and in a small study group consisting of Joe and Tauhid Ansari. Joe was not present as he could not attend this TC meeting, but he and Tauhid were able to send new text for the proposal. There was a lot of lively discussion on this proposal that was finally brought to a motion. The motion was made to adopt the proposed text with further review of specific language for final version in the standard. **Kenneth Skinger** and **Tauhid Ansari** were first and second for this motion. The motion was rejected with **14** Members in Favor and **19** Members Opposed.

WG Item **97**, Operational Test of LTC Equipment in All Tap Positions, a proposal made by Joe Foldi (negative ballot from 2009). From discussions at the Munich meeting, Joe and Tauhid developed new text with two additions which were presented to the Working Group as a part of the discussion topics for the meeting. DGA monitoring requirements were discussed and questioned by several participants. Paul Jarman explained similarities of LTC test with present requirements in IEC standards. It was also stated that some users already request this test for their large transformers. After much discussion this item was tabled for additional review prior to the next meeting.

WG Item **99**, Clarification of Measurement Error on Transformer Ratio While Checking LTC Units with Preventative Auto in Bridging Position. This issue was first raised in the C57.12.90 working group meeting in 2010. Discussions were held in two prior meetings, and Raj Ahuja agreed to take this under consideration and present a proposal for the WG to consider. The proposed new paragraph, which would be inserted in C57.12.00 Section 9.1 Tolerances for ratio, follows:

"For transformers with reactance type tap changers, the turns ratio at bridging tap position is the mean average of the two adjacent non-bridging tap positions, since the Preventive autotransformer/Reactor provides the center tap. When measuring the ratio by small voltage application used by ratio meter, at bridging tap position the excitation current/burden drawn by reactor affects the output voltage and the ratio value displayed by the instrument. For example, if the measured ratio at 12R is 4.0 and at 14R tap is 4.2, at tap position 13R (bridging tap position) the ratio measured should be 4.1, but in actuality the ratio measurement display may be 4.15 which can become out of tolerance if ratio at 12 R is at 0.4% Tolerance."

After discussion, a motion was made to adopt this new text subject to the outcome of a survey within the subcommittee for editorial changes. Motion by **Vinay Mehrotra** and seconded by **Eduardo Garcia**.
The motion was approved with **27** Members in Favor and **1** Opposed.

As time was expiring, the meeting adjourned at 5:55 PM with **Richard Amos** and **Loren Wagenaar,** as first and second in this motion.

11.1.4 WG for IEEE Standard Requirements, Terminology, and Test Procedures; for Neutral Grounding Devices, PC57.32;

Sheldon P. Kennedy – Chair, Tom Melle - Vice Chair

The Neutral Grounding Devices working group was called to order at 4:45 PM on October 22, 2013.

Agenda reviewed and approved.

1. Quorum was established from new membership survey – 12 working group members were present with 24 guests.
2. Minutes from last meeting approved. Motion by Devki Sharma. Second by Peter Balma. Ballot Results, Unanimous.
3 New draft document in Word 2007 format. Please do not save in different versions as changing formats has destroyed template macro function in the past. Tom Melle (vice chair) is maintaining the official draft document.
4. Mike Sharp reported that the Grounding Reactors section does not need any further changes.
5. Klaus Pointner reported that the Ground Fault Neutralizers does not need any further changes.
6. Sergio Panetta reported that no further changes are needed for the Grounding Resistor and Combined Devices sections.

7. Sheldon Kennedy reported that the grounding transformer section still is in need of further work.

   As reported at the last meeting the existing IEC and IEEE temperature calculation methods for liquid filled transformers give different results for the same design. The IEC method always gave higher temperatures for the cases studied. The results of the two methods do not show a constant relationship to each other.

8. The IEC method is straight forward based on physics. It is documented in IEC 60076-5 clause 4.

9. The existing IEEE method contains constants and factors that are not documented as to meaning or source. Efforts to reproduce the table information have not been successful.

10. The existing liquid filled transformer table is based on 55 degree rise insulation systems. Modern designs are built with 65 degree rise materials. The 55 degree rise information could be kept as is and a note added acknowledging that this is a conservative practice

11. The existing Dry type transformer classes not consistent with current practice and materials. The standard should at least cover the modern IEEE insulation classes. Sheldon Kennedy sent a short write-up on thermal capability to WG members before this meeting.

12. Other transformer documents that address short circuit use an all heat stored calculation for short circuit temperature calculation. The conductor temperature limits used are 250 degrees C for copper and 200 degrees C for aluminum. Temperatures above these values create high risk of conductor annealing.

13. Motion: Don Ayers made a motion to adopt the current IEC method and put the old method into an informative annex. Klaus Pointner seconded the motion. The vote results were 2 yes votes and 2 No Votes. There was 1 abstention. This motion failed.

14. Motion Sergio Panetta made a motion to use the IEEE all heat stored calculation with the IEC method as an alternate method, Don Ayers seconded the motion. The vote was 2 yes and 2 no. The motion failed.

15. Motion: Mike Sharp made a motion to use the IEEE all heat stored method with the existing tables moved to an informative annex. Klaus Pointner seconded the motion. The vote was 8 yes and 0 no.neg 0 (Unanimous)

16. Motion: Don Ayers mad a motion to use the conductor temperature limits of 250 degrees C for copper and 200 degrees C for aluminum. Mike Sharp seconded the motion. The vote was 9 yes and 0 no. The motion passed.

17. Draft update: Tom Melle reported that the current draft has the individual sections mostly complete in the prior IEEE template. He also had the old IEEE 32 document is the new template. It was agreed to continue with the current draft rather than starting over with the old IEEE 32.

18. Schedule: Issue draft 12 for review by the end of 2013. Complete draft and have ready for a Subcommittee Survey by the Spring 2014 Meeting. If this is successful, we will go for a ballot. This document must be approved by the end of 2015.

19. The test sections should rely on references to the general C57 equipment standards as much as practical instead of reproducing all of the test information in this document.

20. The use of metric and US customary units will need to be reviewed for compliance with IEEE policy.

11.1.5 (3/2013 not received) WG on Tertiary/Stabilization Windings PC57.158 – Enrique Betancourt, Chairman; Steve Snyder, Secretary

The Chair Enrique Betancourt called the WG meeting to order at 9:30 am on October 21, 2013, Secretary Brian Penny was also present. A statement was made as to the Working Group's purpose for preparing this Guide for publication.

Introductions and a member roll call were taken. As of this meeting the Working Group consists of **43** regular members and **2** corresponding members. **21** Members were counted in attendance thus a quorum was not attained. Additionally there were **48** guests with **8** of them requesting membership in the Working Group.

Frank Damico	TAMINI Transformers
Shawn Luo	Seattle City Light
Tamyres Machado Junior	Siemens
Subhas Sarkar	Virginia Transformer
Michael Shannon	Rea Magnet Wire
Andy Speegle	Entergy Services
Kiran Vedante	ABB
Sukhdev Walia	Brookfield Renewable Power

There were no comments on the minutes from the Munich meeting which were not submitted for approval as a quorum was not attained. Approval of these minutes will be addresses by the Chair via e-mail communication with the WG members.

1. Old Business

Contributions for the sections listed below of the first draft were received from the following individuals.

- (Fundamentals for) Short circuit Analysis of Transformers with Tertiary Windings – Jagdesh Burde
- Function of the Stabilizing and Tertiary Winding – Brian Penny
- Application of Stabilizing and Tertiary Windings – Stephen Anthony
- Testing of Tertiary Windings – Ajit Varghesse

The following sections listed are currently awaiting contributions to be submitted by volunteers.

- Overview on Application of Transformers with Stabilizing Windings- A Systems Perspective
- Behavior (performance) of Transformers with Stabilizing / Tertiary Windings under Short Circuit- Adequacy of Current Standards
- Behavior under Transient and Continuous Unbalance Conditions on Main Windings
- Behavior of Transformers and Autotransformers without Stabilizing / Tertiary Windings
- Specification of Transformers with and without Stabilizing Windings

The chair plans to complete the Overview, Scope and the Background Information sections plus reformat the section numbering sequence in accordance with IEEE requirements. A partial list of references and how they will be formatted was provided in Annex A - Bibliography.

The WG has now available a page within the IEEE TC PCS web site, which will be used as a repository for password protected reference materials and for development of the Guide. Based on the requirement to have this document completed by March 2016, it is necessary for the WG to follow a timetable with detailed milestones to begin the process of reviewing submissions, reorganizing, reformatting and eliminating redundant information from our present rough first draft version to the final version of the document. WG participants are highly encouraged to post and review revisions of the document via the website in order to speed up the development of the Guide to meet the timetable's schedule. The Chair will investigate with officials of the Committee if a Standard Timetable with generic milestones is available as reference for our work.

A brief overview of the Guide in its current state was presented which led to a series of discussions on the items to be addressed in this document. A comment by Frank Damico on whether special transformers should be included in addition to Y-Y and auto connected. David Ostrander on addressing the requirement for a stabilizing winding from the transformer manufacturer's point of view and Jim McIver questioned how the systems engineer requirements will be covered in the document. The Chair explained that both of these issues could be addressed in the overview section.

Even though system requirements drive the need for stabilizing windings, in form of zero sequence impedance and protection facilities, it was stated that from experience it is typically not the systems engineers calling for the use of stabilizing windings on transformer purchases. Sanjay Patel told of one user who does not use stabilizing windings but provides a performance requirement in their specification; this is an example of the user needs to define zero-sequence impedance performance requirements in order for the manufacturer to understand how to design the stabilizing winding to deal with system issues.

Listed are additional items suggested to be considered in the Guide.

- Consideration of 5 leg core designs where saturation of the three main limbs by zero sequence voltage drives full flux through return limbs

- It is very common application to use internal reactors to limit the short circuit current for low impedance stabilizing windings, what is the effect on these internal reactors
- Clarification on how to account for high short circuit currents when the leads are brought out of the stabilizing winding
- Utility vs. industrial transformer applications – unbalanced loads and ungrounded Y

The Chair request volunteers to follow-up on the following items.

- Review stabilizing winding requirements for shell form core designs - Xose Lopez-Fernandez & Mathieu Sauzay
- Review of recommendations for the specification and testing of stabilizing windings - Ajit Varghesse
- Annex B - Symmetrical Components – No volunteer

Prior to the meeting, Saurabh Gosh stepped back from his position as the Co-Chair of the WG. WG Secretary Brian Penny has agreed to assume this responsibility. Jim McIver has volunteered to take over the responsibilities of the WG Secretary.

2. New Business

No new business was presented before the working group.

The meeting was adjourned at 10:40 am.

Respectfully submitted,

Enrique Betancourt
WG Chair

Brian Penny
Secretary

11.1.6 TF on Revision of Section 13 of C57.12.90, Sound Level Measurement

Unofficial Minutes of Fall 2013 Meeting in St. Louis, MO

The TF met at 1:45 PM on Monday, October 21, 2013, with a total of 85 in attendance. This breaks downs to 13 Members, 8 Corresponding Members, and 64 Guests. Seven guests requested membership. Prior to the meeting, the membership had been adjusted to 25 members and an agenda with the unapproved minutes were circulated to all members and corresponding members for review.

At the start of the meeting, a request for corrections or comments to the unapproved minutes of the spring 2013 Munich meeting was made without objection. An updated agenda with a few more items added was presented. A quorum had been established after reviewing the signup rosters. The spring 2013 TF meeting minutes stand approved.

After introductions, Chairman Dr. Ramsis Girgis presided over the technical portion of the meeting. Per the usual practice of this Task Force, a summary review of all the prior agreements made in the TF was presented to assure the group doesn't regress into repeating discussion. This helps maintain focus on completion of unfinished clauses. The basic review included:

- Making the following corrections when using the “Sound Pressure Method”:
    - Wall sound reflection correction
        - Per the IEC formula, but limit the correction to 4 dB instead of 7 dB and limit # of test room cases to 4 instead of 7
    - Near-field correction
        - 1 dB for ONAN contour, no correction for the ONAF contour
- Using the “Sound Intensity Measuring Method”
    - As an alternate method
    - Use newly developed correction for $4 < (Lp - Li) \leq 6$ dB
    - Consider method invalid for $(Lp - Li) > 6$
        - In this case, use the “Sound Pressure Method” with appropriate corrections
- Measuring Load Noise
    - Measure when requested by purchaser
    - Can measure at current 60 % $\leq$ I rated $\leq$ 130 % and correct accordingly; in line w / IEC
- Changing the ONAF measuring contour
    - 2 m all around transformer; in line with IEC
- Determination of Total Noise level of a transformer
    - Adding Load and No Load noise levels logarithmically; in line w / IEC

The next item on the agenda was the continuation of addressing new proposed additions and changes to the text of clause 13.

First item of discussion was clauses 13.3.1 and 13.3.4 dealing with the tap position to be used for measuring no load noise. Per the decision made at the Munich TF meeting, a text that mainly used the section of the IEC Standard that refers to this matter was reviewed in the meeting. The purpose was to consider the following cases that were brought up in this, and the Munich meetings:

- Transformers with Preventive Autos where the no load noise could be higher at tap positions other than the nominal position; including cases where Tap windings may contain different turns per tap.
- Designs with series (booster) transformers, where the excitation of the transformer is highest at tap extremes
- Variable flux designs where no load noise is highest at a tap at, or near, a tap extreme

The text presented dealt with these cases. It was suggested that the main statement of “Measuring no load noise at the principal tap, unless otherwise specified”; which outlines the requirement, is kept the same; with the different cases of possible higher no load noise levels at tap positions other than the nominal be stated under it. It was agreed that the text should be clear that the tap position to be tested on be agreed upon by both the manufacturer and the purchaser and it should be stated in the test report. This could include testing the transformer at the highest noise producing tap position. The agreement would also include which measurement to use for the guarantee.

It was agreed that the chairman will modify the proposed text according to results of above discussion and will send it for review to those who attended the TF meeting.

One of the meeting attendees asked whether this Clause 13 could include comments and limits allowed for differences between measured noise levels of transformers at the factory versus what is measured in the field. The chairman commented that this is outside the scope of this Standard. He added that there is an IEEE paper, co – authored by him that has been recently submitted for presentation at the upcoming T&D conference, dealing with sources and magnitudes of these differences.

The next item presented and agreed upon in the TF meeting was the “Determination of the Total Noise level of transformers”. A numerical example is also included in this section of Clause 13 for clarification.

Four additional text modifications to Clause 13 were presented. These are:

1. Load noise to be measured at the ONAF contour with no fans running. This simplifies the calculation of the total noise level of the transformer and also load noise is typically a contributor to the total noise of the transformer only at high loading conditions when fans are running.
2. Removing the text in the present section 13.5.4 that allows arithmetic summation of Sound Pressure level measurements made around the transformer to obtain the “Average noise level of the transformer”. First, the arithmetic sum is not accurate enough. It is also unnecessary since performing the more accurate logarithmic summation is a simple task.
3. Removing section 13.5.6 which describes the computation of the A-weighted sound power level of the transformer using 1/3 Octave and narrow band Sound pressure measurements. The reason is that this is not what is typically done. What is done is what is described in section 13.5.5; where the A-weighted sound power level of the transformer is computed using the measured average dB (A) level of the Sound Pressure of the transformer.
4. Updates to section 13.7 “Presentation of Results” as a result of introducing the new corrections when using the “Sound Pressure Method”, Using the “Sound Intensity Method”, and measuring Load noise.
5. Modifications to Appendix – B as a result of introducing measuring Load noise.

At the end of the meeting, the chairman acknowledged the help by his associate Mr. Mats Bernesjo for his help with putting together the material of the presentation. He also acknowledged TF members from Siemens, Smit, Alstom, and ABB who provided tested values of Load noise data for over 180 medium and large power transformers. This data will be presented in the spring of 2014 TF meeting as part of developing Reference Levels of Load noise versus MVA that would be equivalent to the NEMA levels for no load noise.

The plan is to finalize a draft of the revised Clause 13 and to send it for review by those who attended the TF meeting and discuss the feedback in the spring meeting.

The meeting was adjourned at 3:00 PM.

11.1.7 WG P60076-16 Standard Requirements for Wind Power Generator Transformers

Chairman: David Buckmaster; Vice Chair: Phil Hopkinson: Secretary: Donald Ayers

The Working Group on Wind Power Transformers was called to order at 9:32 a.m. CST on Tuesday, March 22, 2013 at The Renaissance Hotel, Landmark 4 Salon, St. Louis, Missouri. There were 130 attendees, 30 members present of a membership of 52 and 90 guests. A quorum was present. Jodi Haasz, IEEE liason, indicated that she must be removed from the member rolls due to her position.

The following guests have requested membership on the Working Group:

Susmitha Tarlapally, ABB, Jefferson City, MO
Gary King, Howard Industries, Laurel, MS
Jeewan Puri, Transformer Solutions, Inc., Matthews, NC from corresponding member
Edwin Brush, BBF & Associates, New Harbor, ME
Rogelio Martinez, GE Nogales Dry Transformers, Nogales, Mexico
Ali Naderian, Kinectrics, Toronto, ON, Canada
Baitun Yang, Pennsylvania Transformer, Canonsburg, PA
Hemchandra Shertukde, University of Hartford, Hartford, CT
Kevin Sullivan, Duke Energy, Lake Mary, FL
Aniruddha Narawane, ABB Inc., Jefferson City, MO

The following guest requested corresponding membership on the Working Group:

Kiran Vedante, ABB Inc., St. Louis, MO

The agenda for the meeting was approved by all members.

The minutes from both the Fall 2012 meeting and the Spring 2013 meeting were approved by all members present,

Jody Haasz, IEEE, made a presentation on the methodology of creating a dual logo standard with IEC. The presentation will be placed on the Working Group's web site.

Chairman, Dave Buckmaster, requested a volunteer to amend the IEC forward to the document to include IEEE reference. Jody Haasz stated that a joint IEEE-IEC committee had already agreed to the dual logo standard language.

Previously edited IEC document sections were forwarded to Tom Breckenridge the IEC WG Chair (Convener) for comments to be finalized during their first scheduled meeting in London in late November.

Chairman, Dave Buckmaster, stated that the paper pertaining to Dissolved Gas in Oil Interpretation from GE does not fall within purview of this standard. However a request for amendment will need to be forwarded to C57.104 Working Group.

Phil Hopkinson, HVolt, Inc., made a presentation on the causes of gassing in Wind Farm transformers, particularly Hydrogen gas generation. He also presented a couple of solutions

that can be implemented to prevent the gas generation. The presentation will be placed on the Working Group's web site. General consensus of the attendees was that the information presented should be included in the final document in some form.

Jeewan Puri agreed to head up a task group to propose how to include the information from Phil Hopkinson's presentation as well as several other subjects into the standard, most likely in an Annex. The subjects to also be considered are: (1) Transient voltages caused by interaction between breakers and transformers; (2) Switch and DETC contact carbonization, (3) Low Oil level exposure of live parts.

The meeting was adjourned at 10:50 a.m. CST.

11.1.8 – WG on "Distributed Photo Voltaic (DPV) Grid Transformers" PC57.159, Chairman Hemchandra Shertukde; Vice Chairman: Mathieu Sauzay; Secretary: Sasha Levin

AGENDA

1. Introduction

2. Roster and Quorum Verification

3. Approval of the Munich Meeting Minutes

4. Review of the Draft of the Guide:

- Topic Leaders and Contribution

- Content – Chapters and Topics

5. Timeline of the IEEE Guide preparation for ballot.

6. New Business

The Working Group met in the Landmark 7 room of Renaissance Grand Hotel St. Louis. This was a third meeting of the WG.

The meeting was called to order at 8:00 am by Chairman Hemchandra Shertukde.

The meeting was convened with 51 participants present, 15 of them are members (that constitutes a quorum out of 29 current members in the roster plus 3 absent corresponding members), 8 participants requested a membership.

Old Business

Munich Meeting Minutes were approved.

New business

Meeting Agenda was approved.

Chairman has described the current status of the Guide, commented on the slow progress with contributions and asked the Secretary S, Levin to make a more detailed review of the Draft 1.1. of the Guide.

1. Section 3 Definitions.

C. Johnson recommended to review IEEE C57.12.80 – **S. Levin** will do this (**ACTION**).

2. Section 4. Background and specifics of the typical DPV Power Generation Systems in relation to a transformer application.

S. Sarkar wanted to have a clear idea on the harmonic content in relation to IEEE C57.18.10. This topic is will be covered in Section 5. E. Betancourt commented that there is no harmonics content over 5% that needs to be considered. G. Anderson referred to the published paper where the effect of the individual harmonics on the insulation was studied. **S. Levin** to request the work from Greg and to distribute to the WG (**ACTION**).

J. Mamtora commented on the potential problems when two windings on the same core have some voltage difference. This aspect will be addressed in Section 6. Also J. Mamtora thinks that we need to involve inverter manufacturers in the work of WG.

S. Walia informed that there is a number of different configurations / technologies of DPV systems that they see in the field and these systems can have different performance. **S. Walia** will provide the information about an experience his company has with those different systems (**ACTION**).

S. Sarkar asked about what is known on the possible asyncronization of the inverters. E. Betancourt commented that there are no requirements to consider this situation in the known to him specification.

E. Betancourt will propose the material to be included in the Guide based on the presentation about specification he provided to the WG (**ACTION**).

Enrique also mentioned the requirements for the mutual impedance between the portions of the windings that can be seen in some specifications. This needs to be included in Section 5.

V. Tendulkar commented that the switching frequency harmonics significantly vary depending on the configuration of the system and inverter manufacturer. He also noticed that the systems under consideration often include reactors and the harmonics content can be different in this

case. **Vijay** will review the topics and materials in the current Draft of the Guide and provide his input (**ACTION**).

J. Yu agreed to continue leading the Section 4 (**ACTION**). **Jennifer** talked about a variety of configurations of DPV systems and she will contact a developer(s) in obtaining more information on those configurations and other topics of Chapter 4 (**ACTION**).

E. Betancourt noticed that we need to review the recent publications and recent development in the field of the DPV PGS – it can be significant changes in this system going forward. There are some groups in CIGRE that study similar topics (e.g. group on the study of the effect of the multi-directional power flow on transformers. **Sasha** will request additional information on those groups from Enrique (**ACTION**).

H. Sherdukte and V. Tendulkar will review available information on the progress in DPV PGS (**ACTION**). **Vijay** will also review available specifications and decide what material can be used in a work of our WG (**ACTION**).

3. Section 5. Transformer parameters selection and transformer design.

S. Kennedy will continue leading the work on this section (**ACTION**).

J. Cheng described a variety of winding design configurations he's seen over time. Sometimes the specified requirements are not explained, e.g. the different BIL tests were requested for the cases with or without connected ground shield with no specific reason described. **John** will review the material he has and provide input for the work of our WG (**ACTION**).

G. Anderson mentioned that the very wide variation of temperatures can be an issue for these types of transformers: desert-like location, day/night operation – this can create mechanical forces and thermal cycling.

Regarding a variety of requirements for impedance, V. Tendulkar mentioned the issues related to the specific filters location in the DPV systems and combination of reactor and transformer functions with the required high transformer impedance.

J. Mamtora raised the question about no-load loss and efficiency of the transformers as related to switch off the grid operation for the loss savings. J. Verner commented that in her organization transformers are not switched off even though the period of power generation can be relatively short (4.5 hours). The practical examples of the operation of these transformers need to be obtained.

H. Sherdukte to provide the available information on the optimization of the performance of the DPV PGS transformers (**ACTION**).

C. Johnson will review the available information and experience in the field of the dry-type transformers for this application and decide what information would benefit the development of the Guide (**ACTION**).

J. Prince volunteered to review available information and provide input in the development of the Guide (**ACTION**).

B. Jensen has requested the membership in WG and informed that he has some previous experience with the small scale PV systems and would like to contribute to the work of the WG (**ACTION**).

4. Section 6. Transformer general requirements, construction and protection.

E. Betancourt will lead the work on this section (**ACTION**).

E. Betancourt will find a specialist on the arc-flash specifics and protection within his organization and will ask on development this topic for the Guide (**ACTION**).

Discussion on ground fault: recommendation on the grounding and grounding transformer need to be included. **S. Kennedy and V. Tendulkar** will work on this topic of the Guide (**ACTION**).

It was recommended that the specific consideration of the public safety will not be included in the guide, but recommendation on the useful warning signs can be included.

5. Section 7. Transformer test and commissioning.

D. Ayers will continue lead the development of this section (**ACTION**).

D. Ayers commented that after polling other members of his group, they do not, at the moment, see any specifics as for the factory tests of DPV PGS transformers.

The reference will be made to the appropriate standards (IEEE C57.12.01, C57.12.90, C57.12.91).

Some specifics of the necessary thermal test including harmonics may be considered, if deem necessary.

D. Ayers will review available standards on the transformer commissioning and look at whether any other groups in IEEE Transformer Committee are working on this topic currently (**ACTION**). Comment was made that the available standards might be related only to the power transformers of the higher voltage classes.

6. Section 8. Transformer diagnostics, monitoring and maintenance.

N. Field commented that **J. Roach** continues leading the development of this section (**ACTION**). Norm asked for the input on the current practices and the field test results from the end users.

J. Yu commented that the only additional diagnostic measure compare to the regular distribution transformers (that she knows about) is DGA. It needs to be noticed that DPV PGS transformers often can have ester fluid insulation. **N. Field** to contact J. Yu to discuss whether more information on the field diagnostics can be obtained and the difference between DPV PGS transformers and regular distribution transformers can be detected (**ACTION**).

H. Sherdukte to provide information on the PD investigation performed on the West Coast (**ACTION**).

J. Verner will contact the end users to obtain information on what diagnostics, monitoring and maintenance are typical for these transformers and whether there are any specific issues and/or problems identified (**ACTION**).

7. Section 9. Transformer specification.

M. Sauzay is leading this section (**ACTION**).

Identified important aspects of the transformers under consideration will be recommended for inclusion in the specification.

M. Sauzay asked all section leaders and section TF members to identify what they think needs to be included in the transformer specification.

With no old or new business the Meeting adjourned at 9:15 AM.

Chairman: Hemchandra Shertukde

Vice Chairman: Mathieu Sauzay

Secretary: Sasha Levin

11.1.9 TF to Investigate the Interaction between Substation Transients And Transformers in HV and EHV Applications Chairman Jim McBride

Task Force Meeting took place on Tuesday at 3:14pm in Landmark 7.

The chair opened the meeting with a brief introduction to the objectives and goals of the task force.

The below goals for the group were reviewed for those not present at our first two meetings.

Goal: Prepare a TF report on the need to revise the C57.142 guide to extend to HV and EHV applications.

Deliverables:

TF report and recommendation on forming a WG to revise the guide (or not)

TF Objectives

- Establish the present target voltage class range of the C57.142 guide
- Gather field data, reports and literature on HV and EHV failures related to substation transients and transformer interaction
- Get input from the other technical committees concerning the interactions between substation transients and transformers at HV and EHV applications
- Review IEC and CIGRE standards
- Recommend if there is sufficient need to revise the guide and if WG should be formed.
- Recommend high level changes to the guide (if it should be revised)
- Prepare final report to the SC and present work in SC or tutorial session

Attendees introduced themselves and stated their affiliations.

80 people in attendance
23 members present (quorum was reached).

The proposed agenda and meeting minutes from the Munich meeting were approved unanimously.

The transients survey has been uploaded to the Survey Monkey website. Rod Sauls has interfaced with the Switchgear Committee leadership to let them know the transients work is being performed and that the transients survey will be circulated to the Switchgear committee. The current chairman of the Switchgear Committee is Ted Olsen.

Bob Degeneff made a presentation on the work that is ongoing within CIGRE. A brochure is being published on the mitigation of switching transients caused by the system interactions between transformers, switching devices. Bob has been involved with the group that is producing this brochure. There are several examples in this brochure. Approximately eight of the ten examples in this brochure are related to high voltage interactions. Bob will hopefully be able to present something on this work at our next meeting.

Bertrand Poulin gave a presentation on GSU transformers in back feed mode. Bertrand presented cases where failures have occurred on GSU transformers in back feed mode. There are significant resonant frequencies that occur in the three phase circuit connection on these transformers. Bertrand presented graphical plots produced from an extensive high frequency model he has developed for this interaction case. He indicated that classical models of a power transformer proved insufficient for analysis of failures. Bertrand showed cases demonstrating this model's accuracy and the effect on the system frequency response to varying different

components of the transformer. He demonstrated that damaging voltages can occur with excitations near the resonant frequencies of this circuit.

The chairman presented three phase terminal voltage transients obtained from the energization of a 230 / 20 kV 60 MVA transformer through a circuit switcher. This energization produced many restrikes and re-ignitions on the H terminals of the transformer. This switching operation produced approximately 1 us rise times on the H terminals of the transformer. These transients excited resonant frequencies in the transformer at 44 kHz and 500 kHz which were recorded on the X terminals of the transformer.

The chairman presented a second case study on transient related shunt reactor failures. He summarized this failure investigation performed by Catherine Brady of Progress Energy this past year. A paper on this work was sent to the participants of the task force. This material was presented to inform the task force participants of this work. This work will used to finalize the objectives of the task force.

The meeting was adjourned at 4:35 pm.

11.2 POWER TRANSFORMERS SC – JOE WATSON

The Power Transformers Subcommittee met on Wednesday, March 20th, 2013 at 1:30 p.m. The meeting was called to order by the Chair, with Vice Chair (Bill Griesacker) and Secretary (Kipp Yule) present.

The Chair asked if any additions were needed to the issued agenda, there were none.

There was a roll call based on roster which determined a quorum was present. The final count on the attendance rosters from St. Louis was 63 members (including 1 corresponding member), and 59 guests. 14 guests requested membership, and 10 of those were added as members following the meeting. 3 of those that weren't added showed in AMS as not being an IEEE member and 1 had not attended either of the 2 meetings before the St. Louis meeting.

A motion to approve the Spring 2013 Munich, Germany, meeting minutes was made by the Phil Hopkinson and seconded by John Shear The motion was unanimously approved.

Chair explained the website reorganization showing a table of all Standards and Guides that the POWER SC coordinates is shown under WORKING GROUPS. The website is to have the standard or project name, status, officers (even if inactive) and serve as ready references of the active Working Groups and projects with a link to any separate project webpages for very active groups.

11.2.7 WORKING GROUP AND TASK FORCE REPORTS

11.2.7.1 WORKING GROUP FOR REVISION OF C57.12.10, STANDARD REQUIREMENTS FOR LIQUID FILLED POWER TRANSFORMERS–Gary Hoffman, Chairman

No meeting held in St. Louis.
Chair reported that Corrigendum 2 of IEEE Std C57.12.10™- 2010 corrected two errors in Section A.3.2.13 a), regarding nomenclature for "variable flux, variable voltage" (VFVV), and effect on the impedance variation.

11.2.7.2 WORKING GROUP FOR REVISION OF C57.17, REQUIREMENTS FOR ARC FURNACE TRANSFORMERS – Robert Ganser, Chairman

No meeting held in St. Louis.

11.2.7.3 WORKING GROUP FOR REVISION OF C57.93, IEEE GUIDE FOR INSTALLATION AND MAINTENANCE OF LIQUID-IMMERSED POWER TRANSFORMERS – Mike Lau, Chairman

Chair Mike Lau called the WG meeting to order at 11:00 am on 21 October, 2013. 14 of 26 members were present, so a quorum was achieved. 48 guests also attended, for a total attendance of 62. 5 guests requested membership.

A motion to approve the minutes for both the Fall 2012 and Spring 2013 meetings was made by Kipp Yule, seconded by Al Peterson. The motion passed unanimously.

The chair covered the agenda in his opening remarks, and no changes were made.

Ewald Schweiger presented the results of his review of C57.150, the transportation guide. He identified information common to C57.150 and C57.93, and material in the transportation guide that could be moved to the installation guide. There was discussion of receiving procedures and acceptance test differences for large units versus small units. Greg Anderson clarified the demarcation between the two guides. Testing and procedures that occur before a transformer is off-loaded onto the foundation belong in the transportation guide. Testing and procedures happening after the transformer is off-loaded onto the foundation belong in the installation guide.

Chair Mike Lau presented a summary of comments received re the comparison of the dry out tables listed in the IEEE installation guide and the Doble field processing guide. It was asked why different hold times were recommended for new units versus service-aged units. This question was not resolved, but there was consensus this issue needs to be addressed by the guide.

There was also discussion regarding soak/hold times, and whether this was necessary. The question of the need for soak times was not resolved, but also needs to be addressed.

Al Peterson made a motion to form a task force to review the comparison comments and best practices in order to recommend changes to the guide. Derek Baranowski seconded. The motion passed unanimously.

Task force volunteers:

Paul Mushill	Mike Miller	Tom Melle
Roger Hayes	Larry Kirchner	Al Peterson
Mark Rivers	Bill Solano	Ken Sullivan
Alwyn Vanderwalt	Pat Rock	Kipp Yule

Both presentations were sent to the working group members and guests prior to this meeting.

It was affirmed that the manufacturer's installation procedures will take precedence over this guide's recommendations.

The working group meeting was closed by acclimation at 12:15 pm.

Mike Lau	Saurabh Ghosh	Jim Graham
WG Chair	Vice Chair	Secretary

11.2.7.4 WORKING GROUP FOR REVISION OF PC57.116, GUIDE FOR TRANSFORMERS DIRECTLY CONNECTED TO GENERATORS – Gary Hoffman, Chairman

No meeting held in St. Louis.
Chair report ballot results, 182 Balloters, 97% Approval rate, with 98 comments. Plan to recirculate in February 2014. A meeting of the ballot resolution group was held Monday afternoon.

11.2.7.5 WORKING GROUP FOR REVISION OF PC57.125, GUIDE FOR FAILURE INVESTIGATION, DOCUMENTATION, ANALYSIS AND REPORTING FOR POWER TRANSFORMERS AND SHUNT REACTORS – Wally Binder, Chairman

The WG officers were introduced and the attendance roster was circulated. Quorum was not achieved. 97 persons were present; 25 members and 72 guests.
The meeting agenda was presented. No revisions to the agenda were suggested.
The Fall 2012 / Spring 2013 minutes were presented, but could not be approved due to the lack of quorum.
Chair's Remarks – Wallace Binder

The proposed insertion of the "safety clause" from C57. 152 into C57.125 was presented as an item for inclusion in the next draft. No objections were voiced.
Schedule for revision of C57.125 was presented with an emphasis on the shrinking time horizon to prepare the Guide for ballot.

Vice Chair's Remarks – Tom Melle

Overview of the editorial committee activities to prepare D5 with special thanks to the individual editors
Report on liaison with CIGRE A2.45 Post-Mortem WG with presentation of minutes from Spring meeting and agenda for Fall meeting

Old Business – discussion of resolution for the 300 comments received

New Business

- Discussion regarding removal of publication dates from all ASTM references concluded the date designation should be removed.
- A presentation was made by Kipp Yule regarding merits of including versus excluding a detailed test annex. Lively discussion ensued over whether Polarization Index is a valid test for transformers. A motion was made to eliminate Annex A (testing). A second attempt at quorum was attempted unsuccessfully. The motion to eliminate Annex A was tabled due to the lack of quorum.
- Discussion ensued as to whether Partial Discharge testing should be included in the guide. The request to include new or additional testing in the Guide will be addressed in the next draft.

The meeting was adjourned at 10:45 AM

11.2.7.6 **WORKING GROUP STANDARD REQUIREMENTS FOR PHASE SHIFTING TRANSFORMERS WG IEEE/IEC 60076-57-1202 9**
(Previously planned as revision of C57.135, Guide For The Application, Specification And Testing Of Phase-Shifting Transformers)
Raj Ahuja, Chairman / Paul Jarman, Vice Chair / Stephen Antosz, Secretary

Introductions of all in attendance were done. The Munich minutes of the previous meeting were approved. The Agenda was presented and approved. There were a total of 69 in attendance, 15 members and 54 guests, 9 guests requested membership. 7 were accepted since they attended a previous WG meeting. The other two will have to wait and attend a future meeting. There were 15 of 25 members in attendance, so we had a quorum.

The attendance roster was circulated. The Chair gave a report on a summary of the WG activities done so far and planned activities for future schedule.

Update on the Meeting/Activity Schedule (Past)

- Using the IEC Template, prepared the initial draft based on guide C57-135, IEC 60076-1 and IEEE C57.12.00 - 1/15/13
- Prepared 1st Draft at WG meeting on Jan 30th - 31st 2013, at ENA office London, circulated to all WG members
- Provided update to IEEE WG Members and guests at IEEE meeting in Munich, March 19th, 2013
- Reviewed comments received at IEEE meeting and prepared 2nd draft during 4 hour session at Munich on March 21st, 2013 and circulated to all WG members
- Reviewed comments received and continued work on the draft at IEC WG meeting on June 5th and 6th 2013 at Bad Honnef (attended by 12 members) hosted by ABB (3rd Meeting), circulated Draft to all WG members
- Discussed the comments received and continued work on the draft at meeting in Milwaukee on Oct 15th/16th hosted by SPX (attended by 9 members and 2 guests).

Summary of work done after March 2013 IEEE

- Section 3: Terms and Definitions – modified few existing terms used in the existing guide and added new terms used in the working draft
- Section 6: Rating and General Requirements
  – Revised 6.3 specification of buck capability
  – Revised 6.5.1 Impedance for asymmetric designs
  – Revised 6.12 Sound level
- Section 8: Short circuit capability – Revised
- Section 9: Connection and Phase displacement Symbols – completed
- Section 10: Rating plates – Draft completed
- Section 11: Terminal Markings and phase rotation – Revised
- Section 12: Information to be provided by manufacturer – New added
- Section 13: Tests – Revised the section and added tests 13.8 to 13.16
- Section 14: Tolerances – Draft completed
- Annex A: Check list of information to be provided with enquiry and order – Draft Completed

Future Planned Activities IEEE

- Current Status of the Draft– ~ 75% complete (Draft 4)
- Circulate Draft 4 dated 10/16/13 to all WG members by 10/31/13 and request for comments in the template by 12/15/13
- Review the comments and update the document at next WG meeting scheduled on Jan 22nd and 23rd at Nijmegen hosted by Smit/SGB, and continue work on the sections of the draft
- Annex B: Behavior of a Phase Shifting Transformer with nonsymmetrical fault currents – To be reviewed and completed
- Annex C: Specification of buck capability – To be written
- Annex D: Additional noise measurements – To be reviewed and completed
- Review and complete the sections of the draft high-lighted
- Review the entire draft and modify/add the content as required

- Circulate draft to all WG members by 1/31/14 and request for comments in the template by 2/28/14
- Compile all the comments for review at next IEEE meeting on March 25th 2014
- Schedule meeting if required on March 27th A/N and March 28th AM at IEEE Savannah, Georgia to discuss the comments from WG members and update the document for CD
- 03/31/2014 – Target date for CD - circulate to IEC Members and IEEE Power Transformers (and Performance Characteristics SC Members - TBD) for comments
- Schedule meeting in August 2014 and after as required to update CD for CDV

Target Schedule

- Target Dates (Work started Oct. 2012)
- 1st CD March 31st 2014
- CDV October 2014
- FDIS
- IS/TS March 31st 2015, 1 Year Extension possible, if needed
- IEEE PAR Expires 12/31/2016 Joint Development Work Process Followed
- Involve all the members of both WG
- Prepare working draft at IEC WG meeting, invite all WG members
- Circulate working draft to all IEC & IEEE WG members after each IEC WG meeting and request comments from members in IEC Template
- Compile all the comments and prepare for the discussions at next IEC WG meeting
- Discuss comments and make changes to working draft in WG meeting
- Update IEEE WG members at each IEEE Transformer Committee Meeting

Here are the main topics that were discussed during the review of the latest draft:

- Review Section 13.12.2.
- Ensure the LI test is done as called out, with focus on the chopped wave test.
- Donald Chu had some comments and discussion ensued:
  - What tap position should the LI and SI tests be done at. We want it to be done at maximum voltage stress, which might not be the tap extremes.
  - Add note about the overvoltage factor that must be used
  - Review and consider revising tap position for LI MT test
  - Review and consider revising the conditions for the bypass being used at other than neutral tap
  - Explain why impedances might be tighter than normal tolerances

There were some other areas of the draft that were highlighted by the Chair as sections to be reviewed for improvements.

