



IEEE/PES



Transformers Committee

**Fall 2009
Meeting Minutes**

Unapproved

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IEEE/PES Transformers Committee Meeting

Main Committee Meeting

Thursday, October 29, 2009

Attendance Roster

Ahuja, Raj: AP [Waukesha Electric Systems]
Allan, Dennis: CM - LM [MerlinDesign]
Amos, Richard: CM [Unifin International]
Anderson, Gregory: CM [GW Anderson & Associates, Inc.]
Anderson, Jeffrey: II [Advanced Power Technologies]
Ansari, Tauhid: II [ABB Inc.]
Antosz, Stephen: CM [Pennsylvania Transformer]
Antweiler, Jim: AP [Square D/Schneider Electric]
Arpino, Carlo: CM [ComEd]
Asano, Roberto: AP [ABB]
Ayers, Donald: CM [Pacific Crest Transformers]
Ballard, Robert: AP [ABB Inc.]
Beaster, Barry: CM [ABB Kuhlman]
Beauchemin, Claude: CM [GE Canada]
Berube, Jean-Noel: II [Neoptix Inc.]
Betancourt, Enrique: CM [Prolec GE]
Bhatt, Vivek: II [Waukesha Electric Systems]
Binder, Wallace: CM [WBBinder Consultant]
Blaydon, Daniel: AP [Baltimore Gas & Electric]
Boettger, William: CM [Boettger Transformer Consulting LLC]
Boman, Paul: CM [Hartford Steam Boiler]
Botti, Michael: II [Mitsubishi Electric Power Products]
Bray, Frank: AP [Arkansas Electric Cooperatives]
Britton, Jeffrey: AP [Phenix Technologies, Inc.]
Brown, Kent: AP [Tennessee Valley Authority]
Buckmaster, David: II [Horizon Wind Energy LLC]
Califano, Jeremy: II [Southern California Edison]
Callsen, Thomas: CM [ComEd]
Cancino, Alvaro: AP [Industrias IEM]
Carlos, Arnaldo: AP [A.G. Carlos Inc.]
Castellanos, Juan: CM [Prolec GE]
Chhajer, Dinesh: II [Megger]
Chiu, Bill: CM [Southern California Edison]
Claiborne, C. Clair: CM [ABB Inc.]
Coffeen, Larry: AP [Neetrac]
Colopy, Craig: CM [Cooper Power Systems]
Cooke, Henry: AP [ABB Inc.]
Corel, Dale: II [Sola/Hevi-Duty]
Corkran, Jerry: CM [Cooper Power Systems]
Craven, Michael: AP [Southern Company Services]
Damico, Frank: CM [TAMINI Transformers USA]
Daniels, Timothy: AP [Weidmann Diagnostic Solutions]
Darovny, William: CM [Siemens Canada]
Darwin, Alan: CM [AREVA T&D]
Davis, Eric: CM [Burns & McDonnell]
Del Rio, J. Arturo: AP [Trench Limited]
Duckett, Don: CM - LM [HD Supply Utilities]
Dudley, Richard: CM [Trench Limited]
Dukarm, James: AP [Delta-X Research]
Elliott, Fred: CM [Bonneville Power Administration]
Ellis, Keith: CM [Trench Limited USA]
Fairris, James: AP [Nashville Electric Service]
Faulkenberry, Michael: AP [Georgia Power Co.]
Fausch, Reto: AP [Hubbell High Voltage Test]
Foley, Jefferson: AP [OMICRON electronics Corp USA]
Forrest, George: AP [Uptime Solutions Co LLC]
Forsyth, Bruce: CM [Southwest Electric Company]
Fortin, Marcel: CM [BPR Energy]
Foster, Derek: CM [Magnetics Design, LLC]
Foster, Robert: II [Megger]
Gagnon, Jean-Philippe: II [NOMOS systems]
Galbraith, Shawn: AP [Nuclear Service Organization]
Gamboa, Jose: AP [Siemens Manufacturing S.A.]
Ganser, Robert: CM - LM [Transformer Consulting Services]
Garcia, Eduardo: CM [Siemens]
Gardner, James: CM [Delaware Electric]
Garner, Charles: AP [Georgia Power Co.]
Garza, Joseph: AP [Southwest Electric Company]
Gaytan, Carlos: CM [Prolec GE]
Ghafourian, Ali: CM [ERMCO]
Ghosh, Saurabh: AP [ABB Inc.]
Graham, Richard: CM [Delta Star Inc.]
Graham, James: CM [Pike Energy Solutions]
Gromlovits, Mark: CM [Federal Pacific]
Haas, Michael: CM [Instrument Transformers, Inc.]
Haasz, Jodi: II [IEEE Standards]
Hachichi, Said: CM [Hydro-Quebec]
Hammer, Mark: II [AREVA T&D]
Hardin, Michael: CM [H-J Enterprises]
Harley, John: CM [FirstPower Group LLC]
Harris, David: AP [Waukesha Electric Systems]
Hayes, Roger: CM [Siemens Canada]
Heathcote, Martin: AP [Martin Heathcote Associates Ltd]
Henning, William: CM [Waukesha Electric Systems]
Hoffman, Gary: CM [Advanced Power Technologies]
Holdway, Timothy: II [Intermountain Electronics]
Holifield, Thomas: CM [Howard Industries]
Hollingsworth, Richard: CM [Howard Industries]
Hopkinson, Philip: CM [HVOLT Inc.]
Hurley, Catherine: AP [American Electric Power]
Izquierdo, Jose: II [Siemens]
James, Jr., Rowland: CM [Advanced Power Technologies]
Jarman, Paul: AP [National Grid]
Johnson, Charles: CM [ABB Inc.]
Jordan, Stephen: CM [TVA]
Kadar, Laszlo: AP [Hatch]
Kalra, C J: AP - LM [Southern California Edison]
Kang, Jinho: II [Hyundai Heavy Industries]
Kennedy, Sheldon: CM [Niagara Transformer]
Kim, Dong: AP [Southern California Edison]

King, Gary: AP [Howard Industries]
Klaponski, Brian: CM [Carte International Inc.]
Kraemer, Axel: AP [Maschinenfabrik Reinhausen]
Laliberte, Guy: II [AREVA T&D]
Lamb, Michael: II [Dominion]
Lau, Michael: CM [BC Transmission Corporation]
Lemke, Eberhard: AP [LDIC]
Lopez, Benjamin: II [Prolec GE]
Luksich, John: II [Cooper Power Systems]
Lundquist, Thomas: CM [Lundquist Consulting Services, Inc.]
Mangum, Willie: II [Niagara Transformer Corporation]
Marek, Richard: CM [DuPont]
Marlow, Dennis: CM [TBEA Shenyang]
Matthews, Lee: CM [Howard Industries]
McBride, James: AP [JMX Services, Inc.]
McGovern, Steven: II [Isberg-Nott Co.]
McIver, James: AP [Siemens Energy, Inc.]
McNally, Mark: II [KCP&L]
McNelly, Susan: CM [Xcel Energy]
McShane, Charles Patrick: CM [Cooper Power Systems]
Mehrotra, Vinay: CM [Waukesha Electric Systems]
Mehta, Shirish: CM [Waukesha Electric Systems]
Miller, Kent: CM - LM [T&R Electric Supply Co., Inc.]
Moleski, Hali: AP [S.D. Myers Inc.]
Morse, Brad: II [Megger]
Mulkey, Daniel: CM [Pacific Gas & Electric]
Murphy, Jerry: CM [Reedy Creek Energy Services]
Neuls, Flavio: AP [AREVA T&D]
Nguyen, Van Nhi: CM [Hydro Quebec]
Niemann, Carl: CM - LM [Niemann Consulting]
Olen, Robert: CM [Cooper Power Systems]
Olmedo, Juan: II [Siemens]
Oommen, T.V.: AP - LM [ABB Inc.]
Ostrander, David: AP [Ameren]
Papp, Klaus: CM [Trench Austria GmbH]
Parkinson, Dwight: AP [Cooper Power Systems]
Patton, Jesse: CM - LM [ECP Tech/SquareD]
Pepe, Harry: II [Phenix Technologies, Inc.]
Platts, Donald: CM [PPL Electric Utilities]
Ploetner, Christoph: CM [ABB Inc.]
Pointner, Klaus: II [Trench Austria GmbH]
Poulin, Bertrand: CM [ABB Inc.]
Powell, Paulette: CM [3P]
Powell, Lewis: AP [Pepco]
Prevost, Thomas: CM [Weidmann Diagnostic Solutions]
Progar, John: CM [Southwest Electric Company]
Puri, Jeewan: CM [Transformer Solutions, Inc.]
Radbrandt, Ulf: CM [ABB]
Rasor, Robert: AP [S.D. Myers Inc.]
Rave, Martin: AP [ComEd]
Riboud, Jean-Christophe: AP [RTE]
Riffon, Pierre: CM [Hydro-Quebec]
Rizvi, Syed M. Aslam: II [Waukesha Electric Systems]
Roizman, Oleg: AP [IntellPower Pty Ltd]
Roussell, Marnie: CM [Entergy]
Sandhu, Surinder: AP [Sanergy Consulting]
Sauzay, Mathieu: II [JST Transformateurs SA]
Schappell, Steven: CM [Waukesha Electric Systems]
Schweiger, Ewald: CM [Siemens AG]
Sewell, Jeremy: II [Quality Switch Inc.]
Sharma, Devki: CM [Consultant / Entergy]
Sharp, Michael: AP [Trench Limited]
Shertukde, Hemchandra: CM [University of Hartford]
Shull, Stephen: CM [The Empire District Electric]
Sim, H. Jin: CM [Waukesha Electric Systems]
Smith, Edward: CM [H-J Enterprises, Inc.]
Smith, James: CM [V19 Consulting, Inc.]
Snyder, Steven: CM [ERMCO]
Som, Sanjib: AP [Virginia Transformer Corp]
Spurlock, Michael: AP [American Electric Power]
Stahara, Ronald: CM - LM [Central Moloney, Inc.]
Stankes, David: II [3M IPT]
Stankowski, Krzysztof: II [Weidmann Electrical Technology]
Steineman, Andrew: AP [Delta Star Inc.]
Stiegemeier, Craig: CM [ABB Inc.]
Swan, Phil: II [ABB Inc.]
Swinderman, Craig: CM [Mitsubishi Electric Power Products]
Szewczyk, Radoslaw: II [DuPont Poland Sp. z o.o.]
Tellez, Richard: II [Siemens S.A.]
teNyenhuis, Ed: CM [ABB Inc.]
Termini, Giuseppe: CM [PECO Energy]
Thompson, Jim: CM [T&R Service Company]
Thompson, Robert: CM [RST Consulting, P.C.]
Tolcachir, Eduardo: II [Tubos Trans Electric]
Traut, Alan: CM [Power Partners]
Trautmann, Frank: II [Siemens AG]
Tridon, Florence: AP [JST Transformateurs SA]
Tuli, Subhash: CM [Delta Star Inc.]
Vailoor, Vasanth: II [Trantech]
Varghese, Ajith: II [Waukesha Electric Systems]
Vedante, Kiran: AP [ABB Inc.]
Viereck, Karsten: AP [Maschinenfabrik Reinhausen GmbH]
Vir, Dharam: CM [Waukesha Electric Systems]
Vogel, Herman: AP [GE Energy]
Wagner, Anton: II [INCON (Intelligent Controls)]
Wallach, David: CM [Duke Energy]
Walling, Donald: II [PEP]
Watson, Joe: CM [HICO America]
Weffer, Felipe: CM [Consultant]
Werelius, Peter: AP [Megger]
Wicks, Roger: CM [DuPont]
Wimmer, William: CM [Dominion]
Woodcock, David: CM [Weidmann Diagnostic Solutions]
Yule, Kipp: CM [Bechtel Power Corp]
Zhao, Peter: CM [Hydro One]

Membership Code

CM – Committee Member

CM – LM – Committee Member – IEEE Life Member

AP – Active Participant

II – Interested Individual

SP – Spouse

GT – Guest

IEEE/PES Transformers Committee Meeting Fall, 2009

Committee Members and Guests Registered for the Fall, 2009 Meeting

Afonso, Nuno: II	Bray, Anna: SP	Davydov, Valery: AP
Ahuja, Raj: AP	Britton, Jeffrey: AP	Degeneff, Robert: CM
Albert, Glenn: II	Brown, Kent: AP	Del Rio, J. Arturo: AP
Allan, Dennis: CM - LM	Brush, Edwin: AP	Diaby, Mohamed: II
Allan, Glenis: SP	Buchanan, Paul: CM	Digby, Scott: II
Allen, Jerry: II	Buckmaster, David: II	Dix, Larry: CM
Alvarez, Jose: II	Bush, Carl: CM	Dong, Rick: II
Amos, Richard: CM	Bush, Richard: II	Dorris, Don: AP
Anderson, Gregory: CM	Cai, Jim: AP	Drees, Terry: II
Anderson, Jeffrey: II	Califano, Jeremy: II	Drexler, Charles: AP
Ansari, Tauhid: II	Callsen, Thomas: CM	Duckett, Don: CM - LM
Antosz, Stephen: CM	Hanak, Cindy: SP	Dudley, Richard: CM
Antweiler, Jim: AP	Cancino, Alvaro: AP	Dudley, Mary Jane: SP
Arpino, Carlo: AP	Cantrell, Rick: AP	Dukarm, James: AP
Asano, Roberto: AP	Carlos, Arnaldo: AP	Dunn, James: II
Ault, Nanette: II	Castellanos, Juan: CM	Duval, Michel: II
Ayers, Donald: CM	Cheim, Luiz: AP	Ebbert, Alexander: II
Bailey, David: II	Chen, Jia: II	Elliott, Fred: CM
Ballard, Jay: AP	Cherry, Donald: CM	Ellis, Keith: CM
Ballard, Robert: AP	Chhajer, Dinesh: II	Fairris, James: AP
Balma, Peter: CM	Chisholm, Paul: AP	Fairris, Linda: SP
Baranowski, Derek: AP	Chiu, Bill: CM	Fallon, Donald: CM
Baranowski, Diana: SP	Chmiel, Frank: AP	Farooqui, Adnan: II
Bartek, Allan: AP	Choinski, Scott: AP	Faulkenberry, Michael: AP
Bartley, William: CM	Christini, J. Mark: AP	Faulkenberry, Janice: SP
Bartley, Dorothy: SP	Chronister, James: II	Fausch, Reto: AP
Bartnikas, Ray: AP - LM	Chu, Donald: CM	Fedor, Ken: II
Basu, Bikash: AP	Claiborne, C. Clair: AP	Feghali, Pierre: CM
Beaster, Barry: CM	Coffeen, Larry: AP	Fernandes, Tania: II
Beaster, Barb: SP	Colopy, Craig: CM	Field, Norman: AP
Beauchemin, Claude: AP	Comely, Tracy: AP	Foldi, Joseph: CM - LM
Bell, Clarence: II	Comely, Christine: SP	Foley, Jefferson: AP
Berler, Zalya: AP	Cooke, Henry: II	Forrest, George: AP
Bertolini, Edward: AP - LM	Corel, Dale: II	Forsyth, Bruce: CM
Berube, Jean-Noel: II	Corkran, Jerry: CM	Fortin, Marcel: CM
Betancourt, Enriquet: AP	Corkran, Patricia: SP	Foster, Derek: CM
Bhatt, Vivek: II	Costa, Florian: AP	Foster, Robert: II
Binder, Wallace: CM	Craven, Michael: AP	Foster, Sylvie: SP
Binder, Laurie: SP	Crotty, John: CM	Frimpong, George: AP
Blackmon, Jr., James: AP	Crouse, John: CM - LM	Gagnon, Jean-Philippe: II
Blackmon, Donna: SP	Cui, Yuan Zhong: II	Galbraith, Shawn: AP
Blake, Dennis: II	Cunningham, Bob: II	Gamboa, Jose: II
Blaydon, Daniel: AP	Damico, Frank: CM	Ganser, Robert: CM - LM
Boettger, William: CM	Daniels, Timothy: AP	Ganser, Robert Jr.: II
Boman, Paul: CM	Darovny, William: CM	Ganser, Linda: SP
Bonmann, Dietrich: II	Darwin, Alan: CM	Ganser Jr., Robert: II
Botti, Michael: II	Darwin, Sue: SP	Gao, Zhi: II
Brady, Ryan: II	Davis, Larry: CM	gao, zhi: II
Brafa, John: II	Davis, Eric: CM	Garcia, Eduardo: CM
Bray, Frank: AP	Davis, Horace: II	Garcia, Benjamin: II

Gardner, James: CM
Garner, Charles: AP
Garza, Joseph: AP
Gaudino, Francesco: II
Gaytan, Carlos: CM
Ghafourian, Ali: CM
Ghosh, Saurabh: AP
Ghosh, Chandana: SP
Girgis, Ramsis: CM
Golner, Thomas: II
Gomez, Rolando: II
Gonzalez de la Vega, Jorge: AP
Graham, Richard: CM
Graham, John: CM
Graham, James: CM
Brown, Gillian: SP
Kuecker, Susan: SP
Griesacker, Bill: CM
Gromlovits, Mark: CM
Gruber, Myron: CM
Gruber, Carol: SP
Guerra, Jorge: AP
Guo, XiangFu: II
Haas, Michael: CM
Haasz, Jodi: II
Hachichi, Said: AP
Hammer, Mark: II
Handley, Jason: II
Hanson, David: AP
Hardin, Michael: CM
Harley, John: CM
Ernest, Judy: SP
Harlow, James: CM - LM
Harris, David: AP
Hastenrath, Michael: II
Hatch, Stanley: II
Hayes, Roger: CM
Heathcote, Martin: II
Heathcote, Penny: SP
Henault, Paul: II
Hennessey, John: AP
Henning, William: CM
Hernandez, Carlos: II
Herndon, Rodney: II
Herron, John: II
Herz, Josh: AP
Hilgers, Marcel: II
Hochanh, Thang: CM
Hochanh, Tuyet Le: SP
Hoffman, Gary: CM
Holdway, Timothy: II
Holey, Scott: II
Holifield, Thomas: CM
Hollingsworth, Richard: CM
Hollingsworth, Cathy: SP
Hopkinson, Philip: CM
Hopkinson, Jane: SP
Hurley, Catherine: AP
Hwang, Sun-Ae: II
Inkpen, Jesse: II
Izquierdo, Jose: II
Jakob, Fredi: AP
Jakob, Karl: AP
James, Jr., Rowland: CM
James, Sylvia: SP
Jarman, Paul: AP
Jaroszewski, Marion: AP
Jauch, Erwin: AP - LM
Jauch, Beverly: SP
Johannson, Larry: AP
Johannson, Jocelyn: SP
Johnson, Charles: CM
Jonak, Ryan: II
Jordan, Stephen: CM
Kadar, Laszlo: II
Kalra, C J: AP - LM
Kalra, Rama: SP
Kang, Jinho: II
Kanty, Stephen: II
Kazmierczak, Jerzy: II
Kennedy, Sheldon: CM
Kennedy, George: II
Kennedy, Nancy: SP
Kim, Dong: AP
King, Gary: AP
Klaponski, Brian: CM
Klaponski, Lois: SP
Kobida, Dan: AP
Koch, Maik: II
Kopf, Jon: II
Kraemer, Axel: AP
Kraetge, Alexander: AP
Kriska, Jeremy: AP
Kriska, Jeremy: II
Krump, Reiner: AP
Kurth, Bernhard: AP
Kwon, Wan Seop: II
Ladroga, Richard: CM
Laliberte, Guy: II
LaLiberte, Guy: II
Lamb, Michael: II
Lamb, Lori: SP
Lau, Michael: CM
Lau, Nancy: SP
Lawless, Andrew: II
Lawson, Matthew: II
Lee, Terence: II
Lemke, Eberhard: AP
Livingston, Kerry: II
Locarno, Mario: II
Lopes, Ana: II
Lopez, Benjamin: II
Rivera, Juliette: SP
Lopez-Fernandez, Xose: II
Riguera-Gonzalez, M. Belen: SP
Luksich, John: II
Lundquist, Thomas: CM
Machado Junior, Tamyres: AP
Maia, Mario: II
Mamtora, Jitendra: AP
Mamtora, Karuna: SP
Mango, Joe: II
Mangum, Willie: II
Marek, Richard: CM
Marek, Halina: SP
Marlow, Dennis: CM
Martin, Michael: AP
Martin, Terence: AP
Martin, Claude: II
Martinez, Rogelio: AP
Matthews, John: CM
Matthews, Lee: CM
Matthews, Marian: SP
McBride, James: AP
McGovern, Steven: II
McIver, James: AP
McNally, Mark: II
McNelly, Susan: CM
McNulty, Andrew: II
McShane, Charles Patrick: CM
McTaggart, Ross: CM
Mehrotra, Vinay: CM
Mehta, Shirish: CM
Melanson, Joseph: CM
Meyers, Aaron: II
Miller, Kent: CM - LM
Miller, Shirley: SP
Millward, Paul: CM
Milton, Curtis: AP
Molden, Arthur: CM
Moleski, Hali: AP
Moore, Steven: II
Morris, Andrew: II
Morrissette, Guy: CM
Morse, Brad: II
Mulkey, Daniel: CM
Mullikin, Randolph: II
Murphy, Jerry: CM
Natale, Anthony: II
Navarro, Martin: AP
Neal, Jason: AP
Neuls, Flavio: AP
Nguyen, Vuong: AP
Nguyen, Van Nhi: CM
Niemann, Carl: CM - LM
Nikoley, Ingo: AP
Nims, Joe: AP
Nims, Torie: SP
Nordman, Hasse: AP
Norman, Stephen: II
Nugent, William: II