11.2.7.7 WORKING GROUP FOR THE REVISION OF PC57.140, GUIDE FOR EVALUATION AND RECONDITIONING OF LIQUID-IMMERSED POWER TRANSFORMERS – Roland James, Chairman / Paul Boman, Vice-Chair / Saurabh Ghosh, Secretary

No meeting held in St. Louis.

11.2.7.8 WORKING GROUP FOR DEVELOPMENT OF PC57.153, GUIDE FOR PARALLELING TRANSFOREMRS – Tom Jauch, Chairman / Mark Tostrud, Secretary

Total attendees
20 of 30 members were present
25 Guests (14 new)
2 attendees requesting membership had attended multiple consecutive meetings and will be added as members

- Introductions
- Quorum was achieved
- Motion to approve the minutes from Munich
  - 1st Daniel Sauer
  - 2nd Marnie Roussell
  - Vote
  - ☐ Yes - unanimous
- Motion to approve the agenda for this meeting
  - Daniel Sauer
  - Sanjib Som
  - Vote
  - ☐ Yes - unanimous
- Motion to send the guide to the subcommittee for approval
  - 1st Hemchandra Shertukde
  - 2nd Daniel Sauer
  - Discussion
  - ☐ Cannot take it to the subcommittee until the draft is approved by the working group super majority
  - Motion to table the issue
  - ☐ 1st Jim Graham
  - ☐ 2nd Daniel Sauer
  - No discussion
  - Vote
  - ☐ Yes - unanimous
- Reviewed proposed wording for section on GPA
  - 1st Daniel Sauer
  - 2nd Jim Harlow
  - Discussion occurred regarding the correct wording for the section.
  - ☐ Friendly ammendment proposed to change the wording as follows:
    - Applications with the following ideal conditions
  - Unanimous approval
- Members voted to include application summary tables at the Munich meeting
  - A sample “Application Summary Table” was presented
  - Discussion
  - ☐ Summary tables are not provided in any other standards
  - ☐ Wording used in the rows is inconsistent. Some rows listed the limitations while other rows simply stated the method was “not recommended*” but did not state the reason for the limitation.

- ☐ Alternative wording was discussed.
- Possible wording – “See limitations in section x.y”
  - Jim Harlow to review and send a sample table to Reinhausen by 10/31/2013
- Section 10 – reverse reactance R and X settings
  - Method for determining the R and X settings is needed in the guide
  - ☐ Jim Harlow had proposed a method
- Jim Harlow, Mark Tostrud and Craig Colopy to review
- Motion to Adjourn
  - 1st - Hemchandra Shertukde
  - 2nd – Daniel Sauer
  - Vote
  - ☐ Yes - unanimous
- Meeting was adjourned at 6:00pm

11.2.7.9 WORKING GROUP FOR DEVELOPMENT OF PC57.156, GUIDE FOR TRANSFORMER TANK RUPTURE MITIGATION OF LIQUID-IMMERSED POWER TRANSFORMERS AND REACTORS– Peter Zhao, Chairman

The Working Group for the Guide for Tank Rupture Mitigation convened Monday afternoon at 1:45 pm. Working Group Chairman Peter Zhao chaired the meeting.

In attendance were 13 members and 47 guests, with 2 guests requesting membership. A quorum was not obtained, so the minutes of the previous meeting were not approved and no official business was conducted.

Chairman Zhao provided some background for perspective and a prospective on current status of the work of this working group.

The chairman and vice chairman would like to thank Josh Herz and Craig Swinderman for leading the spring meeting in Germany to allow progress. Josh was asked to review the minutes of that meeting although a vote to approve was not possible.

Josh Herz responded to tasks necessary to address the issues in regard to air pressures vs liquid pressures presented in section 5.2.2. Further testing is needed and are expected to be done prior to the next meeting, although there are challenges to be met to accomplish the testing. Josh agreed to continue pursuit of testing to generate data and expects completion prior to our Spring 2014 meeting.

The requirement for “Type” testing in section 7.5 was discussed and it was agreed that allowances should be made for alternatives to testing of actual transformers. Matthew Brien volunteered to recommend revised wording for the relevant paragraph.

The general issue of excessive demands placed on manufacturers to prove their designs was discussed and it was agreed that Dan Perco and Josh Veens would be contacted to follow-up in their respective comments in this regard.

Chairman Zhao stated the goal of completing our work on this proposed guide by the next meeting and having it ready to present it for approval by the fall meeting.

There is much work remaining. The chair and vice chair will conference within the next few weeks to develop a plan to assure remaining tasks are effectively completed on time.

The meeting adjourned at 3:00 pm.

11.2.7.10 WORKING GROUP FOR DEVELOPMENT OF PC57.157, GUIDE FOR CONDUCTING FUNCTIONAL LIFE TESTS FOR DE-ENERGIZED TAP CHANGER CONTACTS – Phil Hopkinson, Chairman

Attendance:

Members	15 (out of 22)	
Corresponding Memebers	7	
Guests		74
Guest requesting membership		8
Total		104

The Working Group was called to order at 8:10 AM on October 22, 2013.

A. Introductions
The chairman welcomed attendees and all attendees announced their name and company name. Attendance sheets were passed out. A count of 15 members (out of 22) was made at this time, so a quorum was present.

B. Prior Minutes Approval
The minutes were approved from the Spring 2013 meeting in Munich, Germany. Motion by D. Sauer, & seconded by J. Sewell, none opposed.

C. Chairs Comments
The chairman brought up comments that were collected on Draft 5 of the Guide and began reading comments and discussing resolution with the group.
Comments were reviewed. There were still comments with no resolution due to time constraints of the meeting, so they will be reviewed by TF after this meeting.

D. Future Work
The meeting title of WG Functional Life Tests, De-energized Tap Changers (DETC) is a deceiving title since the guide is for functional life tests of contacts. The secretary has checked with Greg Anderson who posts the meeting titles and he will change the title of this working group meeting to be a shortened version of our guide title. WG Functional Life Tests, De-energized Tap Changers (DETC) PC57.157 will be changed to WG Functional Life Tests on Switch Contacts PC57.157.

It was suggested to use a task force to review the comments received. Representatives from Reinhausen, ABB, and Quality Switch were suggested by the chairman to be a part of this task force.

Comments will be reviewed/implemented and then the Draft 6 will be created and circulated through the WG for ballot.

E. Time and place of next meeting
Next in person meeting will be at the Spring IEEE Transformer Committee meetings in Savannah, GA during the week of March 23-27, 2014.

F. Adjournment
The meeting was adjourned at 9:15AM.Motion-D.Sauer, second-J.Sewell, none opposed.

11.2.7.11 WORKING GROUP FOR REVISION OF IEEE STD 638-1992, IEEE STANDARD FOR QUALIFICATION OF CLASS 1E TRANSFORMERS FOR NUCLEAR POWER GENERATING STATIONS – Craig Swinderman, Chairman

The Working Group for revision of IEEE 638 did not meet during the St. Louis session in October 2013.

During the initial ballot of the standard, Draft 9, a total of 56 comments were received, including 3 negative votes.

The working group formed a comment resolution team and updated the document Draft 10 to reflect the comments made and the changes to address them. The revised document was submitted for the recirculation ballot on August 13, 2013.

After the Recirculation ballot, out of 87 balloters, an 83% response rate was achieved, with a 95% Approval rate and 4% Abstain rate. No additional comments were received from the recirculation ballot.

The document has been submitted to RevCom, and confirmation has been received that P638 will be reviewed for approval during the December 10, 2013 RevCom meeting.

11.2.8 <u>OLD BUSINESS</u>

The Chair emphasized that while new standards have a ten (10) year life, we should decide at 5 years if revision is required and proceed (not wait until year 9 or 10). It was noted that PARs are only four years and by commencing action at five years the revision would be timely. It is will be Power SC's practice to have those assigned to inactive standards to make the review and recommendation.

The prior LTC/PA issue was discussed at the Administrative Subcommittee meeting and the decision was not to have any action by the Power SC. The topic will be addressed by the Distribution SC.
(Prior LTC/PA issue discussion by Joe Foldi)
An LTC / PA issue has been identified, that at least in one occasion, the transient voltage, during the diverter switch operation of the reactor type tap changer, exceeded the tap changer and the PA limits. This transient voltage occurs, when one moving contact is open (for a short time) and the full load current is carried by one branch of the PA windings only. In this case the Reactance of the PA is much higher than with both branches in circuit for the load current. This high Reactance times the load current generates high transient voltage, which is usually not known and/or considered in the PA design. The purpose of the Study Group would be to provide proper description of this occurrence, so that the PA could be adequately designed.

11.2.9 NEW BUSINESS

There was a new business discussion by Phil Hopkinson regarding forming a Task Force to include awareness and cautionary language to cover switching failures that could be introduced by vacuum and/or SF6 switching devices and breakers. The failure point is typically the transformer even though it is a more complex interaction situation with system and switching devices. While we have C57.142, there is not language in C57.12.00 or C57.12.01 to address switching interaction.
Paul Jarman noted that IEC 60076-1 Clause 13 addresses this subject and read out the following:

13 High frequency switching transients

Switching lightly loaded and/or low power factor (inductively loaded) transformers with vacuum and SF6 interrupters may subject the transformer to potentially damaging voltage transients with frequencies up to the MHz range and voltages exceeding the transformer impulse withstand. Mitigation measures, while not part of the transformer, might include means to increase damping through resistor-capacitor snubbers, pre-insertion resistors within the switches, or switching under load. If specified by the purchaser, the manufacturer shall provide details of natural resonant frequencies and/or high frequency model parameters of the transformer.

NOTE More information is available in IEEE C57.142 Guide to describe the occurrence and mitigation of

switching transients induced by transformer, switching device, and system interaction

There was much discussion regarding the various proposed wordings of the motion. However, as Don Platt point out, the subject for such an effort would fit more appropriately in the Performance Characteristics Subcommittee, and subsequently the motion was withdrawn by the nominator.

Administrative SC update IEEE Senior membership is available, if your qualified it is recommended to apply. We have two new Fellows, Peter Balma and Jim Harlow.

Load Tap Changer Standards are covered by IEEE C57.131 and IEC 60214. There is discussion to include Annex E Tutorial Information on LTC Application of C57.131 in IEC 60214 during the next iteration, as explained by Paul Jarman. This would make the documents similar and then the path would be to make a joint IEC/IEEE document.

11.2.10 STATUS OF "INACTIVE" GROUPS

Please see the Power Transformers Subcommittee webpage table listing of all working groups under the Power SC for **"Inactive"** WGs and TFs at the following hyperlink:
http://www.transformerscommittee.org/subcommittees/power/Transfo_SC.htm

11.2.11 ADJOURNMENT

Meeting adjourned following motion by Gary Hoffman and second by Sanjib Son.

Respectfully submitted on behalf of Power Transformers SC:
Joe Watson – Chair
Bill Griesacker – Vice Chair
Kipp Yule - Secretary

11.3 UNDERGROUND TRANSFORMERS & NETWORK PROTECTORS SC – CARL NIEMAN

Introduction/Attendance

The Underground Transformers and Network Protectors Subcommittee met at 11 AM on Wednesday October 23, 2013 in the Landmark 5,6 rooms at the Renaissance Grand Hotel in St Louis MO.

There were 9 members and 18 guests present. Dan Mulkey Chaired the meeting and George Payerle acted at the Recording Secretary.

Minutes from the Munich meeting were reviewed. Brian Klaponski moved and Said Hachichi seconded and the minutes were approved.

Alan Trout stated that C57.12.23 single phase submersibles WG will resume in Savannah in March 2014.

C57.12.24 Three-Phase Submersible Transformers working group – Giuseppe Termini, Chairman

IEEE/PES Transformers Committee Working Group on Requirements
for Three-Phase Submersible Transformers (C57.12.24)
Meeting Minutes
Renaissance Grand Hotel, St. Louis, MO October 21, 2013
Landmark 1 Room

Members present
Giuseppe Termini – (Chairman) Exelon – PECO
Paramjit Bhatia – Moloney Electric
Adam Bromley – Fort Collins Utilities
Paul Chisholm - IFD Corp
Said Hachichi – Hydro Quebec
Brian Klaponski - CARTE International Inc.
Kent Miller – T&R Electric
Charles Morgan – Northeast Utilities
Dan Mulkey – PG&E
George Payerle – Carte International Inc.
Justin Pezzin – IFD Corp.
Christopher Sullivan - Heartland Solutions, Inc.
Alan Traut – Power Partners

Guests present
James Aimstions – Siemens
*Timothy Albers – ABB
Jerry Allen – Metglas, Inc.
Kahveh Atef – San Diego Gas & Electric

Ed Bertolini – Richards Manfacturing
*Mark Bielat – Public Works Commission
Rhett Chrysler - Ermco
Anil Dhawan – ComEd
Ben Ehmcke – Ehmcke Consulting
Jean-Francois Gagnon – Siemens
Carlos Gaytan – Prolec GE
Jack Harley, FirstPower Group
Paul Henault – IFD Corp
Brian Just – IFD Corp
Bob Kinner, FirstPower Group
Alejandro Macias - CenterPoint Energy
Brian Marquardt – AK Steel
Mike Miller – WE Energies
Abhinav Mitra – Siemens
Jeffrey Nazarko – Tempel Steel
Barb Patoine – Weidmann
Nahid Pempin – Optimized Program Service
*Juan Saldivor – Prolec GE
Stefan Siebert - Brockhaus
Liz Sullivan – ABB
Tas Taousakis – PHI Inc.
*Bill Wimmer – Dominion

* = requests membership

The chairman called the meeting to order at 9:30 AM in the Landmark 1 room of the Renaissance Grand Hotel in St Louis on October 21, 2013. Introductions were made and an agenda was presented. The meeting was attended by 13 members and 27 guests. A quorum was achieved with 13 out of 15 members present. Four (4) guests requested membership. The chairman explained the requirement of attending three (3) consecutive meetings in order to qualify for membership. George Payerle acted as recording secretary.

The Minutes from the Munich meeting were reviewed. Brian Klaponski made a motion to accept the minutes as submitted, Said Hachichi seconded the motion. The motion was put to a vote and was approved unanimously. The chairman then moved to discuss the draft revision (D0) of the standard. The chairman stated that changes to the draft D0 will be sent out to members and guests for review under a new draft revision (D1).

The remaining of the meeting consisted of the review of Section 7.3 of the standard relating to the accessories. The suggested changes in the draft were highlighted in yellow. Some of the administrative changes in draft revision D0 included changing the revision number of the IEEE standards referenced in the document with the latest issued revisions. Al Traut suggested discussing the revision changes of the referenced IEEE standards. The chairman recommended addressing Al's suggestion after the review of the draft changes however; no action was taken at this meeting. The results of the review and changes to the draft revision are summarized below:

- **Section: 7.3 Accessories**
    - **Existing Sub-Section: 7.3.1 Tap changer – No changes**

- **New Sub-Section: 7.3.2 Pressure relief device**

- **New Sub-Section: 7.3.2.1** A ½ inch NPT fitting or UNC fitting with gasket shall be provided for mounting the pressure relief device. The pressure relief fitting shall allow slow release of pressure without completely removing the fitting. If a replaceable automatic pressure relief valve is specified, the fitting shall be sized for the flow rate of the valve.

Christopher Sullivan clarified a statement he had made at the previous meetings in regard to the pressure relief device (PRD). Previously, Christopher stated that manufactures of PRDs could not guarantee that water or other debris would not enter the tank if a PRD became stuck in the open position following operation. At this meeting, Christopher added that the occurrence of water or debris entering the tank, though possible, is very unlikely and that he is not aware that it has ever happened.

A discussion followed on the wording of the thread sizes specified and the location of pressure relief fittings and valves. Carlos Gaytan suggested that the same terminology referenced in C57.144, Section 3.12 be used in Sub-Section 7.3.2.1 and said that either NPT or UNC can be used.

Dan Mulkey volunteered to look into standard threads for PRDs and rework Sub-Section 7.3.2.1. Dan will provide the reworked section to the chairman who will incorporate it in the next draft revision and send it to the WG for review.

- **New Sub-Section: 7.3.2.2** The pressure relief fitting shall be located on the transformer cover.

- **New Sub-Section: 7.3.2.3** If an automatic pressure relief valve is used, it shall be operable by using a standard hot-line tool.

Dan Mulkey made a motion to keep 7.3.2.2 and 7.3.2.3 as modified pending further discussion, Adam Bromley seconded the motion. The motion was put to a vote and was approved unanimously.

- **New Section: 7.3.3 Loadbreak Switch**

- **New Sub-Section: 7.3.3.1** A two-position loadbreak switch shall be provided to energize and de-energize the transformer's high voltage windings.

- **New Sub-Section: 7.3.3.2** The switch shall be labeled as "OPEN" and "CLOSED" and shall be distinctly observable at a distance of eight (8) feet from the transformer by the position of the handle.

- **New Sub-Section: 7.3.3.3** The switch operating handle shall be located on the transformer cover and shall be operable by using a standard hot-line tool.

- **New Sub-Section 7.3.3.4** The switch rotation shall be clockwise to close, to energize the high-voltage windings, and counterclockwise to open, to de-energize the high voltage windings.

Brian Klaponski made a motion to accept Sub-Sections 7.3.3.1, 7.3.3.3 and 7.3.3.4 and modify Sub-Section 7.3.3.2 to include the metric value for the distance, Said Hachichi seconded the motion. The motion was put to a vote and was approved unanimously.

The chairman stated that the remaining changes in the draft will be reviewed at the next WG meeting and encouraged the WG to provide additional input prior to the meeting so that the changes can be included in the next draft revision. The meeting was adjourned at 10:45 with the next meeting scheduled for March, 2014 in Savannah, GA.

Respectfully Submitted by: Giuseppe Termini, Chairman C57.12.24 Working Group

Aditional discussion at the SC meeting -- Giuseppe then requested that participate more fully in the work of this WG so that more progress can be made. Brian Klaponski stated that we need to draw the proper expertise from those in specific industries to move forward on subjects such as tank material selection where we are not experts.

Brian gave as an example that in talking with a materials expert following his meeting he learned that for example, if you work 304 on equipment that you normally work mild steel, properties of the 304 can be compromised. If you use 316, there is enough chrome and nickel in the material that you won't have the problem. The recommendation was that stainless be fabricated on dedicated equipment.

The par for 12.24 expires in 2015 so balloting has to be in 2014. Dan Mulkey suggested that Giuseppe take a small part of the standard and send it out for comment and get that resolved so that at least some of the standard can be revised before the par expires.

C57.12.40 Secondary Network Transformer working Group – Brian Klaponski, Chairman

IEEE Transformers Committee
C57.12.40
Secondary Network Transformer Working Group

St. Louis, MO Meeting Minutes
Renaissance Grand Hotel in Munich, Germany
Landmark Room
11:00 am October 22, 2013

Members Present	**Company**
Brian Klaponski (Chairman)	Carte International Inc.
John Crouse	Crouse Consulting Company
Larry Dix	Quality Switch
Said Hachichi	Hydro-Quebec
Dan Mulkey	PG&E
George Payerle	Carte International Inc
John Rossetti	Memphis Light, Gas & Water
Jeremy Sewell	Quality Switch

Giuseppe Termini	PECO (Exelon)
Terry Turvey	The Specialty Switch Company

Guests Present	**Company**
Jeff Antal	Eaton/Cooper Power Systems
Paramjit Bhatia	Moloney Electric Inc.
Alejandro Marcias	Center Point Energy
Cory Morgan	Northeast Utilities
Barb Patoine	Weidmann
Stefan Siebert	Brockhaus Messtechnik
Adam Sewell	Quality Switch
Russ Sewell	Quality Switch
Christopher Sullivan	Heartland
Liz Sullivan	ABB
Tas Taousakis	PEPCO

1) The WG met on Tuesday, October 22, 2013 at 11:15 am with 10 members and 11 guests.

2) An agenda was presented and approved; and introductions were made.

3) The minutes of the March 18, 2013 meeting in Munich, Germany, were reviewed. Jeremy Sewell made a motion to approve the Meeting Minutes and Bill Wimmer seconded the motion and they were approved unanimously.

4) The meeting consisted of the discussion of proposed changes for the next revision made by various individuals within the WG over the last 3 meetings. The proposed changes are listed below:

   a. Comments received from John Rossetti regarding network protector interface issues will be considered for the next standard revision.
   John Rossetti volunteered to provide proposed changes to address the network protector interfaces.

   b. A suggestion was made to review (sect 3.6) the Audible Sound Levels and possibly align them with the NEMA TR1 document.

      The Chair asked the end-users if sound was an in issue for network installations and based on the responses, sound does not appear to be an issue.

   c. A suggestion was made to have a second drawing similar to Figure 1 but without a primary switch.

      The Chair agreed to create this new drawing for the next meeting.

   d. Jeremy Sewell suggested that the last sentence of section 6.2.2.2 be changed to read: "The peak current value for each of the three phases shall be equal to or greater than 107 kA."

      The WG agreed to incorporate the suggested change.

   e. Section 6.2.2.4 – Change: "…….minimum of 5000 amperes rms symmetrical passes through……." to: "minimum of 15000 amperes rms symmetrical passes through……..." .

There was a lot of discussion around this suggested change. It was agreed that this change will require further discussion and will require input from the end-users.

f. Table 8 – rms, in lower cases, is missing from the header of the third column “Cable test (kV) ac 5 minutes”. This header should read: “Cable test (kV) ac rms 5 minutes”. The WG agreed to incorporate the suggested change.

g. Table 9 – drop the word “minimum” from the header of the third column: “Minimum dropout voltage” and add the words: “or less” next to numeric values. This column should read: “

Table 9 – drop the word “minimum” from the header of the third column: “Minimum dropout voltage” and add the words: “or less” next to numeric values. This column should read:

Dropout voltage
15 or less
33 or less

Larry Dix pointed out that after further consideration that there needs to be a minimum Dropout Voltage and he agreed to propose a minimum dropout voltage range for consideration by the end-users.

h. In consideration of the suggested change to Section 6.2.2.4, a recommendation was made to use as a minimum 600 amps bushings and wells instead of 200 amps as 200 amp wells are not adequate for 15000 amp 5 sec fault levels.

Larry Dix and Tas Taousakis agreed to develop a table to address the current rating of primary deadfront bushings and wells based on available fault currents. Tas stated that there is a 40KA rated elbow in the market.

i. The Chair stated that there should be coordination between the C57.12.24 and this standard in regard to tank corrosion requirements discussed at the previous working group meeting for the C57.12.24 standard.

The C57.12.24 Chair stated that the draft revision of his standard will contain tank material changes that will be addressed at the next WG meeting set for Savannah, GA. Bob Alens was asked if he could attend future meetings of C57.12.24 as he has expert knowledge in this area.

6) The meeting was adjourned at 12:15 pm with the next meeting set for Savannah, GA in March 2013.

Respectfully submitted
B. Klaponski, Chairman

C57.12.44 Secondary Network Protectors working group – Bill Wimmer, Chairman, Mark Faulkner, Secretary

Document #: PC57.12.44

Document Title: Standard Requirements for Secondary Network Protectors

Co-Chairman: Bill Wimmer & Mark Faulkner

PAR Date: 06/17/2010 **PAR Expiration Date:** 12/31/2014

PAR Status: Approved

Current Standard Date: 06/07/2006

Current Draft Being Worked On: Draft 9 **Dated:** NA

Meeting Date: 10/21/2012 **Time:** 1:45-3:00 PM

Attendance:

Members	**5 of 9**
Guests	**7**
Total	**12**
Guests Requesting Membership	**0**

Meeting Minutes / Significant Issues / Comments:

The meeting was called to order and a review was made of the members present. Introductions were made of all members and guests present.

It was determined that a quorum of the membership was present.

Dan Mulkey set motion to approve agenda, a second confirmed by Ed Bertolini. We had an unanimous approval.

Approval of minutes was postponed to later in the meeting when projector issues were resolved.

Old Business

The two remaining issues were discussed as below:

8.3 Para 1. Comment on fuses

1) Lee Welch – Clause 8.3, paragraph 1. Not normal fuses?? Why would an industry standard require something which it defines as abnormal? This phase adds no value and could create liability issues.

   Bill Wimmer suggested a change to eliminate the wording “not normal fuses and are specially….” and replaced with “specifically designed for use in network protectors”

Cory Morgan motioned to accept change, Dan Mulkey second. We had an uanimous approval.

2). John Teixeira – Clause Annex H. Remove reference B3 and renumber the other references.

Mark Faulkner motioned to keep references , Ed Bertolini second. We had an unanimous approval.

The minutes of the last meeting in Milwaukee were reviewed. A motion to approve was set by Dan Mulkey and second by Ed Bertolini. The minutes were approved by a unanimous vote.

All the changes in response to comments were discussed and will be captured in revision 09.

Revision 09 will be sent out electronically in the near term for review and the group will make comments at this time. Working Group members will also be asked (vote) if Revision 09 is ready for recirculation.

New Business

The chair opened a discussion on the future of this Working Group. There is concern that shutting down the group for a period of 3-4 years would result in a loss of expertise and discontinuity. Dan Mulkey suggested two options: 1) Making the working group a standing group. 2) to pair two working groups together and cycle between the two every four years. This issue will be discussed at the subcommittee meeting.

Meeting adjourned.
Respectfully submitted,
Bill Wimmer

Dan Mulkey mentioned that pars are good for 4 years and standards are good for 10. We could split up the standard, revise a section, then work on another section and get that one approved and that way we would make progress on at least some of the document.

Old business

From a discussion in of Munich regarding a table in C57.12.00, we have not received a reply. We will ask them again. (After our meeting this was discussed with Bill Chui and he indicated that it was being dealt with.)

New Business

There was no new business. The meeting was adjourned at 12:00. Next meeting will be in Savannah GA in March 2014.

11.4 BUSHINGS SC – PETER ZHAO

11.4 Bushing Subcommittee – Peter Zhao, *Chair*; Eric Weatherbee, *Secretary*.

11.4.1 Introduction / Attendance

The Chair opened the meeting at 9:30 AM and welcomed the members and guests. This was followed by attendee introductions. There were 117 attendees of whom 23 were members, 46 were repeat guests, and 48 were new guests. A quorum was reached.

11.4.2 Chairman's Remarks

a) Review of the TF and WG schedule which can be seen in Appendix A.

11.4.3 Working Group (WG) and Task Force (TF) Reports

11.4.3.1 C57.19.00 – Keith Ellis, Chair

No meeting was held for this standard but Mr. Ellis discussed with the SC as new technology emerges we need to be aware how it may or may not be covered in the standard. If anyone has concerns with the changes or addition that should be added they should feel free to contact Mr. Ellis with their concerns and suggestions. Mr. Sharma brought up his concerns to the SC that IEC has separate standards for composite and porcelain bushings. The Chair suggested that a Task Force may be able to study this topic and come to a conclusion. Mr. Sharma made a motion to have Task Force formed to investigate, Mr. Wagenaar 2nd the motion and the floor was opened for discussion. After the discussion had concluded a vote was taken and passed.

11.4.3.2 PC57.19.01 – Dr. Shibao Zhang, Chair; David Wallach, Secretary

See complete minutes in Appendix B of this report.

11.4.3.3 C57.19.100 – Tommy Spitzer, Chair

No meeting was held for this guide, however Mr. Spitzer informed the SC that the guide had been approved last December and published last February. Mr. Spitzer also offered his thanks and congratulations to all involved with completing the newest iteration of the guide.

11.4.3.4 PC57.19.04 – Carlo Arpino, Chair; JD Brafa, Vice-Chair; Secretary - vacant

See complete minutes in Appendix C of this report.

1.4.3.5 IEC / IEEE 65700.19.03 – Les Recksiedler (IEEE) and John Graham (IEC), Chair

No meeting was held. Mr. Recksiedler informed the group that the IEEE portion has been passed (2 editorial comments were made). Currently waiting for IEC to complete their portion, Mr. Recksiedler estimates this should be completed by next spring. If major changes are needed a new vote will be completed for the IEEE side. More detail can be seen in Appendix D, IEC Bushing Standardization.

11.4.4 IEC Bushing Standards Activity - John Graham, IEEE Liaison

See complete minutes in Appendix D of this report.

11.4.5 IEEE 693 – Eric Weatherbee, IEEE Liaison

Mr. Weatherbee gave a brief presentation updating the SC on IEEE 693 status. Dr. Schiff is the group leader for Bushings and Transformer interactions subgroup and will distribute papers to those interested individuals who contact Dr. Schiff by email. Interested parties should review and offer comment/suggestions to Dr. Schiff for review by 693 working group. After the spring 693 meeting the papers will be updated as needed and sent to the

transformer committee for distribution/review. Interested parties may contact Dr. Schiff by email, schiff@stanford.edu.

11.4.6 Task Force on PD Measurement on Bushings & CTs - Thang Hochanh, Chair; Thomas Sizemore, Secretary

See complete minutes in Appendix E of this report.

11.4.7 Unfinished Business

a) Definition of Solid Dielectric Bushings - Keith Ellis

Mr. Ellis stated he is having difficulty with the definition has each manufacturer uses different methods and materials. He will try to have something prepared for the spring meeting

b) Distribution Transformer Bushings- A Manufacturer's View – Josh Verdell

The Chair refreshed the group's memory on why this area of discussion was brought to the SC and then introduced Mr. Verdell to lead the topic discussion. After the discussion was completed by the SC the Chair suggested a more research needs to be completed before the spring meeting at that time a decision can be made on the need to form a TF to look into the issue. Study group was formed and Chaired by Mr. Verdell with several transformer and bushing manufacturers, still in need of some users to participate.

c) Proposal for IEEE Transformer Gas Bushing Standard – John Graham

Mr. Graham was not in attendance but the Chair made reference to the SC that Mr. Graham's previous comments are on the website.

11.4.8 New Business

a) Proposal to add special test to C57.19.00 – Egon Kirchenmayer

Mr. Kirchenmayer explained to the SC that they have experienced bushing PD showing up during Shunt Reactor testing when current flows through the Reactor during PD testing. They have had 2 cases out of 300. Bushings were returned to the supplier, tested and passed. Mr. Kirchenmayer asked if any other manufacturer has experienced this issue (none replied). He stated they pulled the bushings and reinstalled them several times with no improvement. He presented one proposal for performing this special test (see Appendix F) and addressed several questions from the SC. The Chair suggested a study group should be formed and Chaired by Mr. Kirchenmayer. Several people volunteered to join the group, Mr. Zhao, Mr. Wagenaar, Mr. Brzonznowski and Mr. Stenestan. The group plans to have a proposal by the spring meeting.

11.4.9 Adjournment 10:46am

Minutes submitted respectively by,
Eric Weatherbee, Secretary
Bushing Subcommittee

IEEE/PES TRANSFORMERS COMMITTEE
Status Report of Transformers Standards

revised Oct 13, 2013

STANDARD / PROJECT	TITLE	Working Group Chair / Phone / Email	Pub Year / Rev Due Dat	PAR Issue Dat / PAR Expiration	Standard Status / Remark
SubCommittee **BUSHING**		(417) 345-5926			
Chair **Zhao P.**		peter.zhao@HydroOne.com			
PC57.19.04	Standard Performance Characteristics and Dimensions for High Current Power Transformer Bushings	Arpino C. 847 439-4122 carlo@astareg.com		6/16/2011 12/31/2015	New Project
C57.19.00	Standard General Requirements and Test Procedure for Power Apparatus Bushings	Ellis K. P. (615) 847-2157 keithcota@aol.com	2004 12/31/2020		Approved Formally Std. IEEE 21 Previous revision 1991. Errata issued March 2010 Reaffirmation approved 12/8/2010
C57.19.01 PC57.19.01	IEEE Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings	Zhang 941.729.5606 gzhang@grandeagle.com	2000 12/31/2018	12/8/2010 12/31/2014	Approved +PAR for Revision Formally Std. IEEE 24 Reaffirmed in 2005. PAR for Rev first approved Dec 2007 Mar '10: NesCom extended PAR, unitl December 2013
C57.19.03-19 P65700-19-03	Standard Requirements, Terminology, and Test Code for Bushing for DC Applications - Corrigendum 1	Recksiedler 204 474 3192	 12/31/2018	3/25/2010 12/31/2013	Approved + PAR for Revision Published 6/6/2006 See Corrigenda -1, Published in 2006 New PAR for revision submitted 10/2007 Std merging with IEC std NesCom extended PAR, unitl December 2013 IEEE Work complete; still waiting for IEC. Extension Request submitted
C57.19.100	IEEE Guide for Application of Power Apparatus Bushings	Spitzer T. (817) 215-6457 tommy.spitzer@oncorgroup.com	1995 12/31/2022		Approved New PAR requested and approved to 12/31/2010. NESCOM approved Extension till Dec 2012 Revision approved Dec 2012

APPENDIX B

WG Revision C57.19.01 Standard Requirements for Bushings.
MINUTES OF WORKING GROUP MEETING – F13 St Louis, MO.

The working group met on Tuesday October 22, 2013, at 9:30 am with a total of 62 participants. Of those, 13 members and 47 guests with 3 guests requesting membership. Working Group membership is currently 25 Members therefore we had a quorum.

Eric Schleismann requested membership and his status was changed to member after verification of participation. Two guests requesting membership were not granted due to attendance requirements not being met (T Martin, B Beaster).

- The meeting was opened by Peter Zhao with introduction of Dr. Shibao Zhang as new chair replacing Art Del Rio w David Wallach will serve as secretary.
- **Introductions:** Attendee introductions and affiliations was performed.
- **Minutes Approval** (after quorum was obtained)
  - F12 Milwaukee meeting were approved as posted
  - S13 Munich meeting were approved as posted
- **Review of prior work:**
  - Reviewed F12 Milwaukee meeting minutes as a review of past discussions.
  - Reviewed S13 Munich meeting minutes as a review of past discussions.
    - Keith Ellis noted that some transformers are not following P and D dimensions on new transformers coming into the U.S. market resulting in replacement bushing issues in the future adapting to optimized CTs, etc. Keith Ellis was requested to write up a 1 page or less summary to clearly describe this concern.
    - Users and suppliers have not responded to the call for definition for solid type bushing and cast insulation bushing.
    - Call for dimensions for 5000 A bushings through 230 kV is needed.
- **Survey concerning usage of 2000 standard:** Doble Engineering assisted the Working Group with a survey the impact of the change of the year 2000 change to the standard. Six questions were posed to 112 participants representing 80 companies. Questions focused on elimination of 25, 115, and 161 kV voltage classes. Results of the survey were reviewed including the free-form comments from the respondents. The detailed survey results are not provided in the minutes but are available.
- **Higher current bushings:** A table will be circulated to collect the values users have been seeing and suppliers have been providing to circulate to working group in advance of the S14 meeting to allow time to assemble a recommended set of dimensions.
- **250 kV BIL Class:** An attendee inquired about the status of adding back the 250 kV BIL/46 kV bushing. This can be added to the table as a proposed bushing to supply dimensions in the future also for comment.
- **ERIP Power Factor:** Comments about the power factor of ERIP bushings as discussed on Central Desktop survey were presented by Dr. Zhang. Peter Zhao suggested the information should be distributed by email to members and guests to consider along with summary and recommendation.
- **Request to add high temperature limit to standard:** Request from C57.19.04 since this standard covers 5000 A and below. High temperature bushings would be out of scope for this working group.

Minutes by: David Wallach, WG Secretary.

APPENDIX C

Minutes: WG PC57.19.04 – LV Bushings Rated >5000A and Applied in Metal Enclosures
Date: October 22, 2013 @ 11:00am – St. Louis MO

1. Attendance:
   - 44 Attendees:
     - 10 of 25 Members were present (<50%). A quorum was not reached.
     - 34 Guests
       - 14 new, 20 repeat
2. Summary:
   - Peter Zhao filled in for the Chair as he and the Vice-Chair were unable to attend this meeting. Peter presented the documents previously prepared by Carlos (WG Chair) to the working group.
   - The acting Chair discussed the need for active people to help bring this standard to fruition. The acting Chair reviewed the PAR milestones.
   - The working group is still looking for a volunteer to take over the vacant Secretary position. Interested individuals were urged to email Carlos.
   - Reviewed the minutes of Munich meeting.
     - Hot spot
     - High Temperature Insulation definition
       - Peter suggests the WG tries to correlate with existing standard IEEE P-1276
       - Do the bushing manufacturers offer these materials
         - heat-resistant aramid fiber such as Nomex seemed to be the most common
     - Must meet the user's needs, such as if the bushing will be used in an enclosure
   - Power factor table discussion.
     - Peter suggests the WG borrow the table from C57.19.01 and add notes to cover the differences with the high temperature applications.
   - Reviewed dimensional table prepared by Carlos that were supplied by two bushing manufacturers.
     - Three suggestions were made on how to handle the different values between manufacturers:
       - List typical values with notes on how the different values can affect the others.
       - List the multiple values for each voltage rating
       - Reach consensus on one value for each rating, but it must be fair in order to not put the entire burden on one manufacturer to make changes.
         - Circulate the table as a survey to the working group (guests and members) and ask for suggestions on how they would like to proceed. End users and manufacturers can look at the tabulated values to see if they can work with either or both of the supplied dimensions. Is it possible to make changes to allow for the max./min. values as appropriate so both will work. For example use the larger "D" value as the max., which may include having to use the larger bolt circle as well.
3. Adjournment: 12:15pm.

Minutes by: Eric Weatherbee, Acting Secretary

APPENDIX D

IEC Meetings

The IEC bushing committee SC36A will meet during the IEC General Session in New Delhi, India on October 19th 201.
Subcommittee Chair – John Graham, Siemens UK.
Secretary – Gian Franco Giorgi, CEDESPA, IT.

IEC60137 "Insulated Bushings for Alternating Voltages above 1000V"

AT the 2011 meeting in Melbourne it was decided that a joint working group should be formed for the AC and DC bushing standards including experts from TC14 (Transformers). A Request for Experts was circulated by IEC in January 2012 and the extended group has been formed with 23 members.
Work has been delayed as a new Convenor for JMT5 has been found only recently, Lars Jonsson from ABB, Sweden. A preliminary draft document was circulated in October 2012 and a new working document will be issued shortly. It is proposed to proceed with three task forces to look at Mechanical, Thermal and Dielectric aspects.

IEC/IEEE6570.19.03 "Bushings for DC Application"

SC36A MT5 is working with The IEEE Bushing subcommittee with a joint working group to produce a dual logo document.
Comments on a CDV circulated in March 2013 have been received IEC and IEEE members and the IEEE ballot resolution process has been completed. The IEC process is slower and comments on the CDV will be discussed and agreed in New Delhi. A FDIS and final IEEE vote will follow in December 2013. The IEEE PAR has been extended to cover the IEC delay.

Other Work –

IEC61463 Seismic qualification of bushings – a new maintenance team MT6 has been formed and held it's first meeting in Milan on October 9th 2012 with Paolo Cardano, Alstom P&V as convenor. The team will review other existing standards including IEEE693 to strengthen the document. An internal working group draft has been circulated in September 2013.
IEC61464 Dissolved gas analysis of oil impregnated paper bushings – IEC TC10 is working on a revision of the main DGA standard IEC60599. This revision 10/907/CD includes an annex relating to interpretation of DGA in bushings. This is very similar to guidance in IEC61464, which may be withdrawn in future.
IEC61639 Bushings for direct connection transformer/GIS – this is under review by the switchgear committee SC17C MT27 and has been re-numbered IEC62271-pt211. Document 17C/566/CDV was circulated in October 2012 and SC36A submitted several comments. As a result an annex on very fast transient testing will be removed in the next draft.
IEEE Bushing subcommittee is discussing any need for a similar document in IEEE.

Cigré:

There is a Cigré working group A2: 43 Bushing Reliability chaired by Antun Mikulecky from Hungary.
The group has held a number of meetings the last hosted by Zurich in September 2013.
The group has three task forces;
1. Questionnaire on bushing failure rates and data. _ the questionnaire is completed for circulation.
2. Drafting of technical brochure sections – definitions, failure modes, mechanisms.
3. Drafting of technical brochure sections - diagnostics and monitoring methods, including theory, measurement method and decision criteria.
It is aimed to publish the brochure during 2013.

John Graham
October 8, 2013

APPENDIX E

Meeting Minute: WG PC57.160, meeting on PD in Bushings, PTs and CTs
Date: October 21, 2013
Attendance: 41 with 15 being members and 26 being guests

After introductions and a brief comment from the chair T. Hochanh, Bertrand Poulin cautioned against expansion in the scope of what the working group was to perform.

Marek (Polycast) brought up a question of AC and DC testing of bushings. Bertrand had some comments.

Discussion moved to 6.2 of the draft. Comments were made that the third bullet wording needed to be modified in a way that a particular bushing should not be tested in reference to a particular transformer size.

Next conversation moved to section 6.3.1 of the draft. Initially the conversation focused on the size of C2 with a manufacturer indicating the values provided looked quite large and that determination of the size of C2 should be done by testing. As the conversation progress it was noted that the circuit being discussed was for a voltage tap bushing. This type is in use in North America but is not widely used elsewhere. It was asked if this example should not be first. Instead it was suggested that a different more commonly used bushing type be first in this section.

Techniques that could be used to improve signal to noise ratio were then discussed. It was offered by Detlev that the IEC bushing standard is being revised for pulse calibration.

Next the conversation moved to a discussion of the balanced unbalance and balance methods covered in sections 6.3.2.1 and 6.3.2.2 . During the discussion Pierre Riffon questioned the 50% limit about the maximum recommended permissible noise level. Can we accept the bushing if it never exceeds the limit? The chair explain that this limit is the recommended noise limit accepted by IEC 60270 and during Factory Acceptance Tests, by agreement between the Customer (Test witness) and the Manufacturer this level value could be modified to a higher value.

Section 6.5.1 Calibration was discussed. An editorial comment was made about C57 not C56.
The meeting concluded with statements regarding the focus of the next meeting.

Secretary: Thomas Sizemore

WG Chair: Thang Hochanh

APPENDIX F

Proposal to add a Special Test to IEEE C57.19.00 which can be requested for Bushings which will be installed on Reactors

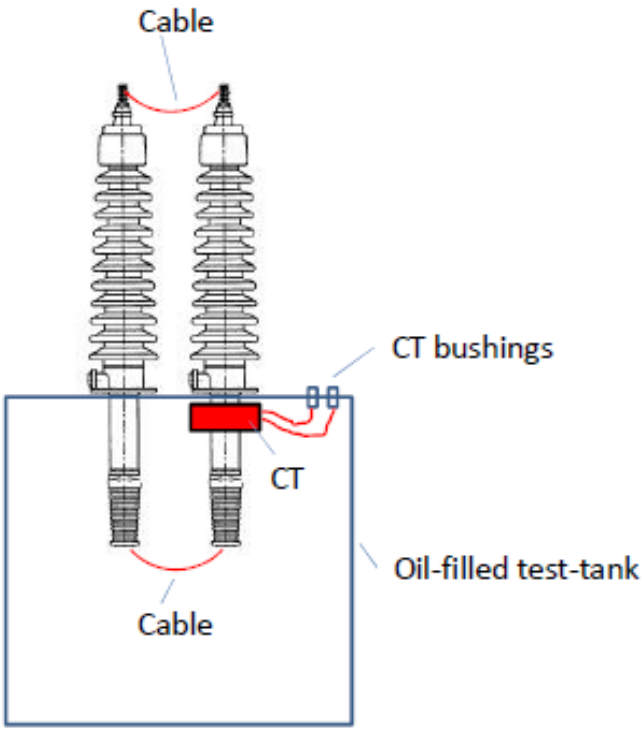
Part 2: Proposal for a Special Test Setup

In March 15, 2013 I made a proposal to add a Special Test for bushings which will be installed on Reactors. (See also the attached document). During this special test, a Low Frequency Test Voltage is applied to the bushing and at the same time the rated current has to flow through the bushing.

During the discussions on this subject the question was raised, how the rated current can be injected in the bushing during the Low Frequency Test while Partial Discharge is measured.

Please find below a proposal for a test setup:

- Two bushings are installed on the oil-filled test-tank.
- A conductive loop is formed with the help of cables.
- The rated current is injected into the circuit with the help of a Current Transformer.
- The Low frequency Test Voltage can be applied at the same time.



October 16th 2013, Egon Kirchenmayer

11.5 DRY TYPE TRANSFORMERS SC – CHARLES JOHNSON

Acting Secretary Casey Ballard

11.5.7 Introductions and Approval of Agenda and Minutes

The Subcommittee met on October 23, 2013 at 1:30 PM. There were 14 of 21 members present (therefore we had a quorum), 2 corresponding members, and 18 guests present, 5 guests requested membership.

The agenda was approved unanimously after a motion from Sanjib Som and a second from Tim Holdway.

The minutes of the Milwaukee, WI meeting were approved unanimously after a motion from Carl Bush and a second from Tim Holdway.

The minutes of the Munich, Germany meeting were approved unanimously after a motion from Dave Stankes and a second from Roger Wicks.

11.5.8 Working Group/Task Force Reports

The next order of business was the presentation of the reports of the various working groups and task forces. See the following sections for the individual reports:

11.5.8.1 I

EEE PC57.12.01 - Dry Type General Requirements **Chair Tim Holdway**

The working group met in the Landmark 7 Room of the Renaissance Grand Hotel St. Louis.

The meeting was called to order at 1:45 PM by Chairman Tim Holdway

The meeting was convened with 17 members (out of 24 – therefore a quorum was reached with 71% attending) and 29 guests present with 3 requesting membership.

The agenda was approved unanimously.
Motion: Casey Ballard
Second: Mike Haas

The minutes of the Munich March 18, 2013 meeting were approved unanimously.
Motion: John K. John
Second: Kerwin Stretch

The chair reminded the membership what it meant to be a member of the working group and that included participation in balloting, surveys, and attendance at all meetings. He offered an opportunity for anyone who did not want these responsibilities to remove their name when the attendance roster was circulated

Old business

- Draft 3 was balloted with 90 responses, 79 approval, 7 disapprove and 4 abstentions. From these responses, there were 107 comments. These comments were submitted to the WG membership by the chair on 10-3-13.

New business

- There was a proposal made that a task force be setup to 'help resolve the comments' that passed unanimously.
    - Motion: Chuck Johnson
    - Second: Rick Marek
- The chair agreed to chair the task force with the following members volunteering to participate:
    - Carl Bush
    - Sanjib Som
    - Rick Marek
    - Kerwin Stretch
    - Chuck Johnson

    - Sasha Levin
    - John K. John
    - Derek Foster
    - Dave Stankes
    - Dhiru Patel
    - Casey Ballard

- Table 9 was modified and presented by Chuck Johnson for discussion
    - The group agreed to keep his proposals.
    - Rick Marek proposed that 150 be changed to 155.
    - Vijay Singh proposed that 240C be added.
    - The TF will address his proposal.

- Section 5.10.1 was modified and presented by Chuck Johnson for discussion
    - The group agreed to accept his proposal

- Introduction rewrite was proposed by Peter Balma
    - The group agreed to accept his proposal

- There was a proposal to modify the scope from 'This standard describes electrical, mechanical, and safety requirements of single and polyphase ventilated' to 'This standard describes electrical and mechanical requirements of single and polyphase ventilated'. The motion carried unanimously.
    - Motion: Rick Marek
    - Second: Chuck Johnson

- There was a proposal to modify the purpose from 'This standard is intended to serve as a basis for the establishment of performance, interchangeability, and safety requirements of equipment described, and for assistance in the proper selection of such equipment.' to 'This standard is intended to serve as a basis for the establishment of performance and interchangeability requirements of equipment described, and for assistance in the proper selection of such equipment.' The motion carried unanimously.
    - Motion: Rick Marek
    - Second: John K. John

- There was a proposal to search the document for the word 'safety' and for the TF to remove them accordingly. The motion carried unanimously.
    - Motion: Chuck Johnson
    - Second: Mike Hass

- There was a proposal to remove the Note from 4.2.1. The motion carried unanimously.
    - Motion: Casey Ballard
    - Second: Rick Marek

- The following topics were proposed in the balloting and will be further addressed by the TF
    - Equation 8 and the removal of exponent 2
        - The group agreed to leave the exponent 2
    - The following definitions were discussed in reference to this standard and C57.12.80. The TF will determine the need for and define the following winding types
        - Cast coil
        - Resin encapsulated
        - Vacuum cast
        - Open Wound
    - Section 5.8 references 'product standards' which are commonly considered to be C57.12.51 and C57.12.52.
        - The TF will determine if these should be added to Section 5.8 and Section 2

Next meeting: Spring 2014, Savannah, Georgia USA, March 23-24 2104.

With no further business, the meeting was adjourned at 2:58 PM.

Motion: Sanjib Som
Second: Chuck Johnson

11.5.8.2 W

G Dry Type O&M Guide C57.94 Chair Dave Stankes

The working group met in the Landmark 1 Room of the Renaissance Grand Hotel.

The meeting was called to order at 4:45 PM by Chairman David Stankes.

The meeting was convened with 14 out of 21members (enough for a quorum) and 17 guests present with 1 requesting membership.

The minutes of the Milwaukee (Fall 2013) and Munich (Spring 2013) meetings were approved by unanimous vote – proposed by Tim Holdway and seconded by Chuck Johnson.

The agenda was approved unanimously – proposed by Carl Bush and seconded by Roger Wicks.

The chair discussed the timeline of the PAR leading to the end date of Dec 2015.

Document Review

1) There was a motion to consolidate and/or add titles as proposed in Munich – proposed by Richard Marek and seconded by Jerry Murphy – approved by unanimous vote
2) A proposal was presented to delete terms “cast coil”, “resin encapsulated winding” and “solid cast windings” – Richard Marek explained that the deletion of these winding types corresponds with definitions reviewed and approved during the C57.12.96 loading guide balloting. The motion to eliminate these above mentioned definitions was proposed by Casey Ballard and seconded by Richard Marek – motion carried unanimously. Rick Marek mentioned that the SC may investigate reviewing C57.12.80 to make sure all definitions were updated and correct.
3) Carl Bush brought up the question as to whether or not the reference to poly-phase in the scope be eliminated. Chuck Johnson explained why that would be unsustainable, noting that the effort is to generalize winding types and not eliminate scope of transformer applications.
4) There was a motion to drop the note in the definition of seal dry type transformer – proposed by Richard Marek and seconded by Chuck Johnson. There was some discussion regarding whether or not the note should remain, but be amended to eliminate reference to fluorocarbons which are no longer used. After some discussion a vote was taken, and the motion to eliminate the Note was approved.
5) Just prior to the meeting, the Chairman received extensive comments regarding Section 6 Testing from a Jill Duplissis, a guest of the Working Group. The Chair thanked Jill for her comments, and displayed these comments on the screen for discussion. One comment that was discussed was the proposed elimination of SFRA testing. Casey Ballard commented that he would recommend retaining the reference use of SFRA, which has been requested by several customers who actually bring their own instrument in for measurement. Carl Bush recommended replacing the SFRA abbreviation with its completely expanded description. There was a very animated discussion for 15 minutes at the end of which the Chair proposed that a separate (web conference) meeting be planned to review Section 6 Testing. He also noted that the comments and proposals received from Jill Duplessis would be sent out by email to all WG members and guests prior to the meeting so that they had sufficient time to review.

No new business was proposed.

The motion to adjourn was proposed by Tim Holdway and was seconded by Jerry Murphy. The meeting ended at 5:59pm.

11.5.9 Old Business

The chair presented the standards report for the dry-type standards and reminded the members that the group is small and must stay on top of the standards to keep them current.

Casey Ballard spoke about the need to update C57.12.55 which is outdated when compared to CSA C22.2 No. 94-M91, IEC 60529, and NEMA 250. He asked for reviewers to compare the standards so that the SC can be updated in Savannah. Chuck Johnson and Jim Atwiler agreed to join the existing group of Kerwin Stretch, Sanjib Som, and Vijay Tendulkar. Casey will provide a secure, password protected, copy of the standards referenced above working with Erin Spiewak from IEEE.

11.5.10 New Business

Casey Ballard noted that he had been nominated by Phil Hopkinson in the TC14 meeting to represent the US when IEC 60076-11 is opened for revision. He asked the membership to provide him input on any changes that might be needed.

There was a discussion on how to update the definitions in C57.12.80 once they were completed by the TF from C57.12.01. There was not a clear answer so the Chair agreed to research it further.

Roger Wicks and Jewan Puri commented that C57.12.58 should be opened to allow for enough time for a WG to make changes. The Chair asked them to review the current version and provide feedback in the Spring 2014 meeting.

C57.12.91

- The past chair, Derek Foster is considering opening up this document for revision. He held an informal session in which the attendees agreed on some topics to address.
- There was a TF created by the SC Chair and it will have its first meeting in Spring 2014
- Jewan Puri offered to present a tutorial on sound from the TF in C57.12.90

Sheldon Kennedy asked for the groups input on the maximum allowed temperature for a grounding transformer. There was some limited discussion, but Sheldon agreed to provide the Chair with more information to be distributed to the SC for their input.

11.5.11 Adjournment

Being no further business, the meeting adjourned at 2:33 PM

11.6 DISTRIBUTION TRANSFORMERS SC – STEVE SHULL

Meeting Date: 10/23/2013 **Time:** 9:30 – 10:45

Attendance:

Members	**39**
Guests	**54**
Guests Requesting Membership	**13**
Total	**106**

Meeting Minutes / Significant Issues / Comments:

Steve opened the meeting and rosters were passed out. The members were listed on the screen and by a show of hands, it was discovered that we had a quorum with only 32 of the 51 members in attendance.

Fall 2012 minutes were motioned for approval by Kent Miller & seconded by Ron Stahara. The subcommittee approved these without opposition.
Spring 2013 minutes were motioned for approval by Phil Hopkinson & seconded by Ron Stahara. The subcommittee approved these without opposition.

Each of the working groups that met reported as follows.

- C57.12.36 –Distribution Substation Transformers – Jerry Murphy

  Jerry Murphy called the meeting to order. Introductions were made. The names of the members were projected on the screen. By a show of hands the quorum was reached by having 12 out of the 21 members present.

  The minutes of the Fall 2012 meeting in Milwaukee were presented. A motion was made by Gael Kennedy and seconded by Steve Shull to approve the minutes as written. The minutes were approved unanimously.

  Then the minutes from the Spring 2013 meeting in Munich were presented. A motion was made by Dwight Parkinson and seconded by Terry Martin to approve the minutes as written. The minutes were approved unanimously.

  Draft 3 of the standard was reviewed. Section 5.11.2 on fan motor voltage and frequency was discussed. This section was updated with the comments made at the Spring meeting in Munich, and following the current version of the C57.12.10 Standard; the motor voltage for 60 Hz was now limited to 240 V. Gary King and Dwight Parkinson mentioned that there were motor voltages other than 240 V that are in use to accommodate to the transformer secondary voltage rating. John Rossetti provided a table with a study of what manufacturers offered on motor characteristics.

  After some discussion, Steve Shull made a motion, seconded by Gael Kennedy, to table this topic, and have further discussion with Gary Hoffman, in order to prepare a revised draft to be reviewed either before or at the Spring 2014 meeting. The motion was approved unanimously.

  Jerry mentioned that he would prepare a revised draft in the next 60 days, requesting the group to study it and provide comments back, to try to reach consensus prior to the Spring 2014 meeting in Savannah, to be ready at that meeting to vote on to going to ballot; if not before.

  The meeting was adjourned at 3:00 PM

- C57.15/IEC 60076-21 - Step-Voltage Regulators – Craig Colopy

  As this is a new Task Force there isn't a quorum requirement.

  Munich unapproved Minutes were noted but because there was no task force at that time, no approval was needed. Blank rosters were passed out for interested personnel to sign up for Task Force Membership.

  Jodi Hassz gave a presentation of the IEC/IEEE Dual Logo Agreement for Joint Development. This provided the background and basis for the process to be followed in this revision.

Craig provided a short list of items that needed to be considered for the coming updated, including:

- Reflect the latest revisions of referenced documents IEEE Std C57.12.00™ **Error! Reference source not found.**, IEEE Std C57.12.90™ **Error! Reference source not found.**, IEC 60076-1, IEC 60076-2, IEC 60076-3, IEC 60076-4, IEC 60076-5, IEC 60076-7, IEC 60076-10, IEC 60214-1 eliminating duplicating applicable text.
- Adapt the latest IEC approved format.
- Include additional references to applicable IEC standards, keeping IEEE standard references to a minimum. Due to this status as a dual logo (IEC/IEEE) document, the work is done as a joint review by IEEE and IEC.
- Review the requirement for 55 C winding temperature rise ratings versus 65 C winding rise.
- Add Sound Levels and description of tests
- Add a tank rupture type test.
- Add PD type test.
- Include a Control Compatibility type test
- Update IEC standard references for Control type tests.
- Include a section covering routine and design tests of On Load Tap Changers
- Clarify further short-circuit requirements for distribution and substation applications, revising where applicable (Additional Note?).
- Include external dielectric clearances
- Address comments from IEEE Ballot Process that were deferred until next revision.
- Address comments from IEC Ballot Process that were deferred until next revision.
- Meeting adjourned at 17:56 just in time to make it to the tour.

Subsequent to the meeting:

- Alan Peterson – NETA Representative requested Committee Membership.
- Comment from Section 5.12 'Power Supply for Transformer Auxiliary Equipment' in the C57.12.36 Sept 2012 draft standard. (Also Section 5.9.2 of C57.12.10-2010)
- Add Annex covering "Bypass of Neutral"
- Add Annex for Platform mounting
- Make note of the Acceptance Testing Standard and the Maintenance Testing Standard from ANSI/NETA (InterNational Electrical Testing Association). (ANSI/NETA ATS-2013 and ANSI/NETA MTS-2011)

After the report was given, Jodi Haas spoke to the IEC requirements for revision. She said that five countries must agree to provide experts for the process before this could begin. This group currently has one USA and will need four others to volunteer to be involved before this can move forward.

- C57.12.20 – Overhead Distribution Transformers – Alan Traut

Introductions of members and guests.

Al Traut provided the Chair's Report. The current PAR expires December 31, 2016. The 10-year cycle ends December 31, 2021.

Al Traut provided an update on the Task Force charged with the replacement of "mineral-oil-immersed" with "liquid-immersed".

A quorum of the WG's members was present (30 out of 36 members were present).

The minutes of the fall 2012 Milwaukee and the Spring 2013 Munich meetings were discussed and approved.

The first order of old business that was discussed was the discussion on adding minimum or maximum impedances to the document. Steve Shull suggested taking the 65kA breaker limitation into account during

future discussion. Al Traut volunteered to put together a table of impedance values that the WG can discuss in the next meeting.

Next, Josh Verdell presented the research that he and Marty Rave had gathered regarding Low Voltage Bushing interchangeability dimensions. It was noted by Steve Shull that any bushing requirement belongs in the bushing standards. John Rossetti made a note that all applicable voltages need to be defined. The spreadsheet showing the research will be made available.

The last order of old business that was discussed was in regards to Platform Mounting requirements for overhead type transformers. Survey information was presented to the WG. Marty Rave provided a typical installation schematic. Steve Shull asked if this discussion needs to be addressed with the regulator group. Steve Shull also asked if the direction for this discussion would be to add an ANNEX covering this information. A straw-pole of the meeting attendance indicated that more people want an informational annex provided than do not.

James Gardner, Ali Ghafourian, Dan Mulkey, and Said Hachichi volunteered to gather information regarding platform and mounting dimensions for discussion at the next meeting.

No new business was brought up during the meeting.

Meeting was adjourned at 12:10 PM.

- C57.12.34 – Three Phase Pad-mount Transformers – Ron Stahara

Ron Stahara called the meeting to order. To establish a quorum, a member list was displayed on the screen and those who saw their names were asked to hold up their hand. From this count of hands, it was determined that a quorum was established. Ron asked that everyone introduce themselves. Also, an attendance roster was circulated. The complete detail of attendance is recorded in the AMS system. A motion was made by Mike Faulkenberry and seconded by Justin Pezzin to accept the minutes of the Fall 2012 meeting as written. The motion was pasted unanimously. A motion was made by Paul Henault and seconded by Justin Pezzin to accept the minutes of the Spring 2013 meeting as written. The motion was pasted unanimously.

A discussion was continued from the spring meeting concerning the location of the H0 bushing. Jeff Schneider's presentation was referenced in the discussion and reviewed by Steve Shull. The discussion resulted in a suggestion that we draw the different configurations suggested in the discussion as well a common statement of user preference. This would then be circulated to the members for review before the next meeting. This would then be finalized at the next meeting.

An agenda item was raised to address a question concerning a section in the 2012 NESC:

> ***381. Design***
> *G. Pad-mounted and other above ground equipment*
> *2. Access to exposed live parts in excess of 600 V shall require two separate conscious acts. The first shall be the opening of a door or barrier that is locked or otherwise secured against unauthorized entry as required by Rule 381G1. The second act shall be either the opening of a door or the removal of a barrier.*

Steve Shull suggested that if the design was deadfront, the voltage exposed was less than 600 volts. This was based on the previous designs using a hood design on single phase units. The common consensus of the group was that this was true. After some discussion and wordsmithing by the group, the following section in the draft was changed to read as follows:

> **8.3 Access**
> Each compartment shall have a door so constructed as to provide access to the higher voltage compartment only after the door to the lower voltage compartment has been opened. There shall be one or more additional captive fastening devices that must be disengaged before the higher voltage door can be opened. If the lower voltage compartment has exposed live parts that are over 600 volts, a non-hygroscopic barrier shall be placed so as to require its removal or opening before access to the lower voltage compartment can be attained. Where the lower voltage compartment door is of a flat panel design, the door shall have three-point latching with a handle provided for a locking device. The compartment doors shall be of sufficient size to provide adequate operating and working space when removed or open. The doors shall either be equipped for latching in the open position or designed for manual removal

The underlined text indicates the changes in this section. A motion was made by Ali Ghafourian and seconded Gary King to accept this revision. The motion was pasted unanimously.

Another question was raised concerning the meaning of the "permanently affixed". After some discussion and time being close, this discussion was tabled until the next meeting. This concluded the meeting.

- C57.12.28/29/31/32 Enclosure Integrity – Bob Olen

Standards Status:

C57.12.28, Standard for Pad-Mounted Equipment – Enclosure Integrity
- **Published 9/30/2005, Revision Due date 12/31/2018**
- **PAR Approved 30-Sep-2010, Expires 12/31/2014**

C57.12.29, Standard for Pad Mounted Equipment - Enclosure Integrity for Coastal Environments
- **Published 10/11/2005, Revision Due date 12/31/2018**
- **PAR Approved 30-Sep-2010, Expires 12/31/2014**

C57.12.30, Standard for Pole-Mounted Equipment - Enclosures for Coastal Environment
- **Published 9/20/2010, Revision Due date 12/31/2020**
- **PAR Approved N/A, Expires N/A**

C57.12.31, Standard for Pole-Mounted Equipment - Enclosure Integrity
- **Published 9/20/2010, Revision Due date 12/31/2020**
- **PAR for Corrigenda** (SCAB Corrosion Test /4.5.6) **Approved 6-Mar-2013, Expires 12/31/2017**

C57.12.32, Standard for Submersible Equipment – Enclosure Integrity
- **Published 3/7/2003, Revision Due date 12/31/2018**
- **PAR Approved N/A, Expires N/A**

Meeting Minutes / Significant Issues / Comments:
- Quorum was established
- Ron Stahara motioned, and Bill Wimmer seconded, to approve the minutes of the previous meeting on October 23, 2012 in Milwaukee, Wisconsin. The motion was approved unanimously. (Note this WG did not meet during the Spring 2013 Transformers Committee meeting.)

Discussion of C57.12.31:

Bob Olen reported that he will soon form the ballot pool for the corrigenda to correct Section 4.5.6, Simulated Corrosive Atmospheric Breakdown (SCAB), on page 8, which should require 10 SCAB cycles not the 15 that is stated in the 2010 Standard.

Discussion of C57.12.28 Ballot:

Current Draft Being Worked On: **D9** **Dated:** **4/22/2013**

- The Ballot Results were:
  - 89% Return (passed > 75%)
  - 94% Affirmative (passed > 75%)
  - 5 negatives
  - 75 comments
- Chairs will deal with the numerous editorial comments
- Technical Comments (TC) were discussed and disposed of as follows:
  - T i-3 – Jerry Murphy motioned, Ron Stahara seconded, to leave 1.1 as is. Passed unanimously
  - G i-52 –Steve Shull motioned, Ron Stahara seconded, to add “mild steel” as suggested, passed unanimously
  - G i-66, i-32 – Jerry Murphy motioned, Brian Klaponski seconded, to not add a section to 4 on galling, passed with 20 in favor, 5 abstentions, no negatives
  - G i-67, i-34, i-53 – Brian Klaponski motioned, Jerry Murphy seconded, to retain as is the wire probe with the bolt missing, passed unanimously
  - T i-57 – Tim Albers motioned, Ron Stahara seconded, to add a column to Table 1 indicating the affected clause, passed unanimously
  - G i-13, i-27 – Ron Stahara motioned, Steve Shull seconded to add as per the i-13 comment, passed unanimously
  - T i-56 – Steve Shull motioned, Ali Ghafourian seconded, to leave 4.3.4 as “intrusion into the interior”, passed unanimously
  - G i-68, i-54, i-35 – Steve Shull motioned Mike Miller seconded, to leave retest at 5 years, unanimously
  - G i-64, i-31, i-65, i-38 – Ali Ghafourian motioned, Mike Miller seconded, to add gel-coat to 5.3.1 and to definitions in clause 3, passed unanimously
  - T i-75, i-69, i-55, i-39 – Jerry Murphy motioned, Ali Ghafourian seconded to leave the 2 year retest in place, passed unanimously

- T i-70, i-40 – Marty Rave motioned, Mike Miller seconded, to add quotes around the whole Munsell number including the high-gloss and semi-gloss terms, passed unanimously
- Figure 5 – Jerry Murphy motioned, Gael Kennedy seconded, to remove the squiggle representing an indefinite line from the panel in Figure 5, passed unanimously
- G i-71, i-41 – Ali Ghafourian motioned, Alan Wilks seconded, to remove "Any color shift shall be noted" from the end of 5.5.4, passed unanimously
- T i-72 – Jerry Murphy motioned, Ali Ghafourian seconded, to leave the FS-40 bulb in 5.5.2, passed unanimously
- E 1-23 – Ron Stahara motioned, Gael Kennedy seconded, to change the four "should"s to "shall"s and the one "may" to "shall" in Annex A, passed unanimously
- T i-73, i-44: typo correction – missing "3" in 2.235" free length of spring
- T i-5 – Dan Mulkey reported that per IEEE editorial the Bibliography entries are supposed to have a "B" label even though they are in Annex C

Most the above are applicable to the .29 standard as well, though the comment numbers change.

Discussion of C57.12.29 Ballot:

Current Draft Being Worked On: **D9** **Dated:** **4/22/2013**

- The Ballot Results were:
  - 90% Return (passed > 75%)
  - 93% Affirmative (passed > 75%)
  - 6 negatives
  - 71 comments
- Chairs will deal with the numerous editorial comments
- Technical Comments (TC) that are unique to .29 were discussed and disposed of as follows:
  - T i-59, i-28, G i-46 – Ali Ghafourian motioned, Bill Wimmer seconded, to re word section 4.1 so that it is a list of two separate possible actions to prevent galling. Passed unanimously
  - G i-60, i-30, i-26 Gael Kennedy motioned, Ali Ghafourian seconded, to add footnote 5 from 4.1.1 in .28 to 4.2.1 in this standard on the user being responsible for bolting down the pad. Passed unanimously
  - G i-22 – Paul Chisholm motioned, Tim Albers seconded, to not add salt spray as suggested to clause 5 since salt spray test is not effective on stainless steel substrates, Passed unanimously.
  - G i-64, i-31 (of .28), James Shekelton motioned, Tim Albers seconded to remove gel-coated from 5.3.1. After discussion the motion was rejected unanimously.
  - T i-67, Gael Kennedy motioned, Ali Ghafourian seconded, to leave the chip mark evaluation at 2.0 mm, Passed unanimously.

Concluding Remarks

The chairs will correct the drafts as agreed, respond to the ballot comments, and submit .28 and .29 for a recirculation. The results of those recirculations and of the ballot for the corrigenda of .30 should be available for discussion at the next meeting in April 2014 in Savannah, Georgia. The group's next task will be to begin working on a revision of C57.12.32, Standard for Submersible Equipment – Enclosure Integrity.

- C57.12.37 Test Data Reporting – John Crotty

The meeting was called to order at 3:20pm.

Introductions were done.

Roster was taken, quorum was met.

Minutes from the meeting on 10/23/2012 reviewed and approved.

Old business:

1. The chair asked the WG if there were any changes or issues found from the review of the standard. None were found.

2. The chair asked if there were any needed changes due to the new DOE ruling. None were found.

New Business:

The chair asked for a motion to move to ballot. The motion was approved. We will move forward with the ballot process.

Adjourned at 3:50pm

- C57.12.38 Single Phase Padmount Transformers - Ali Ghafourian

  Ali Ghafourian opened the working group meeting at 1:47 p.m. Twenty-six of thirty-four working group members were present and a quorum was established.

  A motion was made to approve the minutes from the fall 2012 meeting, it was seconded, and the motion was passed unopposed by the working group members.

  Ali stated that the PAR expires at the end of 2014 and that we need to resolve the remaining issues, if possible, in this meeting so that the document can be sent to ballot.

  Ali explained that there is a subcommittee task group working on the verbiage needed to incorporate natural ester fluids into standards. That work will not be completed prior to our PAR expiration and, therefore, this issue will have to be addressed in the next PAR.

  The document also has not been revised to include verbiage to address concerns about the tank pressure requirements that contributed to the formation of the task group, and now working group, C57.12.39. That working group will not be finished with their work before our document's PAR expires. It was decided in the last meeting to leave this subject as currently written. It will be revised with the next PAR after the C57.12.39 working group completes their work.

  The last major item to be resolved is how to address low voltage bushing cantilever strength requirements. Prior to the meeting, a proposed paragraph to address this was sent out to the working group members. Mike Faulkenberry presented the paragraph to the group and substantial discussion was begun. There were a number of questions and concerns about the test values and the test method. Steve Shull made the working group aware that the bushing subcommittee would be setting up a task force, and potentially a working group, to address distribution bushings. Steve made a motion, which was seconded by Ron Stahara, to table this item until the next PAR and to review it again at that time when the bushing subcommittee addresses the issue. The motion passed with 24 voting for, and 2 against.

  A quick review to go over the changes in Draft 1.4 of the document was conducted. There was a question about the requirement in Clause 7.6 for lifting provisions being "permanently attached." Most manufacturers provide permanently attached inserts for using lifting bolts. The question was whether or not that met the "permanently attached" requirement or if some form of lifting hooks needed to be required. It was stated that historically that type of requirement was discussed but not included previously in the document due to the risk management issues associated with having protrusions on the transformer that could become a hazard to the public.

  After the document review and no further questions or comments, Ron Stahara made a motion that Draft 1.4 be accepted and that the document be sent to ballot. That motion was seconded by Steve Shull and the motion passed unanimously.

  No new business items were suggested, and the meeting was adjourned.

- C57.12.39 Tank Pressure Coordination – Carlos Gaytan

  The meeting was called to order at 4:45 PM. Introductions were made. The names of the members were projected on the screen. By a show of hands the quorum was reached by having 18 of the 34 members present.

  The minutes of the fall 2012 meeting in Milwaukee were presented. Ali Ghafourian moved to approve them as written. Said Hachichi seconded. Under discussion, Tom Holifield mentioned that he thought the note that a 7 psig PRV would activate more often than a 10 psig PRV was not what the group agreed on, and felt that the 7 psig would effectively operate the same amount of times as a 10 psig PRV. After some discussion, the group agreed to proceed with the minutes without resolving this issue at this time provided it would be addressed if necessary during development of the standard. The motion was then voted on and approved unanimously.

  Then the minutes of the spring 2013 meeting in Munich were presented. Steve Shull moved to approve them as written. Ron Stahara seconded. It was approved unanimously.

  The topics reviewed at the last meeting in Munich were presented.

  There was discussion about considerations for negative pressures (vacuum), and tank integrity; the group was in favor of the idea of including negative pressure requirements but requested to present more references before proceeding.

Discussed installation of PRDs. Since the scope of this standard covers all distribution transformers, the requirement for PRDs and transformer kVA and BIL was clarified. A comment was made that a PRD is not necessary a valve.

On the sudden pressure relay section, Josh Herz mentioned that this device can be not only mechanical but also electronic.

The group agreed that Venting Pressure is the desired term when talking about pressure relief, and that specific definitions of this term as well as re-sealing pressure are not needed in the document.

The group was in favor of the idea of including the definitions for Static and Dynamic pressure in the document, but the term static pressure was not acceptable as written and will need to be re-visited when editing the draft.

There was discussion of potential redundancies between this standard and the other distribution transformer standards. The group at the end agreed that having all the requirements related with tank pressure and the associated components in one document would be beneficial, and as the other distribution standards would be updated, any redundancies would be resolved.

Alan Wilks made a motion to: Put all the items together into a draft version of the document and circulate the draft for comments. This was seconded by Ali Ghafourian. It was approved unanimously.

The Meeting was adjourned at 6:00 pm

- C57.12.35 – Distribution Transformer Bar Coding

  The WG met on Tuesday, October 22, 2013 at 9:30 am in the Majestic Room of the Renaissance Hotel in St. Louis, MO.

  An agenda was presented and approved. Introductions were made. There was a quorum present at the meeting. Ron Stahara made a motion to approve the Meeting Minutes from the Milwaukee, WI meeting. Ali Ghafourian seconded the motion and the minutes were unanimously approved. Ron Stahara made a motion to approve the Meeting Minutes from the Munich, Germany meeting. Steve Shull seconded the motion and the minutes were unanimously approved.

  The final draft of the document has been balloted and received a 100% approval vote. The revised standard has been approved by REVCOM and published by IEEE.

  The Chair informed the WG that the Manufacturer/repair facility identification code section was moved from the informative Annex A to the IEEE website with a link from a footnote in the document. This change was made as a result of comments received from IEEE editorial during the Mandatory Editorial Coordination. A discussion on this change ensued within the WG and a motion was made to petition IEEE to move the Manufacturer/repair facility identification codes back into the standard as normative. The motion was made by Alan Wilks and seconded by Steve Shull. The motion was approved unanimously. Erin Spiewak from IEEE attended the WG meeting and will review with IEEE editorial and advise the chairman how to proceed if this change can be accomplished.

  Meeting adjourned at 10:45 am.

- TF – Transformer Efficiency and Loss Evaluation (DOE)

  The Task Force on DOE Energy Efficiency of Transformers was called to order at 1:45 PM on October 23rd, 2012. The secretary was introduced. The guest speaker Mr. Paul Jarman the IEC TC14 Chairman, was introduced

  The chairman reviewed briefly the contents of the March 19th, 2013, meeting in Munich, Germany. A motion was made and seconded to approve the minutes; the motion was approved.

  The chairman remarked that this will be the last meeting of the IEEE Task Force as the DOE has issued its final rule. He mentioned that this meeting will include a presentation from the IEC TC14 chairman on a proposed new CENELEC standard for energy efficiency for large transformers based on a draft of a new European Regulation. He also mentioned that he received a proposal from one of the Working Group Convenors for IEC TC14 for a possible new IEC standard on energy efficiency for large transformers beyond 100 MVA. It was shared with NEMA staff and discussed during the NEMA transformer meetings that occurred on Sunday Oct 20th, 2013. The NEMA section agreed to look at this proposal and respond back within 30 days on their decision. Depending on the outcome, there may be future work with a combined IEEE/NEMA task force to address this.

  The chairman walked thru a power point slides presentation that summarized the following: a summary of the final rule, definitions in the final rule, the liquid filled final rule, the low-voltage final rule, the medium-voltage dry

final rule, life cycle cost and paybacks in the final rule, assumptions, considerations in the final rule, cautions (by utilities, manufacturers, and core steel makers), key issues to establishing new standards, and reference materials. He remarked that the entire presentation has been posted on the IEEE website.

Mr. Jarman gave a presentation on a proposed CENELEC standard for energy efficiency of large transformers up to 100MVA. In addition to no load & load losses, and power factor efficiency, energy performance is calculated via a Peak Efficiency Index (PEI). PEI is based on the transmitted apparent power of the transformer. He then briefly went thru the proposed European Regulation, and then went thru some slides that spoke to the need for using PEI to calculate energy performance.

The chairman remarked again that he has received a proposal from an IEC TC14 Working Group Convenor to for a proposed new IEC standard on energy efficiency for large transformers beyond 100 MVA that will be shared with the NEMA transformer section. Depending on the outcome, there may be future work with a combined IEEE/NEMA task force to address this.

John Caskey from NEMA gave some final remarks on the DOE negotiate rulemaking process. There were many members of the working group who stepped forward with needed technical data that helped discover DOE errors. The end result was more palatable to NEMA manufacturers.

Members expressed concerns that small transformer manufacturers may no longer be able to compete in the market once the new rule goes into effect. Also depending on future DOE proposed efficiency regulations this group may need to start activities again sooner in the process perhaps as a combined IEEE/NEMA task force. The chairman thanked all members for their work, and recommended that this task force disband. There are no future meetings planned.

The meeting was adjourned at 4:00 PM

Old Business:

- After some discussion with the C57.12.20 working group, it was discovered that there was an initiative to include bushing requirements in their standard. However after some discussion it was recommended that we bring this to the Bushing Subcommittee for consideration. Steve Shull discussed this with the Bushings Sub-Committee Chair with a suggested title and scope was follows:

  IEEE C57.19.02 Standard Performance Characteristics and Dimensions for Outdoor Distribution Apparatus Bushings

  Suggested Scope:

  This standard covers electrical, dimensional, and related requirements for outdoor power apparatus bushings that have basic impulse insulation levels (BILs) of less than 95kV. It provides specific values for dimensional and related requirements that are to be interpreted, measured, or tested in accordance with IEEE Std C57.19.00. Bushings covered by this standard are intended for use as components of oil-filled transformers.

  Barry Beaster & Josh Verdell went to the Bushings SC at Steve Shull's request to present our case for this TF.

Chairman's Comments:

- Steve reviewed the membership requirements of TF/WG/SC of the Transformer Committee. This is listed below.
  - Membership is automatically granted to anyone requesting it at the first meeting of a new WG or TF.

- Thereafter, membership is granted after a prospective member attends two consecutive meetings as a guest AND actively participates in the work of the TF/WG/SC. A former member may be reinstated if the same criterion is met.
- Ongoing membership is maintained by consistent attendance at TF/WG/SC meetings, participation in internal TF/WG/SC surveys, or technical/editorial contribution to the TF/WG/SC's document or work.
- Membership may be revoked if a member fails to attend two consecutive meetings or fails to respond to two consecutive surveys. The chair has discretion in not removing members who cannot attend but are still participating via survey responses and/or other written contributions.
- **Another key point that was mentioned is that each TF/WG/SC Chair (or Secretary) must keep regular logs of attendance and participation and update the roster after each meeting. This is done in our Transformer Committee AM system. This should be used to determine our Quorum requirement for TF/WG/SC meeting business.**
- **The main benefit of membership is the privilege of voting on TF/WG/SC issues**.