Nunn, Shawn: II
Olen, Robert: CM
Olen, Gail: SP
Oliver, William: II
Olmedo, Juan: II
Oommen, T.V.: AP - LM
Oommen, Anna: SP
Ortiz, Jow: II
Ostrander, David: AP
Padron, Alfredo: II
Paik, Henry: AP
Papp, Klaus: CM
Papp, Erna: SP
Parkinson, Dwight: AP
Patel, Bipin: CM
Patel, Jashu: II
Patel, Sanjay: AP
Patel, Dhiru: AP
Patel, Poorvi: II
Patni, Prem: AP
Patterson, Shawn: II
Patton, Jesse: CM - LM
Pattou, Arnaud: II
Pavlik, Steve: II
Pellon, Verena: II
Rodriguez, Dionisio: SP
Penny, Brian: II
Pepe, Harry: II
Perkins, Mark: CM
Pezzin, Justin: II
Pink, Tony: CM
Platts, Donald: CM
Platts, Margo: SP
Ploetner, Christoph: CM
Pointner, Klaus: II
Pointner, Karin: SP
Poulin, Bertrand: CM
Powell, Paulette: CM
Powell, Lewis: II
Power, Greg: II
Powers, Nicholas: II
Prevost, Thomas: CM
Pries, Patrick: AP
Pries, Patrick: II
Progar, John: CM
Psyck, Rip: AP
Puri, Jeewan: CM
Radbrandt, Ulf: AP
Rahangdale, Ravi: CM - LM
Rahmatian, Farnoosh: AP
Rajadhyaksha, Mangesh: II
Ramos, Pablo: II
Rasor, Robert: AP
Rave, Martin: AP
Rawls, Earl: II
Ray, Jeff: AP
Razuvayev, Sergiy: II
Razuvayeva, Galyna: SP
Reeves, Jerry: II
Rega, Chris: AP
Reiss IV, Clemens: AP
Rensi, Randolph: AP
Restaino, Mario: AP
Riboud, Jean-Christophe: AP
Riffon, Pierre: CM
Rivers, Mark: II
Rizvi, Syed M. Aslam: II
Roberts, Mark: II
Roberts, Gretchen: SP
Rodriguez, Dionisio: II
Roizman, Oleg: AP
Roussell, Marnie: CM
Sahin, Hakan: II
Salvato, Orlando: II
Sandhu, Surinder: AP
Sankarakurup, Dinesh: AP
Sarkar, Subhas: AP
Sauer, Daniel: II
Sauzay, Mathieu: II
Scaquetti, David: II
Schappell, Steven: CM
Schneider, Jeff: II
Schoen, Jerry: II
Schuette, Christoph: AP
Schweiger, Ewald: CM
Schweiger, Annette: SP
Sestito, John: AP
Sewell, Jeremy: II
Sharma, Devki: CM
Sharp, Michael: II
Shea, Kelly: II
Shertukde, Hemchandra: CM
Shertukde, Rekha: SP
Shi, Lin: II
Shor, Andre: II
Shull, Stephen: CM
Shull, Cheryll: SP
Siebert, Stefan: II
Silva, JP: II
Silvestre, Manuel: II
Sim, H. Jin: CM
Sim, Julie: SP
Simmons, Charles: II
Sizemore, Thomas: II
Skinger, Kenneth: II
Smith, Edward: CM
Smith, James: CM
Snyder, Steven: CM
Snyder, Darlene: SP
Som, Sanjib: AP
Son, Chang-Gon: II
Spurlock, Michael: AP
Stahara, Ronald: CM - LM
Stahara, Mary Ann: SP
Stamatopoulos, Jim: II
Stank, Markus: II
Stankes, David: II
Stankowski, Krzysztof: II
Steineman, Andrew: AP
Stiegemeier, Craig: CM
Stopin, Angelique: II
Sullivan, Christopher: AP
Sundin, David: II
Swan, Phil: II
Sweetser, Charles: AP
Swinderman, Craig: CM
Szewczyk, Radoslaw: II
Tanaka, Troy: II
Tellez, Richard: II
Tendulkar, Vijay: II
teNyenhuis, Ed: CM
Termini, Giuseppe: CM
Termini, Gina: SP
Theilacker, Jorge: II
Thompson, Jim: CM
Thompson, Robert: CM
Todd, Brett: AP
Tolcachir, Eduardo: II
Carpio, Carina: SP
Tong, Lin: AP
Traut, Alan: CM
Trautmann, Frank: II
Tridon, Florence: AP
Trivitt, Donnie: AP
Tuli, Subhash: CM
Tuli, Rita: SP
Turvey, Terry: II
TURVEY, TERRY: II
Tyschenko, Peter: II
Vailoor, Vasanth: II
Varghese, Ajith: II
Vedante, Kiran: AP
Vedante, Sujata: SP
Vedante, Samarth: GT
Verner, Jane Ann: CM
Viereck, Karsten: AP
Vijayan, Krishnamurthy: II
Vir, Dharam: CM
Vogel, Herman: AP
Wagner, Anton: II
Wallach, David: CM
Walling, Donald: II
Walters, Shelby: AP
Ward, Barry: CM
Watson, Joe: CM
Watson, Joe: II
Weatherbee, Eric: AP
Weathington, Larry: II
Weathington, Barbara: SP
Websper, Richard: AP
Weekes, Tony/Mark: AP

Weffer, Felipe: CM
Werelius, Peter: AP
Wicks, Roger: CM
Wilks, Alan: CM
Wilks, Terrie: SP
Williams, Michael: AP
Williams, Randy: AP
Williams, Charles: II
Wilson, John: II
Wimmer, William: CM
Winter, Paul: II

Winter, Paul: II
Woodcock, David: CM
Wray, Daniel: II
Xu, Shuzhen: AP
Yalla, Murty: II
Yang, Baitun: II
Ye, Jun: II
Yule, Kipp: CM
Yute, Douglas: AP
Zarmandily, Hassan: II
Zhang, Jim: AP

Zhao, Peter: CM
Zhong, Juntao: II
Zhong, Juntao: II
Zhu, Hanxin: AP
Zito, Anthony: II
Zouaghi, Abderrahmane: II

Membership Code

CM – Committee Member

CM – LM – Committee Member – IEEE Life Member

AP – Active Participant

II – Interested Individual

SP – Spouse

GT – Guest

Information for all Attendees – IEEE Transformers Committee Meeting, Fall '09 **IEEE Patent Requirements for Standards Development Meetings**

As discussed during the last several years, the Committee continues to be aware of IEEE requirements related to the possibility of inclusion of patents in IEEE Standards. The instances are expected to be rare, and subject to specific review and guidelines. Detailed information on this subject can be found in IEEE website locations listed below. Of present concern to Committee work is the requirement that, at every standards development meeting, a request be made for disclosure of any patents or patent applications any individual believes may be essential to the implementation of the standard. The request, per present IEEE guidelines, is to be made at each WG Meeting, and any responses provided are to be recorded in Meeting Minutes. Positive responses will also prompt a request for documentation on the patent to be supplied to IEEE.

IEEE Instructions for WG Chairs are found on the following Instructions and 4 slides, available at IEEE web location (<http://standards.ieee.org/board/pat/pat-slideset.ppt>)

Our WG Meetings are relatively short, and taking the time show all the slides associated with the required “call” for patents presents a hardship in our schedule. In order to minimize the impact on WG Meetings, while meeting the intent of the IEEE guidelines, these notes and slides are being provided on the Committee’s website, and all meeting participants are encouraged to review prior to the meeting. With this preparation the announcement at WG Meetings, per the following slides, should take no more than a few minutes – and the Committee judges that showing of each slide at each WG Meeting, while appropriate if requested, is not necessary. For any questions, refer to the following websites, or contact one of the Committee officers.

- (<http://standards.ieee.org/guides/bylaws/sect6-7.html#6>) – Note Clause 6 - Patents
- (<http://standards.ieee.org/board/pat/pat-material.html>) – IEEE SA Patent Material

Tom Prevost
Chair

Ed Smith
Vice Chair

Bill Chiu
Secretary

Instructions for the WG Chair

The IEEE-SA strongly recommends that at each WG meeting the chair or a designee:

- **Show slides #1 through #4 of this presentation**
- **Advise the WG attendees that:**
 - The IEEE’s patent policy is consistent with the ANSI patent policy and is described in Clause 6 of the *IEEE-SA Standards Board Bylaws*;
 - Early identification of patent claims which may be essential for the use of standards under development is strongly encouraged;
 - There may be Essential Patent Claims of which the IEEE is not aware. Additionally, neither the IEEE, the WG, nor the WG chair can ensure the accuracy or completeness of any assurance or whether any such assurance is, in fact, of a Patent Claim that is essential for the use of the standard under development.
- **Instruct the WG Secretary to record in the minutes of the relevant WG meeting:**
 - That the foregoing information was provided and that slides 1 through 4 (and this slide 0, if applicable) were shown;
 - That the chair or designee provided an opportunity for participants to identify patent claim(s)/patent application claim(s) and/or the holder of patent claim(s)/patent application claim(s) of which the participant is personally aware and that may be essential for the use of that standard
 - Any responses that were given, specifically the patent claim(s)/patent application claim(s) and/or the holder of the patent claim(s)/patent application claim(s) that were identified (if any) and by whom.
- The WG Chair shall ensure that a request is made to any identified holders of potential essential patent claim(s) to complete and submit a Letter of Assurance.
- It is recommended that the WG chair review the guidance in *IEEE-SA Standards Board Operations Manual* 6.3.5 and in FAQs 12 and 12a on inclusion of potential Essential Patent Claims by incorporation or by reference.

Note: **WG** includes Working Groups, Task Groups, and other standards-developing committees with a PAR approved by the IEEE-SA Standards Board.



(Optional to be shown)

25 March 2008

Participants, Patents, and Duty to Inform

All participants in this meeting have certain obligations under the IEEE-SA Patent Policy. Participants:

- “Shall inform the IEEE (or cause the IEEE to be informed)” of the identity of each “holder of any potential Essential Patent Claims of which they are personally aware” if the claims are owned or controlled by the participant or the entity the participant is from, employed by, or otherwise represents
 - “Personal awareness” means that the participant “is personally aware that the holder may have a potential Essential Patent Claim,” even if the participant is not personally aware of the specific patents or patent claims
- “Should inform the IEEE (or cause the IEEE to be informed)” of the identity of “any other holders of such potential Essential Patent Claims” (that is, third parties that are not affiliated with the participant, with the participant’s employer, or with anyone else that the participant is from or otherwise represents)
- The above does not apply if the patent claim is already the subject of an Accepted Letter of Assurance that applies to the proposed standard(s) under consideration by this group
 - Quoted text excerpted from IEEE-SA Standards Board Bylaws subclause 6.2
- Early identification of holders of potential Essential Patent Claims is strongly encouraged
- No duty to perform a patent search

Slide #1

25 March 2008



Patent Related Links

All participants should be familiar with their obligations under the IEEE-SA Policies & Procedures for standards development.

Patent Policy is stated in these sources:

IEEE-SA Standards Boards Bylaws

<http://standards.ieee.org/guides/bylaws/sect6-7.html#6>

IEEE-SA Standards Board Operations Manual

<http://standards.ieee.org/guides/opman/sect6.html#6.3>

Material about the patent policy is available at

<http://standards.ieee.org/board/pat/pat-material.html>

If you have questions, contact the IEEE-SA Standards Board Patent Committee Administrator at patcom@ieee.org or visit <http://standards.ieee.org/board/pat/index.html>

This slide set is available at <http://standards.ieee.org/board/pat/pat-slideset.ppt>

Slide #2

25 March 2008



Call for Potentially Essential Patents

- If anyone in this meeting is personally aware of the holder of any patent claims that are potentially essential to implementation of the proposed standard(s) under consideration by this group and that are not already the subject of an Accepted Letter of Assurance:
 - Either speak up now or
 - Provide the chair of this group with the identity of the holder(s) of any and all such claims as soon as possible or
 - Cause an LOA to be submitted

Slide #3

25 March 2008



Other Guidelines for IEEE WG Meetings

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

See *IEEE-SA Standards Board Operations Manual*, clause 5.3.10 and "Promoting Competition and Innovation: What You Need to Know about the IEEE Standards Association's Antitrust and Competition Policy" for more details.

Slide #4

25 March 2008



CHAIR'S REPORT – FALL '09 – LOMBARD ILLINOIS

1.0 Chair's Report – T. A. Prevost

1.1 PES General Meeting Notes

The last PES General Meeting was held in Calgary, Alberta Canada this summer from July 26-31.

The schedule for upcoming PES General Meetings is as follows:

- 2010: July 26-31 in Minneapolis, Minnesota

PES T&D Conference & Exposition:

- 2010: April 19-22, New Orleans, Louisiana

IEEE PES Conference on Innovative Smart Grid Technologies:

- 2010: January 19-21, Washington DC

Additional information on any of the above meetings can be found on the PES website at (<http://www.ieee-pes.org>)

1.2 PES Technical Council Activities

1.2.1 O&P Manual

PES has submitted a revised O&P manual to IEEE Audcom. This O&P covers the technical activities of PES but does not cover the standards development activities. The technical council O&P committee has decided to delegate the standards development O&P to those technical committees which sponsor standards development activities. The Technical Council O&P will be revised next year to clarify the authority of the Technical Council O&P subcommittee.

In the meantime the Transformer Committee O&P was officially approved by PES and subsequently approved by IEEE Standards Board in September 2009. Thanks to all involved, particularly Peter Balma who re-wrote the document.

1.2.2 2008 General Meeting in Calgary

The meeting was very successful with over 2,000 attendees.

1.2.3 Standards Coordination

Standards coordination among the different committees continues to be a concern since the advent of the electronic standards process. The role of the standards coordinator has attained greater importance as a result. Bill Bartley should be made aware of any scope conflicts or coordination issues between the Transformer and other technical committees of PES.

1.2.4 Smart Grid

PES started a group on intelligent grid as an interest group in 2005. In 2008 it was elevated to a standing coordinating committee within PES. The role of this committee is to coordinate smart grid related standards activities within PES. They are presently developing a list of existing standards within PES that could contribute to the Smart Grid standardization effort.

CHAIR'S REPORT – FALL '09 – LOMBARD ILLINOIS

1.2.5 New Publications

PES will have two new publications which should be available may 2010:

Transactions on Smart Grid

Transactions on Renewable Energy

Call for papers has been sent for these transactions..

1.2.6 PES General Meeting

Due to conflicts and limited time to present technical papers Technical Council is changing the format of the annual general meeting. The meeting will be divided into two components, Administrative and technical. Administrative half will provide a forum for technical committees to develop and maintain standards (much like the work we do at the Transformers Committee Meeting). The technical half will have paper, panel and poster sessions in which authors can present technical papers.

1.2.7 PES Website

PES has totally revamped its website. It can be seen at www.ieee-per.org I encourage everyone to go and browse this new site.

1.3 Transformers Committee Activities

1.3.1 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 one full year – and can secure the acknowledgement of at least 3 Activity Chairs (WG's, but must include at least one SC 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. These forms have been recently updated with the new O&P manual.

1.3.2 Acknowledgments

As I write my final Chairs report I wish to acknowledge all of you for your diligent work in making the Transformers Committee a model committee within PES. I understand that this work is done as a volunteer. You should all feel proud of the work you do for the betterment of our society and our profession.

Respectfully submitted,



Thomas A. Prevost
Chair, IEEE/PES Transformers Committee

2.0 Approval of Minutes from Spring, 2009 Meeting

Chair asked that a motion be made to approve the minutes of the Spring, 2009 (Miami, Florida) meeting. A motion was made and seconded from the floor. The Chair asked for a voice vote, which was unanimously approved.

The Chair then declares the Spring, 2009 Porto minutes approved as written with a minor correction noted during the meetings leading up to the main committee meeting on October 20, 2009.¹

¹ Note – prior to the Thursday Main Committee meeting, Committee Secretary received a request to change the unapproved minutes from the Insulating Fluids Subcommittee to correct the spelling of the name. This change has been reflected in the final “Approved” version for the Fall, 2008 meeting.

October 25, 2009

3 Administrative Subcommittee – Tom A. Prevost

The meeting took place at the Westin Hotel in Lombard, Illinois on Sunday October 25, 2009. The meeting was call to order at 2:05 pm.

3.1 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.

3.1.1 Attendance of Members & Guests

The following members of the Administrative Subcommittee were present:

- Gregory Anderson
- Steve Antosz
- William Bartley
- Bill Chiu
- Richard Dudley
- Fred Elliott
- Charles Johnson
- Thomas Lundquist
- Carl Niemann
- Donald Platts
- Thomas Prevost
- Jeewan Puri
- Steve Shull
- J. Edward Smith (Ed)
- Jim Smith

The following members were absent:

- Donald Fallon
- Loren Wagenaar

The following guests were present:

- Jodi Haasz (IEEE Staff)
- Thang Hochanh (for Loren Wagenaar)
- Daniel Mulkey
- Jin Sim

3.2 Approval of Miami Admin SC Meeting Minutes

3.2.1 Review and approval of the unapproved minutes from the Miami, Florida meeting

The Chair asked for comments from the Miami Administrative Subcommittee meeting minutes. Hearing no comments nor request to change the draft minutes, the Chair declared the minutes approved as written.

3.3 Additions to and/or Approval of the Agenda

The Chair reviewed the draft Agenda with the attendees. No revision/addition was made to the agenda. The Chair declared the agenda approved. The agenda is included below for reference.

**IEEE/PES TRANSFORMERS COMMITTEE
ADMINISTRATIVE SUBCOMMITTEE MEETING
AGENDA**

Sunday October 25, 2009 - Call to Order 2:00 pm

1. Introduction of Members and Guests (:05)
2. Approval of Miami Admin SC Meeting Minutes
3. Additions to and/or Approval of the Agenda
4. New positions in Transformer Committee (:10)
 - 4.1 - Treasurer
 - 4.2 - New SC Chairs
 - 4.2.1 Performance Characteristics – Antosz
 - 4.2.2 Insulating Fluids – McNelly

October 25, 2009

- 4.2.3 Distribution Transformers - Shull
- 5. Meeting Arrangements, Host Report
 - 5.1 - F'09 – Lombard – Greg Anderson (:10)
- 6. Chair's Report – Tom Prevost (:15) **Time check 2:45 PM**
- 7. Vice Chair's Report – Ed Smith (:05)
- 8. Secretary's Report – Bill Chiu (:05)
 - 8.1 - Membership Review (:05)
- 9. Treasurer's Report
 - 9.1 - Meetings/Finances - Greg Anderson (:10)
 - Next meeting will in Houston in Spring of 2010 – March 7 – 11
- 10. Standards Report – Bill Bartley

- 12. New Business, Committee Planning (:45)
 - 12.1 - Data archival from committee business - Prevost
 - 12.2 - Collection of Power Transformer Failure Data - Lundquist
 - 12.3 - C57.12.33 – Loss Evaluation Guide for Distribution Transformers - Shull
 - 12.4 - IEEE History Center - Balma
 - 12.5 - Establishment of a quorum for official meetings - Prevost
 - 12.6 - Transformer Committee contribution to Smart Grid Standards Initiative – Prevost
 - 12.7 - Task Force paper publication process - Platts
 - 12.8 -Other **Time check - 4:30 PM**
- 13. Subcommittee Reports - Roundtable (:30)
- 14. Old Business
 - 14.1 -TX Committee O&P Manual – T Prevost (:05)
 - 14.2 - Roberts Rules of Order – J Ed Smith (:05)
 - 14.3 - IEC Joint Development of Standards – T Prevost / J. Haasz (:15)

3.4 New Positions In Transformers Committee

3.4.1 Treasurer

The Chair announced with the approval of the O&P Manual from the last meeting, there is a new role of Committee Treasurer, which has one-year tenure. Greg Anderson, as our Meetings SC Chair has essentially been fulfilling the role of the committee treasurer and has effectively dealt with financial audits from IEEE over the past several years. The Chair thanked Greg Anderson for all the diligent work. Greg Anderson accepted the role of Committee Treasurer for a one-year term (starting now through the end of 2010) and will be renewed on annual basis with next renewal coming up at the Fall, 2010 meeting for the 2011 calendar year.