New Business:

Phil Hopkinson brought two items to the SC for discussion:

- Phil has found that transformers used in wind farms are experiencing gassing from what appear to be core static discharges. It appears these are occurring from round wound L-H designs and it is not dependent on manufacturer. It also to more prevalent as the high side voltage increases. There are a number of options to correct the issue and the desire isn't to standardize a design requirement, but to address the issue and recommend solutions. These include low-high-low configuration and shielding between core and winding or around HV windings. Motion was made by Phil Hopkinson and seconded by Ron Stahara for the SC to form a TF to study this phenomenon and make recommendations to address this issue. This could include recommendations to alter the some of the standards. After some discussion Dan Sauer called the question and the SC approved the motion without opposition.
- Phil has also found transformer failures resulting from vacuum or SF6 breaker switching with shielded cables and high inductive loads. Phil suggested this go into a standard. Steve Shull said this will have to go before the proper Subcommittee. Unfortunately this would not be this Subcommittee. Steve Shull suggested that it should be brought before the Performance Characteristic Subcommittee.

Steve adjourned the meeting with unanimous consent at 10:32am.

11.7 DIELECTRIC TESTS SC – MICHAEL FRANCHEK

Dielectric Tests Subcommittee		
Chair: Michael Franchek	**Vice-Chair: Thang Hochanh**	**Secretary: Ajith M. Varghese**
Room : Landmark 1-2-3-4	Date : Wed, October 23 ,2013	Time: 11:00 am to 12:15 pm
Members : 114	Member's Present : 83	Guests : 117
Membership requested during S13 : 12	Membership accepted: 12	
New membership requested during F13 : 10		

11.7.7 Chair's Remarks

The Chair briefly highlighted the requirement that while introducing one need to state their employer / company and sponsor if difference from company in addition to name.

Chair introduced Ajith M. Varghese as new Secretary of Dielectric Subcommittee replacing Dennis Marlow.

The Chair recognized the former Dielectric Subcommittee Chair of 17 years, Loren Wagenaar

11.7.8 Quorum and Approval of Minutes

The membership list was shown and a show of hands of committee members present showed that a quorum of members were in attendance at the start of the meeting. 83 out of 114 members attended, so there was a quorum.

The revised minutes of the spring 2013 meeting in Munich were approved without correction.

11.7.9 Working Group Reports

11.7.3.1 Working Group on External Dielectric Clearances, Eric Davis, Chair; (Vacant), Secretary

The Working Group met on October 21, 2013 at 9:30 am with 63 people attending the meeting; 12 of 13 members, zero of 3 corresponding member, and 51 guests. A quorum was achieved.

David Wallace moved that the Spring 2013 meeting minutes be approved as written. Dan Sauer seconded the motion. There was no discussion. The motion passed unanimously.

The WG Agenda was reviewed. There were no revisions or additions to the agenda.

The WG reviewed the results of the survey on the proposed clearance table for 1.2 through 230 kV. The discussion focused on the seven negative responses to the proposed clearances. These responses covered three basic issues:

- The clearances are lower than those contained in the IEC and CSA standards
- The NEMA TR-1 clearances were not matched correctly with BILs in the proposed table
- The clearances are too small and should be based on voltage not BIL

The WG discussed the fact that the clearances in the proposed table are smaller than those contained in IEC 60076-3 and CSA-CAN C88-M90. This was shown graphically and in tabular form. Paul Jarman confirmed that the IEC values are conservative and to be used if the User does provide any values.

The WG discussed how the NEMA TR-1 clearances were matched with BILs. The highest BIL listed for each voltage in C57.12.00 Tables 4 & 5 was matched with the phase-to-phase clearance listed for

each voltage in C57.12.00, Table 11. This is consistent with the C57.12.00-1993, the first reference the Chair could find to external clearances in C57.12.00 which lists BILs by voltage in Table 3 and external phase-to-phase clearances in Table 11. In addition, the proposed BILs and clearances are consistent with the NESC BILs and associated values. These NESC values have not changed since the 1930's.

Several people felt that for a given voltage, the clearances for the lower BIL values are insufficient. They suggested that a single clearance be provided for each voltage. They suggested the clearances be established using the following method.

- Establish the clearance based on an equivalent BIL based on the voltage.
- The equivalent BIL = Voltage * 1.8 (induced one minute value) * 2.5

It was pointed out that the existing standard contains text stating that larger clearances may be required for testing and that the WG had previously agreed to follow the same approach.

"Factory dielectric test conditions may require larger clearances than those defined here."

After much discussion, a straw poll was taken on this issue. Of those in attendance, 19 people felt the proposed values and methodology was appropriate, 6 people felt the revised method should be used and the balance of the attendees abstained from voting. Based on this straw poll, the WG is moving forward with the values contained in the survey.
The WG briefly reviewed the switching surge phase-to-ground and phase-to-phase clearances. Background information on how these values were established will be included with a survey on the proposed values.

The WG is looking for a new Secretary. After the meeting Troy Tanaka volunteered to fill position.

Meeting adjourned at 10:45 am
Respectfully submitted, Eric Davis

11.7.3.2 WG on Dielectric Frequency Response (DFR) – Ali Naderian, Chair; Poorvi Patel, Secretary. Monday, October 21st, 2013 – (3:15 -4:30PM)

The meeting was called to order by the chair at 3:15 PM. This was the first Working group meeting. There were a total of 82 attendees; 30 requested membership and 52 requested to be guests.

1. Introduction of members and guests
2. The minutes of meeting from the Task Force Spring 2013 meeting in Munich Germany could not be approved since there was no quorum.
3. The Table of content for the DFR Guide was discussed.
   - In definition section – we should define the DFR methodology to be included in the guide
   - Add a section in 3. DFR measurements overview – that describes 50/60 Hz Power factor versus DFR (comparison, statistics…)
   - In section 6- Measurement analysis, interpretation, and report- Add moisture prediction uncertainties
   - Annex D- include examples of measuring issues in the field

Proposed List of Contents:
1. Overview
   1.1 Scope
   1.2 Purpose
2. Definitions
3. DFR measurement overview
   3.0 DFR Test (frequency domain)
   3.1 Use of DFR (DFR vs. tan Δ)

3.2 DFR Moisture Application
3.3 Recommended DFR measurement test parameters

4. Making a DFR measurement
    4.1 Test procedures
    4.2 Test environment preparation
    4.3 Test object preparation
    4.4 Test connections
    4.5 Test Specification
    4.6 Test leads
    4.7 Measurement methods

5. Test records
6. Measurement analysis, interpretation, and report
    6.1 Moisture estimation
        6.1.1 Introduction
        6.1.2 Modeling
        6.1.3 Factors influencing moisture estimate
        6.1.4 Report
    6.2 Examples

Annex A (informative) DFR moisture estimate theory + validation
Annex B DFR Other Application
Annex C: Examples of typical issues with the field measurement in the field (shorting is not an option, high noise interference,)
Annex D (informative) Bibliography,

4. Volunteers for the different section are mentioned in the Table below

3. DFR measurement overview	Diego, Mario, Tom
4. Making a DFR measurement	Mark, Mario, Chuck, Peter
5. Test records	Ronald, Nathan, Diego
6. Measurement analysis, interpretation, and report	Ali, Poorvi, Mark P, Ronald, Tom, Mark L, Peter,
Annex A (informative) DFR moisture estimate theory+ validation	Diego, George, Ronald
Annex B DFR Other Application	Poorvi, Mark P, Mario, Ali, Peter
Annex D.	Peter, Mario, Ali

5. Deadline for 1st draft of section 3 to 6 +Annexes :January 22nd 2014
6. Tentative schedule for conference call to review drafts: Feb 11 2014 or Feb 12 2014
7. Section leader will be appointed by the WG Chair and emails will be distributed to the volunteers for the different sections.
8. WG Chair will also distribute the DFR TF report.

9. Meeting was adjourned at 4.30 pm by Poorvi Patel and Mario Locarno

Ali Naderian, Chair
Poorvi Patel, Secretary

11.7.3.3 Working Group for Revision of the Distribution Impulse Test Guide C57.138, Recommended Practice for Routine Impulse Test of Distribution Transformers; John Crotty, Chair

Document #:	C57.138	**Current Standard Date:**	March 9, 1998
Document Title:	Recommeded Practice For Routine Impulse Test For Distribution Transformers		
Co-Chairman:	John Crotty		
PAR Date:	2/01/2011	**PAR Expiration Date:**	12/31/2015
PAR Status:	New		
Current Draft Being Worked On:	Draft 1	**Dated:**	3/13/2012
Meeting Date:	10/22/2013	**Time:**	11:00am

Attendance:		
	Members	5
	Guests	33
	Guests Requesting Membership	9
	Total	38

Meeting Minutes / Significant Issues / Comments:

Called to Order 11:02am
Quorum Requirement –Not Satisfied

Chair presented Agenda and the Milwaukee – Fall 2012 meeting minutes but they could not be approved.
- The Chair will send the meeting minutes to the members for approval.

Old Business - Reviewed the action items from last meeting.
- Revise 5.1 to use same word rated for the crest value and reduced wave based on C57.12.90. COMPLETE
- Standard version numbers will be revised to say latest version of the standard instead of the year. BY NEXT MEETING
- Dan Sauer updated the WG on analog detection and the tube availability. The tube is outdated and we need to analyze the whole circuit and its validity. Chair asked the group if we can remove this. WG suggested we move this to Appendix and add new software comparison technology.
  - Martin Hinow (HiVolt Inc) JMX Services,Inc –Jim McBride will provide some block diagram for the latest technology /software comparison technique.
- Chair mentioned if we can have any volunteers for redrawing some of the drawings.
  - Jeff Brittain /Phenix technologies volunteered to do some of this.

New Business - Review other changes needed. There were none, but many of the guests have not seen the standard in a while. Chair agreed to send the standard to the guests for review as well as memebers to be ready for the next meeting.

Adjourned - 1132am.

Submitted By: John Crotty

Date: 10/22/2013

11.7.3.4 Working Group on Revision of Impulse Tests – Pierre Riffon, Chair; Peter Heinzig, Vice-Chair

The WG met on October 22, 2013, from 4:45 pm to 6:00 pm. Twenty-one (21) members and fifty-seven (57) guests attended the meeting. Ten (10) guests requested membership. The meeting was chaired by Pierre Riffon, chair of the WG. The co-chair was Peter Heinzig.

Required quorum was met; presence of 21 members was required.

Revision 1 of the agenda has been reviewed and approved unanimously as written. Motion for the agenda was made by Mr. B. Poulin and seconded by Mr. Paul Jarman.

Minutes of the Munich meeting were approved unanimously as written. Motion for Munich minutes approval was made by Mr. Joe Melanson and seconded by Mr. David Wallace.

The first item of business was related to the survey made within the WG and the Dielectric Tests SC on a proposal defining a non-mandatory order for impulse tests. As also defined by IEC 60076-3, the proposal suggests to perform the switching impulse test after the lightning impulse test. Comments received were discussed. Even if the approval rate within the WG and Dielectric SC was close to 89%, and after a long discussion, a modified proposal has been agreed upon in order to satisfy some of the negatives received. This revised proposal will be tentatively discussed during the Dielectric SC meeting as a new business or, if not possible, surveyed within the SC before the next meeting.

The motion of accepting the surveyed proposal was made by Joe Melanson and seconded by Vinay Mehrotra. An amendment to the initial proposal was proposed by Paul Jarman and seconded by Joe Melanson. The amendment was voted 19 in favor, 0 against and 2 abstain. The amended proposal was voted 20 in favor, 1 against and 0 abstain. The need to circulate the modified proposal at the Dielectric Subcommittee level was proposed by Loren Wagenaar and seconded by Joe Melanson. 19 members were in favor of the proposal, none against and 2 abstain.

As a new business, a request was made by Tom Lundquist to clarify the applicable tolerance on the front time during lightning impulse tests. The actual tolerance is ±30% on the specified value of 1.2 µs leading to an upper value of 1.56 µs. Nevertheless, for cases where the winding capacitance is high, an upper limit of 2.5 µs an even higher is also given but the rules defining acceptance of an higher value than the prescribed 1.56 µs are not clear. The text shall be clarified. Paul Jarman presented what has been agreed upon in the new edition of IEC 60076-3. A proposal based on the IEC wording will be surveyed within the WG membership before the next meeting.

As a new business, Peter Heinzig is resigning as the vice-chair of the WG and will be replaced by Mr. Martin Hinow from HighVolt.

The next meeting is planned to be held in Savannah, Georgia, on March 25, 2014.

The meeting adjourned at 5:50 pm on October 22, 2013.

Pierre Riffon P. Eng. WG Chair
October 22, 2013

11.7.3.5 Working Group on Revision of Low Frequency Tests; Bertrand Poulin, Chair; Bill Griesacker, Secretary St. Louis, MO – October 22, 2013

1. There were 71 attendees, 22 members and 49 guests present at the meeting; 7 guests requested membership. More than 50 % of the working group members were in attendance at the meeting, therefore a quorum was present at the meeting.

2. The agenda for the meeting was presented and unanimously approved.

3. A motion was made by the chairman to approve the minutes from the Spring 2013 meeting in Munich, Germany. The minutes were approved unanimously.

4. TF - PD in Bushings and Instrument Transformers:

   a. Nearly completed is the guide material on bushings. In one month will send this section of guide out for comments to members of the task force. Next meeting will focus on completing CT and PT sections of the guide. With the PAR on PC57.160 approved, the status of the TF has been changed to WG and will report directly to the DiSC in the future. Thang Hochanh will continue to lead the technical part of the work and the official WG chairman will be Bertrand Poulin who will take care of the administrative part of the work.

5. Tap Changer Position During Induced Test

   a. Results of Survey: Broad approval was received, 264 out of 410 responded, Approval without comments was 214 or 85 %. Approve with comments was 25 so total approval was about 95 %. There were 12 disapprove votes or 4.8%. Three objections came from manufacturers who claimed not to be in position to test transformers with preventative auto due to insufficient generator capacity. Another objection came from those with design of PA that uses an equalizing winding. After clarification, the member agreed to change his vote. One voter objected to test with a voltage exceeding the required terminal voltage only to test an auxiliary device. May suggest multiple tests to meet new requirement. A voter objected since the proposal may conflict with table 5.

   b. There were no comments that disagreed with the general concept that was proposed. Comments referred to improve the proposed wording.

   c. A second survey will be prepared and re-circulated in the next few months to those that have responded so far.

6. Old Business – none.

7. New Business – Section 10.5 for low frequency tests on transformers that have an internally grounded neutral. The question regarded the reason to the factor 3.46 at induced test on such transformers and why this applies only to single phase transformers. Chairman will search for an answer from people in distribution transformers.

8. The meeting adjourned at 2:21 p.m.

11.7.3.6 WG - IEEE Guide for the Detection of and Location of Acoustic Emissions from Partial Discharges in Oil-Immersed Power Transformers and Reactors (C57.127) – Jack Harley – Detlev Gross Co-Chairs.

1. Meeting Attendance

The working group met for the first time on October 21st 2013 at 11am. 43 persons were in the room. A total of 20 persons will be recorded as members. 23 will be listed as guests.

2. Discussions

The title of the guide, scope, purpose and table of content were discussed. It was agreed that some of the sentences of the scope were informal and should be either removed or moved in a section of the document. The references to "Oil-Immersed" will be removed to allow documentation on other liquid immersed or even dry-type transformers.
The discussions led to a potential source of confusion regarding the permanent monitoring versus temporary monitoring. Phrasing of the purpose will be changed and sections of the guide could later be adjusted to bring precisions on these applications.
Adjustments to the Title, Scope and Purpose of the guide will be made and presented at the S14 meeting.
The guide revision planning was also presented. The schedule indicates that a request for PAR would be emitted after the spring 2014 meeting

3. Adjournment

The meeting was adjourned at 12:10 PM.

David Larochelle – WG Secretary

11.7.4 Liaison Reports

11.7.4.1 High Voltage Test Techniques (HVTT), IEEE Standard 4 - Arthur Molden

The newly revised eighth edition of IEEE Standard 4, "High Voltage Testing Techniques" was published in May this year. There is a great deal of new material in this edition and also, new requirements that impact measuring techniques we use for making measurements during our transformer testing procedures. If there are members still not aware of these new requirements, the standard is now available for purchase; obtain a copy, check it out, do it now! Standard 4 is referenced in almost all the C57 testing standards and guides

There was a meeting of the HVTT working group earlier this year. The project having by then been completed, the meeting was short and sweat and focused on what future tasks the group might consider of interest. Several topics were suggested by the attending members, some of which were: revisions to IEEE 1122 pertaining to digital impulse recorders used for HV impulse measurements, revisions to IEEE 1223 pertaining to, requirements for impulse analysis software and, revisions to IEEE 510 pertaining to, safety in high voltage and high power testing. Other areas of interest were: a guide for HV tests and measurements in the field and, hardware and software requirements for instruments used for AC, DC and impulse measurements. The group will continue to correspond and future meetings will likely be arranged in conjunction with other IEEE apparatus committee meetings such as transformers, insulated conductors, switchgear and the PES general meetings.

Art Molden.

10/23/2013

11.7.5 Old Business

11.7.5.1 Dielectric Tests-Task Force Ad Hoc Meeting To correct problems in Table 4/5 of C57.12.00
Renaissance Grand Hotel, St. Louis, Missouri October 21st 2013
Ad Hoc Meeting Chair: Phil Hopkinson, Ad Hoc Meeting Secretary: Steve Griffith

The Ad Hoc Task Force Meeting was called to order at 1:45 PM. There were 12 attendees: 11 members and 1 guest.

1. Opening of the meeting.

Mr. Hopkinson remarked that the purpose of this meeting was to correct problems with table 5 of the Dielectric Test Tables of C57.12 from 2010. He presented the tables as they are today and noted 3 issue areas: the column 12 and column 13 headers were incorrect, the one hour test level in the 500kV line was incorrect, and the enhanced test level in the 500kV line was incorrect. In addition he proposed suggestions for one of the table footnote #6 recognizing 500/525kV nominal and an additional footnote to account for higher neutral BIL Applied tests.

2. Discussion

Members present agreed to the following changes:

- Correct the column 12 and column 13 headers to read Grounded Y and Impedance Grounded Y
- Change the 460kV one hour test level to 475kV in the 500kV line
- Change the 520kV enhanced test level to 550kV in the 500kV line.

Members discussed the proposed suggestion to footnote#6 and decided to leave it as is.

In addition the following changes were agreed upon.

- In column 1 and column 2 under low-voltage windings change >=17 to 17, and <=15 to 15
- In column 6, the enhanced test levels under low-voltage windings reading from top to bottom will now be 26, 36, 48, and 72
- In column 7, the one hour test levels under low-voltage windings for the first two entries reading from top to bottom will now be 14, and 23
- In column 5, the impedance grounded Y applied test levels under-low voltage windings reading from top to bottom will now be 34, 34, 40, 50 and 70
- The heading low-voltage windings was renamed to state: low-voltage windings (below 69kV nominal)
- The heading high-voltage windings was renamed to state: high-voltage windings (nominal 69kV & higher)
- The last row under low-voltage windings (below 69kV nominal) was then moved under high-voltage windings (nominal 69kV & higher)

Members agreed that Table 4 also needed the same type of corrections. Members agreed that the table needed no provisions at this time for neutral BIL levels above 350kV. Instead they agreed to add a new footnote #7 to the table that states: Applied Voltage test level shall be specified by user.

3. Next Steps

It was mentioned that these proposed corrections would be presented in Dielectric Tests SC meeting on Wednesday.

4. Adjournment

The meeting was adjourned @ 3:00PM

Reported by: Steve Griffith, October 22nd, 2013

Accepted by: Phil Hopkinson, October 23, 2013

11.7.5.2 Discussions on Dielectric Test Tables 4 and 5 C57.12.00

There was a discussion on how to make proposed correction to table 4 and 5 - whether to accomplish this through a core agenda or wait for next revision. Some of the members requested time to review the corrected dielectric table. Motion was proposed and seconded to have correction to table approved by SC before making changes to standard.

Since correction to dielectric table was also impacted by changes to definition, Bertrand Poulin requested chair to read new definition of class I, which was presented by Michael Franchek, Chair. There was a request to have clarity on definition with respect to rating whether MVA is based on Max Name plate or base, which was clarified as Max rating.

An amendment to original motion proposed by Sauer Daniel and seconded by Tom Melle was unanimously approved to **"have a survey conducted within members of Dielectric Sub-committee on:**

1) **Proposed corrections to Table 4 and 5 of C57.12.00-2010**
2) **Proposed change of definition for class I and class II transformers and make recommendation to Transformer Committee for revision of C57.12.00.**

11.7.6 New Business

No new Business was brought for discussion.

11.7.7 Meeting adjourned 12.20 PM.

Minutes respectfully submitted by:

Ajith M. Varghese

Secretary DTSC.

11.8 HVDC Converter Transformers & Reactors – Mike Sharp

Mike Sharp, Chairman Les Recksiedler, Vice Chairman Ulf Radbrandt, Secretary

On October 21, 2013, the HVDC Converter Transformers and Smoothing Reactors S.C. met at 3:15 p.m., in the Landmark 1 Meeting Room of the Renaissance Grand Hotel, in St. Louis, Missouri. There were 11 members, plus one corresponding member and 44 guests present. Three of the guests requested membership. The following are the highlights of the meeting:

1. Introductions were made and the attendance list circulated.
2. The total membership of the SC is 24, but currently that includes 4 corresponding members. If a corresponding member is not present at the meeting, then he/she is not included in the evaluation for the quorum. Since we had one corresponding member attending the meeting we needed at least a total of 11 members including the attending corresponding member (greater than 50% of 21) present in order to have a quorum. This was achieved.
   The agenda for this meeting was approved.
   The minutes from the Munich meeting (Spring 2013) were approved.
3. Work towards a Dual Logo converter transformer standard (between IEEE C57.129 and IEC 61378-2).
   Ulf Radbrandt presented the review of the differences and similarities between the two standards. The work has been performed by him plus Eric Davis, Frank Trautmann, Fred Elliott, Les Recksiedler and Chris Ploetner. The major differences that were found in the review are listed below together with some comments during the discussion at the meeting:
   - Reference to different standards (the IEEE standard refers to a lot of IEEE standards and a few IEC standards and the IEC standard refers to a lot of IEC standards).
     Comment during meeting. Paul Jarman (also Chairman of IEC TC 14) mentioned that there is a possibility to have double references (IEEE and IEC) at several locations in a dual logo standard and in the beginning of it state that the end user must select which track (IEEE or IEC) that shall be followed.
   - Rated current includes harmonics in IEEE but not in IEC
   - Rated power is output from transformer in IEEE and input to transformer in IEC.
   - Reference to different standards for AC side Insulation levels
   - IEEE tables are based on nominal voltages while IEC tables are based on maximum system voltage. Some voltage classes have different levels.
     Comments during meeting. Paul Jarman mentioned that in IEC they are going towards nominal voltages as reference for AC voltage tests. That is a step towards IEEE.
   - Chopped Lightning test is mandatory in IEEE but optional in IEC.
     Comment during meeting. Paul Jarman mentioned that in IEC they are going towards chopped tests as routine test for the highest voltages. That is also a step towards IEEE.
   - IEEE includes but IEC excludes switching impulse testing across valve windings.
     Comment during meeting. The induced switching test gives voltage across the windings. This must be investigated further.
   - AC applied test on AC side bushings is 1 minute for IEEE and 1 hour for IEC
     Comment during meeting. This must be investigated further. The intention at IEC is also to have a 1 minute test.
   - Different reference temperatures for the load losses, 85 °C for IEEE and 75 °C for IEC.
   - Different tolerances on losses

- Different measurement of load losses
- The two standards are very differently structured
  Comments during meeting. We will probably have to start from the beginning and create a totally new standard, which is based on both IEEE and IEC.

Besides the major differences that are listed above, there are a lot of similarities also. E.g., the DC tests are practically the same.
The IEEE document expires in December 2018. The revision to the IEC document should be completed by 2016. That might give too short time for this extensive work. If we will go for dual logo then we must start quite soon. The timing is perfect now since we are about to start the revision process for both standards in the same time. It will take long time until we have such good possibility again.
Remarks were made that it might be too difficult to succeed with this. As an alternative to dual logo, we could create two new standards (one IEEE and one IEC) which should be as similar as possible (harmonized) and a final step to dual logo standard could be taken in the future.
If IEEE submits a PAR for a dual logo standard, then IEC must produce a review report.
There was some discussion regarding establishing a joint IEEE/IEC task force (TF), that would continue to analyze the differences and similarities and also give proposals of recommendations on how to resolve the differences. The output from that TF should then be a base for the final decision to go or not to go for a dual logo standard. This work should be performed within the next six months. If IEC starts a Maintenance Team (MT) for their standard, then that MT can contribute members to a joint TF together with IEEE. Anders Lindroth will, in that case, be the convener from the IEC side.
A motion was put forward by Eric Davis and seconded by Les Recksiedler to go for a joint TF (according to above). The vote result from SC members was reported at the meeting as 9 for and 0 against. We should therefore start that process. The Chairman asked for volunteers to be members or lead the task team from IEEE side. Eric Davis, Les Recksiedler and Ulf Radbrandt volunteered to take a role on the team. The Chairman will ask for further volunteers via e-mail.

4. Les Recksiedler informed the SC about the work on CIGRE B4.54-Life Extension and Assessment, for which he is the convener. The work is now about 50% ready. Important sections are:
   - Selection between Refurbish and Greenfield when HVDC transmissions are to be upgraded.
   - History of HVDC Performance issues.
   - Ground Electrodes and Electrode Lines (does not include sea electrodes).
   - Guideline for identifying techno-economic life of major equipment.
   - Recommendation for specification of refurbished HVDC system
5. Klaus Pointner informed the SC about the status of his work on an Annex for Converter Reactors, which are used for VSC converters. That Annex should be incorporated in IEEE 1277. The first draft of the Annex was presented. Different topologies and a detailed section on recommended tests are introduced. Mike Sharp and Ulf Radbrandt volunteered to review the draft after which it will be circulated among members of the SC for any further comments and discussion at our next meeting.
   It was also pointed out that other Annexes regarding VSC technology must inform that unsymmetrical topologies (when one DC terminal is connected to ground) gives half of the DC voltage at all equipment between the transformer (including the valve side windings) and the converter valve. It should also state that that equipment must be specified accordingly.
6. The meeting was adjourned at 4:24 p.m.

11.9 INSTRUMENT TRANSFORMERS SC – ROSS MCTAGGART

C57.13 Instrument Transformers – Unapproved Minutes – R. McTaggart

- The Instrument Transformer Subcommittee met on Wed Oct 23 at 8AM.
- 13 of the 25 members plus 21 guests attended
- 4 guests requested membership

Chair's Remarks & Announcements

- The schedule for future meetings was presented
- The 2 previous meeting's minutes were approved as written (PR – DW)
- The status of all C57.13 standards was reviewed

11.9.1 Special Presentation: Voltage Effects on CT Accuracy – by Dr Eddy So

Presentation to be posted on ITSC webpage

11.9.2 Working Group on Current Transformers with mA range (WG C57.13.7) - Chair: Henry Alton, Vice-Chair: Adnan Rashid

The WG met on Oct 21 at 3:15 PM

Old Business (House Keeping)

A single piece of old business was to generate a new draft based on comments received since the last meeting.

New Business

A new draft of C57.13.7 was tabled with all of the previous changes implemented. A summary of changes in draft 4 are as follows;
Please find attached the updated version D4 with some inclusions of information as follows;

- Participants
  - Updated the Working Group Members list
- 1.0 Overview
  - Updated commentary to more specifically state the objective in the light of comments that I have received.
- 4.0 Ratings
  - Primary values of 600A and 800A have been added as per the previous draft to make 80mA-100mA equal
- 6.2 Basic Measurement Accuracy Class
  - Item h) slight correction based on comments received.
- 6.4 Requirements for Accuracy and Accuracy of Calibration Systems
  - Added based on comments received

There were no objections to these additions during this meeting.

There was additional change requested by Dr. Eddy So of NRC.

Introduction

This introduction is not part of PC57.13.7/D4, Draft Standard for Current Transformers with Maximum mA Secondary Current of 250mA.

This standard was prepared by the Working Group on mA Current Transformers of the Instrument Transformer Subcommittee of the Transformers Committee of the IEEE Power & Energy Society. The purpose of this standard is not only to allow the evaluation, certification and specification of mA current transformers similar to the present process available for 5A secondary output current transformers, since 80mA and 100mA current transformers are now approved in Canada, but also to take into consideration certain applications in the use of the mA CTs that has the advantage of a much lower voltage drop in the secondary leads when the burden is located at a farther distance from where the installed ma CT is located. Also, for the same voltage drop across the burden as that when using a 5 A CT, its power dissipation in the burden is much less than that when using the 5A CT. However, with a mA CT, care should be taken to minimize environmental interference due to the much lower secondary current as compared to that of the 5A CT, since it would be more susceptible to noise/interference, etc.

Ross McTaggart of Trench and Adnan Rashid of Measurement Canada had the following comments for changes to the document during the meeting;

- Figure 2: X axis scale is not correct Ross McTaggart
- Header correction for the Standard Title Ross McTaggart
- There needs to be some detail added for the test methods for mA CTs Ross McTaggart
- Participants List had a typo OC 57.13 which should read C57.13.7 Adnan Rashid

Actions from this meeting.

Action	Assigned to	Item
Action 1:	**Henry Alton**	• Comments should be implemented in a new draft “D5”.
Action 2:	**Dr. Eddy So**	• Provide the clauses for test methods in this standard • Eddy SO will provide a forecasted date of availability of test methods drafting complete for review. The posting with all of the changes will be coordinated with this date.
Action 3:	**Henry Alton**	• Post a new draft “D5” when the test methods have been received.
Action 4:	**All Participants**	• Provide your IEEE Membership numbers to Henry Alton for preparation of the Balloting Roster
Action 5:	**Henry Alton**	• Prepare the balloting roster on the eTools “MyProject” account for this working group.
Action 6:	**All Participants**	• If there are no further comments after draft 5 the working group will vote to accept that version as final via email or conference call.
Action 7:	**C57.13.7 WG and IEEE**	• Formal balloting and vote to accept and release as a new standard

11.9.3 Working Group for Revision of IEEE C57.13 Instrument Transformers - R. McTaggart

The WG met on Tues Oct 22 at 8 AM, with 14 of the 24 members present along with 34 guests. It was noted that members who consistently do not attend will be reclassified as guests.

A brief history of the WG was presented along with the future milestones. The chair pointed out that to meet the schedule we need to quickly produce a 5th Draft which is good enough that most WG members will vote to accept it.

The changes from draft 3 to draft 4 were summarized and several omissions and minor issues were identified and will be corrected in the next draft.

It was agreed that we would clarify the class1 / class 2 concept and the relationship between C57.13 and C57.13.5. Devki Sharma offered to provide the new wording.

The reference to IEC 60270 was discussed and will be left as-is but reference to the new PD Guide (PC57.160) may be added if allowed. IEEE Test Std 4 will also be reviewed to ensure consistency.

In Annex B it was agreed that temperature rise calculations for the thermal short-circuit test are sufficient (test is pointless)

The next subject was the partial discharge requirements for 72 kV and below but since we were running out of time it was proposed that we have another meeting in the afternoon, which was made possible thanks to Greg Anderson.

The 2nd meeting took place at 1:45 PM with 13 members and 4 guests attending

We started by reviewing comments which R. Mullikin had prepared between the meetings. These were editorial and terminology issues which will be incorporated into the next draft.

The main discussion in this meeting was regarding the Prestress and Prescribed Extinction Voltages for 72 kV and below. In draft 4 the basic values for L-G connected Instrument Transformers are Prestress = 1.8 x nominal system voltage and Prescribed Extinction Voltage = 1.2 x L-G voltage. It was agreed that 1.8 was reasonable but some thought the 1.2 was too low and some wanted an even lower value. After much discussion this was not resolved even though the meeting went 20 minutes overtime. A survey will be sent to the members to resolve this as fairly as possible.

11.9.4 TF on Station Service Voltage Transformers

The inaugural meeting of this Working Group met on Oct 22 at 9:30 AM as convened by Chair David Wallace. Roster sheets were circulated for attendees to sign in and indicate their interest in membership. A total of 22 people were in attendance and 15 people requested membership.

Mr. Kenneth Skinger volunteered to serve as Co-chair of this working group.

Mr. Wallace reported that the PAR application was submitted on October 21, and William Bartley (Standards Committee Coordinator) said the PAR has been submitted in time for the Standards Board December 2013 meeting.

The number assigned to this new standard is C57.13.8. The first draft has been posted on the Transformers Committee web site under the Instrument Transformers Subcommittee link.

Mr. Wallace gave a short history on the evolution of the SSVT product and how it is typically applied. Most applications are to provide low voltage power in substations, although some applications have been to power cellular communications towers or small amounts of power to remote villages.

Some of the topics proposed for discussion within the scope of the document are protection alternatives, such as sudden pressure relays or over pressure relays, primary or secondary overcurrent protection, and any other accessory that might be considered for such a transformer.

The attendees suggested the new standard should include other insulation systems, such as gas insulated or oil-paper insulation which is not of the thermally upgraded material.

Another topic for discussion concerns the accuracy of the metering windings (when included), as affected by loading on the power winding.

It was also recommended that the group review the name chosen for the product, as several designations are in use.

Mr. Wallace invited everyone to review the draft and provide comments to him prior to the next meeting. The next meeting will be at the spring 2014 Transformers Committee meeting in Savannah, Georgia, USA.

Meeting adjourned at 10:00 AM.

11.9.5 ITSC Adjournment (PW – FE)

11.10 INSULATING FLUIDS SC – SUSAN MCNELLY

Insulating Fluids Subcommittee:
Chair Susan McNelly
Vice-Chair Jerry Murphy
Secretary C. Patrick McShane

Introductions, Roll Call, Meeting Approvals, and Chair's Comments

Introductions by all attendees

Chair's comment: The Chair gave a summary on the groups need to follow the Code of Ethics as well as a reminder of WG/TF meeting requirements. Among these were: a count of **any** motions not unanimous must be provided including a count of negatives, a 2/3 vote is needed for a WG to approve a change of WG scope, as well as to move a draft project to the Sponsor SC for approval to go to ballot. Attendance of WG and TF meetings must be kept in the AM System. She indicated that the attendance does not need to be listed in the actual minutes as long as the AM System is used as required.

Roll Call of SC members.

Roll Call of eligible new members. Three were present and the Chair welcomed them as new members:

- Josh Herz
- Rowland James
- Min Jea Lee

There were 25 SC members and 53 guests in attendance at the meeting. A quorum was achieved. The following guests requested membership in the IFSC:

Shawn Galbraith
Tom Golner
Roger Hayes
Poorvi Patel
Jose Izquierdo
Zam Kiparizoski
Egon Kirchenmayer

Agenda Approval

- Motioned by: Jim Graham
- Seconded by: Claude Beauchemin
- SC Vote Outcome: Passed unanimously

Corrections and Approval of minutes from fall 2012, Milwaukee

- Motioned by: Don Cherry
- Seconded by: Claude Beauchemin
- SC Vote Outcome: Passed Unanimously

Corrections and Approval of minutes from spring 2013, Munich

- Motioned by: Clair Claiborne
- Seconded by: Don Cherry
- Outcome: Passed unanimously

WG & TF Reports Presented at the SC Meeting

C57.104 – IEEE Guide for the Interpretation of Gases Generated in Oil – Immersed Transformerseting WG Chair Rick Ladroga, Vice-Chair Claude Beauchemin

The WG Report at the Sub-Committee Meeting: Presented by Sue McNelly:

The vice-chair gave an informative presentation on Data Analysis: The Rate of Change.

An ambitious schedule was presented to the WG to finalize the data and have a draft of the document out for review by December, a WG Ballot by the end of January, and a Sponsor ballot by April of next year as the PAR expires the end of 2014.

The Minutes (unapproved) of C57.104 WG Meeting as Submitted:

The meeting was called to order by Chair Rick Ladroga on Tuesday, October 22, 2013 at 3:15pm. Vice Chair Claude Beauchemin and Secretary Susan McNelly (writer of Minutes) were also present.

There were 52 of 81 members present. There were 64 guests, and 7 guests requesting membership. A membership quorum was achieved. Guests attending the WG meeting for the first time who request membership will be deferred until the next meeting attended.

The following guests requesting membership were (those identified with an asterisk (4 of the 7) will be added as WG members):

Gustavo Acero Richard Simonelli *
Jeffrey Golarz * Rogerio Verdolin
Paul Griffin * Peter Zhao
Emilio Morales-Cruz *

Agenda

1. Welcome & Introductions
2. Quorum Check
3. Approval of Minutes from Fall 2012 Milwaukee meeting and Spring 2013 Munich meeting.
4. Chair's Remarks
5. Presentations
   a. Data - Claude Beauchemin – Full presentation was not completed
   b. Case Studies – Paul Boman – Time expired before this could be presented.
6. Adjourn

Introductions and member roll call were performed. A quorum was achieved.

Motion to approve the Fall 2012 Milwaukee, Wisconsin meeting minutes was made by Don Cherry and seconded by Tom Prevost. The motion was unanimously approved.

Motion to approve the Spring 2013 Munich, Germany meeting minutes was made by Jerry Murphy and seconded by Tom Prevost. The motion was unanimously approved.

Chair's Remarks:

The chair indicated that the group has been meeting both at the Transformer Committee Meetings and at least a couple of additional times per year. There is a lot of data involved that has tremendous commercial value.

TFs:

Framework: Jim Dukarm, Dave Hanson, Rick Ladroga
Data: Norm Field, Luiz Cheim, Claude Beauchemin
Diagnostic Methods: Michel Duval, Dave Wallach
Case Studies: Paul Boman, Arturo Nunez
Arc Furnace TRs: Tom Lundquist
Bibliography: Jerry Murphy, Tom Prevost

Tom Prevost gave a summary of the progress on the data storage and access issue. There are three other groups that are dealing with the same issue. IEEE will provide a data suppository and there will be a non-disclosure document created to help provide assurances that the data will not be misused for commercial gain. The expectation is that this will be in place by the next meeting in Savannah.

Case Studies: presented by Paul Boman

Paul indicated that they are attempting to display the information in the easiest to read format. Diagnostic techniques, gas profiles from sample-to-sample, rates of change, confirmation samples, and diagnosis (when possible) will be part of the case study examples. There are approximately 25 case study examples.

Data: Rate of Change, presented by Claude Beauchemin

Change in PPM, PPM/day, PPM/year, what makes sense?

At the fall 2012 meeting Luiz Cheim presented on this topic. This presentation is on the web. This presentation also covered the various aspects of rate comparison.

Claude indicated that from Luiz's presentation it was shown that the shorter the period, the higher the value of rate of gas increase. Because of this, further analysis was done on approximately 123,000 DGA samples on approximately 44,000 transformers.

The first thing looked at was the sampling interval. There was one very large peak at 1 year (57% of data). Therefore the bulk of the data was based on a yearly sampling interval. With a much smaller peak at 6 months (11%).

Looking at the trends from this data: One question that needs to be asked is what "noise" or DGA variation is resulting from oil sampling, transport, and analysis differences from one sample to the next.

Claude indicated that if we want to use a PPM/year or PPM/day, then a method to handle the spread is needed.

If instead the absolute difference is used, the ratio is reduced by a factor of 100, which makes it much more manageable.

Questions: The following is a portion of the questions/discussion that followed the presentation.

Fredi Jacob – Is there some built in bias? His overall reaction is that maybe the PPM/day is dependent on the interval between the samples and should only be used if you have decided the gassing is high and you have a problem.

Claude responded that the work is not quite finished.

Shuzhen Xu – Suggested that to remove the noise, first you average the data.