3.4.2 New SC Chairs

There have been some recent turnovers for the leadership roles in several subcommittees. The Chair thanked the leadership and contributions of outgoing SC Chairs Ramsis Girgis, Ken Hanus, and Rick Ladroga for the Performance Characteristics, Distribution Transformers, and the Insulating Fluids subcommittees respectively.

The following individuals are officially appointed to the Chair position of the respective subcommittees:

Performance Characteristics Subcommittee - Steve Antosz
Insulating Fluids Subcommittee - Sue McNelly
Distribution Transformer Subcommittee - Steve Shull

October 25, 2009

3.5 Meeting Arrangements, Host Report, and Committee Finances

G. Anderson circulated a list of people who has administrative access to AMS-123 system. All in attendance were asked to verify the list and make correction if errors are noted.

3.5.1 Host Report - F'09 – Lombard Attendance Stats

The meeting host Tom Callsen welcomed the Transformers Committee to Lombard, IL and gave a brief overview on the highlights of the activities planned for the week and also gave a status update on the meeting registration attendees:

Registered Attendees	456
Committee Members	134
Active Participants	139
Interested Individuals	183
Registered Companion & Guests	60
Main Events	
Sunday Reception	365
Monday Standards Luncheon	135
Tuesday Speaker Luncheon	231
	[115(B)+101(C)+15(V)]
Wednesday Dinner Social	210

3.5.2 Meetings/Finances – G. W. Anderson (:10)

Greg Anderson passed around a recent account ledger showing the various funds deposited and expenses for the committee business, and stated that overall the committee funds are in good shape.

3.5.3 Future meeting time slots and locations

Spring, 20101 → (March 7-11, 2010) – Houston, Texas, at the Omni Houston Hotel. The meeting will be hosted by **Jeremy Kriska & Tulstar Products, Inc.**

3.6 Chair’s Report – T. A. Prevost

Refer to Section 1.0 for a complete “Chair’s Report.” The Chair emphasized the revision to the O&P Manual will be the main focus of our discussion under old business.

3.7 Vice Chair’s Report – E. Smith

Ed Smith made special mentioned that Transformers Committee meeting has a great reputation amongst the IEEE/PES organizations and are frequently refer to as the role model for all the technical committees due to the fact that we have a great website with very valuable information and the O&P Manual. Special thanks to our Web Master Sue McNelly, and also Peter Balma for doing all the leg work of getting our O&P manual updated.

Due to the large volume of the papers submitted at the PES general meetings, there is a push to move from the Paper Session to a Paper Forum, which is much like a poster session to squeeze in more papers. Some discussions followed about the need to maintain the quality of the papers accepted for the conference and not dilute

Refer to Section 4.0 - Vice Chair’s Report for further details.

3.8 Secretary’s Report – Bill Chiu

3.8.1 3.10.1 Membership Review

Voting Committee Members – Seven new committee members were approved and added at the Miami, Florida Meeting as shown in the table below:

October 25, 2009

Name	Affiliation	Sponsor #1	Sponsor #2	Sponsor #3	Membership Category
Donald B. Cherry	ABB Inc. (South Boston)	P. McShane C57.147 (6 yrs)	S. McNelly Insulating Fluids SC (5 ½ yrs)	S. McNelly C57.104 (6 yrs)	Producer
Juan G. Castellanos	Prolec GE	R. Wicks C57.100 (3 yrs)	P. Payne C57.12.90 Temp Rise Test Proc. (2 yrs)	D. Platts Insulation Life SC (4 yrs)	Producer
Amitav Mukerji	ABB (Cary, NC)	B. Paulin Low Freq. Dielectric Test WG (1 ½ yrs)	M. Perkins PCS Revision of C57.12.90 (1 ½ yrs)	R. Girgis Performance Characteristic S.C. (1 ½ yrs)	Producer
Ron L. Nicholas	ABB Inc. (South Boston)	E. Lemke TF C57.113 (4 yrs)	R. Girgis Performance Characteristic S.C (4 yrs)	M. Perkins PCS Revision of C57.12.90 (4 yrs)	Producer
Kirk Robbins	Excelon Nuclear	R. Girgis Performance Characteristics SC (2 yrs)	M. Perkins PCS Revision of C57.12.90 (2 yrs)	L. Wagenaar C57.152 (2 yrs)	User
Dharam Vir*	Waukesha Electric Systems Inc.	L. Wagenaar Dielectric Test SC (4 yrs)	D. Platts Insulation Life SC (4 yrs)	J. Puri Sound Power Level Guide (4 yrs)	Producer
Jennifer Yu	Pacific Gas & Electric	L. Wagenaar Dielectric Test SC (1 yrs)	R. Girgis Performance Characteristics SC (1 yrs)	T. Lundquist Power Transformers SC (1 yr)	User

The Transformers Committee currently has three general categories of participation in our activities. These are: **Interested Individual**, **Active Participant**, and **Committee Member**. Any one 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 minimum of three WG or SC chairmanships. Detail of the application requirement and approval process by the Administrative Subcommittee is outline in our O&P manual.

The participant's profiles in our AMS 123 system should reflect the correct status. Here is the link to our AMS 123 system. (<http://www.123signup.com/servlet/com.signup.servlet.org.ALogin?Org=ieee-transformers&Restart=1>)

The following table showed the recent count of the participants grouped by these three general categories.

	April 2009	October 2009
Interested Individual	733	775
Interested Individual - IEEE Life Member *	5	2
Total Interested Individuals	738	777
Active Participant	213	206
Active Participant - IEEE Life Member *	5	6
Total Active Participants	218	212
Committee Member	200	204
Committee Member - Emeritus Member *	7	7
Committee Member - IEEE Life Member *	22	24
Committee Member - Corresponding Member	1	1
Total Committee Members	230	236

October 25, 2009

TOTAL IN AMS DATABASE

1206

1225

* - indicates this member type receives a discounted registration fee.

3.8.2 New Member Applications

Seven new applications for Committee Membership have been received since our previous meeting in Miami, Florida and will be submitted for approval at the Lombard, Illinois meeting. Details of the membership application and sponsors are listed in the following table.

Name	Affiliation	Sponsor #1	Sponsor #2	Sponsor #3	Membership Category
Carlo Arpino	ComEd-Excelon	Bill Henning C57.131 WG (4 yrs)	Jin Sim C57.135 WG (3 yrs)	Fred Elliott Bushing SC C57.19.100 WG (3 yrs)	User
Claude Beauchemin*	General Electric (Canada)	R. Ladroga C57.104 WG (20 yrs)	James Thompson C57.106 WG (3 yrs)	R. Ladroga Insulating Fluids SC (2 yrs)	Producer
Enrique Betancourt	Prolec GE	S. Synder PCS Revision to C57.12.00 WG (2 yrs)	R. S. Girgis Performance Characteristics SC (2 yrs)	Jeewan Puri Audible Sound & Vibration SC (6 yrs)	Producer
C. Clair Claiborne	ABB Inc. (Raleigh, NC)	P. McShane C57.147 (4 yrs)	D. Platts Insulation Life SC (5 yrs)	T. Lundquist Power Transf. SC (5 ½ yrs)	Producer
Said Hachichi	Hydro Quebec	Craig Colopy C57.15 WG (2 yrs)	Stephen Shull Distribution SC (2 yrs)	G. Termini C57.12.24 (WG) (2 yrs)	User
David L. Harris	Waukesha Electric System	Tom Jauch PC57.153 (3 yrs)	H. J. Sim C57.135 PST WG (2 yrs)	Tom Lundquist Power Transf SC (1 ½ yrs)	Producer
Ulf Radbrandt	ABB AB/HVDC (Ludvika, Sweden)	R. Dudley HVDC CT&SR SC (4 yrs)	R. Dudley C57.129 WG (4 yrs)	R. Dudley IEEE 1277 WG (4 yrs)	Producer

* Note: application did not indicate PES member

These applications will be reviewed at the Administrative Subcommittee meeting. 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. Subcommittee Chairs are encouraged to recommend new members, and to communicate the process of attaining membership through **active participation** and **contribution** in Committee work 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 could be submitted to the Committee Secretary's attention at any time. Application will be collected for review and approval in batches at each Administrative Subcommittee meeting. For an application to be included in the following meeting, the application will need to be received by the Committee Secretary at a minimum of one week prior to the start of the next meeting.

3.8.3 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 meeting on Thursdays. The data will be used to update participant's membership profile.

3.8.4 Meeting Minutes

The minutes of the Miami, Florida, Spring, 2009 Transformers Committee meeting were posted to the committee website on Wednesday, October 14, 2009.

October 25, 2009

Meeting minutes are now only available via electronic means. A collection of recent meeting minutes are available in pdf format from the committee's website.

Subcommittee Chairs are requested to submit their SC Minutes for the Lombard meeting by January 31, 2010. Minutes should be submitted via e-mail to the Committee Secretary bill.chiu@ieee.org, with a copy to Susan McNelly simcnelly@ieee.org for posting on the Committee website. The submittal should be formatted in Word 2007 (or earlier versions) and should be formatted in the format as shown in the present assembled Minutes, **with numbering as indicated in Main Committee Meeting Agenda**. Please indicate total attendance count for each Subcommittee, Working Group, and Task Force meeting in your Minutes. Please do not send a copy of the attendance listing for this attendance count. If a SC Vice-Chair, Secretary, or other SC member is preparing the SC Minutes, please advise them of these details regarding Minutes submittals.

Please do all you can to get the minutes in as soon as possible. Collecting the minutes from each subcommittee is the most difficult and time consuming part of this job. Your full corporation and support in this matter is greatly appreciated.

3.8.5 Monitoring of the Membership Role in the AMS-123 System

A question was brought up on whether there is any active monitoring on how the participants select the three categories of the membership, namely: Users, Producers, and General Interests. Greg Anderson indicated that he does review these data from time to time, but is it primarily a self-administered honor system.

3.8.6 Review of the New Member Applications

Detail reviews of the individual membership applications were conducted. Of the seven new applications for Committee Membership, all were approval with the exception of the one for Mr. David L. Harris, which is postponed to the next meeting due to shortage in the required sponsorship with at least one subcommittee with a minimum of two years of active participation.

Details of the approved new Committee Members listed in the following table.

Name	Affiliation	Sponsor #1	Sponsor #2	Sponsor #3	Membership Category
Carlo Arpino	ComEd-Excelon	Bill Henning C57.131 WG (4 yrs)	Jin Sim C57.135 WG (3 yrs)	Fred Elliott Bushing SC C57.19.100 WG (3 yrs)	User
Claude Beauchemin*	General Electric (Canada)	R. Ladroga C57.104 WG (20 yrs)	James Thompson C57.106 WG (3 yrs)	R. Ladroga Insulating Fluids SC (2 yrs)	Producer
Enrique Betancourt	Prolec GE	S. Synder PCS Revision to C57.12.00 WG (2 yrs)	R. S. Girgis Performance Characteristics SC (2 yrs)	Jeewan Puri Audible Sound & Vibration SC (6 yrs)	Producer
C. Clair Claiborne	ABB Inc. (Raleigh, NC)	P. McShane C57.147 (4 yrs)	D. Platts Insulation Life SC (5 yrs)	T. Lundquist Power Transf. SC (5 ½ yrs)	Producer
Said Hachichi	Hydro Quebec	Craig Colopy C57.15 WG (2 yrs)	Stephen Shull Distribution SC (2 yrs)	G. Termini C57.12.24 (WG) (2 yrs)	User
David L. Harris*	Waukesha Electric System*	Tom Jauch PC57.153 (3 yrs)*	H. J. Sim C57.135-PST WG (2 yrs)*	Tom Lundquist Power Transf SC (1-½ yrs)*	Producer*
Ulf Radbrandt	ABB AB/HVDC (Ludvika, Sweden)	R. Dudley HVDC CT&SR SC (4 yrs)	R. Dudley C57.129 WG (4 yrs)	R. Dudley IEEE 1277 WG (4 yrs)	Producer

*The strike through denote postponement to the next meeting.

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3.8.7 Recognition for Committee Members

Starting at this meeting, we will be issuing committee member certificate frame in a plaque to new members. There will also be a “catch up” process in place to issue membership certificates to the existing members. Due to the large number of the members and the logistics of issuing these membership certificate plaques, this process will be spread out to several future meetings for the first 50 registered attendees who have not yet received their certificates. Members will have a choice either picking up their certificate at the time of meeting registration check-in, Monday’s Standards Process Luncheon, Tuesday’s Speaker’s Luncheon or at the Thursday’s Main Committee meeting. Comments were made that we should carefully manage these events so that we do not introduce confusion and take away from the Thursday’s main committee meeting as the official forum for recognition of contributors.

Many have also noted that there is a blue “**Committee Member**” add-on ribbon at the bottom of the name tag for the Committee members. The idea here is to provide a further distinction and recognition for the committee members and also to bring about additional awareness that committee membership is attained through a formal application process. Feedbacks so far have been positive, so this practice will be continued in future meetings.

3.9 Standards Report – B. Bartley

Bill Bartley discussed his role as the representative from PE/TR at the Standards Coordinating Committee and the mentioned that if there standards activities need to coordinate with other standards sponsored by the other technical committees to please engage him. Bill subsequently discussed the highlights of the report of standards activities since the April, 2009 Meeting (Miami, Florida).

Attention was call to the list of projects where PARS that have not started the balloting process and will be expiring at the end of 2009. The responsible Subcommittee chairs are requested to coordinate with each of the Working Group Chair to take appropriate actions prior to the deadline in **October 19, 2009**. Bill Bartley also offered to work with the activity chair to take the appropriate actions.

A substantial discussion took place on [PC 57.130 - Trial-Use Guide for DGA During Factory Temperature Rise Tests](#). It was decided the issue should be address at the [Insulating Fluids Subcommittee](#).

Further details of the standards activities are listed in the Standards Report and is included in the Appendix C - Transformer Standards Development Status and Transformer Committee Organizational Chart.

3.10 New Business

3.10.1 Data archival from committee business – Prevost

Tom Prevost brought forth the need to archive the technical data collected during the development of the standards. Example of the needs include the many standards in the Insulating Fluids Subcommittee. Many examples include historical technical basis that were used in the development technical standards such as several of the loading guide such as C57.91 and the C57.100.

Tom Lundquist mentioned ASTM has some thing similar in the form of “research reports” which are maintained by the ASTM organization rather than the individual working group organization.

A question was raised to the IEEE Staff Jodi Haasz to see if there are similar to the ASTM “research paper.” Tom Prevost suggested that a task force be formed to evaluate how to gather and archive the critical information. A task force name **Intellectual Property (IP) Archival Task Force** was formed under the AdSubCom to investigate how best to proceed.

IP Archival Taskforce members:

- Tom Lundquist
- Sue McNelly

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- Don Platts
- Tom Prevost
- Ed Smith

3.10.2 Collection of Power Transformer Failure Data – Lundquist

Tom Lundquist mentioned that there was a motion before the Power Transformers Subcommittee to begin collect power transformer failure data. The proposal seeks to collect information on standardize failure causes, failure rate, life expectancy, voltage, MVA rating and other related transformer data

Jin Sim mentioned that a similar effort was launched many years ago on GSU failure data. Part 1 was published, but Part 2 was never published because of the sensitive data with individual names of entities.

Don Platts also mention that some 30 years ago EEI started collection of the failure data. The challenge is that data on failures required significant organization and data scrubbing for the results to be useful. If this committee tries to collect this data, it would be difficult to have a comprehensive set of the data due to the typical low response rate of the data survey request and as such the results would not be meaningful representative of the transformers' failure data. A motion was introduced by Don Platts shown below.

Motion:

Ask the AdSubCom to give guidance the Power Transformers Subcommittee not to pursuit this activity.

The motion was seconded. Additional discussion took place on the motion with many concerns that centered on the resources needed to provide an adequate data collection and compilation of the data for this to a meaningful effort. Following the discussion, a vote was taken with the following results.

Vote results:

13 In Favor

0 Opposed

1 Abstention

The Chair declares the Motion carries as stated and the directed the Power Transformers Subcommittee not to pursue this activity.

3.10.3 C57.12.33 – Loss Evaluation Guide for Distribution Transformers – Shull

Discussion was brought forth on the scope overlap between the C57.12.33 and the C57.120. About a year ago a working group was reconvened to bring back to life the PC57.12.33 that was previously put on hold due to renewed interest in energy efficiency standards. The working group found that there are significant overlap with the existing loss evaluation guide for power transformers - C57.120, which was last revised under the West Coast.

A suggestion was made by the working group of PC57.12.33 to expand the scope of the existing loss evaluation guide for power transformer to include distribution transformer. After a brief discussion, Steve Shull introduced the following Motion #1.

Motion #1

To revise the scope of C57.120 to include distribution transformers and withdraw PC57.12.33.

The motion was seconded. Additional discussion took place on the motion, and a vote was taken with the following results.

Vote results:

14 in favor

0 Opposed

0 Abstention

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Following Motion #1, Steve Shull introduced another follow-up motion #2.

Motion #2

To move the C57.120 document from Power Transformers Subcommittee to Performance Characteristics Subcommittee.

The motion was seconded. Additional discussion took place on the motion, and a vote was taken with the following results.

Vote results:

14 In favor
0 Opposed
1 Abstention

The Chair declares Motion#1 carries as stated and directs the move of C57.120 from Power Transformers Subcommittee to Performance Characteristic Subcommittee effective immediately.

3.10.4 IEEE History Center – Balma

Peter Balma introduced the website of the IEEE Global History Network at http://www.ieeeghn.org/wiki/index.php/Main_Page

This is an IEEE sanctioned website that allow users to enter historical information of the various topics and it is essentially a Wikipedia type of knowledge base open the user community for entries and edits. A simple key word search of the work “transformers” will take the user to the following website: <http://www.ieeeghn.org/wiki/index.php/Transformers>

This is essentially a brief history created by a graduate student serving as an intern at IEEE. The question was raised that do we want to participate in the development of this website on the history of transformers. After some substantial discussion, including references to the minutes of the previous meeting minutes on a similar discussion, it was decided that Peter Balma will perform additional assessment and make recommendation back to the AdSubCom on whether and how to pursue this if there is sufficient interest.

3.10.5 Establishment of a quorum for official meetings – Prevost

At the Spring '09 meeting a great deal of discussion took place on the Roberts' Rule. The Chair stated that it is important that a quorum be established and present at the meeting before official business can be conducted.

A concern was brought forth that enough members must be present in order to even conduct the first official business of approval of the previous meeting minutes. An active discussion took place on what constitute an official member and the criteria to be used to decide whether a member is an active participant.

The Chair encourage all subcommittees and working group leaders to take this opportunity to update their membership list so that only active working participants are included as the official members and be counted toward to the quorum and be allowed to vote on official business. One possible way to eliminate non-active participants is to impose a requirement that a working group or subcommittee member be required to return a survey ballot. Failure to return the survey could be interpreted as non-active participation and could be used to remove non-active members so that the working group member roster is at a manageable level.

A suggestion was also made for the activity leaders to take role call at the beginning of a meeting and only the members present are allow to vote for the business activity and at the same time identify whether there is a quorum to conduct official business.

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The Chair stated that is a major change and while it may be cumbersome to deal with initially, the reward of being able to have an official quorum to effectively deal with negative comments from the balloting process will be well worth the effort.

3.10.6 Transformer Committee contribution to Smart Grid Standards Initiative – Prevost

Tom Prevost mentioned there is an intelligent grid coordinating committee at the PES level to coordinate all the activities in the various technical committees that could be considered as smart grid project. The power industry is in a exciting time to be shaping the future of our society. Smart grid is a very broad topic that encompassed renewable resources, telecommunication layers over power lines, distributed generation, two-way power flow, ...etc. with billions of dollars invested and additional billions of dollars to be invested that could positively impact how we generate distribute and consume energy.

Bill Chiu stated that another area of potential impact is the upcoming electric vehicles loads that could have a significant impact to the distribution transformers. It was suggested that perhaps the Transformers Committee should consider issuing a position paper to provide guidance to the industry.

Also mentioned was that NIST has been given the charge to develop the definition and roadmap of the Smart Grid and that a draft roadmap was out for comment.

After some additional discussion, the Chair concluded by requested each subcommittee chairs to examine the standards activities within their respective subcommittees and email in a list of the activities to him that are smart grid related as a starting point.

3.10.7 Task Force paper publication process - Platts

Our current O&P Manual requirements for the publication of technical paper are cumbersome and include some outdated process and procedures for us to follow such as making paper copies of the draft paper to be available for all the committee members at the meeting registration desk. Many of the task forces that are active now will eventually be publishing a technical report as a final deliverable.

A suggestion was made to evaluate the O&P Manual and report back to the AdSubCom at the next meeting. This task was assigned to Don Platts, Bill Chiu, and Ed teNyhouse.

3.11 Committee Service Awards – D. Fallon

Refer to Section 6.0 for the complete “Recognition and Awards Report.”

3.12 Subcommittee Reports

3.12.1 Jim Smith - Instrument Transformer Subcommittee

NO REPORT

3.12.2 Fred Elliott – Bushing Subcommittee

Fred Elliott made mention that there will be a join working group to revise the IEC/IEEE document IEC 62199 and PC57.19.03 (bushings for DC application). New document number will have both IEC and IEEE numbering schemes. 65700-19.03 on HVDC bushing application.

3.12.3 Don Platts - Insulation Life Subcommittee

NO REPORT

3.12.4 Richard Dudley - HVDC Converter Transformers & Reactors Subcommittee

NO REPORT

3.12.5 Greg Anderson - Meetings Subcommittee

NO REPORT

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3.12.6 Bill Bartley - Standards Subcommittee

PC57.12.00 is over due on the final draft. Bill indicated that there will be a change of leadership to head up this working group to bring about some additional focus to this important activity. Steve Antozs mentioned that PC57.12.90 has been on hold since March of 2009 following a recirculation ballot. This means that PC57.12.00 is about one year later than the PC57.12.90.

3.12.7 Steve Antosz - Performance Characteristics Subcommittee

A request was made to update the committee org chart and meeting schedule and standards report to reflect the change from Power Transformers subcommittee to the Performance Characteristics Subcommittee effective today. There is no current active PAR for PC57.12.33 so no withdraw will be necessary.

Steve Antosz indicated the Performance Characteristics Subcommittee is also sponsoring a tutorial on **“Electrical Steel and Core Performance”** on Monday afternoon. However, he stated that he has not seen the presentations. It was mentioned that Ramsis Girgis has taken the lead on coordinating these presentation and Tom Prevost also indicated that he has personally reviewed the presentation and have given the ok to proceed.

It was also mentioned that the Chair of the sponsoring subcommittee is ultimately responsible for the technical content of the tutorial presentation and that it should be free of commercial and political agenda and other related objectionable material.

3.12.8 Carl Niemann - Underground Transformer & Network Protector Subcommittee

NO REPORT

3.12.9 Stephen Shull - Distribution Transformer Subcommittee

NO REPORT

3.12.10 Sue McNelly - Insulation Fluids Subcommittee

NO REPORT

3.12.11 Charles Johnson - Dry Type Transformer Subcommittee

NO REPORT

3.12.12 Jeewan Puri - Audible Sound and Vibration Subcommittee

NO REPORT

3.12.13 Tom Lundquist - Power Transformer Subcommittee

Tom Lundquist raised a point of discussion to seek clarification on the process for approval of the PAR. Reference was made to the Annex E in the O&P Manual which provide the clarifications.

3.12.14 Thang Hochanh (for Loren Wagner) - Dielectric Test Subcommittee

Thang Hochanh will be the acting chair for the Dielectric Tests SC for this meeting. Thang Hochanh also indicated the Dielectric Test Subcommittee is sponsoring a tutorial on Analysis of Transformer Characteristics Through Frequency Response Analysis” on Monday afternoon.

3.13 Old Business

3.13.1 TX Committee O&P Manual – T Prevost

Tom Prevost requested we continue to update the O&P Manual and not let it wait too long before the next revision. Several outstanding issues still need to be resolved.

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Lombard, Illinois

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3.13.2 Roberts Rules of Order – J Ed Smith

There are extra books available for the Roberts Rules of Order for future activities leader. A suggestion was made that a handful of books be shipped to the next meeting and hand out to the

The Chair and Vice Chair both stated that Roberts Rule of Order could be an effective tool to help us conduct meetings. Let's work together to utilize this tool and rather than let the formality of the Roberts Rule be a roadblock.

3.13.3 IEC Joint Development of Standards – T Prevost / J. Haasz

Tom Prevost mentioned that there is a Task force to examine the process and procedure for the Harmonization of the IEC/IEEE standards headed by Jeewan Puri. Joint development is one of several means for harmonization.

Jodi Haasz stated that there may be some confusion on the scope of this taskforce as the name of the group could be misleading. There were some clarifications made on the deliverable of this taskforce, which is provide guidance to working group on how to harmonize with IEC standards. Jodi Haasz also stated that she will be around all week and support our meetings the best she can and will coordinate with Matt Ceglia if there are any issues that come up.

3.14 Adjournment

With no further new or old business up for discussion, the meeting was adjourned around 6 PM.

Vice Chair's Report Fall 2009 Meeting

Lombard, Illinois

October 25 - 29, 2009

2009 IEEE PES General Meeting

Calgary, Alberta, Canada

July 26 - 30, 2009

Theme: Investment In Workforce and Innovation for Power Systems

Call for papers opened: November 3, 2008

Paper submission closed: December 3, 2008

Authors were notified (accept, reject or revised) by: February 2, 2009

25 papers submitted, 23 accepted, 2 rejected

Transformers Panel Session:

Tuesday, July 28, 2009, 2:00pm - 6:00pm

Summary: Natural ester seed oil based dielectric fluid is an environmentally advantaged fluid that is increasingly being used as a replacement for mineral oil and for high temperature flashpoint liquids, including silicone and R-TEMP. This report updates experience with use of the fluid over the last two years. Considerable studies have been conducted to investigate heat aging performance of cellulose, electrical contact thermal stability, dielectric strength, moisture sensitivity, and cold temperature performance. A

series of reports presents a summary of work that has been completed to date and examines customer experience with the use of Natural Esters in real transformers. The work contains both new transformers and retro-fills in Distribution and Power Transformers as well as Step Voltage Regulators and Switchgear.

Notes: Index Terms—Natural ester fluids, biodegradable, non-toxic, less-flammable liquids, insulation life, flash & fire point, coking resistant, sludge-free, retro-filling.

Panel Session Papers:

- 09GM0487 Progress Report On Natural Esters For Distribution And Power Transformers
- 09GM1580 Natural Ester Dielectric Fluid Development Update
- 09GM1581 Tapchangers for De-energized Operation in Natural Ester Fluid, Mineral Oil and Silicone
- 09GM1582 Some Considerations for New and Retrofill Applications of Natural Ester Dielectric Fluids in Medium and Large Power Transformers Revisited
- 09GM1583 Dielectric Properties of Natural Esters and their Influence on Transformer Insulation System Design and Performance - An Update
- 09GM1584 Design and Test Experience with Natural Ester Fluid for Power Transformers Update
- 09GM1588 Distribution Utility Experience With Natural Ester Dielectric Coolants

Conference Transactions

Session: Transformers I

Wednesday, July 29, 2009, 8:00am - 12:00pm

09GM0383 Experimental and Theoretical Analysis of Vacuum Circuit Breaker Prestrike Effect on a Transformer

09GM0475 On the Effects of Subsynchronous Interharmonic Voltages on Power Transformers: Single Phase Units

09GM0765 On the Effects of Subsynchronous Interharmonic Voltages on Power Transformers: Three Phase Units

09GM0873 Parameter Estimation Methods for Five-limb Magnetic Core Model

Paper Session

Session: Transformers II

Wednesday, July 29, 2009, 2:00pm - 6:00pm

09GM0095 Criteria Revision of Dissolved Gas Analysis for Oil-Filled Transformers in Korea

09GMO212 Experimental and Theoretical Analysis of Vacuum Circuit Breaker Prestrike Effect on a Transformer

09GM0439 Comprehensive Analysis of Load Noise of Power Transformers

09GM0719 Hydrogen Gas Generation Due to Moderately Overheated Transformer Cores

Paper Session

Session: Transformers III

Thursday, July 30, 2009, 8:00am - 12:00pm

09GM0856 Genetic Programming Feature Extraction with Bootstrap for Dissolved Gas Analysis of Power Transformers

09GM0875 Construction of Transformer Core Model for Frequency Response Analysis with Genetic Algorithm

09GM0939 Thermal Modeling and Simulation of Transformers

09GM1052 A New Method to Identify CT Saturation Based on the time Difference Algorithm

09GM1463 Application of a 3D Computer Simulation Tool as a Decision Making Tool for Optimizing Transformer Protection

Poster Session

Session: Transformers I

Monday, July 27, 2009, 5:00pm - 7:00pm

09GM0425 Intelligent Framework and Techniques for Power Transformer Insulation Diagnosis

09GM0488 Understanding Frequency & Time Domain Polarisation Methods for the Insulation Condition Assessment of Power Transformers

09GM0565 Frequency Effect on Calculation for Voltage Distribution of Winding

2009 IEEE PES General Meeting Rejected Papers:

09GM0923 Determination of Partial Discharge Location in Power Transformers Using Bayesian Network and Fuzzy ARTmap Neural Network

09GM1500 Dielectric Properties of Natural Esters and their Influence on Transformer Insulation System Design and Performance - An Update

2010 IEEE PES T&D Conference & Exposition

New Orleans, LA USA

April 19 thru 22, 2010

Theme: Smart Solutions For A Changing World

Paper submission closed: August 25, 2009

Authors will be notified (accept, reject or revised) by: November 23, 2009

21 papers submitted, 0 accepted, 0 rejected

Conference Paper:

Transformers Committee

2010TD0020 Detection of Inrush Current Using S-Transform and Probabilistic Neural Network

2010TD0225 Transformer diagnosis using probabilistic vibration models

2010TD0272 Review of Recent Changes to Mineral Insulating Oil Specifications

2010TD0276 Experimental Research of Vibration Sweep Frequency Response Analysis to Detect the Winding Deformation of Power Transformer

2010TD0294 Detection of Inrush Current Based On Wavelet Transform and LVQ Neural Network

2010TD0300 HPLC method for the study of degradation products of cellulosic insulation materials in a power transformer

2010TD0311 Investigating Short-circuit in Power Transformer Winding with Quasi-static Finite Element Analysis and Circuit-based Model

2010TD0387 Methods to improve cycle of vacuum-drying process for power

transformers

2010TD0409 Design of a Planar Power Transformer for High Voltage, High Frequency Use

2010TD0424 Investigation of EMTP Transformer Model for TRV Calculation after Fault Current Interrupting by Using FRA Measurement

2010TD0475 On-Site Methods for Reliable Moisture Determination in Power Transformers

2010TD0492 Utilizing Piecewise Linear Approximation and Harmonic Regression to Analyze Power Transformer Insulating Oil On-Line Dissolved Gas Samples

2010TD0521 Thermal Modeling of Electrical Utility Transformer Using Finite Element Modeling Technique and Thermal-Electrical Analogy

2010TD0528 Moisture in Transformers and Online Dryer Performance

2010TD0607 New consolidated findings in use of Maintenance Free Breathing Systems for Transformers

2010TD0636 Improvements for the Drying and Insulation of Power Transformers with Related Technology

2010TD0649 Development of a Fluid Structure Interaction Tool for the Study and Prevention of Transformer Tank Explosions

2010TD0687 Distribution Transformer Incorporating External Vacuum Fault Interruption Switch for Fault Protection

2010TD0691 The Use and Advantages of Amorphous Metal in Distribution Transformers

2010TD0711 Transformer Diagnostics using Frequency Response and Terminal Impedance Analysis

2010TD0726 Environment Friendly Power Transformer Technologies

IEEE PES Calendar of Upcoming Events

2010

T&D Conference and Exposition (Sponsored by PES)

April 20 - 22, Morial Convention Center, New Orleans, LA, USA,
Contact Tommy Mayne, 30523 Woodland Dr., Lacombe, LA 70445, +1 504 427 3390, fax +1 985 882 8059, t.w.mayne@ieee.org Web: <http://www.ieeeet-d.org>

IEEE PES Conference on Innovative Smart Grid Technologies

January 19-21, 2010, NIST Conference Center, Washington D.C. (Metro)

A forum for the participants to discuss the state-of-the-art innovations in smart grid technologies. The

Conference will feature special sessions and tutorials by international experts on smart grid applications.

2010 PES General Meeting
July 25 - 30, 2010
Minneapolis, Minnesota USA
Theme: "Power Systems Engineering in Challenging Times"

The 2010 PES General Meeting call for papers has been posted on the IEEE/PES Call for Papers web page.

Minneapolis Convention Center, 1301 Second Avenue South, Minneapolis, Minnesota 55403, 612-335-6000

Hilton Minneapolis, 1001 Marquette Ave, Minneapolis, Minnesota 55403, 612-376-1000

Notable Presentations

Including selected panel sessions, plenaries, special technical sessions, presentations with audio (*new!*), focused technical meetings, and other roundtables and forums.

"Robert's Rules of Order" Program

Copies of "Robert's Rules Of Order Newly Revised", "In Brief" are available upon request.

IEEE/PES Transformers Committee
Standards Subcommittee Meeting
October 28, 2009 Lombard, IL, USA

1. Opening Remarks

- a. Chair, William Bartley summarized the recent activities at the ADCOM meeting that resulted in the approval for issuance of **Transformers Committee Organization & Procedures Manual – April 2009** to the PES. The O&P Manual is posted on TC website (Link is: www.transformerscommittee.org/info/OPMan04-2009.pdf).
- b. The O&P Manual has a procedure for publishing papers which requires updating. A volunteer is requested to update the section “12.2 EVALUATION AND PRESENTATION OF TECHNICAL PAPERS” with respect to copies, distribution, and use of electronic tools, in lieu of present hard copy process.
- c. The Transformers Committee (TC) is also seeking recommendations for methods and means to store and archive the electronic data, other than floppy disks and hard drives. The Chair will be working with the PES Standards Coordinating Council, and other PES Standards committee chairs (such as Switchgear) etc to determine the IEEE PES storage / archive procedure for the TC.
- d. The **Fall 2009 Standards Report** website location will be presented in detail at the Oct 29 main meeting. (The link is; <http://www.transformerscommittee.org/meetings/F2009-Lombard/Minutes/F09-StandardsReport.pdf>).
- e. The IEEE TC requirements to have quorum present was reiterated.

2. Meeting Attendance

The Standards Subcommittee met on Wednesday, October 28, 2009, at 4:30 PM. A preliminary count of members (requested to stand if believed to be member) showed 25 members in attendance. (At the meeting this was not believed to be a quorum; however, business as usual was conducted). The meeting roster was circulated.

Postscript – After the meeting a verification of the roster and role status regarding members was conducted and subsequently determined that a quorum was present. Based on an email verification; there were (5) members that were in attendance, but did not sign roster; and (10) that were shown as members, did not attend and have graciously agreed to be changed to a Guest role; and (4) attending guests that have requested member status; therefore, the SC Standards really did have a quorum present.

The final count shows 38 Guests, and 33 Members participated in the Fall 2009 SC Standards meeting.

3. Approval of previous meeting minutes

Vice Chair motioned for approval of the previous meeting minutes. The meeting minutes from the Spring 2009 meeting in Miami, Florida were approved as posted.

4. Working group reports.

- a. **Cont. Revision of C57.12.00** – Bill Bartley reported the present status as ballot resolution continues, and that shortly the standard would be re-issued for recirculation. The Standards SC Chair recognized and thanked Dong Kim for the efforts over the past several years; and also announced a change of Working Group Chair to Steven Snyder going forward.
- b. **Cont. Revision of C57.12.90-2006 – S. Antosz-** The status of C57.12.90 is effectively ready for joint recirculation with C57.12.00. The negative ballot from last recirculation has been resolved.
- c. **PC57.12.70 Terminal Markings Revision – S. Shull** – The quorum (6 of 11 members) reviewed examples provided by Chuck Simmons. Volunteers committed to check with manufacturers to provide additional examples coming from customers. Changes in the drawings will be made by WG Chair after considering the comments of the Chuck Simmons and Dr. Juan Balda.
- d. **PC57.12.80 – Terminology for P & D Transformers – B. Chiu** The status is in ballot resolution. Reference temperature has been requested to be added. Core reference Temperature has also been requested to be added. The presentation will be in the folder WG PC57.12.80 on the TC website

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- e. **WG on Revision of IEEE C57.152 (old 62) –Jane Verner** – Total of 66 were in attendance including 32 members, (including 4 requesting membership) and 34 guests at this sixth meeting. The Spring 09 meeting minutes were approved.

Three web meetings here held, since the last formal meeting, achieving progress in several key areas towards a revised standard; Excitation Current, Infrared Testing, Visual Inspection & Ratio/ Polarity/ Phasing.

A new section on Tank Vacuum Testing by Dharam Vir was discussed. It was determined that the section was not properly named and should focus on vacuum filling in the field as referenced by clause 4.8.1 of C57.93. Comments will be incorporated.

Section 6.1.2 - Ratio/ Polarity/Phase was revised after the comments of the September 15th web meeting by John Herron. The section was revisited. The group agreed to call the “test meter current ” rather than “test meter excitation current”.

Jeff Foley and Paul Salvato gave interpretation comments on 6.1.2.4 with two different connection charts for TTR. Jeff and Paul will have further discussion on the charts with Peter Werelius to combine them into one chart.

Section 6.1.7 - Induced Voltage Test was assigned to Kirk Robbins and Jim McIver.

A third draft of PC57.152 was issued to WG and has been posted on the web. The draft will be updated to include the sections above. Volunteer assignments to review various sections were made and are included on a separate spreadsheet. Draft 4 in Word format with track changes, and a clean version (with changes accepted) will be posted by Dec 1.

- f. **TASK FORCE on IEEE-IEC CROSS REFERENCE – J. Sim** - the following progress was reported:

IEC 60076-1/C57.12.00/C57.12.90 – comparison will move forward even though new edition is not complete.

IEC 60076-3/C57.12.00/C57.12.90 – reassigned

IEC 60076-5/C57.12.00/C57.12.90 - volunteered for this review

IEC 60076-7/C57.91 – reassigned

IEC 60559/C57.104 – has been reassigned

IEC 60076-2 Annex D/PC57.130 – has been reassigned

A comparison of ASTM to IEC regarding materials may also be included.

The complete project list, cross reference list and assignments are available in the folder for the Task Force on IEEE-IEC Cross.

- g. **TASK FORCE on IEEE-IEC Harmonization – Jeewan Puri** - first meeting held with 6 members and 16 guests present. The following points were discussed:

- The main purpose of this meeting was to develop a scope statement for this working group. J. Puri explained that there is a need among the IEEE standards developers to understand the process and the expected deliverables of the IEEE & IEC Standards Harmonization.
- Jodi Haasz of IEEE Standards reviewed with the group the help that she and her colleagues can provide for obtaining any permissions needed for obtaining any IEC information for inclusion in our standards. She also reviewed the process for developing the Dual Logo documents.
- J. Puri explained to the WG participants that there is a need for a clear policy toward developing IEEE Standards that have worldwide recognition. The WG agreed that this is the right approach for developing IEEE Standards in the future and that this should form the basis for our harmonization efforts.

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- J. Puri reviewed his proposal for the Scope Statement for this WG. It was agreed that this proposal should be sent to all the WG participants for their comments. These comments will be discussed in our next meeting.
- Paul Jarman (Chairman IEC TC 14) proposed that the contacts should be identified in IEEE and IEC organizations for information flow on projects that are being worked on in the two standards making bodies.
- It was agreed that J. Puri's proposal for the Scope Statement will be circulated among the WG participants for their input and their comments. These comments will be discussed in the next WG meeting. The next step will be to write an outline of a position paper on the subject of harmonizing IEEE and IEC standards.

h. C57.144 - Guide to Metric Conversion of Transformer Standards – Peter Balma – The reaffirmation is in progress, the balloting was launched early October, and no negatives had been received as of Oct 28, 2010 per, as reported by Bill Bartley for Peter Balma

5. Old Business

Task Force - Class I / Class II – Gael Kennedy - The Standards Subcommittee Chair advised that this topic is also under review by Dielectric SC. Being the Dielectric SC is primary on this topic, the Standards SC Task Force will defer this topic. pending Dielectric SC review. Task Force did not meet.

6. New Business

No new business was raised.

7. Adjournment

The motion to adjourn by Chair made and hearing no objections; the meeting adjourned around 5:30PM.