Tom Prevost – Indicated that it costs money to sample, so most people are not going to sample unless there is a suspected problem. He suggested that the graphs in the document need to be fairly uncomplicated. He recommended that the one year data be used in the guide.

Don Platts – Indicated that the analysis is not practical for the normal user of the guide. They will be looking for guidance on what rate of change is acceptable and what action they should take based on the rate of change.

General

Rick indicated that the goal was to obtain real data. The challenge now is to boil this tremendous amount of data down into tables that can be used by the users.

To stay on track with the document, Rick indicated that he would like to have the following schedule in line with a December 2014 PAR expiration date:

- Complete data collection by November 1
- Meeting November 4 or 5 to finalize analysis of data
- Draft to the WG by November 28
- Discuss comments on draft by January 7
- Issue a WG ballot by January 28
- Resolve WG ballot comments by March 2014
- Issue V2 for ballot April 15, 2014
- Discuss ballot negatives
- Resolve comments May – June 2014
- Recirculation Ballot

The meeting was adjourned at 4:35 pm.

Rick Ladroga
WG Chair
Claude Beauchemin
WG Vice-Chair
Susan McNelly
WG Secretary

C57.106 – IEEE Guide for Acceptance and Maintenance of Insulating Oil in Equipment

WG Chair Bob Rasor, Vice-Chair Jim Thompson, Secretary Claude Beauchemin

The WG Report at the Sub-Committee Meeting: Presented by Bob Rasor:

There were several phone conferences over the summer to review specific sections of the guide with the TF leaders. Some progress has been made, but the need of a more efficient process was recognized. Major revisions to the Guide are not expected to be needed. One issue is whether or not the standard should include mineral oil used in circuit breakers. A liaison with the Switchgear Committee will be assigned. The WG is looking for some additional TF leaders.

A revision of the acid number in Table 1 and 2 will probably be needed. ASTM analytical method is reported has having a reproducibility of 0.015, which is the maximum value given in Table 1 and 2 of the Guide.

The Minutes (unapproved) of C57.106 WG Meeting as Submitted:

Fall Meeting 2013, St-Louis Missouri, October 21, 2013. 16H45
Attendees: 62 (including 2 proxy). Members: 18 out of 33: Quorum is obtained
New Membership request: 4
Jeff Golauz (or Golavz), Paul Griffin, Richard Simonelli, Ryan Thompson
Adoption of Fall 2012 and Spring 2013 minutes.

Review of past year activities:

No quorum in Germany meeting.

There were several phone conferences over the summer to review specific section of the guide with the TF leaders. Some progress was done, but the need of a more efficient process was recognised.

It was proposed to divide up the work to several TF, each assigned to TF chair as follow:

Acknowledgements and bibliography:	(need TF lead)
New transformer tables:	(Hali M.)
Thermodynamic Moisture Equilibrium:	(Dave H.)
ASTM and definitions:	(Clair C.)
Breakers	(need TF lead)
LTCs	(need TF lead)
Environmental	(Stephanie D.)

A request for TF volunteers to fill the vacant TF chair will be posted and emailed to active members.

Review of documents done to date:

Several editorial changes have been applied during the summer conference call.

A revision of acid number in table 1 and 2 is probably needed. ASTM analytical method is reported has having a reproducibility of 0.015, which is the same value as in table 1 and 2. However, a standard limit should not be set equal to a method reproducibility limit, as the method could then not supply the required precision to guarantee the standard requirement.

The actual ASTM D974 method reproducibility limit will be verified and the guide will be adjusted accordingly.

Section 8 on breaker raised two discussions:

1- A reference in section 8.1 to the effect that adding inhibitor could affect thermal characteristic of oil would be removed as this statement is inaccurate.

2- The pertinence of the inclusion of a section (section 8) on oil breaker in a Transformer guide is also debatable, as this might be better covered by the Switchgear committee. If it turn out that it is required, then a confirmation for the pertinence of this inclusion in a transformer guide will need to be reaffirmed between the transformer committee and the switchgear committee. To be followed up.

Meeting was adjourned at 18H00

WG C57.121 – IEEE Guide for Acceptance and Maintenance of Less-Flammable Hydrocarbon Fluid in Transformers

Chair: David Sundin

The WG Report at the Sub-Committee Meeting: Presented by David Sundin

The WG amendment for C57.121 had its initial meeting on Tuesday. 40 attended, 7 requested membership. There was a quorum. This WG is making the first revision of the original standard guide published in 1988. There was discussion on whether there is a need to change IFT value based on commercially available insulating fluids. Does this value need to be included? Paul Griffin stated that he recommended any change be communicated to ASTM, WG headed by Jimmy Rascoe.

The Minutes (unapproved) of C57.130 WG Meeting as Submitted:

Working Group on Amendment of C57.121, IEEE Guide for Acceptance and Maintenance of Less Flammable Hydrocarbon Fluids" had its initial meeting at 1:30 pm CST in St. Louis, MO

The WG was chaired by David Sundin

There were 40 in attendance, of whom 7 requested membership.

The WG Chair acted as secretary.

The chair explained the scope of the WG being a revision of the Guide that would change the Interfacial Tension value to reflect oils that are commercially available. Specifically, the minimum IFT value recommended in the Guide is 40 mN/m2, and the chair, representing the only North American manufacturer of the fluid, recommended a value of 30. There was some discussion with regard to the utility of a value of 30, and whether the Guide should follow the example of the Natural Ester guide and simply not include a value for IFT.

Paul Griffin noted that ASTM D5222, Specification for High Fire Point Electrical Insulating Oils, contained a minimum value of 40 mN/m2 for IFT, and that traditionally, IEEE accepted the values of ASTM specifications in cases such as this, and that he recommended that this precedent be followed. There was more discussion regarding whether there exists justification for a value of 30 mN/m2, and if so, whether it should be presented to ASTM, which is currently reaffirming ASTM D5222 specification. Jimmy Rasco stated that he was spearheading the effort at ASTM D27 to reaffirm this Standard Specification.

Roger Wicks asked whether other changes to the Guide would be undertaken at the next revision and was assured that they would, but that the next revision is currently scheduled for 2019.

There was a discussion with regard to the historical difficulty that High Molecular Weight Hydrocarbon fluids had in maintaining an IFT value of 40 mN/m2. David Sundin commented that this value was set artificially high during the first version of C57.121 in 1988 by commercial competitors as a means to discredit this type of oil, as the commercially available oils would have difficulty in meeting this value.

Don Cherry made a motion that "David Sundin will present data to ASTM Committee D27 that will support a revision of ASTM D5222 to include a minimum acceptance value of 30 mN/m2, and that the WG would then amend C57.121to match that value". The motion was seconded by Paul Griffin and was passed with unanimous support by all attendees who had indicated an interest in being members of the WG.

There being no other business to attend, the chair asked for a motion of adjournment. Don Cherry made that motion, which was seconded by Clair Claiborne, and passed unanimously.

Respectfully submitted,
David Sundin

WG C57.130 - IEEE Guide for Dissolved Gas Analysis During Factory Temperature Rise Tests

Jim Thompson– Chair, Tom Prevost- Vice-Chair

The WG Report at the Sub-Committee Meeting: Presented by Jim Thompson

A PAR revision has been requested to remove the "Trial-Use" language from the Guide's title. The WG is also requesting to add the word "mineral" before "oil".

The current draft has DGA volume limits lower than three other documents including the IEC standard.

The Chair will make the WG Ballot comments available for review within the next two weeks. The comments will be posted on the web. The intent is to have a revised draft available for ballot early next year, however, there is significant work needed to come to a consensus on Table limits.

The Minutes (unapproved) of C57.130 WG Meeting as Submitted:
October 22, 2013

Unapproved Minutes Working Group Meeting for IEEE PC57.130
IEEE "Guide for the Use of Dissolved Gas Analysis Applied to Factory Temperature Rise Tests for the Evaluation of Mineral Oil-Immersed Transformers and Reactors"
Chair Jim Thompson

The working group meeting was conducted on October 22, 2013 at St. Louis, Missouri with 85 people in attendance, including 9 of the 14 current working group members.

This document was in draft 18 when the decision was made to let the PAR expire in 2009. A new PAR was approved on June 17, 2010 and is presently in draft 3.

The previous minutes from F12 (fall 2012) were presented for approval. The F12 minutes approval, motion by Vijayan and second by Don Platts, was followed by unanimous approval.

A previous unanimous motion at the F11 meeting to change the guide from a trial use guide to that of a guide and to add the word "mineral" to "oil" in the title has been carried forward to the SA in the form of a PAR amendment. These changes were recently submitted to IEEE Standards Association Standards Board New Standards Committee for approval.

The meeting discussion included straw ballot comments regarding table 1 "Gas Generation Rate Guidelines." The chair presented data for four data sets with gas generation rates in a power point presentation. Also guideline gas generation rate limits were presented in table form from two IEC documents, along with suggested rate limits from the document reference B6, Oommen (1982), and the rate limits presently in the draft document. It was noted by the chair that in general rate limits were much higher than in the current document table 1.

It was also noted by the chair that several of the data sets submitted to the working group have data points greater than the current document rate limits for level 1. Level 1 has a description of "no problem detected". The chair noted that the data indicates that a significant percent of the transformers from the data showed was gassing over the rate limits in the draft document. It was suggested that the rates be increased slightly for hydrogen and carbon dioxide according to the Oommen values. The chair asked for discussion.

The discussion included one wg member suggesting the limits should be lower for HC (methane, ethane, and ethylene). On the other hand 5 people in attendance suggested the limits should be higher for HC, carbon monoxide, and hydrogen. There was a question as to where this data came from. The chair noted that the data source was requested to be anonymous. A comment was made that the gas generation rate will be influenced by voltage class, size, construction (core or shell) and paper/oil ratio.

A motion, presented to the wg members by Tom Prevost, seconded by Vijayan, in the audience, to accept the limits as-is: failed to pass. Another motion by Tom Prevost, seconded by Vijayan, presented to the wg members in the audience, to keep the limits as-is but to lower the limit for HC to 0.2, 0.5, and >0.5 ppm per hour in table 1: failed to pass.

On another issue, Juan Castellanos suggested that the document might apply only to 10 MVA and greater transformers with a voltage rating of 69KV or higher. The chair noted that the straw ballot response will be completed taking into account the discussions of the meeting. After that the document will proceed towards a ballot.

Respectfully submitted,
Chair Jim Allen Thompson

IEEE C57.139 IEEE Dissolved Gas Analysis in Load Tap Changers

WG Chair David Wallach, Secretary Sue McNelly

The WG Report at the Sub-Committee Meeting: Presented by David Wallach:

A second draft of the document has been posted on the WG web page and is also available on the Central Desktop site. Dave expressed special appreciation to Michel Duval, Jim Dukarm, Rainer Frotscher, and Fredi Jacob for their work on the draft since the last meeting. The plan is to have a WG Ballot issued before the Spring 2014 meeting in Savannah.

The Minutes (unapproved) of C57.139 WG Meeting as Submitted:

Chair Dave Wallach called the WG meeting to order on Tuesday, October 22, 2013 at 11:00 am. Vice-Chair Mark Cheatham and Secretary Susan McNelly (minutes written by) were also present. There were 32 of 63 members present (Quorum requirement was met). There were 62 guests present with 3 guests requesting membership. Guests attending the WG meeting for the first time who request membership will be deferred until the next meeting attended. The membership roster and attendance will be recorded in the Committee AM System.

The following guests requested membership in the WG and will be added as members:
Rainer Frotscher
Jeffrey Golarz
Richard Simonelli

Agenda:
1. Introductions/Member Roll Call
2. Approval of minutes from Fall 2012 and Spring 2013 meetings
3. Document Status
4. Old Business
5. New Business
6. Adjourn

Introductions and member roll call were performed. A quorum was achieved.

Motion to approve the Fall 2012 Milwaukee, Wisconsin meeting minutes was made by Bob Kinner and seconded by Mark Perkins. The motion was unanimously approved.

Motion to approve the Spring 2013 Munich, Germany meeting minutes was made by Craig Colopy and seconded by Brian Penny. The motion was unanimously approved.

Document Status

Dave Wallach gave the following status update:

The WG is using the Central Desktop where a working draft of the Guide is available for review and comment. He indicated a special appreciation to Michel Duval, Jim Dukarm, Rainer Frotscher, and Fredi Jacob for their work since the last meeting.

Dave indicated that he would like to send out the draft for a WG ballot before the Spring 2014 meeting in Savannah and would like to have a vote at that meeting to send the document through for Ballot by mid 2014.

Dave asked if there were any updates to the spreadsheet out on the street. No comments were made.

Section 5.3.3 Resistive Tap Changers has undergone considerable revision. Rainer Frotscher discussed the revisions made to this section. An attendee expressed concern over a portion of the revised text. There will be some additional offline discussion required to modify the content of this section.

Michel Duval indicated that there has been a lot of discussion regarding the presence of acetylene from low arc energy in a small amount of oil. Mike Lau shared his experiences that over time, they have seen a switch to pattern B. Michel indicated it could be due to a high current flowing through contacts due to coking. Fredi Jacob asked if there had been any tracking of the current due to coking. Rainer indicated that it is due to different switching speeds. Luiz Cheim suggested the recovery voltage arc resistance be measured.

Dave urged the WG members to review the latest document and provide comments. He would like to get this out for a WG ballot prior to the Spring 2014 meeting in Savannah.

Old Business
No old business was discussed.

New Business
No new business was raised for discussion.

A motion to adjourn was made by Claude Beauchemin and was seconded. The motion was unanimously approved. The meeting was adjourned at 11:45 am.

Dave Wallach
Chair
Mark Cheatham
Vice-Chair
Susan McNelly
Secretary

IEEE C57.147 Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers

WG Chair: Patrick McShane, Vice-Chair: Clair Claiborne, Secretary: Jim Graham

The WG Report at the Sub-Committee Meeting: Presented by Patrick McShane:

An update on IEC 62770, Unused Natural Esters for Transformers and Similar Equipment was presented by Clair Claiborne.

Rainer Frotscher presented a proposed Annex C on Natural Esters for LTCs.

If the outstanding TF assignments are not completed by Feb. 15, the WG officers will review assigned sections and edit as needed in current Guide.

The Minutes (unapproved) of C57.147 WG Meeting as Submitted:

WG C57.147, October 21, 2013, St. Louis, MO

- Call to Order was made at 3:15 PM.
- Introductions/Membership Attendance/Quorum Check
- Attendance: 23 of 36 members present, quorum was achieved. 33 guests. Total: 56
  6 guests requested membership.
- A motion to approve the Spring 2013 minutes was made by Don Cherry, seconded by Jerry Murphy. The Spring 2013 Minutes were unanimously approved.

- Chair's Remarks, Patrick McShane:
  - Welcome of new members
  - Discussion of a new task force established by the Insulating Fluids Subcommittee for the consolidation of the insulating liquids maintenance guides, including C57.147.
  - Review of the time line goals for completion of the guide revisions:
    1. All outstanding TF assignments will be dealt with asap
    2. If TF assignments are not completed by Feb. 15, the WG officers will review assigned sections and edit as needed in current Guide.
    3. First draft to be reviewed at S15
    4. To assist in insulating liquids guide consolidations project, the SA approval target is Q3, 2015; 5 quarters prior to PAR deadline.

• Clair Claiborne presented an update on IEC 62770, Unused Natural Esters for Transformers and Similar Electrical Equipment. Clair highlighted differences between IEC document and its equivalent, ASTM D6871. IEC added an oxidation stabilization test, but this was controversial. The FDIS was issued August 2013, and voting terminated 18 October, 2013. The international standard will be published before the end of this year. Discussion included questioning of why the IEC dissipation factor is higher, 5% vs. IEEE 4%. A: Apparently to include all available products available. Rainer Frotcher stated he does not agree with the 28 hour duration for the oxidation test. A: The goal of the TC was not to repeat what happen in their standard for less-flammable insulating liquids which kept some commercially available products from the IEC market.

• Rainer Frotscher presented a proposed Annex C titled Natural Esters for Load Tap Changers (LTCs). This will be posted with the minutes for working group review.

- Task Force Reports:
  - Stephanie Denzer reported via email TF8 had met since the Spring 2013 meeting and submitted a revised draft of section 8. This will be posted on the web site for working group review.

- David Sundin presented a current draft of Annex B, titled Additional technical information. There was additional discussion regarding the removal of the 300C minimum fire point limit from Table B.5 and Table 5 in the main document.
- The drafts received will be made available to the working group to review.

• Old Business:
- TF chairs will be notified their final reports are due February, 2013 so the working group can review their work prior to the Spring 2014 meeting.
- WG officers will review the C57.93 installation guide to determine if any of the items of interest for revision would be more appropriately addressed in the installation guide.

• New Business:
- Roberto Asano made a motion to remove the fire point properties from Table 5 and move this information elsewhere within the guide. Don Cherry seconded the motion. After spirited debate, a motion was made by Jim Graham to close discussion, seconded by Don Cherry. The motion to close discussion carried, and Mr. Asano's motion also carried.

• The meeting adjourned by acclimation at 4:30 pm.

Respectively submitted, Jim Graham, WG Secretary

PC57.155 – Guide for Interpretation of Gases Generated in Natural Ester and Synthetic Ester Immersed Transformers

Chair Paul Boman, Secretary John Luksich

The WG Report at the Sub-Committee Meeting: Presented by Paul Boman:

Results from the initial Draft 4 sponsor ballot was reported to Working Group:

Ballot Closed: 17-Oct-2013 with 90 comments (6 negative ballots), 37 of which must be satisfied.

The ballot has met the 75% returned ballot requirement.

Ballot resolution work has begun. There were five items that were difficult to resolve:

1. Ostwald Coefficients appear to be laboratory dependant and the annex will be removed.
2. Section 4 that covers DGA theory was deemed too overwhelming, so the section will be summarized and moved to the Appendix.
3. Recognized need to get more DGA data to substantiate the limits recommendations.
4. A concern was raised that the user may not know which insulating liquid is being tested, but the comment was rejected unanimously by the resolution TF.
5. Agreed to removed two tables of the Ostwald Coefficients lab results while adding additional guidance of the tables.

It has been decided that publishing the document as an IEEE/IEC dual logo document will not be pursued at this time. Draft 5 with comments will be on the web site. There will be a new ballot. Sue McNelly stated that since the document is already in the balloting stage, the approval to recirculate for a new ballot does not need to be voted by the full IF Subcommittee.

The Minutes (unapproved) of C57.155 WG Meeting as Submitted:

PC57-155 Guide for Interpretation of Gases Generated in Natural Ester and Synthetic Ester Immersed Transformers

Report given at the Sub-Committee Meeting: WG meeting minutes (unapproved) as received:
Paul Boman– Chair, Patrick McShane – Acting Secretary
Meeting Date: October 22, 2013 Time: 9:30 AM

Attendance: 16 members of 26 members including 4 corresponding members were in attendance and the total attendance was 95.

- Introductions

- Quorum present

- Approval of Meeting Agenda

- Approval of Meeting Minutes for Fall 2012, Claude Beauchemin motion and Don Cherry 2nd motion, Working group approved unanimously
- Approval of Meeting Minutes for Spring 2013 Claude Beauchemin motion and Don Cherry 2nd motion, Working group approved unanimously.

Continued business

Initial sponsor ballot information was reported to Working Group:

Ballot Open Date: 17-Sep-2013
Ballot Close Date: 17-Oct-2013
Type: New
Draft #: 4
Comments: 90
Must Be Satisfied Comments: 37
RESPONSE RATE
This ballot has met the 75% returned ballot requirement.
96 eligible people in this ballot group.
69 affirmative votes
6 negative votes with comments
0 negative votes without comments
4 abstention votes: (Lack of expertise: 3, Other: 1)
79 votes received = 82% returned 5% abstention
APPROVAL RATE
The 75% affirmation requirement is being met. 69 affirmative votes 6 negative votes with comments

- Draft guide 4 comment resolution
- Most comments made to Draft 5
- Draft 5 and comments will be placed on Transformer Committee web site for Working Group

- Ballot Comment Resolution Items
- Item 1:

Comment #	Page	Sub-clause	Line
i-28, matrix sheet 2	37	F	3

Annex F - What is the origin of this data? Should that not be noted? And Sheet 2 Comment Table F.1 contains erroneous data
There needs to be some narrative explaining the information contained in this annex. Also it should be pointed out that Synthetic Ester B is measured at a different temperature than the other fluids.

Concerned that the Synthetic Fluid B had a different reference temperature at 20º C and the table needed references.
Overriding concern is the comment about erroneous data.

Clair Clayborne, some problems in developing the OC for high oleic, and other esters.
Don Cherry, “I question why data needed in the guide?”

Mel Gel: Not to be used for analysis (ASTM uses), the data is useful to lab to discuss with clients tell you how solubility, explaining why results change, the why.
Michel Duval: Data helps if have nitrogen blanket with partition coefficients.
George Frimpong: we know some of these numbers are wrong.
Luis Cheim: Maybe indicate only as reference.
Valery: 20 C for different liquid.

Motion on item.1: Don Chu Remove Table F.1 from document Don Cherry 2nd motion
Discussion Fred Jakob: run per std (ASTM? ANSI?)Std 3612C . Most labs will use their own run of OC.
Working Group Vote Yes 13, No 1 Motion Passed

Comment #	Page	Sub-clause	Line
i-14, i-51	Section 4		

Acid production -Figures 7 thru 17 (lines 1-23 & 7-18)

Move chemical reaction figures to an Annex (as a chemist I can see and understand the figures depicting the chemical reactions showing the formation of specific gasses. I believe that the everyday user may not find this as useful. They are interested only in the resulting gasses).

Chair: Several comments to take Section 4 remove from main body and make it an annex.
Don Cherry made motion to move bulk of Section 4 to informative annex , Jerry Murphy seconded motion.
Working group approved unanimously and Motion passed

Chair formed TF: Dave Hanson chair TF, Jerry Murphy, Claude Beauchemin and Don Cherry. Shorten theory section, put rest in informative annex.

Comment #	Page	Sub-clause	Line
i-32, i-61, i-36		6	

The scope and purpose of this guide is listed below. While the draft document does a good job of providing both the theory and bibliographic references, I feel that the guidance given for interpretation and recommended actions is lacking. If I was a user with the results of a DGA in my hands it would be a real struggle for me to determine whether the reported results are good or bad. Likewise if the results are bad what is the recommended action that should be taken? I understand that this is a new area and that there is limited data available. However, our charge should be to provide clear guidance to the user. I do not see where this document in its present form meets that goal.

Comments on Mostly Section 6: Concern of lack of guidance on interpretation and actions as required by Scope Item 3. Chair wants it done right, not rushed.

Chair asked if Working Group wants to address this item, no answer. Chair commented on Section 6 revises that included Table 1 and Figure 1 draft then discussed with copies of Section 6 handed out for the discussion. The general feeling from the negative balloters in the group (Don Cherry and Clair Claiborne) and the Working Group that this is the correct direction. One of the negative balloters was not present at the Working Group meeting and no feedback has been received yet. Don Cherry need to quantify condition 1 ,2, 3. Like c57.104 if possible or remove.

Section 6 is of most concern to Chair. Any changes now are limited to sections that deal with comments. Comment received that need to address other sources of gases that are not related to stray or fault gases. Fuse, rectifier transformer or load-break switch so a note was placed into Section 6.

Comment #		Page	Sub-clause	Line
i-60	1	1.1	19	

The proposed document does not have a direct interpretation of the gas results for these fluids. The % in table 1 are only useful if one knows the fluid in the equipment and if the users orders fluid according to ASTM D6871 there is no way that a user is able to determine what fluid may be in equipment. The % are so diverse no conclusion may be drawn from the data. This document is probably a white paper not a guide for interpretation as there is none in the main document that is useful.

Comment: Chair presented Ballot Comment i-60 as item 4. Comment i-60 states experimental data and Table 1 information inadequate for a guide, this should be a white paper not a guide. Objection is users will not know which type of fluid is being used and which information to use. The i-60 balloter name was not given to Working Group and he did not attend the Fall 2013 meeting.

Threshold was explained and the usage reference from C57-146 DGA Guide for Silicone Fluid

Jerry Murphy: Motion to reject comment i-60, Don Cherry 2nd Motion

Jerry Murphy we need a guide and supports Guide in current forms including Section 6. General group feeling is that Section 1.3 gives limitations that user needs to know details about the equipment.

Working group approved unanimously and Motion passed

Comment #		Page	Sub-clause	Line
Sheet 2	16 through 18	Table B.1 and C1		

Why do we even have this in this document? Would this not be better in ASTM D6871?

Needs some wording on the reason for this type of testing. Used for mineral oils to demonstrate a particular phenomenon associated therewith.

Comment that Table B.2 – ASTM 7150. Chair thought germane to topic and data available. Michel Duval thinks very import to discuss stray gasses. Clair Claiborne stated Michel Duval has a good point.

Chair : Need more commentary , looking for help and the same for C1. (data produced by Dave Hanson). Clair would be satisfied with commentary on purpose.

Rainer Frotscher: why UV data included? There is no UV in transformers. Answer by Dave Hanson: UV data is important per during sampling and testing an need to add commentary

Working Group declined to address Item 5 so additional text will be added to explain the table application to DGA for re-balloting.

Chair: I will get general committee password for access. Not sure if this Working Group will have another meeting before re-ballot.

Thanks to all who made comments. Chair plans to speak with Ballot Resolution Task Force. Chair: Do we need to get Draft 5 approved by SCIF and TC before submitting to IEEE SA? Sue McNelly stated authority already exists but will double check.

Motion to re-ballot after comments are resolved. Sue

Jerry Murphy motion to re-ballot after first ballot comments are resolved, Don Cherry 2nd motion. Will vote on re-ballot once Draft 5 is available.

Meeting adjourned at 10:40

WG PC57.637 Guide for the Reclamation of Insulating Oil and Criteria for Its Use

WG Chair Jim Thompson

The WG Report at the Sub-Committee Meeting: Presented by Jim Thompson:

The PAR for this Guide will expire at the end of 2014.

A WG Ballot (Draft 5) has been completed. Comments from the straw ballot are being reviewed. The Chair has been asked to make available the comments that were received for posting on the web site and to his WG. He indicated he expects to have initial responses to the comments complete by December. The goal is to proceed to ballot. The SC Chair reminded the WG Chair that the requirement for a 2/3 majority from the WG must be met prior to going to the SC for approval to go to ballot.

The Minutes (unapproved) of C57.637 WG Meeting as Submitted:

October 22, 2013 Unapproved Minutes Working Group Meeting IEEE PC57.637, IEEE PES, Transformer Committee, Insulating Fluids Subcommittee, Working Group for the "IEEE Guide for Reclamation of Insulating Oil and Criteria For Its Use"

The working group meeting was conducted at 8 am on October 22, 2013 at St. Louis, Missouri with 42 people in attendance and with 13 of the 15 current working group members present. This document was reaffirmed in 2007 and the PAR for revision was approved December 10, 2008. A PAR extension request was approved until December of 2014. Working Group member Jim Thompson (chair) conducted the meeting.

The minutes for the F12 (fall 2012) meeting were reviewed. The F12 minutes approval, motion by Don Cherry and second by Jim Graham, was followed by unanimous approval.

The final sections had been submitted by the volunteers and reviewed as draft 3 at the F12 meeting. The document has been provided to the working group members for straw ballot and is still in review process. The expected completion time for this review is 6 weeks.

The chair invited wg members to discuss their comments. The meeting discussion then included one question about table 1 in the document regarding a similar table in C57.106. There was a general consensus however, after discussion, that a notation in table 1 referencing the C57.106 document would be sufficient.

After straw ballot review the goal is to proceed towards ballot.
Respectfully submitted, Chair Jim Thompson

TF on Moisture in Oil

Chair: Bob Rasor

The TF Report given at the Sub-Committee Meeting by Claude Beauchemin:

The TF reviewed the data collection that has been performed. There was no quorum of the TF, but a consensus vote of those present indicated it was time to complete the TF activities and pass the data collected to date to the new WG on Moisture in Insulation that has been started in the Insulation Life SC.

A motion by Clair Claiborne, seconded by Don Cherry to terminate the TF was made in the IFSC meeting. During discussion of the motion, Valery Davydov on behalf of the SCIL WG expressed thanks for the work done on this by the TF. The motion approved was unanimously approved.

The Minutes (unapproved) of TF on Moisture in Oil as Submitted:

October 22, 2013. 16H45

Attendees: 63
Members: 14 out of 62: No Quorum

Chair: Bob Rasor (proxy by Claude Beauchemin)
Secretary: Hali Moleski (absent due to maternity leave)
Valery Davidov took the minutes)

Review of past year activities:

There were two phone conferences over the summer to review the data accumulated and to evaluate the future of the TF. It is the opinion of the active members that the work should be completed, the data transferred to the new C57.162 and the TF disbanded.

Bob Rasor had to excuse himself due to urgent family matter and Claude Beauchemin acted as TF chair for the time of the meeting. Hali Moleski had to excuse herself due to maternity leave.Valery Davydov was also present as acting secretary.

A review of the TF scope was presented, followed by a review of some of the data collected since the TF formation in 2009.

The objectives of the TF had been meet:

1- Obtain moisture data from several sources: Owners, Laboratories, manufacturers and repair facilities as well as from on-line monitors.

2- Information from literature was also collected.

A review of some of the collected data was made. The review indicate that moisture in oil is dynamic and that variations occurs for both short term periods, in hours, and for longer period such as yearly seasonal changes. These variations are sufficiently large to cause the actual ppm limits (such as 25and 35) to be exceeded for some time.

No motions were presented due to the absence of quorum.

A show of hand with the present attendees indicated that the general opinion was to complete the work and disband the TF. One member suggested to compute RS value from the KF data (the 22 350 points data set) for comparison purpose.

Meeting adjourned at 15H15.

Thanks to everyone for the work.

TF on Consolidation of Insulating Fluid Guides –

Chair: Tom Prevost

The TF Report given at the Sub-Committee Meeting by Tom Prevost:

The first meeting of this TF met Monday morning. All who applied to be members of the TF were accepted. Information on the history behind the formation of the TF was provided. The effort will involve review of what will be required to combine the 4 existing insulating liquid guides. An actual PAR for this work cannot be requested until work presently in progress on C57.106, C57.121, and C57.147 has been completed nor can a draft be issued. In the meantime, the TF will work in parallel on document structure, comparison of test methods used in the individual guides, and whether circuit breakers need to still be addressed in the service-aged oil table in C57.106.

The Minutes (unapproved) of TF on Consolidation of IF Guides as Submitted:

Task Force - Combination of Oil Guides
Tom Prevost Chair
IEEE Meeting St. Louis Monday 10/21/2013

There were 66 people attending the meeting. 26 Requested memebrship.

General scope is to look at combining four guides into one document with the overall intent to reduce the number of (complimentary) standards.

This process originated in the Insulating Fluids subcommittee, for more info see the Fall 2011 minutes
It was noted that future revisions may be difficult.

The four documents are:
C57.106 C57.111 C57.147 C57.121

This document will focus on maintenance guides only and not anything to do with the guides for DGA. Many comments from the floor, most were positive, some had concerns. Status of current guides

C57.106 is in the revision process, expect completion before 12/2015 which is when the PAR expires.

Bob Rasor gave an update on the current state of the work.

Some questions were raised on whether or not historical CB oil data would be included in the new guide since some thought this was part of C37 work. Others felt it would be necessary to keep this in the new guide.

Jerry Murphy and Paul Bowman offered to liaison with C37 to get advice on the matter.

C57.111 Silicon fluids has just been re-affirmed and has a 2019 revision date.

There was however a suggestion to bring current test methods (D1816) as they are not currently referenced in 111.

C57.121 amendment underway, revision due 2019, not a lot of work left to be done on the measurement.

C57.147 (new) natural esters - work is proceeding Patrick McShane leading effort

Question was raised about acceptance values.

SA note, we can't submit a PAR for this TF (to become a WG) until the work on 106 & 147 is complete

Task force assignment of work groups:

1 C37 liaison to inquire about CB info relating to this guide
Jerry Murphy and Paul Bowman

2 Section on mixing of fluids ???
Dave Hanson and Tommy Spitzer

3 Comparison of test methods
Don Cherry, Claire Claiborne, Jimmy Rasco, Patrick McShane

4 Document structure
Jim Graham, Tom Prevost, Jerry Reeves, Bob Rasor

Regarding the new Task Force and the proposed guide: Paul Griffin made a request to include such info as type test vs. routine test

Another request was made to have word documents of the existing guides made available?

Respectfully submitted
Mario Locarno; acting secretary
Please note the position of secretary for this task force still needs to be filled.

TF on Particle Count Limits in Mineral Oil

Chair: Mark Scarborough, Secretary: Paul Boman

A meeting of this TF was not held in St. Louis. The Chair, Mark Scarborough, has indicated that a final report on the information collected has been started, but is not yet ready for comment.

New Business:

As a result of Susan McNelly moving into the Transformer Committee Secretary position starting January 1, a new WG Chair will be needed. It was announced that David Wallach has agreed to take on this role. The SC will be in great hands. Thank you David!

Respectively Submitted, Patrick McShane SCIF Secretary

11.11 INSULATION LIFE SC – BRUCE FORSYTH

The Insulation Life Subcommittee met in St. Louis, MO on October 23, 2013 at 8:00 AM.

A hand count of the members at the beginning of the meeting revealed that 53 of 92 members were present. A quorum was present.

H. Shertukde made a motion to approve the Milwaukee Meeting minutes as written. D. Wallach seconded the motion. There was no discussion. It was unanimously approved.

The Chair pointed out a correction to the Munich Meeting minutes. The expiration of C57.91 was incorrectly listed as 2012. It should be 2021. D. Duckett made a motion to approve the minutes as noted. T. Tanaka seconded the motion. There was no discussion on the minutes. It was unanimously approved as noted.

The agenda was reviewed. R. Merek made a motion to approve the agenda. M. Shannon seconded the motion. There was no discussion on the agenda. It was unanimously approved.

The attendance rosters show that the meeting was attended by 182 people, 60 of 92 members and 122 guests. 15 guests requested membership.

11.11.1 Chair's Report

The Spring 2014 IEEE Transformers Committee Meeting will be held March 23, 2014 through March 27, 2014 in Savannah, Georgia. The Fall 2014 meeting will be held October 19, 2014 through October 23, 2014. Greg Anderson will announce the location during the Thursday General Meeting.

Subcommittee Members were reminded of the need to avoid overt commercialization during the meetings. Company names should not appear in the meeting minutes.

The Chair reviewed the purpose & scope of the Subcommittee and encouraged the Task Forces & Working Groups to review their purpose & scope at the beginning of every meeting.

The minutes for Activity Groups should record:

- The attendance including the number of members, the number of guests, and if a quorum was present
- The Chair or Acting Chair
- The Secretary or Acting Secretary
- The name of the member who makes a motion, the name of the Member who seconds the motion, a restatement of the motion and if the motion carried or was defeated.
- A summary of the discussion and comments.

The Chair reviewed the process to submit documents for Sponsor ballot. Working Groups must have a 2/3 majority to submit the document for Sponsor ballot. The Subcommittee must achieve a simple majority to submit a document for Sponsor ballot.

11.11.2 Project Status Reports

11.11.2.1 C57.91 IEEE Guide for Loading Mineral-Oil-Immersed Transformers

C57.91 is valid until 2021.

11.11.2.2 C57.100 IEEE Standard Test Procedure for Thermal Evaluation of Liquid-Immersed Distribution Transformers

This standard is valid until 2021.

11.11.2.3 C57.119 IEEE Recommended Practice for Performing Temperature Rise Tests on Oil-Immersed Power Transformers at Loads Beyond Nameplate Ratings

C57.119 is valid until 2018.

11.11.2.4 C57.154 Design, Testing and Application of Liquid-Immersed Transformers with High-Temperature Insulation

C57.154 is valid until 2022.

11.11.2.5 1276 Guide for the Application of High Temperature Insulation Materials in Liquid-Immersed Power Transformers

The 1276 PAR expires December 31, 2016. The standard is valid until 2018.

11.11.2.6 1538 IEEE Guide for Determination of Maximum Winding Temperature Rise in Liquid-Filled Transformers

1538 is valid until 2021.

11.11.3 Working Group and Task Force Reports

11.11.3.1 Task Force on Winding Temperature Indicators - Phil McClure

Monday, 10/21/13 St Louis, MO

The meeting was called to order at 9:30am. There were 7 members and 15 guests in attendance. There are 10 members in the Task Force, including two new members since last meeting. A quorum was achieved. Five guests requested membership.

Minutes of the Spring 2013 meeting in Germany were discussed. After discussion, the minutes were unanimously approved.

Old Business: No old business

New business:

Chairman McClure briefly reviewed progress and the current state of our efforts toward completion of the paper. He circulated proposed draft 11 of the paper to members prior to the meeting as a possible avenue forward. Basically, draft 11 is a trimmed-down version of draft 9, with extraneous materials removed.

Discussion began with the experiment. Gary Hoffman expressed a concern that the experiment did not explicitly declare that IS WTI's may not provide an accurate indication of winding temperature at all times, particularly in large power transformers. Several guests addressed the subject and there was general agreement that this is true. Chairman McClure pointed out that the experiment's scope is limited by the objectives, but it might be a good idea to remove the potential for misinterpretation. Gary Hoffman made a motion to include a statement that the thermowells tested in this experiment may not indicate winding temperature accurately in all transformers at all times. Dave Wallach seconded the motion. During discussion V Sankar said that while it may be true that IS WTI's may not indicate accurately in all transformers, in all loading conditions, IS WTI's do indicate accurately in many, if not most situations and that the use of the information in the experiment should be left to the discretion of transformer designers. Gary agreed and made a motion to amend the previous motion and make the advice statement that the use of the information in the experiment should be left to the discretion of transformer designers for application to specific designs. Dave Wallach seconded the amended motion and the motion was carried by unanimous vote of the members. Chairman McClure said that the revised experiment would be circulated within a week.

Bruce Forsyth indicated that this TF began in 1997 and advised that the final document is to be officially presented to the Insulation Life subcommittee as expeditiously as possible. V Sankar requested to proceed with finalization of the paper in its draft 9 form and present this as the final document to the subcommittee, but no members motioned for approval of that request.

Gary Hoffman picked up the issue and made a motion to approve moving forward to incorporate selected information from some sections of Draft 9 into the proposed Draft 11, and submit to the Insulation Life subcommittee. The motion was seconded by Josh Herz. During the ensuing discussion, Bruce Forsyth indicated that the title should include "Task Force Report on Winding Temperature Indicators". Chairman McClure requested a motion to modify the previous motion to add the suggested wording to the title of the document. Gary Hoffman made the motion and Tim Rinks seconded it. The modified motion passed by unanimous member affirmatives.

Discussion then progressed to the sequence for completion of the paper. Chairman McClure suggested that assignments be given to willing members and/or guests for updating of the draft 9 information for inclusion in draft 11; followed by circulation of the compiled document to the group; followed by comment resolution; followed by a vote by members and finally submission to the Insulation Life Subcommittee. Gary Hoffman made a motion to accept that suggestion and the motion was seconded by Josh Herz. The motion carried unanimously.

During a related discussion, V Sankar asked if we would like to collaborate with IEC on a WTI standard. It was agreed that we will make contact to IEC via Phil Hopkinson or Jodi Haus to discuss, after we complete work on the technical paper. Gary Hoffman submitted a motion that we will contact Phil or Jodi for sharing with IEC when the paper is completed. Dave Wallach seconded. Motion passed by unanimous affirmation.

Chairman McClure solicited members and guests for specific tasks relating to the completing of the draft:

Section 5.1 Hybrid IS WTI – Josh Herz volunteered to submit a draft
Section 5.2 Direct Measurement WTI – Jean-Noel Berube volunteered to submit a draft
Section 5.3 Calculating WTI – Gary Hoffman volunteered to submit a draft
Section 5.4 Virtual WTI – Phil McClure Volunteered to submit a draft
Sections 4.0 and Conclusions – Phil McClure will provide a draft.