Respectfully Submitted

Kipp J. Yule

Standards SC



Status Update for
PC57.12.80
Revision to Standard Terminology for Power
and Distribution Transformers

October 28, 2009
Lombard, Illinois



Progress Update

- | | | |
|--------------------|---|---|
| Complete | } | <input checked="" type="checkbox"/> Withdraw Amendment PAR |
| | | <input checked="" type="checkbox"/> Request New PAR for Revision |
| | | <input checked="" type="checkbox"/> Respond to NesCom Questionnaires and gain approval for new PAR |
| | | <input checked="" type="checkbox"/> Solicit and Receive Inputs from Committee Activity Leaders (basis of WG membership) |
| | | <input checked="" type="checkbox"/> Form Ballot Pool, Form Working Group, Develop Draft1 |
| | | <input checked="" type="checkbox"/> Discuss the proposed changes and gain buy-in from WG |
| | | <input checked="" type="checkbox"/> Update Draft1 to reflect comments/Feedback from WG (Draft 2) |
| | | <input checked="" type="checkbox"/> MEC – Mandatory Editorial Coordination |
| | | <input checked="" type="checkbox"/> Update Draft2 to reflect comments/Feedback from MEC (Draft 3) |
| In Progress | } | <input type="checkbox"/> Initiate ballot on Draft 3 |
| | | <input type="checkbox"/> Resolve Comments |
| Future | } | <input type="checkbox"/> Re-circulate Ballot |
| | | <input type="checkbox"/> Submit to RevCom for Approval |



Working Group Membership

- Bill Chiu (Chair)
- Ramsis Girgis
- James Graham
- William Henning
- Michael Lau
- Thomas Lundquist
- Dennis Marlow
- Richard Marek
- Donald Platts
- Paulett Payne
- Thomas Prevost
- Jeff Ray
- Timothy Raymond
- John Rossetti
- H. Jin Sim
- Steven Snyder
- Jane Ann Verner
- Loren Wagenaar



3

Reference Temperature Dry Type General Requirement (C57.12.01-2005)

The term “reference temperature” appears seven times with two different definitions.

•5.11.5 Reference temperature for efficiency, losses, impedance, and regulation

The reference temperature for which efficiency, losses, impedance, and regulation are stated shall be the rated average winding temperature rise plus 20°C.

•7.10 Calculation of winding temperature during a short circuit

T_r is the reference temperature, which is 20°C ambient temperature plus rated average winding rise



4

Reference Temperature Dry Type Test Code (C57.12.91-2001)

The term “reference temperature” appears twelve times with four definitions.

- **5.3 Conversion of resistance measurements**
Cold-winding resistance measurements are normally converted to a standard **reference temperature** equal to rated average winding temperature rise plus 20°C. In addition, it may be necessary to convert the resistance measurements to the temperature at which the impedance-loss measurements were made.
- **9.2.2 Temperature**
Load losses are also a function of temperature. The I^2R component of the load losses increases with temperature, while the stray loss component decreases with temperature. Procedures for correcting the load losses and impedance voltage to the standard **reference temperature** are described in 9.4.1.
- **10.8.1 Preparation for tests**
c) Temperature of the transformer near the **reference temperature of 20°C**.
- **15.1 Reference temperature**
The **reference temperature** for determining total losses, voltage regulation, and efficiency shall be equal to the sum of the highest rated winding temperature rise plus 20°C.



Reference Temperature Liquid Filled General Requirement (PC57.12.00/D2-2008)

The term “reference temperature” appears eight times with five different definitions.

- **5.9 Total losses (page 21)**
 - The standard **reference temperature** for the load losses of power and distribution transformers shall be 85 °C.
 - The standard **reference temperature** for the no-load losses of power and distribution transformers shall be 20 °C.
- **7.4 Calculation of winding temperature during a short circuit (Page 52)**
 T_r is the reference temperature, which is 20 °C ambient temperature plus rated average winding rise
- **8.4 Determination of transformer regulation (Page 57)**
Regulation calculations shall be based on a reference temperature equal to the rated average winding temperature rise, plus 20°C.
- **8.7 Certified test data (page 59)**
NOTE 3—All temperature sensitive data should be reported after correcting to reference temperature (defined in 14.1 of IEEE Std C57.12.90) except no-load losses (see 8.4 of IEEE Std C57.12.90).



Reference Temperature

Liquid Filled General Requirement (PC57.12.90/D8-2008) 1 of 2

The term "reference temperature" appears twenty-one times with multiple definitions.

- **5.2 Conversion of resistance measurements**
Cold winding resistance measurements are normally converted to a standard **reference temperature** (Ts) equal to the rated average winding temperature rise plus 20 °C.
- **8.4 Temperature correction of no-load losses**
A **reference temperature** is required when stating no-load losses because the no-load losses vary with core temperature. The standard reference temperature Tr for transformer no-load losses is specified in 5.9 of IEEE Std C57.12.00-2006. However, ordinary variations of temperature encountered when performing the no-load loss test will not affect no-load losses materially, and no correction for temperature needs to be made, so long as the following conditions are met:
 - The average oil temperature is within $\pm 10^{\circ}\text{C}$ of the **reference temperature** Tr.
- **9.2.3 Temperature**
Load loss values are also a function of temperature. The I²R component of the load losses increases with temperature, whereas the stray loss component decreases with temperature. Procedures for correcting the load losses and impedance voltage to the standard **reference temperature** are described in 9.4.2.
- **9.4 Calculation of load losses and impedance voltage from test data**
Load losses and impedance voltage measurements vary with temperature and, in general, shall be corrected to a **reference temperature**. In addition, load loss measurement values shall be corrected for metering phase angle error.



Reference Temperature

Liquid Filled General Requirement (PC57.12.90/D8-2008) 2 of 2

- **10.11.1 Preparation for tests**
d) Temperature of windings and insulating liquid near the **reference temperature** of 20°C
- **14.1 Reference temperature**
The **reference temperature** for determining load losses, voltage regulation, and efficiency shall be equal to the sum of the rated average winding temperature rise by resistance plus 20°C.
- **14.2.2 Load losses**
Load losses shall be determined for rated voltage, current, and frequency and shall be corrected to the **reference temperature** (14.1).
- **14.3 Efficiency**
The efficiency of a transformer is the ratio of its useful power output to its total power input: When specified, efficiency shall be calculated on the basis of the **reference temperature** for the average winding temperature rise of the transformer.
- **14.4.2 Reference temperature**
When specified, voltage regulation calculations shall be based on the **reference temperature** described in 14.1.
- **14.4.3 Load loss watts and impedance volts**
The load loss watts and impedance volts used to compute voltage regulation are derived from the measurement of the factors described in 9.2 corrected to **reference temperature** described in 9.4.



Proposed New Definitions

- **Reference Temperature for No-Load Losses**
The no-load losses of power and distribution transformers shall be determined based on a reference temperature of 20 °C.
- **Reference Temperature**
Unless otherwise stated, the reference temperature shall be defined as 20°C plus the rated average winding rise. For multiple winding transformers that have more than one base rated average winding rise, the highest average winding rise shall be used to determine the reference temperature.



6.0 Recognition and Awards – Chair: Donald J. Fallon

6.1 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:

<u>Name</u>	<u>Transformers Committee Award</u>
<u>Project Awards:</u>	
Alan Traut	Chair, IEEE C57.12.23-2009 Revision
Bikash Kanti Basu	Vice Chair, IEEE C57.12.23-2009 Revision
Paul Eric Boman	Reaffirmation of IEEE C57.111-1989 (R2009)
Giuseppe Termini	Chair, IEEE C57.12.24-2009 Revision
Ali A. Ghafourian	Co-Chair, IEEE C57.12.38-2009
Michael D. Faulkenberry	Co-Chair, IEEE C57.12.38-2009
Ross D. McTaggart	Co-Chair IEEE C57.13.5-2009 Revision
Pierre Riffon	Co-Chair IEEE C57.13.5-2009 Revision
Craig A. Colopy	Co-Chair, IEEE C57.15-2009 Revision
Gael R. Kennedy	Co-Chair, IEEE C57.15-2009 Revision
<u>Service Awards:</u>	
Thomas Callsen	Host - Fall 2009 Meeting, Lombard, IL
Ramsis S. Girgis	Chair, Performance Characteristics Subcommittee (2002-2009)
Richard K. Ladroga	Chair, Insulating Fluids Subcommittee (2006-2009)
Kenneth S. Hanus	Chair, Distribution Transformers Subcommittee (2006-2009)
Kenneth S. Hanus	Chair, IEEE/PES Transformers Committee (2004-2005)
Donald J. Fallon	Chair, IEEE/PES Transformers Committee (2006-2007)
John C. Sullivan	Chair, IEEE C57.12.01 Working Group (2001-2008)
Peter M. Balma	Outstanding Contribution to the Committee – Committee O&P Manual Development

The Project Awards above related to document completion are prepared by the Committee upon approval by the IEEE SA Standards Board (IEEE SA SB) of the balloted document. Continuing the process initiated at our meetings last year, we are including Reaffirmations with these Awards, as Reaffirmations can involve substantial effort and are an integral part of the process of maintenance of IEEE Standards documents.

6.2 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. We will recognize the following IEEE SA SB Award recipients in Lombard:

IEEE SA SB Award Recipients:

<u>Name</u>	<u>IEEE SA SB Award</u>
Alan Traut	Chair, IEEE C57.12.23-2009 Revision
Bikash Kanti Basu	Vice Chair, IEEE C57.12.23-2009 Revision
Giuseppe Termini	Chair, IEEE C57.12.24-2009 Revision
Brian Klaponski	Certificate of Appreciation , IEEE C57.12.24-2009 Revision
Paulette Payne Powell	Chair, IEEE C57.12.51-2008
Derek Foster	Certificate of Appreciation, IEEE C57.12.51-2008
Charles Johnson, Jr.	Certificate of Appreciation, IEEE C57.12.51-2008
Sheldon Kennedy	Certificate of Appreciation, IEEE C57.12.51-2008
Richard Marek	Certificate of Appreciation, IEEE C57.12.51-2008

6.3 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.

6.4 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.

6.5 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. Each Technical Council Committee is urged to submit one electronic copy of nominations for each of these awards no later than November 27.

Please forward suggestions for nomination for the next (2010) PES WG Recognition Award to my attention, ASAP, so a nominee can be selected and forwarded to PES in November.

6.6 Transformers Committee Meritorious Service Awards

In 2008 we initiated 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 (individual contact for nominees, to maintain an element of surprise). Award nominees will be reviewed by the Awards Chair and the SC Officers. One Award for Outstanding Contribution to the Committee will be presented at this Meeting in Lombard (see Clause 6.1).

6.7 Member Certificates

We will continue with the process, approved by Committee Officers and implemented at the Miami Meeting, of providing a framed Certificate, certifying Membership in the Committee, to new Members. The intent is to provide a symbol of recognition of Membership status, in a format suitable for display. The Certificate will indicate date of acceptance into the Committee, and will be signed by the Committee Chair. The Officers have also approved a plan to similarly recognize all Committee members with a framed Membership Certificate. With the Committee Membership total presently at 236, preparation and presentation of these Certificates is expected to take 4 to 5 Meetings. We will include the best estimate of Membership year on the Certificates. As record of acceptance dates is sketchy at best, we will rely on the recollection of Members when records are not available. The first batch, including 58 Certificates, will be distributed in Lombard. At the discretion of the Awards Chair, the initial recipients were chosen from the first 50 or so Committee Members registered for this Meeting (early registration pays off, in addition to the discount!), and from among the ranks of Committee and Subcommittee Officers. We will set up a process for contacting all Committee Members for their recollection of the year they attained Membership. Your cooperation in responding will facilitate preparation

of all these Certificates within the next two years. 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.

6.8 Nominations for IEEE, PES, and Technical Council Awards

There are no nominations in these categories at this time. Regarding IEEE Fellow Nominations, we're unfortunately getting close to missing the opportunity for preparation of nominations for the 2011 Class of IEEE Fellows. Borrowing from the IEEE Awards web pages (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. Ramsis Girgis had provided some practical suggestions on how to get the Fellow nomination process moving:

- Poll Committee Members who have been IEEE Senior members for at least 10 years to determine their interest in possible nomination for Fellow grade. If interested, these Members can submit an outline of their qualifications
- Submit names/qualifications to a small team of IEEE Fellows from within our Committee membership
- Review/recommendation by the Committee Fellow team advising which nominations should proceed.

Unfortunately my focus on this task has been a bit diverted as we prepared to implement the Member Certificate program. We'll attempt to make some progress before March 2010, and will keep you posted as we start this process.

Recognition and awards provide motivation and encouragement to our members to perform at their highest level, and provide a welcome reward to those who do. Recognition should not be given lightly, but the accomplishments, talents, and dedication of many of our members and participants are worthy of recognition – we should look for more opportunities for appropriate recognition. Please bring any other suggestions you might have for additional recognition and/or awards to my attention.

Respectfully submitted,
Donald J. Fallon
Chair, Awards Subcommittee

MINUTES OF THE MEETING OF THE HVDC CONVERTER TRANSFORMERS & SMOOTHING REACTORS S.C. IN LOMBARD, ILLINOIS, OCTOBER 26, 2009

The HVDC Converter Transformers and Smoothing Reactors S.C. met on Monday, October 26, 2009 from 1:45 p.m. to 3:00 p.m., in the Cypress A/B Meeting Room of the Westin Lombard Yorktown Center in Lombard, Illinois. There were 10 members and 12 guests present. One guest requested membership. The following are highlights of the meeting:

1. Introductions were made.
2. No patent issues were raised.
3. The minutes of the SC meeting in Miami were approved.

Note: The minutes of the Lombard meeting of the SC will not be approved until the SC meeting in Houston, Texas.

4. The Chairman briefed attendees on the highlights of the Administrative SC meeting.
5. The remainder of the meeting focused on the IEEE ballot of Draft #5 of the Revision of IEEE 1277; 2 negative ballots (Ballot Group 50, Returned 38, Negative 2) and approved with comments ballots. A recirculation ballot will be required to address the negative ballots.
 - (i) Since a recirculation ballot is required to address the negative ballots, the comments received with approved ballots can be included in Draft #6. If this is done, can those individuals in the ballot group who did not vote in the initial ballot vote in the recirculation ballot? RFD will check with Mat Ceglia.
 - (ii) Dates on referenced standards will be removed unless a specific clause etc. is cited. This "mixed" approach will be confirmed with IEEE by the Chairman.
 - (iii) Notes in tables will be converted to footnotes to ensure the information is normative vs. informative. Is it equally valid to enclose the notes in the table? The Chairman will check with IEEE.
 - (iv) J. Marlow's Negative ("Must Be Satisfied") was rejected as "guide" type information is necessary and was included in the previous edition of the standard.
 - (v) D. Sharma's Negative ("Must Be Satisfied") re the notes in 12.12.3 was accepted; informative material in the notes will be integrated into the main text as normative information.

- (vi) D. Sharma's Negative ("Must Be Satisfied") re the NOTE at the end of 11.3 was rejected. The NOTE must remain where it is. It gives background information re the polarity reverse test and will not have the same impact in the "Introduction".
- (vii) D. Sharma's Negative ("Must Be Satisfied") re eliminating dates on referenced standards has merit. Dates will only be used if specific clauses, equations are referenced.
- (viii) J. Riboud's Affirmative with comment re liquid-immersed was not accepted. The scope of the standard is oil-immersed. Consideration can be given to including other liquids at the time of the next revision.
- (ix) J. Riboud's Affirmative with comment re cooling classes was accepted; ODAF will be added in addition to OFAF in clauses 6.6.1.2, 6.6.1.3 and 6.6.1.4. Titles of all clauses in 6.6 will be changed from "Liquid-immersed" to "Oil-immersed".
- (x) J. Riboud's Affirmative with comment re covers in clause 7.1.2. is accepted; bell type covers are available.
- (xi) J. Riboud's Affirmative with comment re nameplate location was accepted; "the nameplate shall be located on the main tank near the control cabinet".
- (xii) Lars-Erik Juhlin's Affirmative with comment re clause 12.4.4.2 was accepted; the title of the clause will be changed to reflect the measurement of ambient temperature "Containers for thermometers used to measure ambient temperature".
- (xiii) Lars-Erik Juhlin's Affirmative with comment re the use of the word "end user" was accepted; "purchaser" will be used as the "end user" may not be the "purchaser".
- (xiv) Lars-Erik Juhlin's Affirmative with comment re clause 6.4.3 and 9.2.1.1 was accepted, the tolerance on inductance and minimum inductance should include overload conditions as applicable or as specified by the purchaser.
- (xv) Lars-Erik Juhlin's Affirmative with comment re cooling class was accepted; clause 6.6.1.3 etc. This standard covers oil-immersed SMRs only and liquid-immersed will not be used. Also in clause 6.6.1.3 b) it should read oil-immersed self cooled / water cooled class ONAN/OFWF.

The Chairman agreed to make all changes and produce Draft #6. This will be sent to SC/WG members for approval/comment and then submitted for recirculation ballot. The objective is to complete the "recirculation" before year end so that Draft #6 can be sent to the Standards Board for approval at their March 23 meeting; submission deadline is February 12, 2010.

The meeting adjourned at 3:00 p.m.

R. Dudley
:cb
(08241)

8.2 Instrument Transformers – J. Smith – Unapproved Minutes

Chair's Remarks & Announcements

The Instrument Transformer Subcommittee met on Wed Oct 28 at 8:00 AM
6 members and 20 guests attended. The meeting was chaired by J. Smith

The previous meeting's minutes were approved as written and there were no
Patent issues.

The next meeting is scheduled for March 7 - 11 in Houston, Texas

8.2.1 Presentation on mA Current Transformers – H. Alton & V. Nguyen

This presentation explained the concept and application of small form factor CT's
with low secondary current designed to fit in metering panels up to 600V. There
is presently no standard covering such devices and the presenters were seeking
the cooperation of the ITSC to include this type of CT in the C57.13 series. In the
ensuing discussion it was recommended that Protection applications also be
included and that there was no reason to limit the applications to 600 V. A
motion was made to create a WG to write a new standard C57.13.7 and it was
approved by vote. The WG Co-chairs will be H. Alton and V. Nguyen. J. Smith
said he would arrange a meeting time for the Houston meeting. He also offered
to invite representatives of NEMA to join the WG.

8.2.2 Working Group Reports

8.2.2.1 TF on Bushing and Instrument Transformer Partial Discharge

The task force on Partial Discharge in Bushings, VTs & CTs met on Monday
October 26th, 2009, at 3:15pm with 35 attendees with 12 requesting membership
and 23 guests.

- The meeting was opened with patent disclosures and introductions.
- The agenda for the meeting included a presentation by Prof. Lemke regarding
the theoretical aspects on partial discharge measurements using balanced
bridge, single-ended connection and a combination of these methods. The
advantages and disadvantages for each of the methods were discussed.
- This presentation was followed by comments on laboratory experience and
troubleshooting on PD measurements by Reiner Krump.
- The question was asked to the audience whether a guide for PD
measurements on bushings and instrument transformers is needed as a
separate document from the PD measurements in transformers and what it's
needed. The consensus was affirmative, with no objections.

- The scope for the guide is to provide recommendations on the partial discharge measurements for factory acceptance tests. It does not include interpretation of test results or PD tests performed in the field.
- Meeting was adjourned at 4:30 pm.

8.2.2.2 PAR P1601 Optical Current and Voltage Sensing Systems - F. Rahmatian (TC/ITSC) and H. Gilleland (PSIM)

This WG did not meet in Lombard but F Rahmatian reported that the draft had been balloted and received 90 % positive votes with a 75% response. More than ½ of the comments on the negative ballots have been addressed. An extension to the PAR has been requested as it will expire soon.

8.2.3 New Business

8.2.3.1 C57.13.2 & C57.13.6

These 2 standards are due to expire in 2010. J. Smith made a proposal to reaffirm them both. There was a question about whether they could instead be incorporated into C57.13 but, since they would expire before this could be done, they need to be reaffirmed. The reaffirmation may include proposed changes for the following revision, which would require setting up a WG. The group agreed to the reaffirmation proposal.

8.2.3.2 WG Member Participation

In the new operating manual issued by the Administrative Subcommittee, the requirements for Subcommittee membership have become more stringent. To be eligible it is now necessary to be an active participant for 2 years. To be considered an active participant it is required to contribute to discussion and to respond to surveys, etc – not simply to attend. Based on this, the chairperson will be reviewing the ITSC membership and anyone who is not participating will be designated as a guest.

8.2.3.3 C57.13 Survey - Quality of Comments

J. Smith explained that when submitting comments on clauses in a specification, a specific change, revised wording, alternative clause or other concrete course of action must be proposed. Simply saying that a clause or section needs more work is not sufficient.

A 2nd time slot to review comments was recommended for the next meeting.