At 10:32am, having no more business to cover, Josh Herz moved to adjourn and D Wallach seconded. Motion carried.

Respectfully,
Bob Thompson, Vice Chair

11.11.3.2 Working Group on PC57.162 - Guide for the Interpretation of Moisture Related Parameters in Dry, Gas Insulated and Liquid Immersed Transformers and Reactors – Tom Prevost

Chair: Tom Prevost
Vice Chair: Dr. Valery Davydov
Secretary: Deanna Woods

- Introduction of attendees
- Review of PAR
  - Project Scope
  - Project Purpose
  - Project Timeline
- Call for membership
  - We had a total attendance of 118 people
  - 64 Requested membership
    - Because this was the first meeting of the WG all 64 have been granted membership.
    - New members will need to attend at least two meetings consecutively to maintain membership
      - Active participation in TF will be taken into account
    - Members cannot miss more than two meeting consecutively to retain membership AND they must participate in survey ballots
- Document Structure
  - Terminology and definitions
  - Measurement and evaluation of moisture-in-gas insulation parameters
  - Measurement and evaluation of moisture-in-liquid insulation parameters
  - Measurement and evaluation of moisture-in-solid insulation parameters
  - Evaluation of aging and end of life of solid insulation parameters
  - Factory/workshop application of knowledge on moisture; benchmarking
  - Field application of knowledge on moisture*
    ** Note: This section lists the risks associated with moisture*

- Establishment of Task Forces
  - TF1: Terminology and definitions
  - TF2: Measurement and evaluation of moisture-in-gas insulation parameters
  - TF3: Measurement and evaluation of moisture-in-liquid insulation parameters

- TF4: Measurement of moisture in solid insulation using balance
- TF5: Evaluation of moisture in solid insulation using dielectric response methods
- TF6: Inferring of moisture in solid insulation from measurements conducted in liquid or gaseous medium
- TF7: Evaluation of aging and end of life of solid insulation parameters
- TF8: Factory/workshop application of knowledge on moisture; establishing baselines
- TF9: Field application of knowledge on moisture

  * Note: *This section lists the risks associated with moisture*

- Next meeting
- Adjourn at 12:15 PM

11.11.3.3 Working Group for Application of High-Temperature Materials IEEE P-1276 – Mike Franchek

1. Welcome and Chair Remarks

Meeting was called to order at 3:15pm.

2. Meeting Quorum – WG Member Count

12 Members so we have a quorum (vs. 23 members), 48 guests and 3 guests requesting membership to bring the total of 26 members.

3. Approval of the meeting agenda

The meeting agenda was approved.

4. Approval of Munich, Germany Spring - 2013 Meeting

Minutes of Munich Germany Spring 2013 meeting were approved.

5. Review and Discussion on the Survey on Scope / Purpose of the Guide

The chair reviewed the scope of the document of the original P1276-1997 Application guide, which was very narrow in scope (power only/mineral oil, hybrid insulation system with aramid and mineral oil).

The chair reviewed topics of past two meetings about the need to maintain this document while we have C57.154. It was noted that much of the tutorial information in 1276 is not in this document (since it is a standard) and their needs to be a place for this type of guide-like information.

Subhas Sarkar asked a question about whether or not mobile substations are covered – they are excluded from C.57.12.00. This led to a healthy discussion, including comments from Craig Stiegemeier, Dave Sundin, Radek Szewczyk, Rick Marek, etc.

C57.154 does discuss technology used in mobile substations. Mobiles negotiated between buyer and seller. BILs, voltage limits, etc. Mobile users are willing to take more risks. The chair noted that this information would be useful to these applications, but there might not be a need to specifically include reference to mobiles. We likely will want to put a note in the document providing information to the applicability to mobiles. The WG will not put this in the document scope, since this is not in the scope of C57.154.

Radek then remarked that most of the applications which use high temperature materials are outside of the scope of C57.12.00. Neil Kranich noted that most of the customers start with C57.12.00 and then negotiations happen which aspects of C57.12.00 are included and which are not. Winds, Traction, Arc Furnace, Mobile, and Specialty transformer all are specifically excluded and yet all are users of high temperature materials.

We then discussed the wording of the scope – should the year be listed or not. Should we include this reference to C57.154 or should we reference C57.12.00 directly.

Scope of Document:

> "This guide applies to liquid-immersed distribution, power and regulating transformers that are designed to operate at temperatures that exceed the normal thermal limits of IEEE Std C57.12.00 under continuous load, in the designed average ambient, and at rated conditions."

Don Chu asked question regarding the last part of the sentence (why not just end the sentence at C57.12.00.

A motion to approve the scope as shown above was proposed and seconded. The motion was made by Craig Stiegemeier and seconded by Neil Kranich. The motion passed with only affirmative votes.

The chair then discussed a proposed purpose for this document.

Purpose of Document:

> "The purpose of this guide is to provide an informative technical background for the design, testing, and application of high-temperature transformers covered within the scope of IEEE Std C57.154-2012"

There was no discussion. Motion was made to approve the new Purpose by David Sandin and seconded by Craig Stiegemeier – the motion passed unanimously.

6. Revision of the WG Par

The chair will update the PAR and supply it to Bill Bartley for the next Revcom submittal for the revision.

7. Old Business - No Old Business

8. New Business

The chair discussed the potential for new content for the revised document. He will reach out to members to provide content for the new document. New solids, new fluids, may need to add/subtract clauses from the prior document. The chair reviewed the current table of contents of the existing IEEE 1276-1997 document.

Clause 5 will require a very detailed revision due to the new materials, liquids, test procedures, insulation systems. Likely it will provide recommendations to loading but not a loading guide. Will send the active members the existing document so they can revise the document (post it with password access).

9. Chair's Closing Remarks
Will make sure we do the introductions in the future.

10. Adjournment
Motion made for adjournment and the meeting was adjourned at 4:07pm.

11.11.4Old Business:

No Old Business

11.11.5 New Business:

IEEE 1538-2000 (Reaffirmed 2011) –R. Marek stated that H. Nordman presented a tutorial on Thermal Measurement at the last meeting and that this should be added to the standard. In addition, R. Marek stated that during the reaffirmation ballot a negative ballot was received stating that the standard needed to be updated.

D. Platts made the following motion:

> Form a Task Force to evaluate the merits of opening IEEE 1538 for revision and to develop a scope and purpose of a PAR if necessary.

T. Prevost seconded this motion. During discussion, G. Hoffman proposed amending the motion to decide if an amendment or a revision is necessary. D. Platts and T. Prevost both accepted this amendment. The Subcommittee voted on the following amended motion:

> Form a Task Force to evaluate the merits of opening IEEE 1538 for amendment or revision and to develop a scope and purpose of a PAR if necessary. The term of the Task Force shall be 6-months.

This motion was unanimously approved. The Chair appointed R. Marek to Chair this TF.

5.8.6 Adjournment
B. Beaster made a motion to adjourn. E. Davis seconded this motion. The meeting adjourned at 8:45 AM.

Respectfully submitted,
Eric Davis, Secretary, Insulation Life Subcommittee

12 EDITOR'S REPORT – SANJIB SOM

Between Spring 2013 meeting and Fall meeting of 2013 a total of 129 new & resubmitted papers in the transformer area were submitted to IEEE Transactions on Power Delivery for possible publication. For all of these papers the recommendations were as follows:

Accept:	22
Revise and Resubmit:	46
Reject:	33
Under Review	28

The above numbers include reviews managed by all editors. The 22 papers accepted for publication are shown below:

Num	Paper ID	Title
1	TPWRD-01008-2012.R3	A Novel Parameter Identification Method for Single-Phase Transformers by Using Real Time Data
2	TPWRD-01113-2012.R2	Ladder Network Parameters Determination Considering Non-dominant Resonances of Transformer Winding
3	TPWRD-01394-2012.R1	Inverse Hysteresis Models for Transient Simulation
4	TPWRD-00096-2013.R1	Eddy Current Loss Estimation of Edge Burr affected Magnetic Laminations Based on Equivalent Electrical Network-Part I Fundamental Concepts and FEM Modeling
5	TPWRD-00097-2013.R1	Eddy Current Loss Estimation of Edge Burr affected Magnetic Laminations Based on Equivalent Electrical Network-Part II Analytical modeling and Experimental Results
6	TPWRD-01411-2012.R1	Coupled Electromagnetic-Structural Analysis of the Spiraling Phenomenon in a Helical Winding of a Power Transformer
7	TPWRD-00972-2012.R1	CT Saturation Detection Based on Wave shape Properties of Current Difference Functions
8	TPWRD-01035-2012.R2	MTL based Analysis to Distinguish High Frequency Behaviour of Interleaved Windings in Power Transformers
9	TPWRD-01419-2012.R2	Determining the Broadband Loss Characteristics of Power Transformer Based on Measured Transformer Network Functions and Vector Fitting Method
10	TPWRD-01005-2012.R1	Application of Wavelet Transform to obtain the Frequency Response of a Transformer from Transient Signals – Part 1: Theoretical Analysis
11	TPWRD-01324-2012.R2	Loss Evaluation and Total Ownership Cost of Power Transformers: Part I – A Comprehensive Method
12	TPWRD-01325-2012.R2	Loss Evaluation and Total Ownership Cost of Power Transformers: Part II – Application of Method and Numerical Results
13	TPWRD-01388-2012.R2	Estimation of Series Capacitance for a 3-Phase Transformer Winding From its Measured Frequency Response
14	TPWRD-01373-2012.R1	Initial Parameter Estimates and Constraints to Support Gray Box Modeling of Power Transformers
15	TPWRD-00841-2012.R3	Determination of Parameters of Zero-Sequence Equivalent Circuits for Three-Phase Three-Legged YNynd Transformers Based on On-Site Low-Voltage Tests

16	TPWRD-01070-2012.R2	Data Requisites for Transformer Statistical Lifetime Modelling I - Ageing-Related Failures
17	TPWRD-01210-2012.R2	Data Requisites for Transformer Statistical Lifetime Modelling II - Combination of Random and Ageing-Related Failures
18	TPWRD-01080-2012.R2	Validated Transient Heat Transfer Model for Underground Transformer in Rectangular Vault
19	TPWRD-00376-2013	Dual Reversible Transformer Model for the Calculation of Low-Frequency Transients
20	TPWRD-00001-2013.R1	Analysis of Buckling Strength of Inner Windings in Transformers Under Radial Short-Circuit Forces
21	TPWRD-00680-2013	Analysis, Modeling and Simulation of the Phase-Hop Condition in Transformers: The Largest Inrush Currents
22	TPWRD-01258-2012.R2	Streaming Electrification Dynamics in Multilayer Sensor

I would like to thank all of the reviewers who volunteered for this effort and donated their time, and would like to encourage everyone associated with IEEE Transformers Committee activities to consider becoming a Reviewer. I would like to encourage those Reviewers that already have an account on IEEE Manuscript Central to keep their profile information updated and complete the areas for key words and areas of interest. We need more reviewers and I encourage any of you that have not signed up as reviewers to sign up per the instructions at the end of this document.

It is important for all interested individuals to follow the norm for writing papers as provided in IEEE; the link is http://www.ieee.org/publications_standards/publications/authors/authors_journals.html and the link to upload the paper is http://mchelp.manuscriptcentral.com/gethelpnow/training/author/.

Please inform me at sanjib.som@siemens.com as soon as you do sign up so that we are able to utilize your efforts.

- I would also like to take this opportunity to personally acknowledge the reviewers involved in the transformer committee who have been regularly and consistently reviewing papers. This is an important contribution since it maintains the high standards for our papers and it gives back to the industry their expert knowledge.

Special mention must also go out to the editors who have worked hard to make this possible; they are Dr Kulkarni, Dr. Francisco De Leon and Dr. Reza Iravani.

Respectfully Submitted,
Sanjib Som
Editor, IEEE Transactions on Power Delivery from Transformer Committee

All members and attendees of the IEEE Transformer Committee are invited to review technical papers. Please sign up at: http://tpwrd-ieee.manuscriptcentral.com/

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3. Please specify any “Specialty / Area of Expertise” according to the 5 numerical codes below:

    13a: Power and Instrument Transformers

    13b: Insulating fluids category

    13c: Dielectric Testing

    13d: Audible Noise and Vibration

    13e: Transformer Modeling Techniques

13 LIAISON REPORTS

13.1 STANDARDS COORDINATING COMMITTEE NO. 4 – PAULETTE PAYNE POWELL

No report.

13.2 IEC TC14 TECHNICAL ADVISOR TO USNC – PHIL HOPKINSON

U.S. National Committee of the International Electro technical Commission,
A Committee of the American National Standards Institute

Technical Advisory Group for IEC TC 14

TAG Administrator:
National Electrical Manufacturers Association
1300 North 17th Street, Suite 1752, Rosslyn, VA 22209
Tel: 703-841-3252, fax: 703-841-3353

MINUTES

PLACE OF MEETING:	Renaissance Grand Hotel 800 Washington Avenue St. Louis, Missouri 63101 Room: Majestic B-C
DATE AND TIME:	**Wednesday October 23rd, 2013** 7:00-8:30AM
PRESIDING OFFICER:	P. Hopkinson, Technical Advisor
SECRETARY:	Steve Griffith, NEMA

Members Present:

Raj Ahuja	SPX Transformer Solutions, Inc.
Robert Ballard	ABB Inc
Larry Dix	Quality Switch
Sheldon Kennedy	Niagara Transformer
Mario Locarno	Doble Engineering Co.
Richard Marek	DuPont
Jeewan Puri	Transformer Solutions Inc.
Dan Sauer	Cooper Power Systems by Eaton.
Vijay Tendulkar	ONYX Power, Inc.

Others present:

Matthew Almquist	ABB
Tom Breckenridge	TB TCS Ltd.
Lars Brocke	Haefely Test AG
Robert Brusetti	Doble Engineering
Edwin Brush	BBF & Associates
Eric Davis	Burns & McDonnell
Keith Ellis	Electric Connection, Inc.
Tim Gradnik	EIMV
Jodi Haasz	IEEE
Wolfgang Hauschild	Dr. W. Hauschild
Martin Hinow	HIGHVOLT
Thang Hochanh	Alstom
Paul Jarman	National Grid
Brad Jensen	Burns & McDonnell
John John	Virginia Transformer Corp.
Axel Kramer	Maschinenfabrik Reinhausen
Matthew Lawrence	Doble Engineering Co
Vinay Mehrotra	SPX Transformer
Tomas Olsson	ABB
Christopher Ploetner	ABB Inc.
Mark Rivers	Doble Engineering
Larry Rudolf	AES
Jeremy Sewell	Quality Switch
Devki Sharma	Entergy
Ed Smith	H-J Enterprises
Bengt-Olof Stenestam	ABB
Troy Tanaka	Burns & McDonnell
Luke VonderZel	EPRI
Dharam Vir	SPX Transformer
Baitun Yang	Pennsylvania Transformer
Shirasaka Yukiyasu	Hitachi Ltd.
Kipp Yule	Bechtel Power Corp.
Dave Zabel	S&C Electric

1. CALL TO ORDER

The meeting was called to order; meeting guidelines were reviewed and attendance recorded. By show of hands it was determined that 11 members were present.

2. APPROVAL OF THE AGENDA

The presiding officer approved the agenda.

3. APPROVAL OF THE PREVIOUS MINUTES

The minutes of the meeting held March 19th, 2013 in Munich Germany were approved.

4. REVIEW AND UPDATE OF USNC ROSTERS FOR TC14

The roster was reviewed.

5. 2013 PLENARY MEETING

The last meeting of TC14 was just held October 17th-18th in Milwaukee, Wisconsin. Mr. Hopkinson asked Mr. Jarman to brief attendees on the meeting.

Mr. Jarman provided an update on the following TC14 standards activities. If present he called the respective working group convenor to provide the update

6. UPDATE ON TC14 STANDARDS ACTIVITIES

6.1 IEC 60076-3 Ed 3.0: Power transformers - Part 3: Insulation levels, dielectric tests and external clearances in air.

It was reported that this was published in July. There is good alignment with IEEE.

6.2 IEC 60076-7 Ed 1.0 (2005-12-15): Power transformers - Part 7: Loading guide for oil-immersed power transformers (Loading Guide)

Mr. Marek who is one of the US Experts reported that work has started on this and that this group has had one meeting.

6.3 IEC 60076-10 Ed. 2.0 - Power transformers - Part 10: Determination of sound levels

Dr. Ploetner reported that this has been more aligned with IEEE. A CDV is up-coming on this document with final publication by the end of 2014. There was discussion concerning the annex tables if they should go in the appendix or the main standard. It was mentioned that NEMA TR-1 is currently the only standard that addresses sound levels, however these levels are high. One of the decisions coming out of the TC14 plenary meeting was to have CIGRE A2 consider providing a guide to transformer & reactor noise levels. This would provide a basis for understanding what ranges are typical, what is a low noise transformer, and what noise levels are achievable

6.4 IEC 60076-14 Ed.1.0 - Power transformers - Part 14: Design and application of liquid-immersed power transformers using high-temperature insulation materials

Mr. Marek reported that work on this is complete and the standard was published in September. Its companion IEEE document is C57.154

6.5 IEC 60076-15 Ed 1.0 (2008-02-27): Power transformers - Part 15: Gas-filled power transformers

It was reported that work is underway on this project. It was mentioned that there is a shortage of experts on the MT assigned to this.

6.6 IEC 60076-16 Ed. 1.0 - Power transformers - Part 16: Transformers for wind turbines applications

It was reported that there were good discussions with the IEEE WG for Wind Turbine Generator Transformers on how to proceed with the joint document. The next WG meeting is in London. IEEE WG members are welcome to attend. Another joint meeting is expected before the Spring IEEE 2014 meetings in Savannah, Georgia.

6.7 IEC 60076-19 TS Ed.1.0 - Rules for the determinations of uncertainties in the measurement of losses in power transformers.

Work is complete on this project. This was published as a technical standard.

6.8 IEC 60076-20 Power Transformers Part 20: Energy Efficiency

At the TC14 plenary meeting there was a decision to combine the (2) separate standards (60076-20 and 60076-20-2) back into one standard based on the CENELEC work done for TC14 on transformers above 36kV. Energy efficiency will be determined via three relevant methods: load/no-load losses, efficiency @ 50% rated power, and the PEI index.

It was mentioned that a separate proposal will be sent to NEMA for a proposed IEC standard to determine energy efficiencies for large transformers beyond 100MVA

6.9 IEC 60076-57-1202 Ed 1.0 Dual Logo IEEE/IEC standard for “Liquid Immersed Phase Shifting Transformers”

It was reported that there was a WG meeting this week. A CDV is expected within the next 6 months.

6.10 IEC 60214-1 Ed.2.0 - Tap changers - Part 1: Performance requirements and test methods

Mr. Kraemer reported that there were no negative votes on the CDV. As such there will be no FDIS and the draft was approved for publication.

6.11 IEC 60214-2 Ed. 1.0 (2004-10-14): Tap-changers - Part 2: Application guide

No current maintenance activity for this standard. There was further discussion concerning incorporating the IEEE guide for life testing into the appendix.

6.12 PNW 14-752/14-753/14-754: Future IEC 60076-XX-1 Power transformer and reactor fittings-protective devices, Future IEC 60076-XX-2 Power transformer and reactor cooling equipment, and Future IEC 60076-XX-3 Power transformer and reactor cooling equipment

This work was approved. It was noted that there is a shortage of experts for the AHG 1 working group assigned to these projects.

6.13 IEC 61378-2 Ed. 2.0: Convertor transformers - Part 3: Application Guide
A CDV was just issued. It has a closing date of 12/6/13.

7. OTHER ISSUES

The following new work was decided during the TC14 meeting

7.1 IEC 61378-2: Converter transformers-Part 3: Application guide

This could occur with IEEE as a joint document revision. A new convenor for the WG was requested. There will be a subsequent call for experts within the next few weeks

7.2 IEC 60076-4: Power transformers- Part 4: Guide to the lightning impulse and switching impulse testing

There will be a subsequent call for experts within the next few weeks.

7.3 IEC 60076-11: Power transformers- Part 11: Dry-type transformers

It was noted that Casey Ballard from ABB has requested to be the US expert for this project.

7.4 IEC 60076-5: Power transformers- Part 5: Ability to withstand short circuit

It was mentioned that a WG convenor is needed. It was noted that Vinay Mehrotra from SPX has requested to be the WG convenor for this project. Work is expected to start in 2015. It was agreed that the IEEE C57.142 standard should be circulated for possible consideration as a dual logo project.

It was mentioned that the next TC14 plenary meeting will occur in conjunction with the General IEC 2014 meetings in Tokyo, Japan

8. NEW BUSINESS

There was no new business

9. DATE AND PLACE OF THE NEXT MEETING

The next in person meeting is expected to occur during the 2014 IEEE Fall Conference during the week of March 23rd-27th in Savannah Georgia. The meeting was adjourned at 8:36AM.

Reported by: Steve Griffith, October 29th, 2013

13.3 REPORT OF IEC TC14 POWER TRANSFORMERS – PAUL JARMAN

IEEE Transformers Committee Fall Meeting 2013
St Louis 21st October 2013-11-03
Paul Jarman Chairman TC14

1. Last meeting

The last TC14 meeting was held in Milwaukee on 17-18th October 2013, the meeting was particularly successful because of the presence of Don Platts who reported on IEEE work, Jodi Haasz who presented on the Dual Logo procedure and Claude Rajotte who presented on CIGRE A2 work.

2. Next Meeting

The next meeting will be held in Tokyo November 10-11 2014 in conjunction with the IEC general meeting at the kind invitation of the Japanese National Committee.

3. Website

Attention is drawn to the TC14 website WWW.IEC.CH/TC14 which gives a summary of projects and publications. Attention is also drawn to the website www.electropedia.org which gives a comprehensive electrotechnical vocabulary reference

4. New Documents published

- **IEC 60076-14 Liquid immersed Power Transformers using high temperature insulation materials**
  - Published September 2013

- **IEC 60076-19 Rules for the determination of uncertainties in the measurement of losses in power transformers and reactors**
  - Published March 2013
  - New technical report based on an existing CENELEC document but significantly revised
  - It is encouraged that this document is used to understand uncertainties in the loss measurement and feedback on its use would be welcomed.

- **IEC 60076-3 Insulation levels, dielectric tests and external clearances in air**
  - Published July 2013
  - Major revision – document made simpler to use and tests rationalised and clarified.
  - Improved alignment with IEEE
  - Three categories <=72.5kV<=170kV >170kV
  - Change in phase to phase requirement for induced test
  - ‘Line terminal AC’ rather than ACSD

- Switching impulse levels for all >72.5kV as alternative to LTAC
- PD for all >72.5kV
- Induced test levels based on rated rather than max voltage
- Introduction of K factor in impulse wave
- Chopped waves routine for >170kV
- Revised test levels
- Revised dielectric clearance distances

5. New documents in progress

- **IEC 60076-20 Energy efficiency for transformers**
  - Since the EU regulation on transformer efficiency is in its final stages, progress is now being made on the committee draft of the IEC standard. This CD is expected soon.
  - Reflects 3 world practices for defining energy efficiency
    - Peak Efficiency Index (developed for large transformers)
    - Efficiency at 50%
    - No load and load loss limits
  - Note that following the Milwaukee meeting the two 60076-20 projects for higher and lower voltages are to be merged.
- **IEC 60076-57-1202 Liquid immersed Phase Shifting Transformers**
  - Joint with IEEE – new standard
  - Several meetings held
  - Working towards first committee draft
- **Publish EN 50216 Transformer and Reactor Fittings as IEC documents**
  - 3 parts
    - Protective devices (alarms and trips)
    - Cooling
    - Accessories (passive)

  - New work Item Proposal has positive vote but needs additional support in terms of experts nominated by national committees.

6. Revisions in progress

- **IEC 60076-10 Determination of Sound Levels**
  - draft for vote is with IEC circulation is imminent
- **IEC 60076-10-1 Determination of transformer and reactor sound levels- User guide**
  - First committee draft is with IEC circulation in parallel with 60076-10
- **IEC 60076-16 Transformers for wind turbine applications**
  - joint revision of IEC document into dual logo
  - First CD awaited, First IEC meeting November
- **IEC 61378-3 Converter transformers – Application Guide**
  - CDV has now been circulated, the closing date for comments is 6th December 2013
- **IEC 60214-1 Tap changers – performance requirements and test methods**

  - The CDV was circulated with no negative votes
  - Will go direct to publication after a maintenance team meeting in November
- **IEC 60214-2 Tap changers - Application guide**
  - Work is starting on the revision when the standard is finished
- **IEC 60076-15 Gas-Filled Power Transformers**
  - The CD was circulated (closing date 15th Feb 2013) the CDV will be circulated soon.
- **IEC 60076-7 Loading guide for liquid immersed transformers**
  - First meeting has taken place

7. New revisions starting

- **IEC 61378-2 HVDC converter transformers**
  - Revision due to start possibly as joint work with IEEE
  - Anders Lindroth to convene
- **IEC 60076-21 Standard requirements terminology and and test code for step voltage regulators**
  - Dual logo revision with IEEE
  - Craig Colopy to convene
- **IEC 60076-11 Dry-type transformers**
  - Michel Sacotte to convene
- **IEC 60076-4 Guide to lightning impulse and switching impulse testing – power transformers and reactors**
  - Thang Hochanh to convene

8. Possible New Documents

- **IEEE C57 143 Guide for application of monitoring**
  - Adopt as dual logo proposed by Spain for consultation
  - Covers work also done in CENELEC
  - To be sent to NCs for comment

- **IEEE C57.142 Guide to describe the occurrence and mitigation of switching transients induce by transformer switching device and system interaction**
  - This document is referred to in IEC 60076-1 and it may be an advantage to make it dual-logo, NCs to be consulted.

13.4 CIGRE – RAJ AHUJA

CIGRE Liaison Report on SCA2 Transformers for IEEE Transformer Committee Meeting. October 20-24, 2013, St. Louis, MO

Scope of The Transformer Committee (SC A2)

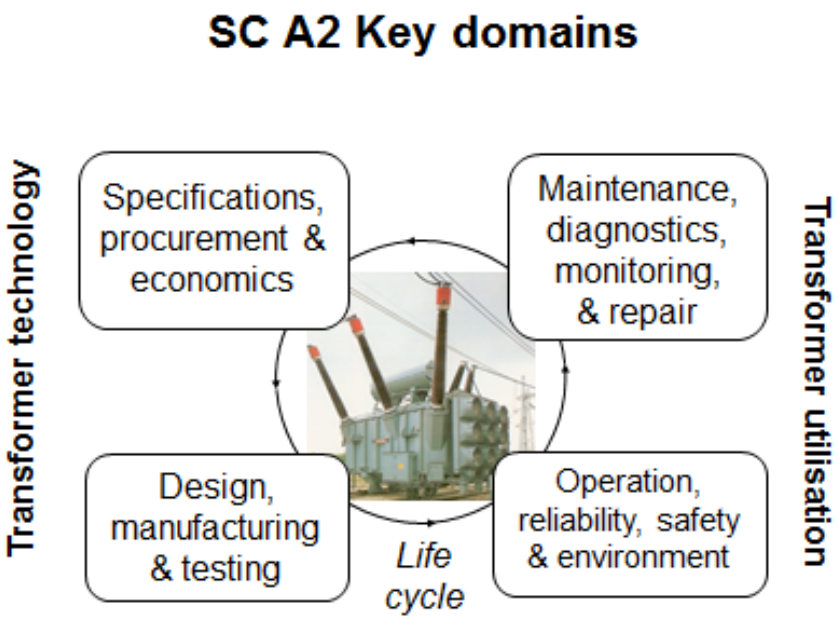
Scope : Design, construction, manufacture and operation for all kinds of power transformers, including industrial , DC converters and phase-shift transformers and for all types of reactors and transformer components (bushing, tap-changer…)

In the past *(known as SC12)* activities were focussed on design problems related to the rapid increase of rated voltage and power

Today, the two Strategic Directions for A2 future activities are :

- Services to Customers (Reliability, Life management, Economics, Tutorials, ...)
- Technology Issues (Safety, New technologies and New concepts, Electrical environment, Pre-standardisation work, ...)

Chairman: Claude Rajotte (CA) Secretary: Patrick Picher (CA)



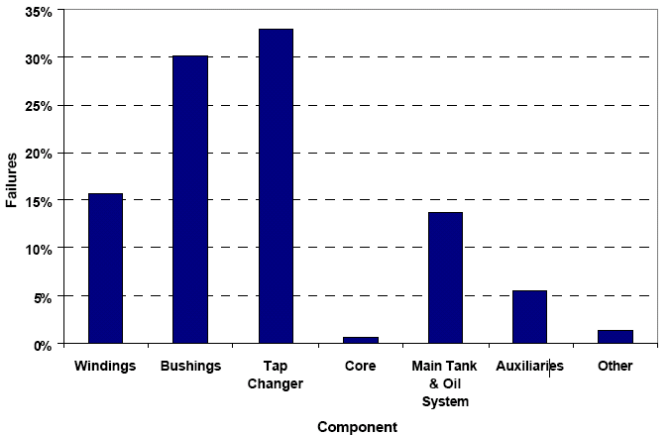
Present SC A2 Activities

- 24 regular member Countries
- 19 observer member Countries
- 10 Working Groups and 3 Joint WG's
- Almost 300 experts from 43 countries
- 5 Advisory Groups

Present SC A2 Working Groups

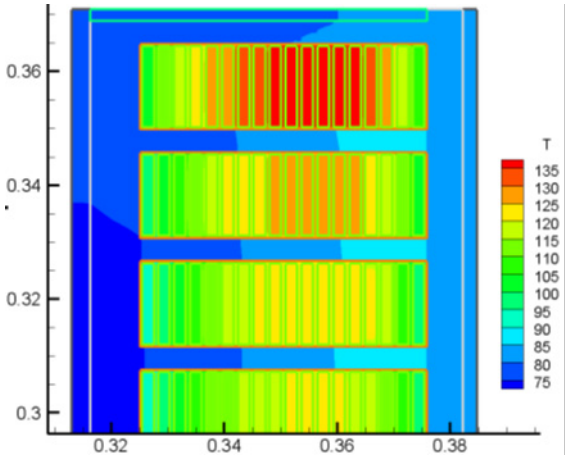
WG A2-37 Transformer Reliability Survey (S. Tenbohlen/DE)

- Review all existing national surveys and study different practices ; identify best practices
- Compile and present the information available in these national survey reports
- Make recommendations to improve the situation
- Final Brochure Expected by Dec 2013

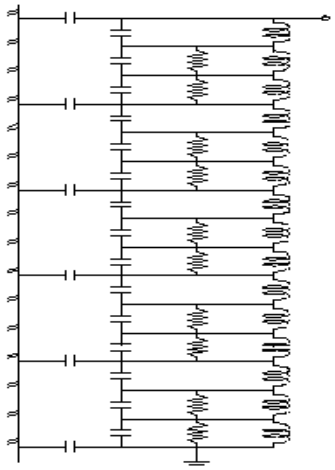


WG A2-38 Transformer Thermal Modelling (J. Lapworth/UK)

- Describe the state of the art techniques in transformer thermal modelling to evaluate winding hottest spot as well as hot spots on other metallic parts
- Examples of application of hottest spot direct measurement and best practices
- Recommendation for improvement of standards
- 11WG Meetings held since June 2008, Final Draft expected by August 2014



JWG A2/C4.39 - Electrical Transient Interaction between transformers and the Power System (A.Rocha/BR)



- Assess and discuss the different types of electrical transient interaction

  - Discuss the general increase in transformer dielectric failures in the system.
  - First Draft will be circulated by Dec2013

WG A2.40 - Copper sulphide long-term mitigation and risk assessment (J. Lukic/RS)

- Method, tools and diagnostic
- Metal passivator stability and efficiency
- Efficiency of existing on-site oil treatment
- Technical Brochure expected by Dec 2014

JWG A2/D1.41 - Oil conductivity under DC condition (A. Küchler/DE)

- Started under recommendation of WG A2/B4.28
- Review techniques and standards for measurement of conductivity of liquids
- Suggestions for new standards
- First Draft Expected by Aug. 2014

WG A2.42 - Guide on transformer Transportation (A. Mjelve/NO)

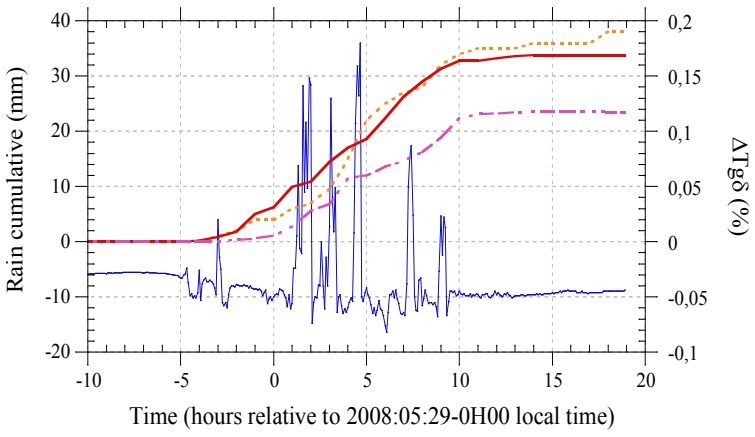
- Typical conditions/forces during transport
- Specifications and design review
- Requirements on transportation issues
- First Draft expected in July 2014

WG A2.43 Transformer bushings reliability (A. Mikulecky/HRvatska)

- Bushing failure definition
- Failure mechanisms for OIP, RBP, RIP
- Bushings failure rate
- Predicted life time, maintenance, diagnostic
- Survey started, first Draft to be ready by Dec 2014

WG A2.44 – Transformer IntelligentCondition Monitoring (C. Dupont/BR)

- Conversion of data to relevant information
- Demonstration of benefits
- Hardware/software/data integration
- Expected completion Sept. 2014



WG A2.45: Transformer Failure Investigation and post-mortem Analysis (M.C. Lessard/CA)

- Important information to collect
- Availability and significance of design data
- Documentation during the dismounting
- Paper sampling: how, where, precautions
- Draft technical report expected by Aug 2014

JWG A2/D1.46: Field experience with transformer solid insulating ageing markers (R. Mertens/BE)

- Field cases: correlation between chemical markers and DP
- Design information relevant to ageing markers models
- Consideration of operation and maintenance records
- Influence of oil sampling conditions (ex: temperature)
- Test data being compiled, first draft expected Aug 2014

WG A2.48: Technology and utilization of Oil Insulated High Voltage Shunt Reactors (S.Ryder/UK)

- Specification, design, noise
- Type/routine tests and criteria
- Reliability in service, failure mechanism and investigations
- Operation, condition assessment, monitoring, DGA, etc.
- New WG, 1st meeting held in Sept 2013

WG A2.49: Condition Assessment of Power Transformers (P. Cole/AU)

- Review existing CIGRE documents and literature
- Determine key parameters and how these parameters can be combined to determine health index
- Consideration should be given to both deterministic and probabilistic methods.
- Provide details of health indexes/condition assessment tools currently in use and provide examples of applications
- New WG,

IMPACT										RISQUES
9										
8								XX		ÉLEVÉ
7	XX					XX				%
6										
5										FORT
4										
3			XX							MOYEN
2							XX		XX	
1										FAIBLE
0	1	2	3	4	5	6	7	8	9	PROBABILITÉ

WG A2.50: Effect of the distributed energy sources and consequent induced reverse power flow (step up) on transmission and distribution transformers (J.C. Riboud/FR)

- Effect of step up operation on transformers that were not designed for this purpose.
- Effect on flux density, temperature rise, noise and other performances for both core and shell types designs
- Possible tap changer control problems
- Theoretical consequences for core flux and voltage regulation
- New WG, Target completion Sept 2015

Recent CIGRE Technical Brochures

Scope	*Ref*	*Year*
Guide for Preparation of Transformer Specifications	528	2013
Guidelines for conducting Design Review For Power Transformers	529	2013
Guide for conducting Factory Capability Assessment	530	2013
Guide for Fire Safety Practices	537	2013

Future activities

Possible future WG - under discussions

- Spare transformer policy
- Experience with UHF PD measurements
- Use of stabilisation winding in Star/Star transformers
- On-site repairs
- Efficient and eco-design transformers
- Experience with utilisation of transformers in FACTs

Recent and Future SC A2 Sessions & Colloquium

2013 Zurich Colloquium (with SC C4) September 9-12

- Interaction between transformer and the Power System
- Experience with the use of Phase-Shifting transformers
- Network planning in the context of an ageing transformer fleet

2014 Paris Session August 24 – 29

- Best practices for transformer asset management
- Transformers for specialized applications
- Field experience with the use of non-conventional materials and technologies

14 Unfinished (Old) Business

None

15 New Business

None

16 Meeting Schedule

See attached

IEEE/PES TRANSFORMERS COMMITTEE

www.transformerscommittee.org
Fall 2013 Meeting; October 20-24
Hosted by The H-J Family of Companies
Renaissance Grand Hotel; St. Louis, Missouri USA

NOTES: See Page 4 for a key to abbreviations.