8.2.4 Adjournment

UNAPPROVED MINUTES
SC Insulating Fluids Meeting
October 28, 2009
Lombard, Illinois

8.3. Insulating Fluids Subcommittee (Susanne J. McNelly, Chair, Jerry Murphy Vice-Chair, C. Patrick McShane, Secretary)

8.3.1. Introduction/Attendance

The Insulating Fluids Subcommittee meeting in Lombard, IL was called to order by the Chair at 3 PM on Wednesday, October 28, 2009. All of the officers of the SC were present. There were of 21 of 33 members present (quorum was achieved) and 45 guests present. The following guests requested membership:

Claude Beauchemin	Timothy Daniels
Rick Dong	Martin Navarro
Oleg Roizman	David Sundin

Claude Beauchemin, Oleg Roizman, and David Sundin will be added as subcommittee members. The remainder will be considered after the Spring 2010 meeting based on continued attendance and participation in the SC.

8.3.2. Introduction/Attendance, S09 Minutes Approval, & Patent Disclosure Request

As required the IEEE patent disclosure requirements were discussed and a request was made for disclosure of any patents that may be related to the work of the subcommittee. No new disclosures were forthcoming.

The Minutes of the Spring 2010 Miami, Florida meeting were approved as written.

8.3.3. WG & TF Reports Presented at the SC Meeting

8.3.3.1. C57.104 – IEEE Guide for the Interpretation of Gases Generated in Oil – Immersed Transformers.

WG Chair: Rick Ladroga,
WG Secretary: Sue McNelly
Tuesday, October 27, 2009, Lombard, Illinois

Report Given at the Sub-Committee Meeting:

Status of C57.104: The Guide has been published and is now available. Rick expressed thanks to those who worked to get the new Guide in place after it had previously been withdrawn.

A PAR for the Scope and Purpose was determined at the Spring 2009 meeting was submitted October 26th. Task force status reports were given and are detailed in the meeting minutes below.

Minutes (unapproved) of WG Meeting as Submitted:

The meeting was called to order by Chair Rick Ladroga at 1:45 pm. Secretary Susan McNelly was also present. There were 28 of 60 members present, 47 guests, and 12 guests requesting membership. The membership list was pared down based on attendance of a minimum of 2 of the

past 4 meetings. Since it is important to have the ability to achieve a quorum during WG meetings, new working group members will only be added when they indicate a willingness to participate and contribute to the WG effort. Attendance at meetings alone is not sufficient for membership consideration. Members presently on the list that do not in the course of development of the Guide participate and contribute, will be removed prior to the final draft being sent for ballot.

Guests requesting membership were:

Vivek Bhatt, Tim Daniels Rick, Dong Joe Foldi, Jefferson Foley, Jesse Inkpen*, Mark McNally Kent Miller, Jow Ortiz, Verena Pellon ,Charles Sweetser, Ajith Varghese

All of these guests requesting membership have been added to the WG roster as members. However, membership in the WG requires both participation and attendance unless other arrangements for corresponding membership have been made. Existing members of the WG may be removed due to non participation at any time.

Agenda

1. Welcome
2. Introduction
3. Approval of Minutes from Spring 2009 Porto, Portugal Meeting
4. Patent Disclosure
5. C57.104 – NEW GUIDE
 - a. PAR submittal (Scope and Purpose)
 - b. Task Force Reports:
 - DGA in Arc Furnace Transformers - Tom Lundquist
 - Framework Structure - Jim Dukarm
 - Data - Norman Field
 - Case Studies (Q – Existing – SDM, ABB, DOBLE, WEIDMANN, etc) - Brian Sparling
 - Diagnostic Studies – open
6. New Business

Approval of minutes from the Spring 2009 meeting in Miami, Florida was requested. The minutes were approved as written.

The IEEE Patent disclosure requirements were discussed and a request was made for disclosure of any patents that may be related to the work of the WG. There were no responses to the request for disclosure.

Status of C57.104: The Guide has been published and is now available. Rick expressed thanks to those who worked to get the new Guide in place after it had previously been withdrawn.

Rick Ladroga reviewed the membership requirements for the WG which have been identified above. He indicated that we need to make sure that those that are listed as members are working on the Guide and contributing. He welcomes those that wish to become WG members, but indicated that WG members will be expected to participate and contribute to the new Guide.

Rick announced that a PAR for the Scope and Purpose determined at the Spring 2009 meeting was submitted October 26th.

New Guide:

Task Force reports:

DGA in Arc Furnace Transformers – TF Chair Tom Lundquist

Tom Lundquist presented a presentation on the percentile values of DGA in arc furnace transformers. An annex will be added to the C57.104 gas guide. Tom outlined the data that was requested, received, and processed. The data was separated by fluid type (i.e. RTemp, mineral oil, Silicone, and a small insignificant number with NE).

Tom addressed the size effect, indicating that the data was broken down into 20MVA and larger and 19MVA and smaller categories. The only significant difference was that the smaller units had 17ppm higher Hydrogen.

Tom indicated that the 90th percentile numbers from the data collected are what is proposed to be included in the annex.

Claude Beauchemin requested that those with nitrogen blanket be separated out in the data. Tom indicated that almost all of the transformers in the data set were nitrogen blanket type units.

Tom Prevost indicated that one of the things we should look at is that the numbers are not that far out of what would be seen for the general transformer population. He indicated that it may not be necessary to separate the arc furnace units out from other transformers. The only item somewhat different is the acetylene value, which could be handled with a note.

Framework – TF Chair Jim Dukarm

Jim discussed where we have been and that for the past year we have expended most of our effort into getting a document out for use as an interim Guide. Jim indicated that the idea of not having a Table 1 has been pretty well put to rest. He indicated that we are going to have to have something for values provided in the new Guide, perhaps as ranges of values, rather than absolute limits.

Jim indicated that he would like to have a document that is well organized and useful to new engineers just starting out.

Transformer Size discussion – Tom Prevost

Tom Prevost has done some research and has seen some difference in CO and CO₂ values between large and small transformers. He reviewed greater than 100,000 data points and will provide the paper supporting his work for posting on the web site.

He broke the data into 25kVA, 1000kVA, and 20,000kVA categories based on oil/paper ratios. Tom indicated that he would send the data to Jim Dukarm and have him run some statistical analysis of the data. Tom expects that with the huge data set, that once the outliers are removed, there won't be a significant difference. Tom indicated that the IEC guide gives a range of values for each gas rather than a set limit. Tom indicated that the CO and CO₂ values were higher for the smaller units.

Tom indicated that the challenge will be that the equipment information will be incomplete on the data submitted. He stressed that it is important for the data used to be as complete as possible.

Tom indicated that the most samples that he had from any specific unit was 5.

Tom indicated that CIGRE in the course of doing a project collects literature for inclusion in a bibliography. He indicated that we should start working on building a bibliography for the document. Rick asked if there was anyone willing to head up a new TF on putting together a bibliography. There were no takers.

A request was made that the names and contact information for the TF chairs be provided for people who wish to participate on one of the TFs.

Schedule:

1. Rick indicated that we need to kick start the new Guide to get things rolling. He suggested that initially bi-weekly meetings be held on Wednesdays. He would like to have input from Diagnostic Methods and data case studies by December 16th.
2. Issue compiled draft for WG TF review by Jan 13, 2010.
3. Continue meeting bi-weekly editing and refining in preparation for the Spring 2010 IEEE Transformers Committee Meeting in March.
4. Incorporate comments from the WG TF review and revisions by February 24, 2010.
5. Issue draft to entire C57.104 WG for review and discussion at the Spring 2010 meeting.

Task Forces:

Rick went through the TFs that are in place and the present chairs for each. He also indicated that anyone wishing to participate in the TFs should contact the Chairs of each.

1. Arc Furnace – Chair Tom Lundquist
2. Framework – Chair Jim Dukarm
3. Data – Chair Norman Field
4. Case Studies – Chair - Open
5. Diagnostic Methods – Chair - Open

The meeting was adjourned at 3:00 pm.

Rick Ladroga
WG Chair

Susan McNelly
WG Vice-Chair and Secretary

8.3.3.2. IEEE C57.121 Guide for the Acceptance and Maintenance of Less Flammable Hydrocarbon Fluids in Transformers. WG Chair: David Sundin

Report Given at the Sub-Committee Meeting:

The WG Chair advised that the reaffirmation vote results are pending. Nothing further to report.

8.3.3.3. IEEE C57.130 IEEE Trial-Use Guide for Dissolved Gas Analysis During Factory Temperature Rise Tests for the Evaluation of Oil-Immersed Transformers and Reactors. WG Chair: Fredi Jacob WG Secretary: Sue McNelly

Report Given at the Sub-Committee Meeting:

The WG has been inactive. The issue has been discussed by report was presented by Tom Prevost. He started with a background summary stating that the PAR was started in 2000. Draft 17 went to ballot on July 2006. 116 ballots produced 60 comments. So far the WG has been unsuccessful collecting additional data nor is there data to substantiate the values in Table 1. Tom does not believe

any further extensions will be granted due to the four years of inactivity. He suggested to let the PAR to expire, and submit a new PAR. A new effort to get data is needed. Many negatives related to different size transformers need to be addressed. A motion was made by Tom Prevost to have a new PAR submittal. Rick Ladroga seconded, and the motion was carried. Jim Thompson agreed to chair the new PAR submittal draft TF. Jin Sim stated that the data collecting must be done very carefully due to the low expected values, which makes it difficult to get similar test results between different labs. It was mentioned that Draft 17 was based on gas increase, not absolute gas values. Tom made a plea to transformer manufacturers to provide their heat run DGA data.

Minutes (unapproved) of WG Meeting as Submitted:

No WG meeting was held.

**8.3.3.4. IEEE C57.139 IEEE Dissolved Gas Analysis in Load Tap Changers.
WG Chair: Fredi Jacob WG Secretary: Sue McNelly**

Minutes (unapproved) of WG Meeting as Submitted:

Sue McNelly, WG Secretary, presented. Draft 12 would be going to ballot within a few weeks. The PAR is set to expire at the end of the year. A request for a 12 month extension was submitted. A PAR for continual refinement is in the planning stage. A question was asked if the requested extension of 12 months would be sufficient. Tom Prevost stated that the WG should not count on getting a longer extension as the one was granted previously.

**8.3.3.5. WG PC57.637 Guide for the Reclamation of Insulating Oil and Criteria for Its Use
Chair: Jim Thomson; Co-Chair: TV Oommen**

Report given at the Sub-Committee Meeting:

Jim Thompson stated that the PAR was approved in December 2008. There were no further comments or discussions.

Minutes (unapproved) of the WG meeting as submitted:

Unapproved Minutes Working Group Meeting PC57.637 October 27, 2009: The working group meeting was conducted at 8 am on October 27, 2009 with 22 people in attendance with 17 of the 19 working group members present. This document was reaffirmed in 2007 and the PAR for revision has been approved December 10, 2008. Working Group members Jim Thompson (chair) and TV Oommen (co chair) conducted the meeting. There was a request for patent declarations regarding the PC57.637 document and none given. The minutes were approved with no negatives. The discussion of the meeting included a) a name change of the guide include "mineral;" b) references to 40CFR761 for askeral trade names; c) reference to local guidelines for PCB handling and disposal requirements; d) leaving out the definition of natural esters from the draft language; e) including language to address high molecular hydrocarbons; d) posting the moisture tutorial from 2004 on the IEEE Transformer Committed website under the Insulating Fluids Subcommittee web site; and e) changing the draft to conform to the IEEE style guide. Assignments were made prior to the meeting for all sections except section 6.9 regarding choice of reclamation methods.

Respectfully submitted,

Chair Jim Allen Thompson

Co Chair TV Oommen

8.3.3.6. TF Natural Based Ester Fluids DGA Guide Development

Chair: Paul Boman, Secretary: John Luksich, 9:30 am Tuesday, October 27, 2009 4th meeting of the group.

Report given at the Sub-Committee Meeting:

Paul Boman made the presentation. The TF will apply a PAR to become a WG. Sue McNelly advised that the PAR draft was approved and forwarded to the Chair of the Standard Subcommittee, Bill Bartley.

Minutes (unapproved) of the TF meeting as submitted:

Attendance:

Attendance total attendees 53, Members 14 attendees were guests with 6 attendee requested membership

Patents:

No patents were disclosed.

Miami Minutes from Spring 2009:

Motion to approve the meeting minutes from Miami made and the Task Force approved the minutes

Discussion:

The PAR Application Process will be start with development of Guide Scope and Purpose

Task Force edited Scope and Purpose resulting in the following statements:

Scope:

This guide application is for Natural and Synthetic Ester-immersed transformers. This guide addresses the following:

- The theory of combustible gas generation in a natural and synthetic ester filled transformer
- Interpretation of the dissolved gas analysis results
- Recommended actions based on the interpretation of dissolved gas analysis results.
- A bibliography of related literature.

Purpose:

The purpose of this guide is to assist the transformer operator in evaluating Dissolved Gas Analysis (DGA) data obtained from natural ester and synthetic ester filled transformers.

Lines were removed in Scope about sampling and sample analysis at laboratory. Also removed statement that limited the guide application to transformers originally designed for these fluids.

Format for DGA Guide was discussed with a template taken from the silicon Fluid DGA guide. The IEEE style guide will be used during the initial drafting process.

Inclusion of the Oswalt Coefficients in the guide was discussed with the decision to place a table in the Annex.

Volunteers for Task Force Sections:

David Sundin – synthetic ester theory section

Dave Hanson- natural ester theory section

Laboratory data interpretation and formatting

Dave Hanson, Jesse Inkpen, Tad Daniels, Dr. James Dukarm, John Luksich, Paul Boman

Examples & Case Studies- not filled

Bibliography & Annex

Mark McNally

Chair is planning to use Webinar to speed up development time-line

Viewed several slides with available laboratory data

Adjournment

Motion to adjourn meeting which was made and seconded by Task Force Members.

8.3.3.7. TF Guide for Field Application of Natural Esters

Jim Graham – Chair, Jerry Murphy Vice-Chair

Sub-Report Given at the Sub-Committee Meeting:

Jim Graham presented the TF task force meeting summary. The meeting was one short of quorum. After the request by the Chair for patent disclosure,

TF meeting minutes (unapproved) as received:

Meeting Date: 10/27/2009 Time: 3:15 – 4:30 PM

Current Draft Being Worked On: Draft 1, March 2008

Attendance: 12 members, 31 guest (2 requesting membership)

The meeting was called to order at 3:15 PM. Introductions were skipped, and an attendance roster was circulated. Membership attendance was checked, and we did not have a quorum. The chair asked if there were any patent disclosures, which triggered a discussion of the purpose of the disclaimer and how to interpret the disclaimer requirements. No patent disclosures were made. The Spring 2009 task force minutes were sent out prior to the meeting for comments, and no corrections were submitted.

The chair discussed presented a draft of the PAR application based on previously approved task force recommendation of scope and purpose. With no quorum the group was unable to approve the final scope and purpose during the meeting. The chair will contact the members via e-mail to get final consensus on the title, scope and purpose for the PAR. The following subjects were discussed:

Does this task force belong in the Insulating Fluids Subcommittee? Consensus is yes.

Many of the proposed sections of this guide would duplicate material duplicate sections 6, 7 and 8 of sections IEEE C57.147-2008 IEEE Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers. Should IEEE C57.147 be revised, or left as is if this guide is finished? No strong support one way or the other was given by those present. A proposal will be sent to the group for comments.

Should synthetic ester fluids be included? No; the task force has previously discussed this issue and decided to limit the scope to natural esters only. No new data was presented to change this decision.

Should the title of the guide be changed to remove **Field** from the title of this Guide? Task force members will be polled and comments solicited.

The chair asked how many of the attendees were asked if there was still interest in creating the guide. There was a near unanimous affirmative response. When the attendees were asked if they were willing to volunteer to work on the proposed guide, few indicated a willingness to join the task force.

Dave Harris resigned as secretary and Patrick McShane agreed to fill the position.

The meeting adjourned at 4:30 PM.

8.3.3.8. TF on Particle Count Limits - Chair: Mark Scarborough

Report given at the Sub-Committee Meeting:

No report was given. A TF member did announce that the Chair was setting up a webcast meeting in November for the TF.

Sub-Report Given at the Sub-Committee Meeting:

No TF meeting was held at F09 meeting.

8.3.3.9. TF on Moisture in Insulation - Chair: Bob Rasor

Report given at the Sub-Committee Meeting:

The Chair stated that the main intent of the TF is to gather and review currently available data. There was high attendance at the TF meeting showing the interest is high. Jim Thompson suggested that the TF wait for the publication of the next revision of the Insulation Live Sub-Committee document titled "Determination of Moisture in Transformer Insulation that used up-to-date data from global sources. A motion was made to for the TF to wait, seconded by Don Platts. After discussion, the motion failed. Discussion: Sue McNelly asked if any new information/data received since the latest issuance of C57.106. Tom Prevost stated that there is work being done globally, so the goal for data collection should be done. Jim Thompson replied that collecting data without a clear end goal of the TF is questionable value. Jin Sim stated, while he had no issue with collecting data, that the issue is complex for converting ppm to percent saturation as there are several variables including oil contamination. He suggested not pushing for a change until the Insulation Life document is published.

TF meeting minutes (unapproved) as received:

The meeting was called to order by Chair Bob Rasor and vice chair Hali Moleski at 3:18 pm. The roster indicated there were 88 attendees present. Of those present, 23 requested membership. Attendees requesting membership were:

Tony Pink	C.J. Kalra	Paul Boman
Eduardo	Subhas Sarkar	Dinesh
Garcia	Frank	Chhajer
Flavio Neuls	Trautmann	Jon Kopf
Mark Rivers	Dave Hanson	Jin Sim
Dennis Allan	Oleg Roizman	Jeffrey Britton
Tom Prevost	Claude	Don Cherry
Jorge	Beauchemin	Ron Nicholas
Gonzalez de la	Juan	
Vega	Castellanos	
Don Platts	Jim Thompson	

Agenda

1. Welcome and roster
2. Introduction of Chair and vice Chair
3. Brief explanation for beginning the task force
4. Discussion of preliminary scope
5. Discussion and comments from attendees
6. Meeting was adjourned 4:08 pm

An introduction to this new task force was given by Chair Bob Rasor. The main focus of the task force is to improve the understanding of the meaning of moisture levels in oil. The emphasis of the TF will be to gather data and understanding. The purpose is not to create or modify existing standards – rather to gather data.

The objective of the meeting was to:

- Give attendees an opportunity to provide general comments
- Define and clarify the scope

Once opened up for discussion, many topics were discussed that included the following:

- possibility of overlap with other existing standards
- issues with previous version of C57.106 and its affect on the industry
- changing the TF name to Moisture in Transformers
- consideration of including other parameters such as particulates, dielectric strength, dissolved gas and furans with moisture and how they relate to each other
- caution in allowing the large group to determine the scope, as much more can be accomplished in smaller groups with a better defined scope

It was commented that moisture data collection would benefit the industry as it is a very interesting topic with many interested individuals as evident by the number of people attending the meeting. And if the data eventually would affect current guides, it would be carefully handled at that time. Chair Bob Rasor commented that data collection was the main focus of the TF.

8.3.4. Old Business:

None

8.3.5. New Business:

Rowland James recommended the use of proxy to help the SC, WG, and TF meetings quorums.

Respectfully Submitted:

Susan McNelly, Fluids SC Chair
Jerry Murphy, Fluids SC Vice-Chair
Patrick McShane, Fluids SC Secretary

Insulation Life Subcommittee - Unapproved Meeting Minutes
October 28, 2009 – Lombard, IL

8.4 Insulation Life Subcommittee – Don Platts, Chairman

The Insulation Life Subcommittee met in Lombard, IL on October 28, 2009 at 8:00 AM.

The minutes of our meeting in Miami, FL on April 22, 2008 were approved as written.

The meeting was attended by 164 people, 58 of 111 members and 106 guests.

8.4.1 Chair's Report

The Spring 2010 IEEE Transformers Committee Meeting will be held in Houston, TX in March. The Fall 2010 meeting location has not been announced.

The Transformers Committee's Operations and Procedure Manual was approved by the PES Technical Committee in September. This manual is posted on the web site.

When clearing ballot comments, the Working Group Chairs need to make sure they provide the resolution and details of the resolution for each item on the spreadsheet.

Our subcommittee has three special publications in process. The Operations and Procedures Manual contains the process for publishing these documents. This process takes about a year to complete.

8.4.2 Project Status Reports

8.4.2.1 C57.91 Loading Guide

C57.91 and its PAR expire at the end of this year. A PAR extension has been requested.

8.4.2.2 C57.100 Thermal Evaluation Guide

The PAR for C57.100 expires the end of 2010.

8.4.3 Working Group and Task Force Reports

8.4.3.1 Working Group for the Revision to C57.91 Loading Guide – Don Duckett

The working group was called to order by Chair Don Duckett and Vice Chair Carlo Arpino at 9:30 am on Tuesday, October 27, 2009. Secretary Susan McNelly was also present.

There were 31 of 55 members present and 63 guests with 4 guests requesting membership to the WG. Guests requesting membership were:

Rick Dong	Jerry Kazmierczak
Jow Ortiz	Kiran Vendant

Agenda:

- 1. Roll Call**
- 2. Patent disclosure announcement**
- 3. Previous meeting minutes approval**
- 4. Comments to latest revision**
- 5. Plans for Completion**
- 6. Adjournment**

A roll call of members present and introductions of members and guests were made.

The IEEE Patent disclosure requirements were discussed and a request was made for disclosure of any patents that may be related to the work of the WG. There were no responses to the request for disclosure.

Approval of minutes from the Spring 2009 meeting in Miami, Florida was requested. There was one correction to the mention of the former Chair Tim Raymond whose name was incorrectly shown. The minutes were approved as modified.

Action items:

Juan Castellanos indicated that he is working on his review of Annex G and should have something soon.

Kurt Robbins volunteered at the last meeting to review the Clause 7 equations. Kurt was not present at the meeting for an update report.

Barry Beaster, Jin Sim, Rick Marek, and Dave Wallach volunteered at the last meeting to help go through comments received to resolve any issues identified. Barry Beaster indicated that he found two mathematical errors in the tables that will need to be corrected. No comments have yet been identified for review by the group.

PAR extension: The existing PAR expires at the end of 2009. A PAR modification was submitted requesting a two year extension to the existing PAR. A decision will be received from REVCOM in December.

Chair's Comments – Three options for consideration:

1. Set the current work aside and work for reaffirmation of the present Guide.

2. Get the current work ready to go before Houston. If this option is chosen, what is needed to get the present work ready for a successful ballot attempt.
3. A third option would be to do minimal modification to insert the voltage regulation section and any other critical items such as gas bubble generation.

A straw vote indicated interest in getting the existing document reaffirmed. Discussion indicated that this could still be used as a fall back position if attempts to get the present work in shape.

A question was asked what items would need to be revised for the option of minor modifications?

TV Oommen indicated the changes that were made to the gas bubble generation portion which is in Annex E of the present working version of the Guide. Equation E.2 was modified. The gas bubble generation portion is presently Annex A in the existing Guide.

Jin Sim recommended that for a minimal modification option, that the existing Annex A be replaced with the new version.

There was discussion whether the existing Annex G equations should or should not be moved to section 7.

A motion was made and seconded to replace the existing Annex A bubble section in the existing drafts Annex E containing TV's layer models and leave the balance of the document as is. A request to modify the motion to include the corrigenda items that have already been previously approved into the document. Jin Sim approved the amended motion. The motion passed.

Don Platts made a motion and it was seconded that the modified version of the document include voltage regulators since the present PAR indicates that voltage regulators are included. Bill Chui indicated that it would not be recommended that the PAR be amended, so they would need to be included. After discussion the motion was put to a vote and was passed.

The WG will pursue the minimal modifications.

The meeting was adjourned at 10:45 am.

Respectfully Submitted

Don Duckett
WG Chair

Carlo Arpino
WG Vice Chair

Susan McNelly
WG Secretary

8.4.3.2 Working Group On Thermal Evaluation Of Power And Distribution Transformers (C57.100) – Roger Wicks

8.4.3.2.1 Introduction and Rosters

The working group met on Monday, October 26, 2009 at 11:00 AM with 28 members and 88 guests attending, with 5 guests requesting membership. At this time, we will not add these guests to our membership (see note below related to survey/questionnaire). So, at this time the membership will stay at 84 members.

8.4.3.2.2 Approval of minutes from April 20, 2009 meeting

The minutes of the April 20, 2009 meeting in Miami, Florida were approved as written.

8.4.3.2.3 Patent Disclosure

The chairman asked if anyone knew of any patents that could pertain to this project. There were none.

8.4.3.2.4 Questionnaire Results and Revisions C57.100 in Draft 1

The chairmen spent the bulk of the meeting describing a questionnaire circulated to working group members and the results from that questionnaire. These were discussed sequentially, and the corresponding changes to document to create Draft 1 were discussed. The chairman noted that only 17 questionnaires were returned (16 from working group members (less than 20%).

Time/Temperature Decision

Extrapolation beyond 20C

- Keep existing method (5X life requirement for three points) – define range of data (how many degrees apart - **YES/NO**)
- Add capability for longer extrapolation with more points – **YES/NO**
- Add capability for longer extrapolation with more points (but less than above) and 2X safety margin) – **YES/NO**
- Other Input on this requirement?

Life Curves Decision

- Add finite new life curves – each a 5X multiplier from prior curve (to enable an adjustment to the loading guides to be easier) – **YES/NO**
- Is C57.100 the place for these life curves or a different location – **YES/NO** (where?)
- Other input on life curves? **Location for new curves (if agreed to) would be C57.91. This document is method of test.**

Materials Decision

- Should we specify that the tests be conducted with “minimum allowable” products if adjustable (such as nitrogen content?) – **YES/NO** (if not – how to deal with this issue)

Test Duration Decision

- Do we need to deal with the accuracy of the test by detailing minimum number of cycles (thermo/electrical tests) – **YES/NO** (if minimum not met – what is the recourse?)
- Do we need to deal with the accuracy of the test by detailing the minimum number of tests to determine a “end of life test” for the thermal only tests – **YES/NO**

Oil Decision

- Should the top oil temperature be controlled in all tests (other than sealed tube test), and does this then dictate the top oil temperature of the approved system? **YES/NO**.
- If yes, should the temperature limit of the system be equal to the tested value, or 5C or 10C below the tested value (for safety margin). Select a value 0, 5, 10 **Mixed**

Other Issues Decision

- Should we define an Industry Proven System which by definition meets our 65C rise (110C hot spot) life curve? **YES/NO**
- If Yes – is the outline on the earlier slide the right starting point? **YES/NO**
- What conditions require a full aging curve to be validated? **New Insulation system – new temperature class**
- What conditions allow a single/two point test to be used for validation? **NO**
- What conditions allow sealed tube tests to be used for validation? **Screening of new systems, Change of materials – no change of system/life curve.**

Major changes to the document include a definition of an industry proven system, specification of moisture content for all testing, adding the dual-temperature test, adding the concept of a relative test (vs. a control) to allow shorter duration testing, movement of the 5X multiplier to Annex B (informative) and changing sealed tube tests(Annex A) to informative (from Normative).

Discussion related to this presentation was good, with much of the questions related to how to determine end of life in the non-model tests (dual-temperature test and sealed tube test). John Luksich and others pointed out that in C57.91 there are different evaluation methods (200 Dp, 35% tensile and 50% tensile). Sam Mehta noted that some materials have higher start values and even at 50% tensile are stronger than some kraft materials currently used. The Chairman

(and Secretary) noted that we need a method that is standard and applicable for all materials. Since our dual-temperature test shows reasonable correlation to the current life curve (in C57.100) using 50% retained tensile, this is what was selected as the criteria for the first draft. Also noted was that other materials (such as wire enamels) will require other criteria (80% dielectric strength retention) which the draft also covers.

Another area of spirited discussion led by Jin Sim, included the moisture content at the start of the test (draft states 0.25 to 0.50%) or to control the moisture at a given level. Valery Davydov noted they have conducted testing with a constant moisture level with good effect. The chair responded that the initial moisture content would be easier to control (for all methods) and seemed to give similar life to our existing curve. So for this first draft, that will be what is proposed.

Finally – Figure1 (our life curve) needs to be referenced to the correct document, and Tom Prevost will help the chair with this.

8.4.3.2.5 Membership Responsibilities

The chair then finished up the discussion offering clemency to the member of the working groups who did not respond to the questionnaire. He will allow working group members to stay on the list IF they respond the chairman with comments related to the draft 1. Guests will also be solicited for comment. These comments are requested by the end of the year, and the chair will then look for help in resolving major issues so a draft 2 can be completed by the end of the first quarter (and potentially balloted).

8.4.3.2.6 The meeting adjourned at 12:16 PM.

8.4.3.3 Working Group for Temperature Rise Test Procedures Section 11 of C57.12.90 - Paulette Powell

The Working Group met at 11:00am October 27, 2009 in Jr. Ballroom A/B of the Western Lombard Yorktown Center, Lombard, Illinois USA. In attendance there were twenty members and fifty-three guests. The meeting had quorum. Seven new members were introduced to the WG: Messrs. Stephen Antosz, Thomas Holifield, Terence Martin, Joseph Melanson, Lewis Powell, Oleg Roizman and Sanjib Som. The membership now stands at thirty-eight.

There were no patent disclosures.

The minutes of the April 20, 2009 were distributed prior to the meeting and approved as written.

Projects:

11.2.2b Straw Ballot – The WG discussed the recirculation for power transformers concerning lower capacity heat runs. There were six negatives requesting the removal of the

statement specifying the order of tests as test room logistics and energy costs may necessitate a different order. As the terminal pair used for hot resistance measurements below the maximum rating must be determined from prior testing to have the greatest winding temperature rise, the statement specifying order of test is not needed, and will be removed. Kipp Yule expressed concern for measurement of the terminal pair with the highest winding temperature to obtain the correct gradient for winding hottest spot temperature indication. Two negatives which refer to hot resistance measurements on each terminal pair at the maximum nameplate rating, request testing on only one terminal pair for harmonization with IEC. Jerry Corkran stated that the temperature rise test is a type test, not a quality control test. All three phases do not need to be tested as the results will not vary much and would be in agreement with IEC. The statement specifying order of test will be removed and the proposal re-circulated to the members.

Marcel Fortin expressed that for distribution transformers it is just as important hot resistance measurements be made on all terminal pairs. There are different cooling situations in measuring only one leg of 120/240 volt, low-high-low windings. A straw ballot was conducted on this issue with 10 responses from the WG members, 4 in favor and 6 opposed. There was much discussion in agreement with Marcel Fortin's proposal as there was against for which Jerry Corkran cited harmonization with IEC. Due to time limitations, the discussion was ended.

TF – Sub-clause 11.2.2e

The TF is addressing two scenarios that could possibly result in hot-resistance time data not being suited to fit an exponential decay curve:

1. The time constant of small distribution transformers may be short due to transformer thermal characteristics and measuring equipment
2. The mean oil temperature surrounding the winding and the actual location of the winding may result in top and bottom oil temperatures not giving the intended average winding oil temperature.

Proposals by Marcel Fortin and Steve Snyder for distribution transformers were merged by the Chair and presented.

1. Add to 11.2.2.c - At least one resistance measurement shall be taken on all terminal pairs within a time less than half the coils shortest time constant after shutdown.
2. Add to 11.2.2d one of the following:
 - a. Alternate 1 (Marcel Fortin) - A series of at least 10 resistance measurements shall be made on one terminal pair corresponding to a phase of a winding in less than 10% of the bulk oil time constant.
 - b. Alternate 2 (Steve Snyder) - At least 10 resistance measurements shall be made on one terminal pair corresponding to a phase of a winding. All resistance data

points shall be recorded at no longer than 30 second intervals and no less than 10 second intervals.

3. 11.2.2f: Modify to agree with timeframe specified in 11.2.2c.

The Chair will prepare a draft for WG review to include these proposals along with the measurement of all terminal pairs of distribution transformers per the discussion on 11.2.2b.

Bertrand Poulin presented an exact numerical equivalent to the IEC graphical method for fitting hot resistance time data to an exponential decay curve. The IEC graphical method is currently an appendix that is to be removed from the standard altogether. Bertrand fit the data Juan Castellanos had provided last meeting (a radiator configuration not suited to exponential decay) to an exponential decay curve using the numerical equivalent to the IEC graphical method. Bertrand stated that he has many curve fitting cases and that this methodology has been used for many years.

TF – Modified Temperature Test

The proposed wording for the modified temperature test was presented. Kipp Yule asked if the DGA trial use guide was applicable. Mark stated that the guide will be referenced when DGA limits are approved. Noting the time period for holding the current, there was discussion on requirement for stabilization. As stabilization can take 6 to 36 hours, it could be significantly longer than the actual test. It was also mentioned that the all cooling must be present for the maximum run. The proposal will be modified as requested by Sonjib Som to include “hotspot rise” in the next to last sentence.

Report of the Task Force – Modified Temperature Test - Mark Perkins Meeting Minutes

The task force on the modified temperature test met on Sunday October 25 at 1:30 pm with Paulette Payne Powell, Don Platts and Mark Perkins present. The group reviewed the final proposed text of the proposal for the modified temperature test.

1. The modified temperature test could be listed as an "other" test in C57.12.00 and described in a sub clause of section 11 of C57.12.90.
2. The wording for C57.12.90 would be as follows:

The modified temperature test may be used to verify the performance of the transformer when a full temperature test is not performed. Only one test is performed and that is done at the maximum nameplate MVA rating. The selection of tap changer positions, measurement points and setup parameters shall be made on the same basis as the normal temperature test at the maximum MVA position as specified in sections 11.1-11.6. The current in the transformer shall be the total loss current as defined in section 11.5, and this current shall be held for a minimum of eight hours, of which a minimum of six hours must be at a top oil temperature rise above 80% of the calculated value. After this minimum duration, the top oil rise, bottom oil rise and average oil rise shall be calculated prior to shutdown. The average winding temperatures shall then be measured after shutdown as described in clause 11.3, only at the total loss current. The average winding temperature gradients of additional windings shall be measured by circulating current corresponding to the maximum nameplate ratings of the windings for one hour followed by the average winding temperature measurement as

described in clause 11.3. The measured winding temperature rise values shall be adjusted for the maximum nameplate currents and for any other adjustments per clauses 11.2 - 11.6. Oil samples for dissolved gas in oil analysis shall be taken before and after the modified temperature test. The estimated top oil rise and average winding rise (based on readings taken immediately before the shutdown) shall be determined. If any of these values exceed the 65 degree limit, then a full temperature test is required.

This proposal will be presented at the working group on temperature rise test procedures that meets on Tuesday, October 27 at 11:00 am for discussion prior to a straw ballot being sent out. The meeting adjourned at 2:00 pm.

Other Business

As we ran out of time, Sanjib Som's presentation for TF 11.2.2e will be held at the next meeting.

The meeting adjourned at 12:15pm.

Respectfully submitted,

Paulette Payne Powell, Chair
Juan Castellanos, Co-Chair

8.4.3.4 Task Force on High Temperature Transformers – Richard Marek

The third meeting of the WG took place on Tuesday, October 27, 2009 in the Lilac B/D Meeting Room at 3:15 pm, at the Westin Lombard Yorktown Center, Lombard, IL, USA

There were 11 members and 24 guests present. Introductions were made and attendance sheets were circulated. The IEEE patent policy was discussed and there were no concerns regarding patents. Since no one had read the minutes from the Miami meeting that had been sent to all members and guests and only 11 members were present of the 34 members on record, approval was deferred to a survey to be distributed by the Chairman. The members were reminded that a response to the survey is mandatory to remain a member of the working group.

The Chairman proposed a modification to the document scope which would require a revision to the PAR. This proposal deleted the last two sentences defining specific hottest spot, average winding and top liquid temperature rises. The additional detail would be moved to another location in the document such as the purpose. Juan Castellanos made an alternate proposal further simplifying the scope. Both proposals will be added to the survey.

A concern was raised at the previous meeting concerning the content of the draft and whether it should be a standard, a guide or a recommended practice. Based on revisions to the document, the chairman decided to delay this decision. Since the PAR authorization is to

develop a standard, he felt that the working group should first work toward this goal and make a decision after one or two additional drafts.

Alternate terminology was requested for the homogeneous high-temperature insulation system. It was explained that this system originated in the IEC reference document as a system composed of all high-temperature solid insulation and high-temperature liquid. However, over the several years of that document use, the description was modified to “mostly” high-temperature insulation and now the name is no longer accurate. Several suggestions were made, such as composite and thermally graded. Sam Mehta suggested that numbers be used for the systems such as 65/65 or 95/65. Vijayan Krishnamurthy agreed to work with Sam to develop a proposed numbering system. Mathieu Sauzay suggested adding additional explanation for the different systems before the detailed descriptions. He was requested to submit an example to further explain his suggestion.

Hasse Nordman suggested modifying Table 1 to include the specific reference temperature for each system. It has been his experience that a variable reference temperature is unfamiliar to customers specifying liquid-filled transformers and that specific numbers in a table would make discussions easier.

The chairman requested volunteers to review and revise six rather weak sections in the current draft. These guide-like sections should be expanded and upgraded to wording more like a standard. Even the section titles may be changed if considered necessary. The volunteers were as follows:

- Section 6 - Transformer accessories and compatibility
 - Roberto Asano
 - Gary Hoffman
- Section 7 - Special design considerations
 - Vijayan Krishnamurthy
- Section 8 – Required information & Section 10 - Testing
 - Eduardo Tolcachir
 - Marion Jaroszewski

There were no volunteers for the following sections. The membership list will be reviewed and assignments will be made.

- Section 9 – Rating plate and additional information
- Section 11 - Supervision, diagnostics, and maintenance

Under new business, Hasse Nordman requested the addition of the aramid life curve from IEEE Std 1276 as an aid in customer discussions. After some discussion it was decided to add this information to an informative annex.

John Luksich suggested adding a section on ageing studies for natural esters. It was agreed that an informative annex would be appropriate. He and Don Cherry agreed to develop an annex for the next draft.

Draft 4 is expected to be circulated before the fall meeting. The WG was requested to review the draft 3 document and make comments or suggestions which would be incorporated into draft 4.

The meeting adjourned at 4:35

8.4.3.5 Task Force on Moisture Estimation in Transformer Insulation – Jin Sim

The Task Force on Moisture Estimation in Transformer Insulation did not meet during the Spring 2009 Transformer's Committee meeting.

The TF anticipates having a draft of the paper by the end of the year. Once complete, the draft will be circulated in the TF for comment.

8.4.3.6 Task Force on Furan Testing – Kent Haggerty

The Task Force on Furan Testing met Monday Morning, October 26, 2008. 57 people attended the Task Force membership.

Chair, Kent Haggerty could not attend and Tom Prevost filled in to run the meeting.

The minutes of the previous Task Force meeting were not reviewed or approved.

Tom explained that a small working group has been meeting to write the position paper that is the primary function of this group. [Tom, Shushzen Xu, Luiz Chiem, Kent Haggerty, and Don Platts] There are a few issues that still need to be resolved before the paper can be completed.

Tom raised the question if measured furans produced by standard kraft paper are actually higher than those produced by thermally upgraded kraft. His analysis of the data produced during testing with DuPont that indicated there is no observable difference. Luiz Chiem presented a summary of his knowledge and review of the topic and his position is that there is definitely a significant difference between the values that are produced from testing of the 2 paper types.

There was lively discussion among those present. There was not resolution.

Tom also asked that any member or guest who has test data for furans consider providing that to the task force. As a part of the paper, a template for the database will be provided. In addition there will be some general guidance on how a testing program should be set up, including instructions for taking paper samples from failed units, so that the DP of the insulation can be correlated.

One agenda topic was “Should the task force recommend that the committee form a working group to produce a guide?” When introduced, Don Platts, the Insulation Life Subcommittee chair, asked the group to consider waiting until they have had a chance to review the published position paper before they tried to make that decision. There was general agreement, and the question regarding a guide will be reviewed in the future.

Don Platts
Acting Secretary.

8.4.3.7 Task Force on Winding Temperature Indicators - Phil McClure

The Task Force on Winding Temperature Indicators did not meet during the Fall 2008 Transformer’s Committee meeting.

8.4.3.8 Task Force on Metallic Surface Temperatures – Jeff Ray

October 27, 2009 – Chicago, Ill.
Jeffrey L. Ray, Chair
Barry Beaster, Vice chair
Sanjib Som, Secretary

- The meeting was called to order by the Chair.
- There were 57 attendees who were asked to introduce themselves.
- An attendance roster was circulated.
- The IEEE patent disclosure regulations were noted. No one had any items to bring forward.
- The subject of this meeting was introduced by the Chair, namely, whether IEEE C57 documents should be amended to include specific temperature limits for non-current-carrying metallic surfaces in contact with and not in contact with insulation materials. Such numerical limits are not presently included in C57.12.00. Section 5.11.1.3 simply states:

5.1 1.1.3 Rises of metallic parts other than windings

Metallic parts in contact with current-carrying conductor insulation shall not attain a temperature rise in excess of the winding hottest-spot temperature rise.

*Metallic parts other than those described above shall not **attain excessive temperature rises** at maximum rated load.*

- The attendees overwhelmingly agreed that there should be a task force formed to research this matter and report proposed changes to the appropriate sections of IEEE standards (C57.12.00) and guides (C57.91).