DATE/TIME	ACTIVITY	SUB-COM	ACTIVITY CHAIR	ROOM CAP/ARR/AV	MEETING ROOM
Saturday, October 19					
	No Meeting Registration, No Transformers Committee Meetings				
6:00 pm - 9:00 pm	Early Bird Event: Dinner, bowling and fun at The Flamingo Bowl <www.flamingobowl.com> -- Indicate your desire to attend when registering on-line for the Committee Meeting. -- Meet in hotel lobby at 5:45 pm. The Flamingo Bowl is a short walk from the hotel. See flyer for details.				
Sunday, October 20					
	No Technical Tours				
1:00 pm - 5:30 pm	Meeting Registration				Conference Plaza Lobby Level
2:00 pm - 5:30 pm	Administrative SC -- Closed meeting, by invitation only	Admin.	B. Chiu	28 US (w/snack buffet)	Westmoreland-Kingsbury
3:00 pm - 5:30 pm	NEMA Transformers -- Closed meeting, by invitation only	++	C. Drexler	26 US (w/beverages)	Pershing-Lindell
6:00 pm - 8:00 pm	Welcome Reception			400 Reception	Crystal BR Grand Tower 20th Floor
Monday, October 21 -- Monday Breaks Sponsored by Cargill, Inc. **					
7:00 am - 4:00 pm	Meeting Registration				Conference Plaza Lobby Level
7:00 am - 6:00 pm	Internet Cafe'			12 BD	Washington Room
7:00 am - 7:50 am	Newcomers Orientation -- Breakfast Meeting; arrive early! -- Newcomers & Guests are encouraged to attend!		D. Platts	60 CL (with buffet)	Majestic B-C Conf. Plaza 2nd Floor
7:00 am - 7:50 am	Distribution SC Leaders Coordination -- Closed breakfast meeting, by invitation only		S. Shull	16 CONF (with buffet)	Westmoreland-Kingsbury
7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			270 RT (9/tbl)	Majestic D Conf. Plaza (2nd)
8:00 am - 9:00 am	Breakfast - Spouses/Companions (no meeting attendees please)			72 RT (8/tbl)	Statler Room Grand Tower
9:00 am - 4:30 pm **Note Depart Time!**	Spouses/Companions Tour: "Botanical Garden, Cooling Demo, Cathedral Basilica". Includes cooking demo & lunch at the "L'École Culinaire", a premier cooking school. -- Advance registration required. Buses depart the hotel at 9:00 am, and return approx 4:30 pm.				
8:00 am - 9:15 am >	General Session, Transformers Committee (Part 1) -- All attendees are encouraged to attend -- See separate document for meeting agenda -- Session continued on Thursday -- Attendance recorded as eligibility for Committee membership		B. Chiu	200 CL S1 250 TH	Majestic E Conf. Plaza 2nd Floor
9:15 am - 9:30 am	*Break (beverages only)*			Landmark Foyer	

** Contact Joe Watson (joe_watson@ieee.org) if you are interested in sponsoring a coffee-break at a future meeting.

DATE/TIME	ACTIVITY	SUB-COM	ACTIVITY CHAIR	ROOM CAP/ARR/AV	MEETING ROOM
Monday, October 21 (continued)					
9:30 am - 10:45 am	WG 3-ph UG Dist. Transf. C57.12.24	UTNP	G. Termini	80 MX	Landmark 1
9:30 am - 10:45 am	TF Combination of Oil Guides **NEW!**	IF	T. Prevost	80 MX	Landmark 7
9:30 am - 10:45 am	TF Winding Temp. Indicators	IL	P. McClure	120 MX	Majestic B-C
9:30 am - 10:45 am	WG External Dielectric Clearances	DiTests	E. Davis	150 MX S3	Landmark 5-6
9:30 am - 10:45 am	WG Tertiary/Stabiliz. Windings PC57.158	PCS	E. Betancourt	150 MX S3	Landmark 2-3
9:30 am - 10:45 am	WG Failure Analysis & Report. C57.125	Power	W. Binder	200 MX S3	Landmark 4
10:45 am - 11:00 am	*Break (beverages only)*			Landmark Foyer	
11:00 am - 12:15 pm	TBD			80 MX	Landmark 1
11:00 am - 12:15 pm	WG Moisture in Insulation PC57.162	IL	T. Prevost	80 MX	Landmark 7
11:00 am - 12:15 pm	WG Overhead Distr. Transf. C57.12.20	Dist	A. Traut	120 MX	Majestic B-C
11:00 am - 12:15 pm	WG PD Acoustic Detection C57.127	DiTests	J. Harley	150 MX S3	Landmark 5-6
11:00 am - 12:15 pm	WG PCS Rev. to Test Code C57.12.90	PCS	M. Perkins	150 MX S3	Landmark 2-3
11:00 am - 12:15 pm	WG Installation of Power Transf. C57.93	Power	M. Lau	200 MX S3	Landmark 4
12:15 pm - 1:30 pm	Lunch Meeting: Standards Development Review		B. Bartley	200 RT (8/tbl)	Majestic D
	-- Special Presentation: "Standards Development Issues", by B. Bartley & E. Spiewak -- Doors actually open ~12:00 pm. Come early, get a good seat, and start eating. -- Everyone is welcome to attend. All SC/WG/TF leaders are highly encouraged to attend. -- Advance reservation required ($20 for box lunch). No paper tickets. Admission verified at the door.				
1:45 pm - 3:00 pm	WG Standard Require for Secondary Network Protectors C57.12.44	UTNP	B. Wimmer	80 MX	Landmark 1
1:45 pm - 3:00 pm	WG Dry-Type Gen. Require. C57.12.01	Dry	T. Holdway	80 MX	Landmark 7
1:45 pm - 3:00 pm	WG 1-ph Padmount Dist. Transformers C57.12.38 (12.21 & 12.25)	Dist	A. Ghafourian	120 MX	Majestic B-C
1:45 pm - 3:00 pm	WG Less-Flammable Hydrocarbon Insulating Liquid Guide C57.121	IF	D. Sundin	150 MX S3	Landmark 5-6
1:45 pm - 3:00 pm	TF Audible Sound Revision to Test Code	PCS	R. Girgis	150 MX S3	Landmark 2-3
1:45 pm - 3:00 pm	WG Tank Rupture & Mitigation PC57.156	Power	P. Zhao	200 MX S3	Landmark 4
3:00 pm - 3:15 am	*Break (beverages only and treats)*			Landmark Foyer	
3:15 pm - 4:30 pm	**SC HVDC Converter Transformers and Smoothing Reactors**	HVDC	M. Sharp	80 MX	Landmark 1
3:15 pm - 4:30 pm	WG Milli-amp Current Transf. C57.13.7	IT	H. Alton	80 MX	Landmark 7
3:15 pm - 4:30 pm	WG 3-ph Padmount Distribution Transformers C57.12.34	Dist	R. Stahara	120 MX	Majestic B-C
3:15 pm - 4:30 pm	WG Natural Ester-Based Fluids C57.147	IF	P. McShane	150 MX S3	Landmark 5-6
3:15 pm - 4:30 pm	WG Dielectric Freq. Response PC57.161	DiTest	A. Naderian	150 MX S3	Landmark 2-3
3:15 pm - 4:30 pm	TBD			200 MX S3	Landmark 4
4:30 pm - 4:45 pm	*Break (beverages)*			Landmark Foyer	
	~~WG Transformers Directly Connected to Generators PC57.116~~	~~Power~~	Will not meet; balloting document		
4:45 pm - 6:00 pm	WG Dry-Type O&M Guide C57.94	Dry	D. Stankes	80 MX	Landmark 1
4:45 pm - 6:00 pm	WG PD in Bushings & PT/CTs PC57.160	DiTests	T. Hochanh	80 MX	Landmark 7
4:45 pm - 6:00 pm	WG Step-Voltage Regulators C57.15	Dist	C. Colopy	120 MX	Majestic B-C
4:45 pm - 6:00 pm	WG Oil Accept & Maint. Guide C57.106	IF	B. Rasor	150 MX S3	Landmark 5-6
4:45 pm - 6:00 pm	WG PCS Revisions to C57.12.00	PCS	S. Snyder	150 MX S3	Landmark 2-3
4:45 pm - 6:00 pm	TBD			200 MX S3	Landmark 4
6:00 pm- 10:00 pm	Technical Tour 1: H-J Manufacturing & Test Facility; High Ridge, Missouri -- Space is limited, so register soon! Indicate desire to attend when you register on-line for the meeting. -- Buses begin loading at the hotel at 6:00 pm. Last bus departs at 6:30 pm. -- Dinner served at factory. Return approx 10:00 pm. -- For details, contact Jeff Evitts at +1.636.677.3421 ext 383 or <jeffe@h-j.com>.				

DATE/TIME	ACTIVITY	SUB-COM	ACTIVITY CHAIR	ROOM CAP/ARR/AV	MEETING ROOM
Tuesday, October 22 -- Tuesday Breaks Sponsored by Brockhaus Messtechnik **					
7:00 am - 12:00 pm	Meeting Registration				Conference Plaza
7:00 am - 6:00 pm	Internet Cafe'			12 BD	Washington Room
7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			270 RT (9/tbl)	Majestic D
8:00 am - 9:00 am	Breakfast - Spouses/Companions (no meeting attendees please)			72 RT (8/tbl)	Statler Room
7:00 am - 8:00 am	EL&P Delegation (End-users only please) -- Breakfast Meeting; arrive early		J. Murphy	60 CL (with buffet)	Majestic B-C
9:15 am - 3:30 pm **Note Depart Time!**	Spouses/Companions Tour: "Gateway Arch, Anheuser-Busch Brewery". Includes lunch at "Franco" Restaur. -- Advance registration required. Buses depart the hotel at 9:15 am, and return approx 3:30 pm.				
8:00 am - 9:15 am	WG Req. for Instrument Transf. C57.13	IT	R. McTaggart	80 MX	Landmark 1
8:00 am - 9:15 am	WG DPV Grid Transformers PC57.159	PCS	H. Shertukde	80 MX	Landmark 7
8:00 am - 9:15 am	WG Enclosure Integrity C57.12.28, C57.12.29, C57.12.31, C57.12.32	Dist	R. Olen	120 MX	Majestic B-C
8:00 am - 9:15 am	WG Oil Reclamation Guide PC57.637	IF	J. Thompson	150 MX S3	Landmark 5-6
8:00 am - 9:15 am	TBD			150 MX S3	Landmark 2-3
8:00 am - 9:15 am	WG Functional Life Tests, De-energized Tap Changers (DETC) PC57.157	Power	P. Hopkinson	200 MX S3	Landmark 4
9:15 am - 9:30 am	*Break (beverages only)*			Landmark Foyer	
9:30 am - 10:45 am	TF Station Service PTs	IT	D. Wallace	80 MX	Landmark 1
9:30 am - 10:45 am	WG Std Require. for Bushings C57.19.01	Bush	A. Del Rio	80 MX	Landmark 7
9:30 am - 10:45 am	WG Dist. Transf. Bar Coding C57.12.35	Dist	L. Matthews	120 MX	Majestic B-C
9:30 am - 10:45 am	WG DGA Natural Ester Fluids PC57.155	IF	P. Boman	150 MX S3	Landmark 5-6
9:30 am - 10:45 am	TF Committee History -- "Old Timers" welcome!	Mtgs	P. Balma	150 MX S3	Landmark 2-3
9:30 am - 10:45 am	WG Wind Power Transf. P60076-16	PCS	D. Buckmaster	200 MX S3	Landmark 4
10:45 am - 11:00 am	*Break (beverages only)*			Landmark Foyer	
	~~WG Temperature Rise Test Procedures in Section 11 of C57.12.90~~	IL	Will not meet; 11.1.2.2 proposal completed		
11:00 am - 12:15 pm	WG Liquid-immersed Secondary Network Transformers C57.12.40	UTNP	B. Klaponski	80 MX	Landmark 1
11:00 am - 12:15 pm	WG GSU Bushings PC57.19.04	Bush	C. Arpino	80 MX	Landmark 7
11:00 am - 12:15 pm	WG Phase Shifting Transformers IEEE/IEC 60076-57-1202	Power	R. Ahuja	120 MX	Majestic B-C
11:00 am - 12:15 pm	WG Guide for DGA in LTCs C57.139	IF	D. Wallach	150 MX S3	Landmark 5-6
11:00 am - 12:15 pm	WG Impulse Tests C57.138 (Distribution)	DiTests	J. Crotty	150 MX S3	Landmark 2-3
11:00 am - 12:15 pm	WG Loss Evaluation Guide C57.120	PCS	A. Traut	200 MX S3	Landmark 4
12:15 pm - 1:30 pm	Awards Luncheon -- Doors open ~12:00 pm. Come early, get a good seat, and start eating. -- Advance registration is necessary. Paper tickets are not provided. Admission verified at the door.		E. Smith	256 RT (8/tbl)	Majestic D
	~~WG Life Extension C57.140~~	~~Power~~	Will not meet; balloting document		
1:45 pm - 3:00 pm	TBD			80 MX	Landmark 1
1:45 pm - 3:00 pm	WG Revision to Low Frequency Tests	DiTests	B. Poulin	80 MX	Landmark 7
1:45 pm - 3:00 pm	WG Distr. Substation Transf. C57.12.36	Dist	J. Murphy	120 MX	Majestic B-C
1:45 pm - 3:00 pm	WG DGA Factory Temperature Rise Tests PC57.130	IF	J. Thompson	150 MX S3	Landmark 5-6
1:45 pm - 3:00 pm	TBD			150 MX S3	Landmark 2-3
1:45 pm - 3:00 pm	TF Transformer Efficiency and Loss Evaluation (DOE Activity)	Dist	P. Hopkinson	200 MX S3	Landmark 4
3:00 pm - 3:15 pm	*Break (beverages and treats)*			Landmark Foyer	

** Contact Joe Watson (joe_watson@ieee.org) if you are interested in sponsoring a coffee-break at a future meeting.

KEY

Note: A PC projector will be furnished in each meeting room. Arrive early to ensure that equipment operates/syncs correctly.
Overhead projectors are available from the hotel with advance notice.
> -- activity continued into another session / from another session
++ -- not a Transformers Committee activity TBD = "To Be Determined"
FC = flip chart; S1 = sound (special set-up)
S2 = stand mic in front only; S3 = one stand mic in front & stand mic(s) at mid-room

BD -- boardroom
US -- U-shape table
RT -- multiple roundtables
CL -- classroom seating (w/head table for 2)
TH -- theater seating (w/head table for 2)
MX -- mix classroom & theater (w/head table)

DATE/TIME	ACTIVITY	SUB-COM	ACTIVITY CHAIR	ROOM CAP/ARR/AV	MEETING ROOM
Tuesday, October 22 (continued)					
	~~WG Dry-Type Loading Guide PC57.96~~	~~Dry~~	Will not meet; balloting complete.		
3:15 pm - 4:30 pm	TBD			80 MX	Landmark 1
3:15 pm - 4:30 pm	TF Switching Transients Induced by Transf/Breaker Interaction C57.142	PCS	J. McBride	80 MX	Landmark 7
3:15 pm - 4:30 pm	WG Test Data Reporting C57.12.37	Dist	J. Crotty	120 MX	Majestic B-C
3:15 pm - 4:30 pm	WG Application of High-Temp Insulation Materials, IEEE P-1276	IL	M. Franchek	150 MX S3	Landmark 5-6
3:15 pm - 4:30 pm	WG Revision to Gas Guide C57.104	IF	R. Ladroga	150 MX S3	Landmark 2-3
3:15 pm - 4:30 pm	TBD			200 MX S3	Landmark 4
4:30 pm - 4:45 pm	*Break (beverages only)*			Landmark Foyer	
4:45 pm - 6:00 pm	TBD			80 MX	Landmark 1
4:45 pm - 6:00 pm	WG Neutral Grounding Devices PC57.32	PCS	S. Kennedy	80 MX	Landmark 7
4:45 pm - 6:00 pm	WG Tank Pressure Coordinat. C57.12.39	Dist	C. Gaytan	120 MX	Majestic B-C
4:45 pm - 6:00 pm	TF Moisture in Oil	IF	B. Rasor	150 MX S3	Landmark 5-6
4:45 pm - 6:00 pm	WG Transf. Paralleling Guide PC57.153	Power	T. Jauch	150 MX S3	Landmark 2-3
4:45 pm - 6:00 pm	WG Revisions to Impulse Test Sections of C57.12.00 and C57.12.90	DiTests	TBD	200 MX S3	Landmark 4
6:30 pm- 10:00 pm	Technical Tour 2: ABB Transformer Facility; St. Louis, Missouri -- Space is limited; initially only Committee Members and Active Participants. -- Buses begin loading at the hotel at 6:00 pm. Last bus departs at 6:45 pm. -- Dinner served at factory. Return approx 10:00 pm. -- For details, contact Mr. Tomasz Soltyszewski at +1.314.679.4597 or <tomasz.soltyszewski@us.abb.com>.				

Wednesday, October 23 -- Wednesday Breaks Sponsored by Doble Engineering, Co. ***

	No Meeting Registration, No Technical Tours, No Spouse/Companion Tour				
7:00 am - 6:00 pm	Internet Cafe'			12 BD	Washington Room
7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			256 RT (9/tbl)	Majestic D
8:00 am - 9:30 am	Breakfast - Spouses/Companions (no meeting attendees please)			72 RT (8/tbl)	Statler Room
7:00 am - 7:50 am	**SC Meetings Planning**	Mtgs	G. Anderson	24 CL (with buffet)	Majestic A
7:00 am - 8:30 am	IEC TC-14 Technical Advisory Group -- Breakfast Meeting; arrive early -- All interested individuals welcome	++	P. Hopkinson	60 CL (with buffet)	Majestic B-C
8:00 am - 9:15 am	**SC Instrument Transformers**	IT	R. McTaggart	150 MX S3	Landmark 5-6
8:00 am - 9:15 am	**SC Insulation Life**	IL	B. Forsyth	300 MX S3	Landmark 1-2-3-4
9:15 am - 9:30 am	*Break (beverages only)*			Landmark Foyer	
9:30 am - 10:45 am	**SC Bushings**	Bush	P. Zhao	150 MX S3	Landmark 5-6
9:30 am - 10:45 am	**SC Distribution Transformers**	Dist	S. Shull	300 MX S3	Landmark 1-2-3-4
10:45 am - 11:00 am	*Break (beverages only)*			Landmark Foyer	

*** Contact Joe Watson (joe_watson@ieee.org) if you are interested in sponsoring a coffee-break at a future meeting.

DATE/TIME	ACTIVITY	SUB-COM	ACTIVITY CHAIR	ROOM CAP/ARR/AV	MEETING ROOM
Wednesday, October 23 (continued)					
11:00 am - 12:15 pm	**SC UG Transf. & Network Protectors**	UTNP	C. Niemann	150 MX S3	Landmark 5-6
11:00 am - 12:15 pm	**SC Dielectric Tests**	DiTests	M. Franchek	300 MX S3	Landmark 1-2-3-4
12:15 pm - 1:30 pm	Lunch (on your own)				
1:30 pm - 2:45 pm	**SC Dry Type**	Dry	C. Johnson	150 MX S3	Landmark 5-6
1:30 pm - 2:45 pm	**SC Power Transformers**	Power	J. Watson	300 MX S3	Landmark 1-2-3-4
2:45 pm - 3:00 pm	*Break (beverages and treats)*			Landmark Foyer	
3:00 pm - 4:15 pm	**SC Insulating Fluids**	IF	S. McNelly	150 MX S3	Landmark 5-6
3:00 pm - 4:15 pm	**SC Performance Characteristics**	PCS	E. teNyenhuis	300 MX S3	Landmark 1-2-3-4
4:15 pm - 4:30 pm	*Break (beverages only)*			Landmark Foyer	
4:30 pm - 5:30 pm	**SC Standards**	Stds	B. Bartley	300 MX S3	Landmark 1-2-3-4
6:00 pm - 10:00 pm	Dinner Social: Peabody Opera House, with Tony n' Tina's Wedding. Advance registration is necessary. -- Buses begin shuttling from the hotel at 5:45 pm. Last bus departs the hotel at 6:30 pm. -- Begin with cocktails, hors d'oeuvres, tours of buildling. Dinner & entertainment begins at 7:00 pm. -- Buses begin shuttling back to hotel at 9:00 pm, and continue shuttling until 10:00 pm. -- Paper tickets are not provided. Admission verified with a registration list as you enter the Opera House.				
Thursday, October 24					
	No Meeting Registration, No Spouses/Companions Tours, No Technical Tours, No Internet Cafe'				
7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			256 RT (9/tbl)	Majestic D
8:00 am - 9:30 am	Breakfast - Spouses/Companions (no meeting attendees please)			64 RT (8/tbl)	Statler Room
8:00 am - 9:15 am	Technical Presentation #1: "TBD", by TBD Sponsored by TBD SC. See flyer on website			200 CL S1 200 TH	Majestic E Conf. Plaza 2nd Floor
9:15 am - 9:30 am	*Break (beverages only)*			Majestic Foyer	
9:30 am - 10:45 am	Technical Presentation #2: "TBD", by TBD Sponsored by TBD SC. See flyer on website			200 CL S1 200 TH	Majestic E
10:45 am - 11:00 am	*Break (beverages only)*			Majestic Foyer	
> 11:00 am - 12:00 pm	General Session, Transformers Committee (Part 2) -- All attendees are encouraged to attend -- See separate document for meeting agenda		B. Chiu	200 CL S1 200 TH	Majestic E
	Lunch (on your own)				
1:30 pm - 5:00 pm	EPRI Transformers Task Force -- Closed meeting, by invitation only	++	L. Van der Zel	28 US (w/beverages)	Westmoreland/ Kingsbury Room
Friday, October 25					
	No Transformer Committee Meetings, No Internet Cafe', No Social Events or Tours.				

*** Contact Tom Prevost (tprevost@ieee.org) if you are interested in making a technical presentation at a future meeting.

FUTURE COMMITTEE MEETINGS

Spring 2014 - March 23-27; Savannah, Georgia USA. Hosted by EFACEC
Fall 2014 - October 19-23 or 26-30; USA location to be determined

IEEE / PES /TRANSFORMERS COMMITTEE

Standards Report

To: Members of IEEE Transformers Committee Revision 1: Oct 20, 2013

From: William H. Bartley, Standards Coordinator

Executive Summary

This report covers the Transformers Committee Standards activity for the 6-½ month period from March 15th to September 30, 2013. In the last six months, no new Standards, one Revision and one Corrigenda were approved by Standards Board. In this same period, the Standards Board approved two PARs for a new standard; and one PAR for an Amendment.

In this Report:

I. Standards approved since March 15, 2013

NEW Transformer Standards Approved

None

Transformer REVISIONS approved, !!

C57.12.35 Standard for Bar Coding for Distribution Transformers and Step-Voltage Regulators
This will expire Aug 23, 2023

CORRIGENDA approved:

C57.12.60-2009/Cor 1-2013 IEEE Std Test Procedure for Thermal Evaluation of Insulation Systems for Dry-Type Power & Dist Transformers, Including Open-Wound, Solid-Cast, and Resin-Encapsulated Transformers *(Note: A Corrigenda does not affect Expiration. This standard expires Nov 9, **2019** !)*

II. PARs approved since March 15, 2013

PARs for New Standards and Revisions

PC57.121a Guide for Acceptance and Maintenance of Less Flammable Hydrocarbon Insulating Liquid in Transformers: Amendment a *(Note this is a PAR for an Amendment)*

PC57.161 Guide for Dielectric Frequency Response Test

PC57.162 Guide for the Interpretation of Moisture Related Parameters in Dry, Gas Insulated and Liquid Immersed Transformers and Reactors

PAR Modifications approved

none

PAR Extensions approved

none

III. 2013 IEEE Standards Board Meeting Schedule

A. DEADLINES for 2013 & 2014 STANDARDS BOARD Submissions:

Standards Board Meeting	Deadline
December 2013	**Monday, 21st October 2013**
March 2014	**February 14, 2014**
June 2014	**May 2, 2014**
August 2014	**July 11, 2014**
December 2014	**October 20, 2014**

B. RECENT STANDARDS BOARD Submissions *(as of Sept 30, 2013)*

The following was approved on the October Agenda for Early Consideration

PC57.12.10 –Corrigenda 2 Std Requirements for Liquid Immersed Power Transformers - Corrigendum 2: Correction of A.3.2.13

The following standards have been submitted to REVCOM, and are already on their *December* Agenda.

PC57.96 –Guide for Loading Dry-Type Distribution and Power Transformers

PC57.134 – Guide for Determination of Hottest-Spot Temperature in Dry-Type Transformers

P638 - Standard for Qualification of Class 1E Transformers for Nuclear Pwr Gen Stations

IEEE Standards Association Governance Meetings Schedule

2014

JANUARY

FEBRUARY

12–17: IEEE BOD Series, Los Angeles, CA

27-28: BOG Series, Delhi, India

MARCH

01: BOG Series, Delhi, India

25-27: SASB Series, Piscataway, NJ

31: CAG (tentatively Brazil)

APRIL

01-04: CAG (tentatively Brazil)

MAY

29-31: BOG Series, California

JUNE

10-12: SASB Series, Piscataway, NJ

18–23: IEEE BOD Series, New Brunswick, NJ

JULY

AUGUST

19-21: SASB Series, Beijing, PRC

SEPTEMBER

23-24: CAG, Sicily [host: STMicroelectronics]

OCTOBER

NOVEMBER

19-24: IEEE BOD Series, New Brunswick, NJ

DECEMBER

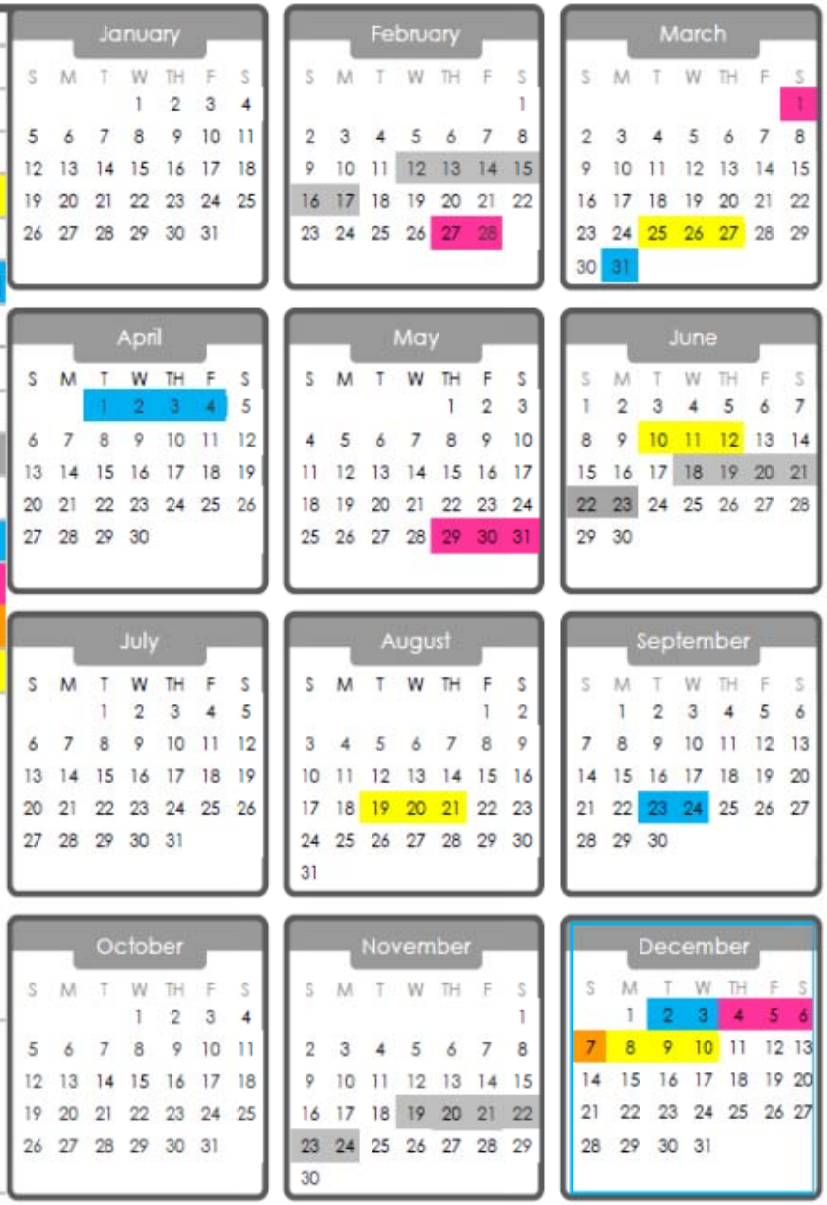
02-03: CAG mtgs

04-06: BOG Series, Piscataway, NJ

07: Awards Ceremony, New Brunswick, NJ

08-10: SASB Series, Piscataway, NJ

SASB Submittal Deadlines:
14 February 2014
02 May 2014
11 July 2014
20 October 2014



IV. Transformer Committee Ballot Status *(as of Oct 13, 2013)*

SubCommittee/ Standard #	*Title*	Date Ballot Closed	Current Status
Bushing Subcommittee			
C57.19.03 /65700-19-03	Requirements, Terminology, & Test Code for Bushings DC Applications NOTE PAR extension request submitted	5-Jul-2013	Comment Resolution
Distribution SC			
PC57.12.28	Standard for Pad-Mounted Equipment – Enclosure Integrity	7 Sept 2013	Comment Resolution
PC57.12.29	Standard for Pad-Mounted Equipment – Enclosure Integrity for Coastal Environments	7 Sept 2013	Comment Resolution
Dry Type			
PC57.134	Guide for Determination of Hottest-Spot Temperature in Dry-Type Transformers		Submitted to REVCOM
PC57.12.01	Standard Requirements for Dry-Type Dist & Power Transformers	15 Sept 2013	Comment Resolution
Ins Fluids SC			
PC57.155	Guide for DGA in Ester Fluids Ballot Pool Invitation closed Sept 15, 2013	17-Oct-2013	In Ballot
Power			
IEEE P638	Standard for Qualification of Class 1E Transformers for Nuclear Pwr Gen Stations Ballot is complete & submitted to Revcom	23-Aug-2013	Submitted to REVCOM
PC57.116	Guide for Transformers Directly Connected to Generators	22-Aug-2013	Comment Resolution
UTNP			
PC57.12.44	Standard Requirements for Secondary Network Protectors	10-Jun-12	Comment Resolution

V. Transformer Committee PAR Status *(as of Oct 13, 2013)*

PAR #	Description	PAR first approved	PAR Expires Dec 31st
P1276	Application Guide for Hi-Temp Insulation Materials in L.I. Power Transformers	6-Feb-12	2016
P60076-16	Standard Requirements for Wind Turbine Generator Transformers	8-Jun-12	2016
P60076-57-1202	Standard Requirements for Liquid Immersed Phase-Shifting Transformers	8-Jun-12	2016
P65700-19-03	Standard for Bushings for DC application	5-Dec-07	2013
PC57.104	Guide for the Interpretation of Gases Generated in Oil-Immersed Transformers	5-Feb-10	2014
PC57.106	Guide for Acceptance and Maintenance of Insulating Oil in Equipment	9-Nov-11	2015
PC57.116	Guide for Transformers Directly Connected to Generators	10-Sep-11	2015
PC57.12.00	Std Gen Requirements for L.I. Distribution, Power, and Regulating Transformers	16-Jun-11	2015
PC57.12.01	Standard for General Requirements for Dry-Type Distribution and Power Transformers	9-Dec-09	2015
PC57.12.20	Std for Ovrhd-Distribution Transformers <500 kVA HV <34 500v; LV, 7970/13 800Y V	8-Jun-12	2016
PC57.12.24	Standard for Submersible, 3-ph Transformers, <3750 kVA, HV <34 500 LV < 600 Volts	9-Nov-11	2015
PC57.12.28	Standard for Pad Mounted Equipment - Enclosure Integrity	30-Sep-10	2014
PC57.12.29	Standard for Pad Mounted Equipment - Enclosure Integrity for Coastal Environments	30-Sep-10	2014
PC57.12.31	Std for Pole-Mounted Eqpt - Enclosure Integrity - Corr 1: SCAB Corrosion Test /4.5.6	6-Mar-13	2017

Committee PAR Status continued			
PAR #	Title	PAR Approved	PAR Expires
PC57.12.34	Std for Req's-Pad-Mounted, Compart'l Self Cooled, 3 ph Dist Transformers, <10 MVA	31-Mar-11	2015
PC57.12.36	Standard Requirements for Liquid-Immersed Distribution Substation Transformers	7-Dec-11	2015
PC57.12.37	Standard for the Electronic Reporting of Distribution Transformer Test Data	7-Dec-11	2015
PC57.12.38	Std for Pad-Mounted-Type, Self-Cooled, 1ph Dist Transformers; <250 kVA	25-Mar-10	2014
PC57.12.39	Standard Requirements for Distribution Transformer Tank Pressure Coordination	6-Feb-12	2016
PC57.12.40	Standard for Network, 3-ph Transformers, <2500 kVA; Subway and Vault Types	30-Aug-12	2016
PC57.12.44	Standard Requirements for Secondary Network Protectors	17-Jun-10	2014
PC57.12.59	Guide for Dry-Type Transformer Through-Fault Current Duration	7-Dec-11	2015
PC57.12.90	Std Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers	16-Jun-11	2015
PC57.120	Guide for Loss Evaluation of Distribution and Power Transformers and Reactors	25-Mar-10	2014
PC57.121a	Guide for Acceptance & Maint of Less Flammable Hydrocarbon Liquids - Amendment a	23-Aug-13	2017
PC57.125	Guide for Failure Investigation, Analysis, and Reporting for Pwr Transformers & Reactors	2-Feb-11	2015
PC57.13	Standard Requirements for Instrument Transformers	25-Mar-10	2014
PC57.13- C 1	Std Req for Instrument Transformers - Corrigendum 1: Figure 3 Correction	30-Sep-10	2014
PC57.13.7	Standard for Current Transformers with a Maximum mA Secondary Current of 250mA	30-Sep-10	2014
PC57.130	Trial-Use Guide for the Use of DGA Applied to Factory Temp Rise Tests	17-Jun-10	2014
PC57.136	Guide for Sound Level Abatement and Determination for L.I. Power Transformers > 500 kVA	30-Sep-10	2014
PC57.138	Recommended Practice for Routine Impulse Test for Distribution Transformers	2-Feb-11	2015
PC57.139	Guide for Dissolved Gas Analysis in Transformer Load Tap Changers	16-Jun-11	2015
PC57.140	Guide for Eval and Reconditioning of Liquid Immersed Power Transformers	31-Mar-11	2015
PC57.147	Guide for Acceptance & Maintenance of Natural Ester Insulating Fluids in Transformers	6-Feb-12	2016
PC57.153	Guide for Paralleling Power Transformers	27-Mar-08	2014
PC57.155	Guide for Interpretation of Gases Generated in Ester Immersed Transformers	25-Mar-10	2014
PC57.156	Guide for Tank Rupture Mitigation of Liquid-Immersed Pwr Transformers and Reactors	16-Jun-11	2015
PC57.157	Guide for Conducting Functional Life Tests for DETC Contacts	7-Dec-11	2015
PC57.158	Guide for the Application of Tertiary & Stabilizing Windings in Powr Transformers	15-May-12	2016
PC57.159	Application Guide for Transformers in Photovoltaic Power Gen Systems	8-Jun-12	2016
PC57.160	Guide for the Electrical Measurement of Partial Discharges in High Voltage Bushings	6-Mar-13	2017
PC57.161	Guide for Dielectric Frequency Response Test	23-Aug-13	2017
PC57.162	Guide for Interpretation of Moisture Parameters in Dry, Gas Insulated and L.I. Transformers	23-Aug-13	2017
PC57.19.01	Std Performance Characteristics and Dimensions for Outdoor Apparatus Bushings	8-Dec-10	2014
PC57.19.04	Std Perf Characteristics & Dimensions for High Current Bushings w/ Cont. Current >5000 A	16-Jun-11	2015
PC57.32	Std Requirements & Test Procedures for Neutral Grounding Devices	7-Dec-11	2015
PC57.637	Guide for the Reclamation of Insulating Oil and Criteria for Its Use	10-Dec-08	2014
PC57.93	Guide for Installation and Maintenance of Liquid-Immersed Power Transformers	29-Mar-12	2016
PC57.94	Guide for Installation & Maintenance of Dry-Type Distribution & Power Transformers	9-Nov-11	2015

STANDARD / PROJECT	TITLE	Working Group Chair / Phone / Email	Pub Year / Rev Due Dat	PAR Issue Dat / PAR Expiration	Standard Status / Remark
SubCommittee **BUSHING** Chair **Zhao P.**		(417) 345-5926 peter.zhao@HydroOne.com			
PC57.19.04	Standard Performance Characteristics and Dimensions for High Current Power Transformer Bushings	Arpino C. 847 439-4122 carlo@astareg.com		6/16/2011 **12/31/2015**	New Project
C57.19.00	Standard General Requirements and Test Procedure for Power Apparatus Bushings	Ellis K. P. (615) 847-2157 keithcota@aol.com	2004 **12/8/2020**		Approved Formally Std. IEEE 21 Previous revision 1991. Errata issued March 2010 Reaffirmation approved 12/8/2010
C57.19.01 PC57.19.01	IEEE Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings	Zhang 941.729.5606 gzhang@grandeagle.com	2000 **12/31/2018**	12/8/2010 **12/31/2014**	Approved +PAR for Revision Formally Std. IEEE 24 Reaffirmed in 2005. PAR for Rev first approved Dec 2007 Mar '10: NesCom extended PAR, unitl December 2013
C57.19.03-19 P65700-19-03	Standard Requirements, Terminology, and Test Code for Bushing for DC Applications - Corrigendum 1	Recksiedler 204 474 3192	**12/31/2018**	3/25/2010 **12/31/2013**	Approved + PAR for Revision Published 6/6/2006 See Corrigenda -1, Published in 2006 New PAR for revision submitted 10/2007 Std merging with IEC std NesCom extended PAR, unitl December 2013 IEEE Work complete; still waiting for IEC. Extension Request submitted
C57.19.100	IEEE Guide for Application of Power Apparatus Bushings	Spitzer T. (817) 215-6457 tommy.spitzer@oncorgroup.com	1995 **12/31/2022**		Approved New PAR requested and approved to 12/31/2010. NESCOM approved Extension till Dec 2012 Revision approved Dec 2012

STANDARD / PROJECT	TITLE	Working Group Chair / Phone / Email	Pub Year / Rev Due Dat	PAR Issue Dat / PAR Expiration	Standard Status / Remark
SubCommittee **DIELECTRIC TESTS**		(802) 751-3539			
Chair **Franchek M. A.**		michael.franchek@wicor.com			
PC57.161	Guide for DFR Measurements	Naderian A. a.naderian@gmail.com		8/22/2013 **12/31/2017**	New project
C57.113	IEEE Guide for Partial Discharge Measurement in Liquid-Filled Power Transformers and Shunt Reactors	Poulin B. (450) 652-2901 bertrand.f.poulin@ca.abb.com	1991 **6/17/2020**		Approved std Revision approved June 2010
C57.127	IEEE Guide for the Detection of Acoustic Emissions from Partial Discharges in Oil-Immersed Power Transformers	Gross gross@pdix.com	2007 **12/31/2018**		Approved
C57.138 PC57.138	IEEE Recommended Practice for Routine Impulse Test for Distribution Transformers	Crotty J.W. 573 659 6265 john.w.crotty@us.abb.com	1998 **12/31/2018**	2/2/2011 **12/31/2015**	Approved - Reaffirmed in June '05 Reaffirmation approved by RevCom on 6/8/05. Dec '10: Nescom approved new PAR until Dec31 2015
C57.98	IEEE Guide for Transformer Impulse Tests	Molden A. (845) 225-0993 a.molden@ieee.org	1994 **12/31/2021**		Approved - PAR to Revise IEEE Std C57.98-1994 PAR extension requested and approved to 12/31/2009. Dec '10: PAR mod and extension approved by Nescom

STANDARD / PROJECT	TITLE	Working Group Chair / Phone / Email	Pub Year / Rev Due Dat	PAR Issue Dat / PAR Expiration	Standard Status / Remark
SubCommittee Chair	**DISTRIBUTION TRANSFORMERS** **Shull S.**	(417) 625-6110 sshull@empiredistrict.com			
PC57.12.33	Guide for Distribution Transformer Loss Evaluation	Pekarek T. J. (330) 761-7800 tjpekarek@firstenergycorp.com			PAR WITHDRAWN - Inactive WG Decision made at Las Vegas Meeting to discontinue this activity.
PC57.12.39	Standard Requirements for Distribution Transformer Tank Pressure Coordination	Gaytan C. (52) 818 03022 133 carlos.gaytan.cavazos@indsys.ge.com		2/6/2012 **12/31/2016**	New Project
C57.12.20 PC57.12.20	Standard for Overhead Type Distribution Transformers, 500 kVA and Smaller, High-Voltage 34 500 Volts and Below; Low-Voltage, 7970/13 800 Y Volts and Below	Traut A. 706-548-3121 atraut@ieee.org	2011 **6/16/2021**	6/8/2012 **12/31/2016**	Approved Standard with approved PAR for Revision PAR for Revision approved June 2012
C57.12.28 PC57.12.28	Standard for Pad Mounted Equipment - Enclosure Integrity	Olen O. (262) 835-3362 rolen@cooperpower.com	2005 **12/31/2018**	9/30/2010 **12/31/2014**	Approved Previously NEMA/ANSI C57.12.28-1999 Published 9/30/2005 PAR for Revision approved by NESCOM Sept 2010
C57.12.29 PC57.12.29	Standard for Pad Mounted Equipment - Enclosure Integrity for Coastal Environments	Olen O. (262) 835-3362 rolen@cooperpower.com	2005 **12/31/2018**	9/30/2010 **12/31/2014**	Approved Previously NEMA/ANSI C57.12.29-1991 Current standards Published 10/10/2005. PAR for Revision approved by NESCOM Sept 2010
C57.12.30	Std for Pole-Mounted Eqpt - Enclosures for Coastal Environment	Olen O. (262) 835-3362 rolen@cooperpower.com	**6/17/2020**		Approved new standard new standard approved June 2010
C57.12.31 PC57.12.31	IEEE Standard for Pole Mounted Equipment - Enclosure Integrity	Olen O. (262) 835-3362 rolen@cooperpower.com	2002 **6/17/2020**	3/6/2013 **12/31/2017**	Approved with PAR for Corrigenda Published 3/6/2003. New PAR approved 3/22/2007 Std Bd approved 6/17/2010 PAR for Corrigenda approved to correct SCAB corrosion test
C57.12.32	Standard for Submersible Equipment - Enclosure Integrity	Olen O. (262) 835-3362 rolen@cooperpower.com	2002 **12/31/2018**		Approved Published 3/7/2003. Reaffirmation approved Mar 2008
C57.12.34 PC57.12.34	Requirements for Pad-Mounted, Compartmental-Type, Self-Cooled, Three-Phase DistributionTransformers, 2500 kVA and Smaller: High-Voltage, 34 500GrdY/19 920 Volts and Below; Low Voltage, 480 Volts and Below	Shull S. (417) 625-6110 sshull@empiredistrict.com	**12/9/2019**	3/31/2011 **12/31/2015**	Approved + PAR for Revision Originally Std. 1447, Combined C57.22-1980 & C57.12.26-1992 Revised Standard approved Dec09 Mar '11: Nescom approved new PAR for Revision
C57.12.35 PC57.12.35	IEEE Standard for Bar Coding for Distribution Transformers	Matthews P (601) 422-1533 lmatthews@howard-ind.com	2007 **12/31/2018**	6/17/2010 **12/31/2014**	Approved Formally P1265. PAR for Revision approved June 2010
C57.12.36 PC57.12.36	Standard Requirements for Liquid-Immersed Distribution Substation Transformers	Murphy J.R. (407) 824-4194 jerry.murphy@ieee.org	2007 **12/31/2018**	12/7/2011 **12/31/2015**	Approved std and approved PAR for Revision approved by SA Board on 9/27/2007 PAR for Revision approved Dec '11

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SubCommittee Chair **DISTRIBUTION TRANSFORMERS** **Shull S.**		(417) 625-6110 sshull@empiredistrict.com			
C57.12.37 PC57.12.37	IEEE Standard for the Electronic Reporting of Transformer Test Data	Crotty J.W. 573 659 6265 john.w.crotty@us.abb.com	2006 **12/31/2018**	12/7/2011 **12/31/2015**	Approved with PAR for Revision Formally C57.132, IEEE Std 1388-2000 D11d approved by SA Board on 3/30/2006. Published 7/21/2006. New PAR for Revision submitted Sept'11 -approved Dec'11
C57.12.38 PC57.12.38	Standard for Pad-Mounted, Compartmental-Type, Self-Cooled, Single-Phase Distribution Transformers with Separable Insulated High-Voltage Connectors; High Voltage, 34500 GrdY/19920 Volts and Below, Low Voltage, 240/120 Volts; 167 kVA and SmallerRequirements	Ghafourian A. A. (731) 285-9121 aghafourian@ermco-eci.com	2009 **9/11/2019**	3/24/2010 **12/31/2014**	Approved - revision in progress This std replaces C57.12.21 & C57.12.25 Std published Nov 30 2009 PAR for Revision approved by Nescom Mar-2010
C57.15	IEEE Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators	Colopy C. A. (262) 896-2342 ccolopy@cooperpower.com	1999 **9/11/2019**		Approved Also known as 60076-21-2011

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SubCommittee **DRY TYPE TRANSFORMERS** Chair **Johnson, Jr. C. W.**		(276) 688-1512 charles.w.johnson@us.abb.com			
C57.12.01 PC57.12.01	IEEE Standard General Requirements for Dry-Type Distribution and Power Transformers Including Those with Solid Cast and/or Resin Encapsulated Windings	Holdway T. (276) 688-1512 thomas.holdway@us.abb.com	2005 **12/31/2018**	12/9/2009 **12/31/2015**	Approved with PAR Previous 1998 version was successfully revised and approved in 2005. Published 5/19/2006 PAR for Revision approved Dec 09. PAR extension approved March 2013; extending PAR to Dec 2015 Ballot Invitation opened Aug 16
C57.12.51	Ventilated Dry-Type Power Transformers, 501 kVA and Large, Three-Phase, with High-Voltage 601 to 34500 Volts; Low-Voltage 208Y/120 to 4160 Volts - General Requirements	Powell P. A. (202) 388-2335 papayne@ieee.org	**12/31/2018**		Approved Previously NEMA document C57.12.51, original publication by NEMA in 1981, Reaffirmed in 1998. This document was transferred to IEEE in Dec., 2002. Approved by SA Sept 2008
C57.12.52	Standard Requirements for Sealed Dry-Type Power Transformers, 501 kVA and Larger, Three-Phase, with High-Voltage 601 to 34 500 Volts, Low-Voltage 208Y/120 to 4160 Volts	Kennedy S. P. (716) 896-6500 skennedy@niagaratransformer.com	1981 **12/31/2022**		Approved Previously ANSI C57.12.52-1981 SA approved Dec 2012
C57.12.56	IEEE Standard Test Procedure for Thermal Evaluation of Insulation Systems for Ventilated Dry-Type Power and Distribution Transformers	Wicks R. C. (804) 383-3300 roger.c.wicks@usa.dupont.com	1981 **12/31/2007**		Withdrawn Dec 31 2009 C57.12.56 and C57.12.60 were merged together
C57.12.58	IEEE Guide for Conducting a Transient Voltage Analysis of a Dry-Type Transformer Coil	Kline A. D. (843) 705-2698 AKLINE1490@AOL.COM	1991 **12/31/2018**		Approved - Active Reaffirmed Sept 2008
C57.12.59 PC57.12.59	IEEE Guide for Dry-Type Transformer Through-Fault Current Duration	Powell P. A. (202) 388-2335 papayne@ieee.org	2001 **12/31/2018**	12/7/2011 **12/31/2015**	Approved Reaffirmation approved in 12/5/2006. PAR for Revision submitted Oct'11 and approved by Std Bd Dec'11
C57.12.60	IEEE Guide for Test Procedures for Thermal Evaluation of Insulation Systems for Solid Cast and Resin-Encapsulated Power and Distribution Transformers	Wicks R. C. (804) 383-3300 roger.c.wicks@usa.dupont.com	1998 **11/9/2019**		Approved with Corrigenda IEEE Std C57.12.56-1986 and IEEE Std C57.12.60-1998 merged together in 2009 Corrigenda 1 approved by SA June 2013
C57.12.91	IEEE Standard Test Code for Dry-Type Distribution and Power Transformers	Foster D. R. (815) 678-2421 dfoster@olsun.com	2001 **12/31/2021**		Approved
C57.124	IEEE Recommended Practice for the Detection of Partial Discharge and the Measurement of Apparent Charge in Dry-Type Transformers	Johnson, Jr. C. W. (276) 688-1512 charles.w.johnson@us.abb.com	1991 **12/9/2019**		Approved Reaffirmed Dec09
C57.134 PC57.134	IEEE Guide for Determination of Hottest Spot Temperature in Dry Type Transformers	Powell P. A. (202) 388-2335 papayne@ieee.org	2000 **12/31/2018**	12/7/2011 **12/31/2015**	Approved Reaffirmation approved 3/30/2006 PAR for Revision approved Dec'11 Submitted to Revcom - On Dec'13 agenda

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SubCommittee **DRY TYPE TRANSFORMERS**		(276) 688-1512			
Chair **Johnson, Jr. C. W.**		charles.w.johnson@us.abb.com			
C57.16 PC57.16	IEEE Standard Requirements, Terminology, and Test Code for Dry-Type Air- Core Series-Connected Reactors	Dudley R. F. (416) 298-8108 richardd@ca.trenchgroup.com	1996 **12/31/2018**		Approved Revision approved by Std Bd Sept 2011
C57.94 PC57.94	IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type General Purpose Distribution and Power Transformers	Stankes S (603) 545-3026	1982 **12/31/2018**	12/9/2011 **12/31/2015**	Approved Reaffirmation approved by the SA Board on 12/6/2006 PAR for Revision approved Dec'11
C57.96 PC57.96	IEEE Guide for Loading Dry Type Distribution and Power Transformers	Marek R. P. (804) 383-2376 Richard.P.Marek@usa.dupont.com	1999 **12/31/2018**	12/9/2009 **12/31/2013**	Approved - Active RevCom approved reaffirmation on 9/22/2004 Previous revision in 1994. PAR for Revision approved Dec 2009 Ballot completed and on Dec2013 Revcom agenda.
IEEE 259	IEEE Standard Test Procedure for Evaluation of Systems of Insulation for Dry-Type Specialty and General-Purpose Transformers	Stankes S (603) 545-3026	1999 **3/25/2020**		Approved 9/22/04 - RevCom approved reaffirmation Reaffirmed March 2010
SubCommittee **HVDC CON TX & SMRs**		416-298-8108			
Chair **Sharp M.**		mikes@ca.trenchgroup.com			
C57.129	IEEE General Requirements and Test Code for Oil Immersed HVDC Converter Transformers	Dudley R. F. (416) 298-8108 richardd@ca.trenchgroup.com	2007 **12/31/2018**		Approved Trial use std published 6/6/2000; upgraded to full use 3/2002 Approved by SA Board 9/27/2007
IEEE 1277	IEEE General Requirements and Test Code for Dry-Type and Oil-Immersed Smoothing Reactors for DC Power Transmission	Dudley R. F. (416) 298-8108 richardd@ca.trenchgroup.com	2000 **12/31/2020**		Approved. Ballot approved March 2010

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SubCommittee Chair	**INSTRUMENT TRANSFORMERS** **McTaggart R.**	(416) 751-8570 rossdm@ca.trenchgroup.com			
PC57.13.7	Standard for Instrument Transformer with max output of 250ma	Alton		9/30/2010 **12/31/2014**	New Project New project approved by NESCOM Sept 2010
PC57.13.8	Standard Requirements for Station Service VTs	Wallace david.wallace@us.abb.com			New Project PAR application is on Dec13 SB Agenda
C57.13 **PC57.13**	IEEE Standard Requirements for Instrument Transformers	McTaggart R. (416) 751-8570 rossdm@ca.trenchgroup.com	2008 **12/31/2018**	9/30/2010 **12/31/2014**	Approved - Active PAR for Corrigenda PAR to Revise IEEE Std C57.13-2008 submitted to NESCOM PAR for Corrigenda to Correct Fig 3 approved Sept 2010
C57.13.2	Conformance Test Procedure for Instrument Transformers	Smith J. E. (601) 346-9104 jes1@ieee.org	2005 **6/17/2020**		Approved PAR to Revise Std C57.13.2-1991; harmonize with C57.13-1993 D4 approved by RevCom on 6/8/2005; Published 9/29/2005. Reaffirmed 6/17/2010
C57.13.5 **PC57.13.5**	Standard of Performance and Test Requirements for Instrument Transformers of a Nominal System Voltage of 115 kV and Above	Riffon P. (514) 840-3000 x3424 riffon.pierre@hydro.qc.ca	2006 **9/11/2019**		Approved Reference Std. 1400 Previously C57.13.5 was a trial use Upgraded to Full Use 3/30/2006
C57.13.6	Standard for High Accuracy Instrument Transformers	Smith J. E. (601) 346-9104 jes1@ieee.org	**6/17/2020**		Approved Document published in 12/9/2005 Reaffiremed 2010

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SubCommittee Chair	**INSULATING FLUIDS** **McNelly S.J.**	(612) 330-6904 sjmcnelly@ieee.org			
PC57.130	IEEE Trial-Use Guide for the Use of Dissolved Gas Analysis During Factory Temeprature Rise Tests for the Evaluation of Oil-Immersed Transformers and Reactors	Thompson J. A. 605-534-3571 serve1@svtv.com		6/16/2010 **12/31/2014**	New Project New Project - Std under development - currently under ballot resolution. PAR extension requested and approved to 12/31/2007. New PAR approved June 2010
PC57.155	DGA Guide for Esters filled Transformers	Boman P.E. (785)256-7161 paul_boman@hsb.com		3/24/2010 **12/31/2014**	New Project PAR approved by NESCOM - March-2010 Ballot Invitation Opened Aug 15, 2013
C57.104 PC57.104	IEEE Guide for the Interpretation of Gases Generated in Oil-Immersed Transformers	Ladroga R. K. 978 410 5507 richard.ladroga@rmiengineers.com	1991 **12/31/2018**	1/9/2010 **12/31/2014**	Active + New PAR for Revision PAR to Revise IEEE Std C57.104-1991 Original PAR and document withdrawn in Dec. 2005. New PAR approved in June, 2006. New PAR approved Jan 2010
C57.106 PC57.106	IEEE Guide for Acceptance and Maintenance of Insulating Oil in Equipment	Rasor B. Bob.Rasor@sdmyers.com	2006 **12/31/2018**	11/9/2011 **12/7/2016**	Approved Standard PAR for Revision approved Dec'11
C57.111	IEEE Guide for Acceptance of Silicone Insulating Fluid and Its Maintenance in Transformers	Boman P.E. (785)256-7161 paul_boman@hsb.com	1983 **3/19/2019**		Approved
C57.121	IEEE Guide for Acceptance and Maintenance of Less-Flammable Hydrocarbon Fluid in Transformers	Sundin 903 231 3141 dsundin@svbchemicals.com	1998 **12/31/2019**		Approved Was to be administratively withdrawn in Dec., 2004 Reaffirmation ballot pool invitation initiated in October, 2005. Reaffirmed Dec 2009
C57.139 PC57.139	Guide for Dissolved Gas Analysis in Transformer Load Tap Changers	Wallach D.J. (980) 373-4167 david.wallach@duke-energy.com	2010 **12/8/2020**	6/16/2011 **12/31/2015**	Approved PC57.139 was approved as a new standard by IEEE-SA Dec 8, 2010 PAR for revision approved June 2011
C57.146	Guide for Interpretation of Gasses Generated in Silicone-Immersed Transformers	Murphy J.R. (407) 824-4194 jerry.murphy@ieee.org	2005 **6/16/2021**		Approved Reaff approved 16-June-11.
C57.147 PC57.147	Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers	McShane C. P. 262 366 1091 patrick_mcshane@cargill.com	**12/31/2018**	2/6/2012 **12/31/2016**	Active with active PAR for Revision New Standard approved May 2008
IEEE 637 PC57.637	IEEE Guide for the Reclamation of Insulating Oil and Criteria for Its Use	Thompson J. A. 605-534-3571 serve1@svtv.com	1985 **12/31/2018**	12/10/2008 **12/31/2014**	Approved - Reaffirmed Reaffirmation approved by SA Board 9/27/2007 PAR for Revision approved Dec 2008 PAR extension approved June 2012, until Dec 2014

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SubCommittee **INSULATION LIFE**		405-622-8816			
Chair **Forsyth B. I.**		bruce.forsyth@ieee.org			
PC57.145	Guide for the Definition of Thermal Duplicate Liquid-Immersed Distribution, Power, and Regulating Transformers	Beaster B. L. (601) 422-1302 blbeaster@ieee.org	0		PAR WITHDRAWN Dec 2004 Previously P1524 Modified PAR to expire in 2004 PAR administratively withdrawn in December, 2004
PC57.162	Guide for Interpretation of Moisture in Transformers	Prevost T. A. 781-672-6219 tprevost@ieee.org		8/23/2013 12/31/2017	New Project
C57.100	IEEE Standard Test Procedure for Thermal Evaluation of Liquid-Immersed Distribution and Power Transformers	Wicks R. C. (804) 383-3300 roger.c.wicks@usa.dupont.com	1999 12/31/2021		Approved Standard Requested PAR for revision on 10/18/2004. 1st Ballot -2010; 1st Recirc Sept 2011; 2nd Recirc closed 20-Oct'2011 APPROVED Dec 2011
C57.119	IEEE Recommended Practice for Performing Temperature Rise Tests on Oil Immersed Power Transformers at Loads Beyond Nameplate Ratings	Tuli S. C. 414 477 6669 subhash.tuli@ieee.org	2001 12/31/2018		Approved Previously IEEE 838. Published 3/12/2002. Reaffirmed Mar 2008
C57.154 PC57.154	Design, Testing and App of Liquid-Immersed Transformers with High-Temp Insulation	Marek R. P. (804) 383-2376 Richard.P.Marek@usa.dupont.com	2012	3/19/2009 12/31/2013	New Standard PAR for new standard approved March 2009 Standard Bd approved Aug 30, 2012
C57.91	IEEE Guide for Loading Mineral-Oil-Immersed Transformers	Duckett D. A. (407) 942-9401 don.duckett@pgnmail.com	1995 12/31/2021		Approved Combined from C57.91-1981 & C57.92-1981 & C57.115-1991
IEEE 1276 P1276	IEEE Guide for the Application of High-Temperature Insulation Materials in Liquid-Immersed Power Transformers	Franchek M. A. (802) 751-3539 michael.franchek@wicor.com	1997 12/31/2018	2/6/2012 12/31/2016	Approved with active PAR for Revision Upgrade from trial use to full use on 3/30/2000 Reaffirmation approved by SA Board in 3/30/2006 PAR for Revision submitted Oct'11 and approved by Std Bd Feb 2012
IEEE 1538	IEEE Guide for Determination of Maximum Winding Temperature Rise in Liquid Filled Transformer	Forsyth B. I. 405-622-8816 bruce.forsyth@ieee.org	2000 12/31/2021		Approved Original approval in 2000. Reaffirmed in 2005. Reaffirmed again in Dec 2011

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SubCommittee Chair	**PERFORMANCE CHARACTERISTICS** **TeNyenhuis E.G.**	(519) 837-4691 ed.g.tenyenhuis@ca.abb.com			
P60076-16	Standard Requirements for Wind Turbine Generator Transformers	Buckmaster D.E. 980-321-8381 david.buckmaster@shawgrp.com		6/8/2012 **12/31/2016**	Approved PAR PAR approved June 2012 This is an IEC Joint development
PC57.133	Guide for Short-Circuit Testing of Distribution and Power Transformers	Fortin M. 450-922-0925 fortin.marcel@ieee.org			PAR WITHDRAWN This PAR was withdrawn by consensus of PCSC. Proposed contents are reportedly addressed in C57.12.90.
PC57.158	Guide for the Application of Tertiary and Stabilizing Windings in Power Transformers	Betancourt E. (52-80)-30-2135 enrique.betancourt.ramirez@indsys.ge.c		5/15/2012 **12/31/2016**	Approved PAR
PC57.159	Guide for Application in Distributed Photovoltaic (DPV) Transformers in Power Generation Systems	Shertukde H.M. (860) 768-4847 shertukde@mail.hartford.edu		6/8/2012 **12/31/2016**	Approved PAR
C57.105	IEEE Guide for Application of Transformer Connections in Three-Phase Distribution Systems		1978 **12/31/2018**		Approved Was to be administratively withdrawn in Dec., 2004. Request extension to 2006. Reaffirmation ballot pool invitation initiated in October, 2005. Reaffirmed 2008
C57.109	IEEE Guide for Liquid-Immersed Transformers Through-Fault-Current Duration	Patel B. K. (205) 987-8012 bkpatel8012@charter.net	1993 **12/31/2018**		Approved Reaffirmation ballot pool invitation initiated in October, 2005. Reaffirmed Mar 2008
C57.110	IEEE Recommended Practice for Establishing Transformer Capability When Supplying Nonsinusoidal Load Currents	Marek R. P. (804) 383-2376 Richard.P.Marek@usa.dupont.com	1998 **12/31/2018**		Approved PAR approved 11/18/2004. Approved by SA Mar 2008
C57.120 PC57.120	IEEE Loss Evaluation Guide for Power Transformers and Reactors	Traut A. 706-548-3121 atraut@ieee.org	1991 **12/31/2018**	3/24/2010 **12/31/2014**	Approved - revision in progress Reaffirmation approved by RevCom 6/8/2006. PAR for Revision submitted 1/21/2010 to merge C57.120 & C57.12.33
C57.123	IEEE Guide for Transformer Loss Measurement	TeNyenhuis E.G. (519) 837-4691 ed.g.tenyenhuis@ca.abb.com	2002 **6/17/2020**		Approved std Ref Std. IEEE 1098 Revision approved June 2010
C57.136 PC57.136	IEEE Guide for Sound Level Abatement and Determination for Liquid- Immersed Power Transformers and Shunt Reactors Rated Over 500 kVA	Antosz S. (412) 498-3916 santosz@comcast.net	2000 **12/31/2018**	9/30/2010 **12/31/2014**	Approved + Active PAR for Revision Reaffirmation approved by RevCom on 9/21/2005 PAR for Revision approved by NESCOM Sept 2010
C57.142 PC57.142	A Guide To Describe The Occurrence And Mitigation Of Switching Transients Induced By Transformer-Breaker Interaction	Degeneff R. C. (518) 276-6367 degenr@rpi.edu	2010 **12/31/2020**		Approved PC57.142 was approved as a new standard on December 8, 2010

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SubCommittee Chair	**PERFORMANCE CHARACTERISTICS** **TeNyenhuis E.G.**	(519) 837-4691 ed.g.tenyenhuis@ca.abb.com			
c57.149	Guide for the Application and Interpretation of Frequency Response Analysis for Oil Immersed Transformers	Sweetser C.L. (781) 672-6214 <charles.sweetser@omicronusa.com>		6/24/2004 **12/31/2012**	APPROVED
C57.18.10	IEEE Standard Practices and Requirements for Semiconductor Power Rectifier Transformers	Kennedy S. P. (716) 896-6500 skennedy@niagaratransformer.com	1998 **1/30/2019**		Approved Replaced the C57.18-1964 for pool cathode mercury-arc rectifiers. Amendment 1: Technical and Editorial Corrections was approved 3/27/08 Reaffirmed March 2009
C57.21	IEEE Standard Requirements, Terminology, and Test Code for Shunt Reactors Rated Over 500 kVA		1990 **12/31/2018**		Approved Reaffirmation approved on 6/23/2004. Revised Std approved Mar 2008
IEEE 32 PC57.32	IEEE Standard Requirements, Terminology, and Testing Procedures for Neutral Grounding Devices	Kennedy S. P. (716) 896-6500 skennedy@niagaratransformer.com	1972 **12/31/2018**	12/7/2011 **12/31/2015**	Approved - Active PAR to revise std Dec. 2002 - Sponsor changed from PES/SPD to PES/TR; PAR Modified and extended to Dec 2011; PAR stalled Oct'11, without a ballot. PAR withdrawn & New PAR submitted Oct'11, approved by Stds Bd Dec '11

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SubCommittee **POWER TRANSFORMERS**		561 371 9138			
Chair **Watson J.D.**		joe_watson@ieee.org			
P60076-57-12	Standard Requirements for Phase Shifting Transformers	Ahuja R. K. (408) 957-8348 raj.ahuja@waukeshaelectric.spx.com		6/8/2012 **12/31/2016**	Approved PAR PAR approved June 2012 This is an IEC Joint development
PC57.153	Guide for Paralleling Power Transformers	Jauch E.T. (727) 866-0632 jauch@ieee.org		3/27/2008 **12/31/2014**	New Project PAR approved Mar 2008 PAR Extension granted May 2012, until Dec2014
PC57.156	Guide to Tank Rupture Mitigation	Zhao P. (417) 345-5926 peter.zhao@HydroOne.com		6/16/2011 **12/31/2015**	New Project
PC57.157	Guide for Conducting Functional Life Tests for De-energized Tap-changer Contacts	Hopkinson P. J. (704) 846-3290 phopkinson@ieee.org		12/7/1011 **12/31/2015**	New Project PAR for New standard approved Dec'11
C57.116 **PC57.116**	IEEE Guide for Transformers Directly Connected to Generators	Hoffman G. (973) 621-6600 grhoffman@advpowertech.com	1989 **12/31/2018**	9/10/2011 **12/31/2015**	Approved Reaffirmation approved in Dec. 2005 2010 Reaffirmation Ballot Closed with many Negatives PAR for Revision submitted July 2011
C57.117 **PC57.125**	IEEE Guide for Reporting Failure Data for Power Transformers and Shunt Reactors on Electric Utility Power Systems	Binder, Jr. W. B. (724) 654-3839 wbbinder@aol.com	1986 **12/31/2018**	2/1/2011 **12/31/2015**	Active Previously IEEE 786-1986, original approval date 6/19/1986. Oct 2010 decision to merge with C57.125. This standard is still Active because of PAR for revison of C57.125. This will be withdrawn when Revision of C57.125 is approved.
C57.12.10 **PC57.12.10 C**	Standard Requirements for Liquid-Immersed Power Transformers	Hoffman G. (973) 621-6600 grhoffman@advpowertech.com	1997 **9/30/2020**	6/14/2013 **12/31/2017**	Approved standard with Corrigenda Formally NEMA/ANSI document. Corrigenda 1 approved December 2012 PAR for Corrigenda 2 approved June 2013
C57.125 **PC57.125**	IEEE Guide for Failure Investigation, Documentation, and Analysis for Power Transformers and Shunt Reactors	Binder, Jr. W. B. (724) 654-3839 wbbinder@aol.com	1991 **12/31/2018**	2/1/2011 **12/31/2015**	Approved Oct'10: decision to merge with C57.117. Feb'11: NESCOM approved new PAR to merge 117 and 125.
C57.131	IEEE Standard Requirements for Load Tap Changers		1995 **12/31/2022**		Approved Standard PAR Modified Dec 09 and extended to Dec 2010. Dec '10: Nescom & Revcom extend untul Dec31 2011 1st Ballot closed May'11; 1st Recirc closed 21-Oct; Std was approved Mar 2012
C57.135 **PC57.135**	IEEE Guide for the Application, Specification and Testing of Phase- Shifting Transformers	Sim H. J. (919) 580-3234 jin.sim@ieee.org	2001 **6/16/2021**		Approved Approved for IEEE/IEC Dual Logo Dec. 2005 - IEC 62032 Ed. 1

STANDARD / PROJECT	TITLE	Working Group Chair / Phone / Email	Pub Year / Rev Due Dat	PAR Issue Dat / PAR Expiration	Standard Status / Remark
SubCommittee Chair **POWER TRANSFORMERS** **Watson J.D.**		561 371 9138 joe_watson@ieee.org			
C57.140 PC57.140	Evaluation and Reconditioning of Liquid Immersed Power Transformers	James R.I. (504) 576-6246 r.james@ieee.org	2006 **12/31/2018**	3/31/2011 **12/31/2105**	Approved D18 approved by RevCom 11/16/2006 Mar '11: Nescom approved new PAR until Dec31 2015
C57.143	Guide for Application for Monitoring Equipment to Liquid-Immersed Transformers and Components	Chu D. (212) 460-3456 chud@coned.com	 **12/31/2023**		Approved
C57.148	Standard for Control Cabinets for Power Transformers	Watson J.D. 561 371 9138 joe_watson@ieee.org	2011 **9/10/2021**		Approved Standard Approved by Std Bd Sept 2011
C57.150	Guide for the Transportation of Large Power Transformers and Reactors	Anderson G. W. (402) 680-1111 gwanderson@ieee.org	 **12/31/2022**		Approved
C57.17	Standard Requirements for Arc Furnace Transformers	Ganser R. (330) 492-8433 rganser@aol.com	 **12/31/2022**		Approved Originally IEEEStd 17
C57.93 PC57.93	IEEE Guide for Installation of Liquid-Immersed Power Transformers	Lau M. Y. (604) 528-3201 mike.lau@bchydro.bc.ca	1995 **12/31/2018**	3/29/2012 **12/31/2016**	Approved Standard - with approved PAR for Revision Rev of ASA C57.93-1958, IEEE Std C57.12.11-1980, & C57.12.12-1980 PAR to Revise IEEE Std C57.93-1995 Approved by RevCom 12/2007 PAR for Revision was approved March 2012
IEEE 638 P638	IEEE Standard for Qualification of Class 1E Transformers for Nuclear Power Generating Stations	Swinderman C. (724) 778-5234 craig.swinderman@meppi.mea.com	1992 **12/31/2018**	6/7/2007 **12/31/2013**	Approved - Active - with errata dated 4/7/1999 Reaffirmation approved by SA Board 3/30/2006. New PAR for revision approved 6/7/2007. PAR extended until Dec 2012. PAR extended until Dec 2013. Standard ballot complete and on Dec13 SB Agenda.

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SubCommittee **STANDARDS** Chair **Bartley W. H.**		(860) 722-5483 william_bartley@hsb.com			
C57.12.00 PC57.12.00	IEEE Standard for General Requirements For Liquid-Immersed Distribution, Power, and Regulating Transformers	Snyder S. L. (731) 288-4282 slsnyder@ieee.org	2010 **6/17/2020**	6/16/2011 **12/31/2015**	Approved 2010 rev approved by SA Board in June, 2010. Published 9/10/2010. PAR for Continuous Revision approved June 2011
C57.12.70	IEEE Standard Terminal Markings and Connections for Distribution and Power Transformers	Shull S. (417) 625-6110 sshull@empiredistrict.com	2000 **12/31/2021**		Approved Published 3/16/2001. Reaff approved by RevCom 3/30/2006. New Revision approved by Std Board Dec 2011
C57.12.80	IEEE Standard Terminology for Power and Distribution Transformers	Chiu B. (626) 308-6086 bill.chiu@sce.com	2002 **9/30/2020**		Approved std Amendment PAR approved to add thermally upgraded definition Revision approved Sept 2010
C57.12.90 PC57.12.90	IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers	Antosz S. (412) 498-3916 santosz@comcast.net	2006 **6/17/2020**	6/16/2011 **12/31/2015**	Approved Published Oct 2010 PAR for Continuous Revision approved June 2011
C57.144	Guide for Metric Conversion of Transformer Standards	Balma P.M. (973) 430-8259 peter.balma@pseg.com	2004 **3/25/2020**		Approved Published 10/22/2004 Reaffirmed March 2010
IEEE C57.152	IEEE Guide for Diagnostic Field Testing of Power Apparatus - Part 1: Oil Filled Power Transformers, Regulators, and Reactors	Verner J. A. 202 872-2812 javerner@pepco.com	1995 **12/31/2023**		Approved Originally IEEE 62. Reaff was successful.in 2005. New WG formed to revise document on a continuous basis based on TF recommendation. Revision changed to C57 series,

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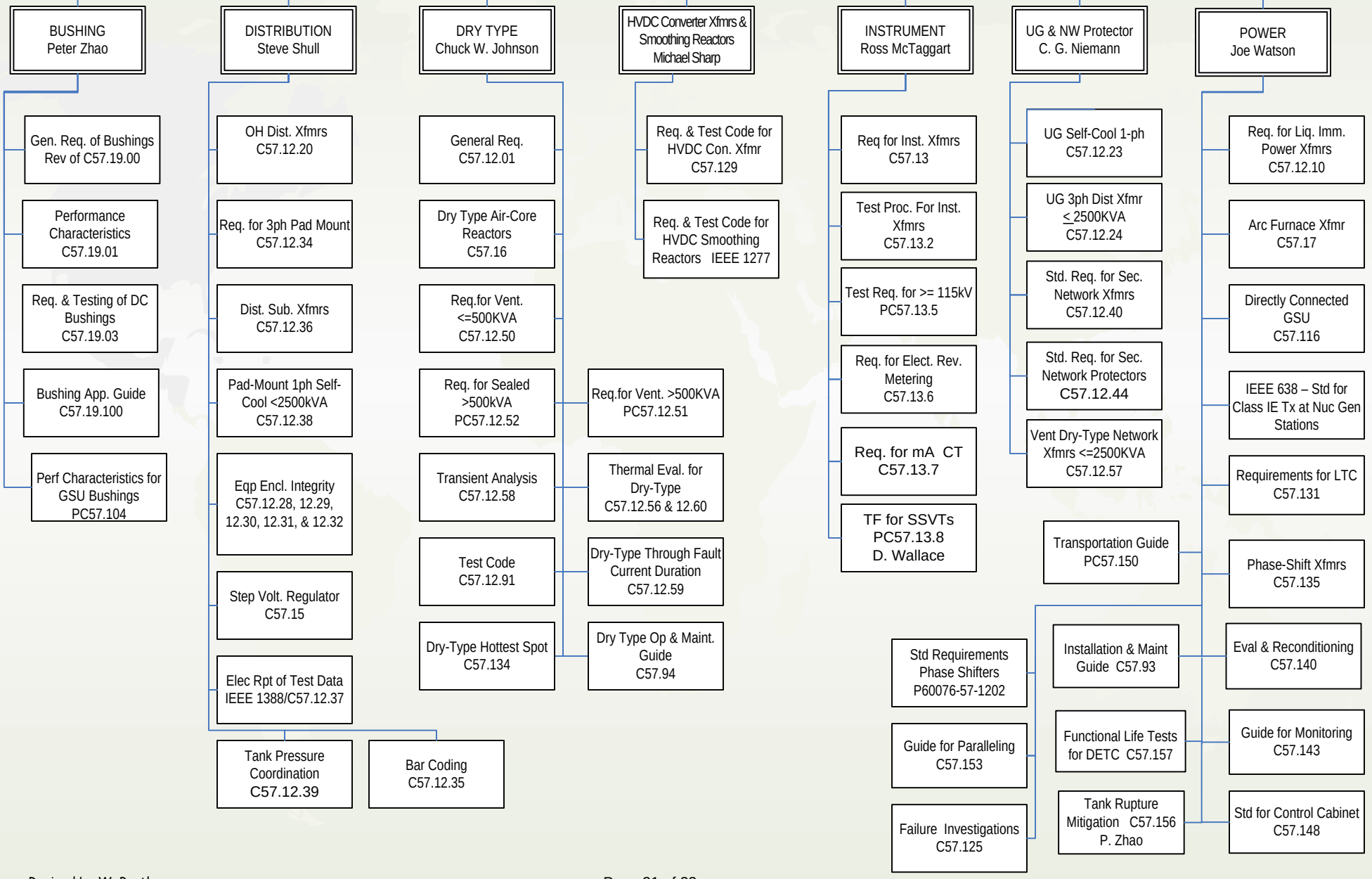
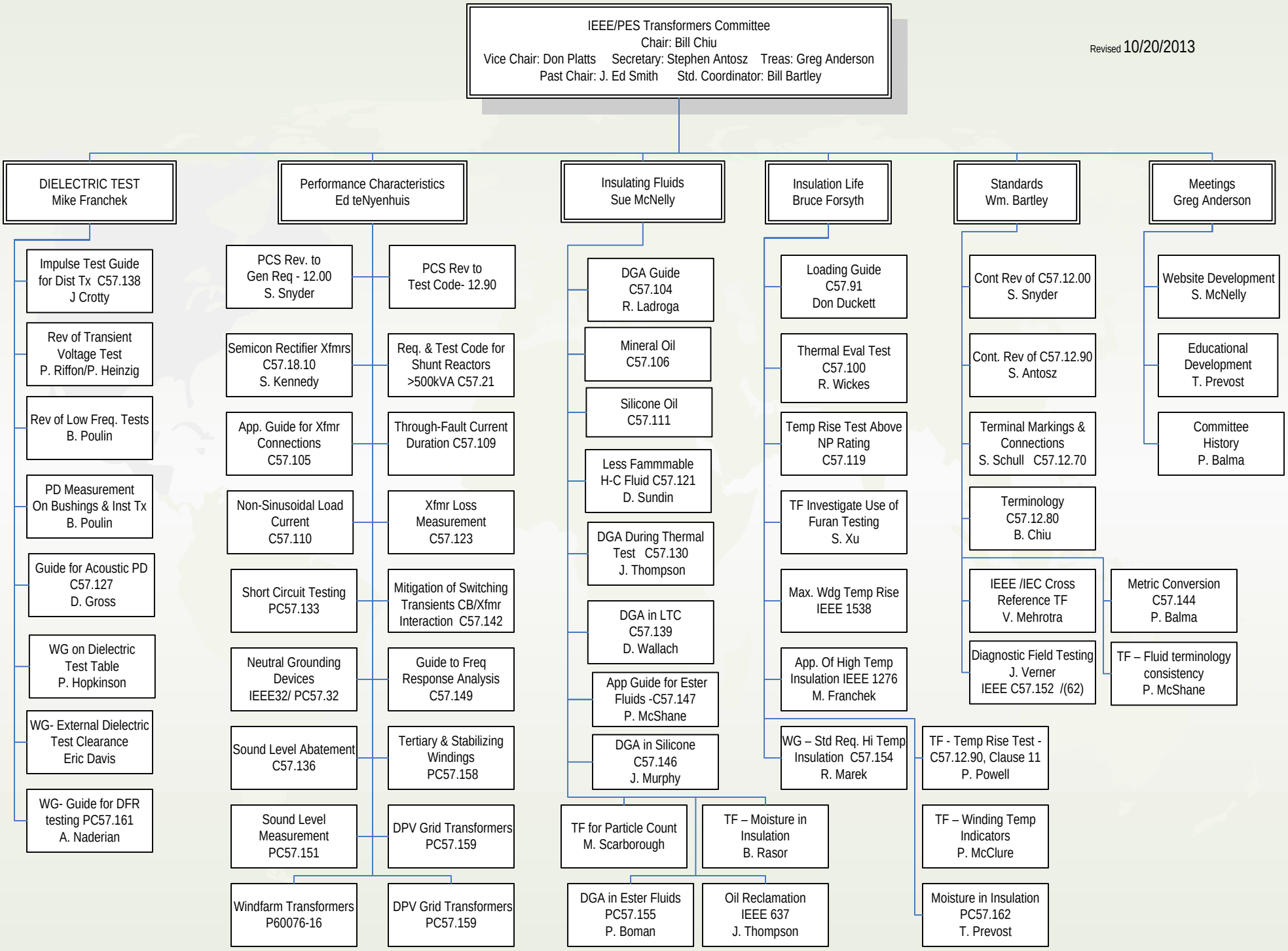
SubCommittee	**UNDERGROUND TR & NW PROTECT**	(847) 683-2145			
Chair	**Niemann C. G.**	carlpumco@sbcglobal.net			
C57.12.23	IEEE Standard for Underground Type, Self-Cooled, Single-Phase Distribution Transformers with Separable Insulated High-Voltage Connectors; High Voltage 25kV and Below; Low Voltage 600V and Below	Traut A. 706-548-3121 atraut@ieee.org	2009 **3/19/2019**		Approved Published 4/20/2009
C57.12.24 PC57.12.24	Requirements for Transformers - Underground-Type, Three Phase Distribution Transformers: High Voltage (34 500 GrdY/19 920 V and Below) and Low Voltage (480V and Below, 2500 kVA and Smaller	Termini G. (610) 941-1524 giuseppe.termini@peco-energy.com	2000 **6/17/2019**	11/9/2011 **12/31/2015**	Approved standard New PAR for Revision approved Nov '11
C57.12.40 PC57.12.40	Standard for Requirements for Secondary Network Transformers - Subway and Vault Types (Liquid Immersed)	Klaponski B. (204) 633-7220 brian.klaponski@carte.ca	2011 **12/31/2021**	8/30/2012 **12/31/2016**	Approved Standard with approved PAR for Revision Approved - C57.12.40-2011
C57.12.44 PC57.12.44	IEEE Standard Requirements for Secondary Network Protectors	Wimmer W. G. (804) 771-4225 bill_wimmer@dom.com	2005 **12/31/2018**	6/17/2010 **12/31/2014**	Approved PC57.12.44/D2.1 approved by RevCom in December 2005. Published 6/07/2006 PAR for Revision approved June 2010
C57.12.57	Requirements for Ventilated Dry-Type Network Transformers 2500 kVA and Below, Three-Phase with High Voltage 34 500 Voltas and Below, Low Voltage 216Y/125 and 480Y/125 Volts	Robinson A. L. (361) 289-4001 alrobinson@aep.com	1992 **12/31/2000**		Standard WITHDRAWN in 2001 Existing standard withdrawn by IEEE on 1/15/2001. No longer endorsed by IEEE.

IEEE/PES Transformers Committee
Chair: Bill Chiu
Vice Chair: Don Platts Secretary: Stephen Antosz Treas: Greg Anderson
Past Chair: J. Ed Smith Std. Coordinator: Bill Bartley

Revised 10/20/2013





Revised by W. Bartley