- The scope of this TF is limited to normal life expectancy loading for transformers filled with mineral oil.
- There was some discussions of the temperature limits for metallic surfaces mentioned in Table 8 of C57.91-1995 which states in column 1, “Normal Life Expectancy”:

*Other metallic hot-spot temperature
(in contact and not in contact with insulation).....140C*

It was generally agreed that 140C is an acceptable value for this condition as it applies to metallic surfaces NOT in contact, but not appropriate for metallic surfaces in contact with solid insulation. It was also noted that there is a task force looking into setting temperature limits for core steel hot spots and that this limit may need to be lower than 140C to prevent excessive gassing in the presence of the thin film of mineral oil next to the core.

- Action Items
 - I. Chair will circulate minutes to the attendees.
 - II. Chair will solicit input from a limited number of interested parties and prepare proposed wording for the additions of temperature values to C57.12.00.5.11.1.3 and distribute said wording to the attendees prior to the Spring 2010 meeting.
 - III. Chair will solicit input from a limited number of interested parties and prepare proposed modifications to Table 8 of C57.91-1995 needed to coordinate with the proposed temperature limits for C57.12.00 and distribute same to the attendees prior to the Spring 2010 meeting.

8.4.4 Old Business:

There was no Old Business.

8.4.5 New Business:

8.4.5.1 Should We Establish A 75 Degree C Rise

Jerry Corkran raised a question concerning C57-100. This document originally evaluated nomex insulation. Cellulose with natural esters appear to have higher temperature limits. Should we be looking at a 75 degree C rise instead of a 65 degree C rise.

A lively discussion followed this discussion. The main points made or raised are summarized below:

- If we qualify a new temperature limit, we need to qualify it according to a standard. The standard should be a comparison with the 65 degree C system we have today.
- Do we need a finite number of life curves? A finite number made sense. C57-91 might be the best location for new curves.

- C57-91 is a guide. You cannot establish requirements in a guide.
- Sealed system should be used to run sample tests.
- We are missing a standard method for determining a maximum operating temperature.
- The EU is looking at elevated temperature rise. We should find out what they are doing.
- Papers were presented at the 1999 PES Conference that showed a 75 degree C rise using the existing guide. We should not need to wait for a new guide to qualify 75 degree C rise. If these standards are not valid, they should be withdrawn.
- If we use a higher temperature, what do we do with the iron and copper losses?
- A manufacturer has distribution model and sealed tube tests. IEEE Std-99 says the temperature should be within 20 degrees of use temperature. These tests have not gone low enough or long enough.

A final suggestion was that, if you have other data available, please provide it.

There was not a resolution to this question.

8.4.5.2 New Subcommittee Chairman

Don Platts announced that this is his last meeting as Chair of the Insulation Life Subcommittee. Bruce Forsyth was introduced as the new Chair.

Tom Prevost thanked Don for his nine years of service as the Chair. He introduced Don as the new IEEE Transformers Committee Secretary. Tom also thanked Bruce for agreeing to serve as the new Chair.

8.4.6 The meeting adjourned at 9:10 AM.

Don Platts
Chair, Insulation Life Subcommittee

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8.5 Performance Characteristics Subcommittee – Stephen Antosz, Chairman; Ed teNyenhuis, Vice-Chair; Bruce Forsyth, Secretary

8.5.1 Introduction / Attendance

The Performance Characteristics Subcommittee (PCS) met on Wednesday, October 28, 2009 with 57 members and 37 guests in attendance. Two guests requested membership. Prior to this meeting the total membership of the PCS was 119; therefore, with 57 members present we did not have a quorum of at least 50%.

8.5.2 Approval of Meeting Minutes

The minutes of the last meeting in Miami, Florida were approved as written.

8.5.3 Chairman's Remarks

8.5.3.1 Administrative Subcommittee Notes

- a) Upcoming IEEE – PES Meetings
 - Next Transformer Committee meeting date and locations is as follows:
 - Spring 2010, March 7-11, – Houston, TX
 - PES General Meeting: July 26 – 30, 2010, Minneapolis, MN.
 - IEEE T&D Conference & Expo: April 19-22, New Orleans, LA
 - IEEE PES Conference on Innovative Smart Grid Technologies: January 19-21, 2010, Washington, DC
- b) Committee Membership Recognition Program:
 - Transformer Committee members will receive a plaque at Main Meeting on Thursday.
- c) Quorums and Rosters:
 - WG & TF Chairs (or Secretary) must maintain accurate and up-to-date list of active members and attendance. AM system has tools to make this easy.
- d) Update on status of revisions of C57.12.00-2006 and C57.12.90-2006:
 - 12.00 is almost ready for recirculation.
 - 12.90 is ready and waiting for 12.00 to catch up so they can both publish at the same time.
- e) New WG under PCS approved by Admin SC:
 - Revision to Loss Evaluation Guide for Transformers C57.120 been transferred from Power Transformers SC to Performance Characteristics SC.
 - Was previously C57.12.33 for Distribution Transformers. The WG met yesterday. See 8.8.4.7 for meeting minutes.

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

8.5.4.1 PCS WG on “Test Code”, C57.12.90 – Mark Perkins, Chairman; Kirk Robbins, Secretary

The PCS Working Group for Revisions to test code C57.12.90 met in Lombard, IL on October 26, 2009 at 09:30 A.M. There were 111 persons in attendance, 51 (of 136 total) members and 60 guests of which 6 requested membership. We did not have a quorum.

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Announcements

The chair asked if anyone had any patent issues relating to this standard. Being none, this discussion was closed.

The minutes from the last meeting were then reviewed and approved as written by oral vote.

Old Business

The previously revised sections of Sections 6 and 7 were sent to the working group and dielectric test subcommittee for survey. There were 21 surveys returned, with 15 affirmative, 5 affirmative with comments and one abstention. The group discussed the comments.

- Dennis Marlow had a comment on method b) from section 7.1.4 that requires that the winding of a transformer with an ungrounded neutral be reconfigured to a delta connection if the voltage readings are not balanced. Dennis felt that a clarifying note should be added. After discussion of the group, it was consensus that method b) should just be removed. The chair agreed to speak with Dennis and if he would be satisfied with this change, then the draft would be modified and resurveyed. A resurvey is needed to allow a majority of the members of the working group to consider this issue.
- Steve Jordan commented that he preferred to keep the old Figures 2 and 3 for academic purposes. When the chair explained that these figures were misleading in that they did not correctly describe the definition of additive and subtractive polarity, Steve agreed to withdraw his comment.
- Barry Beaster suggested moving the section 6.3.3 on the polarity using the ratio bridge to the position of 6.3.1 and renumbering sections 6.3.1 and 6.3.2 since it is the most common method used. The group agreed.
- The other two comments had to do with numbering of figures, which will be handled when the revisions are incorporated within the new document.

The group then had a report from Marcel Fortin on the survey of section 12 of C57.12.90. Marcel reported that there were 17 responses received including 1 negative, 2 without comment, and 6 comments. One comment was received to remove the re-clamping step after a short circuit test prior to dry out. Marcel Fortin recommended no change and he stated this option needs to be left in the standard. After some discussion, it was agreed to not accept this comment and leave the document as is. Marcel recommended accepting the comment that the pre-set method be used on distribution class units. Marcel will discuss the resolution of these comments with the members who submitted the comments, and then the section 12 as revised will be sent to the standards subcommittee for insertion in the next revision of C57.12.90.

The proposal to include testing of buried tertiary windings for resistance, polarity and ratio was discussed, and it was agreed to include this in the test code. A proposal for specific wording changes will be prepared for the next meeting for discussion.

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New Business

Subhash Tuli requested clarification on the wording of Section 6.3.2.1 to indicate that the figures are not all inclusive, but only demonstrate the method. This was agreed to and a minor change in the wording was needed. The third bullet point is changed as follows:

- Either plot these values or compare them for their relative order of magnitude. Figures 5 and 6 show examples of this method for some common types of connections.

Having no other business, the meeting was adjourned at 10:30 AM.

8.5.4.2 PCS WG on “General Requirements”, C57.12.00 – Steve Snyder, Chairman; Enrique Betancourt, Secretary

The Working Group met at 3:15 PM on Monday, October 26, 2009 with **30** members and **42** guests present. There are 82 total members, therefore the criteria of a 50% quorum was not met. The following five (5) guests requested membership, bringing the Working Group membership to **87** members :

William Bartley	Hartford Steam Boiler
Vinay Mehrotra	Waukesha Electric Systems
Joseph Melanson	J. Melanson, Inc.
Abderrahmane Zouaghi	ABB Inc.
Robert Ganser	Transformer Consulting Services

Following introductions, the minutes of the April 20, 2009 Miami meeting were approved as submitted. Working Group members were then asked if anyone was aware of any applicable patent activity that might impact our work. No patent issues were disclosed by anyone.

The chairman provided an update on the latest C57.12.00 ballot. The standard was balloted in October 2008 and has been in the ballot resolution process since the ballot closed. The first ballot recirculation is now expected to come out within the next week.

The meeting began with **Old Business**, WG item 82 :

WG Item 82, Clause 7.1.4.4 Stabilizing Windings

Addresses an issue raised in an earlier ballot of standard C57.12.00 which requested:

- (a) Recommendations for guidelines to determine MVA rating of buried tertiary windings,
- (b) To define the conditions under which this MVA is applicable, and
- (c) Determine the tests or calculations necessary to prove the tertiary MVA rating.

Received a report from the Stabilizing Windings Task Force chairman Enrique Betancourt. Enrique presented a summary of the task force work since the prior meeting, and encouraged all interested individuals to attend a special meeting

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scheduled for Tuesday to continue this discussion in more depth. At the time of this meeting there was not a consensus from the task force on the appropriate changes necessary to resolve the issue.

Under **New Business**, the discussion began with WG item 85 :
WG Item 85, Section 8, Testing and Calculations

Request for consideration of long term over-excitation test. This item was raised as a potential new test for addition into standard C57.12.00 at the spring 2008 PCS meeting. The discussion began about the merits of conducting such a test, what does it prove, how often is it specified, and to what class of products would this apply. Some users specify 110% over voltage for a duration of 10 – 12 hours, but usually only for EHV transformers or where there is some history / suspicion about the core performance. The intent apparently is to detect core over-heating and gassing, and to “stabilize” the core after impulse tests. It was also noted that the Canadian standards do specify such a test, 110% for 1 hour, after all dielectric tests are complete. In opposition to requiring the test it was stated that such an over voltage would have to exist for a much longer time period than 12 hours to generate enough gasses as to be detectable. After considerable debate, it was unanimously determined that this test should NOT be listed in the standards, and the topic will be discontinued.

WG Item 87, Table 18 Short-circuit apparent power of the system

Request to revise Table 18 on short-circuit apparent power of the system to be used unless otherwise specified. This was a comment (negative ballot) generated in an earlier revision of C57.12.00 to reconsider the levels of fault current shown in the table, with a recommended level of 63 kA rms as the standardized maximum value. The discussion began with statements that many times users specify an infinite bus supply and through negotiations with the manufacturer arrive at agreed upon withstand levels. Most users do not know their system characteristics, and those conditions might be subject to change, leading to a preference for infinite bus specifications. But the table is useful in the example of low impedance autos and in other special cases. There is an impression that short-circuit proof design is not a problem these days with advanced computer software available. With limited discussion, there was not much interest in changing the table values, but the chair will contact the commenter (Pierre Riffon) to solicit more input from him. This item will be carried forward for continued discussions at the next meeting.

WG Item 88, Table 10, footnote 9

Request to review Footnote 9, Table 10 as it pertains to CT identification and designation. The request was withdrawn immediately prior to the meeting, and will be removed from WG consideration.

WG Item 89, Sections 5.9, 7.4, 8.4, 8.7

Request to adopt a standard definition for the term “reference temperature”. This is presently being defined for inclusion into C57.12.80, and then will be presented for adoption into C57.12.00. (Future activity).

Meeting adjourned 4:30 PM.

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8.5.4.2.1 <The following report was not presented at the subcommittee meeting but is referred to in the minutes of the PCS WG on “General Requirements”, C57.12.00>

**PCS TF on “Stabilizing Windings”, C57.12.00 – Enrique Betancourt, Chairman;
Steve Snyder, Acting Secretary**

The Task Force met at 11:00 AM on Tuesday, October 27, 2009 with 7 members and 61 guests present; this was the first open meeting of the group since its formation. 7 of 11 members were present therefore a quorum was established. There were eighteen guests (18) that stated interest on further participating as members of the Task Force, that would raise the Task Force membership from 11 to 29 members:

Peter Zhao	Hydro One
Hanxia Zhu	BC Hydro
Bill Boettger	Boettger Transformer Consulting LLC
Dinesh Sankarakurup	Niagara Transformer Corp.
Dihru Patel	Hammond Power Solutions Inc.
Verena Pellon	Florida Power and Light
Devki Sharma	Consultant
Roger Hayes	Siemens Canada
Abderrahmane Zouaghi	ABB Inc.
Subhas Sarkar	Virginia Transformer Corp.
K-Vijayan	CG Power System Canada
Randy Rensi	Dynamic Ratings
Vinay Mehrotra	Waukesha Electric Systems
Vijay B. Tendulkar	Onyx Power Inc.
Vivek Bath	Waukesha Electric Systems
Dong Kim	Southern California Edison
Jinho Kahn	Hyundai Heavy Industries
Tamyres L. Machado	Siemens Brazil

Following introductions, the chairman stated the purpose of the Meeting: “To present to a broader audience the status of discussions of the TF on Stabilizing Windings, and to ask for inputs regarding the present scope of the TF and to sense general interest on development of an Application Guide for Tertiary and Stabilizing Windings”. Task Force members and guests were then asked if anyone was aware of any applicable patent activity that might impact our work. No patent issues were disclosed by anyone.

The chairman provided a report with the background of the TF and a summary of present discussions, as described next.

Background of the TF Stabilizing Windings: To address an issue raised in an earlier ballot of standard C57.12.00 which requested:

- (a) Recommendations for guidelines to determine MVA rating of buried tertiary windings,
- (b) To define the conditions under which this MVA is applicable, and
- (c) Determine the tests or calculations necessary to prove the tertiary MVA rating.

Summary of findings and conclusions from TF activity up to meeting's date:

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- It is necessary to clearly differentiate the concepts of “tertiary windings” (TWs) vs. “stabilizing windings” (SWs): SWs behave more like neutral grounding devices and can carry only single phase (“zero sequence”) currents.
- SWs are Delta connected and apply only to three phase transformers.
- Short circuit performance of SWs is properly covered by present Clause 7.1.4.4.
- It is necessary to describe in explicit form the current and temperature limits required for thermal rating of stabilizing windings.
- The compliance of SWs with a new Clause would be demonstrated by calculation
- An efficient dimensioning of, and even decision on actual need for, SW’s requires appropriate knowledge of expected unbalanced loading conditions of the main windings: an Application Guide would be required
- An Application Guide for SWs could address as well application of TWs
- It is still desirable to solve present ambiguity around thermal rating of SWs by having a simple, extended version of Clause 7.1.4.4 in C57.12.00

Following, the questions to address during the meeting were stated as:

1. Is the scope of this TF achievable?
2. What recommendations might come from the audience?
3. What would be the Next Steps

In order to start the discussion, the chairman presented a proposed new wording for the short circuit requirements and thermal requirements for stabilizing windings, that could be included in C57.12.00.

The part of thermal requirements (“Loading Part”) was the main matter of discussion, departing from the next paragraph:

“----- Loading Part (Paragraph on Section 5?)

Stabilizing windings shall be designed to withstand continuous thermal duty of the circulating current resulting from temporary load and or voltage imbalance on the main windings, as specified by the user. Main windings' load currents and supply voltages should be specified in magnitude, angle and duration, to allow verification of compliance with maximum allowable temperatures according to C57.12.00. In the event no continuous thermal duty for the stabilizing winding can be established from the user's spec, the manufacturer will use as stabilizing winding's continuous circulating current, that current resultant from a full single phase load in the main secondary winding (approximately a 33.3% of the transformer's or autotransformer's three phase rating) and infinite bus supply from the primary winding. The manufacturer shall prepare transient and permanent loading calculations for stabilizing windings temperatures, in order to demonstrate adequacy to requirements established in foregoing clauses. Starting point for those transient and permanent loading calculations will be the three phase transformer or autotransformer operating at its maximum continuous three phase rating and temperatures, in compliance with the present standard, before switching to the single phase loading conditions specified.”

Highlights of the discussion:

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- Thermal rating of SWs should be better correlated with actual service conditions, to avoid unnecessary over dimensioning of SWs: full single phase load is still considered pessimistic, with a 10% load unbalance seen as more realistic.
- For thermal rating of SWs, it should be considered that they might be addressed to perform at its maximum rating (circulating current) right after having the transformer operating at its maximum three phase rating and temperatures.
- Some participants would like to have a more detailed description of short circuit duty for SWs, as, for instance, it is addressed in IEC Stds.
- Eighteen (18) attendees to the meeting raised hands in response to the question if they would be willing to further pursue the development of an Application Guide for SWs and TWs.

Conclusion and Next Steps:

The Task Force has not yet reached a consensus on the best manner to address the original comment, which remains the primary focus until this question is satisfactorily answered. Then the discussions can be expanded to take on the much broader task of addressing all things involving tertiary windings, which may evolve into the development of a "Guide".

Meeting adjourned 12:15 PM.

8.5.4.2.2 Subcommittee Discussion

Subhash Tuli recommended that the WG on "General Requirements", C57.12.00 consider specifying when the no-load losses should be measured for the purpose of performance guarantees. He noted that many manufacturers measure no-load losses before and after impulse tests, but it is unclear in that situation which value should be stated on the test report. After several comments the Chair called the discussion to an end in order to consider the best approach. In subsequent discussion with Subhash, the PCS Chair suggested that the proper place for such a change would be C57.12.90 rather than C57.12.00. The Chair requested Subhash to submit in writing his comments so they could be properly considered at the next meeting. At a minimum, this should cover a summary of the problem, standard and clauses affected, justification for a change, and most importantly with a proposed solution to this issue.

8.5.4.3 WG on "Frequency Response Analysis (FRA) Guide", PC57.149 – Charles Sweetser, Chairman

WG PC57.149 met for the development of the Frequency Response Analysis (FRA) Guide in Lombard, IL on October 26, 2009 at 1:45 PM. There were 78 people in attendance.

The FRA Working Group meeting was called to order at 1:45 PM.

The first order of business was to show the four slides regarding patents, assurances and inappropriate behavior.

The minutes from the Miami, FL 2009 meeting were approved by unanimous vote.

Working Chair Update

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Draft 7 was presented to the Working Group, which is the final "draft" that will be submitted for the balloting process.

The Working Group Chair presented a brief report on what had been prepared for this final "draft." The latest contributions and edits were identified and discussed. It included the following sections.

Edits to Section 4: Test Records – It was determined to consolidate the list of "required" nameplate fields. These entries are the minimum information needed to save a unique data file that can be identified for future use. The fields are: date/time, serial number, location, manufacturer, transformer ID, company (owner), measurement type (OC, SC), and terminal connections.

The working group discussed the possibility of creating a standard data format. The file format XML was recommended and was considered to be the best choice for avoiding obsolescence. The opposing argument felt that the guide did enough to define the content of the data file, and that this requirement should be left to the end user.

Edits to Section 5: Analysis and Interpretation - The discussions focused on failure modes and related case studies.

The working group discussed whether or not the loose clamping structure case study (Section 5.5.8) should remain in the guide, several members expressed interest in keeping this example. The main concern focused on the use of the high frequency to perform the analysis. Alexander Kraetge gave an example of a loose clamping structure example that showed only a slight variation; he felt the results did not warrant enough information to determine the failure mode.

Alexander Kraetge provided a short presentation and update on other FRA industry documents. The following documents were discussed:

- DL 911/2004 (Chinese National Standard)
- Cigré Brochure 342
- IEC Standard 60076-18

In comparison the IEEE PC57.149 appeared more complicated than the others, however the Working Group was satisfied with the content.

Other Comments

It was recommended that Major Deviation and Minor Deviation be removed from the definition section, because they are not used in the document.

A figure illustrating Bulk Movement in Section 5.3 appears to be missing. It will be corrected.

The ballot process will be initiated once the changes are made.

The meeting was adjourned at 3:00 PM.

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**8.5.4.4 WG on “Switching Transients Induced by Transformer / Breaker Interaction”,
PC57.142 – Robert Degeneff, Chairman; Bill Griesacker, Secretary**

1. There were 57 attendees, 16 members and 41 guests. We did not have a quorum.
2. The minutes from the March 2009 meeting in Miami, FL were approved.
3. There was a request for any patent issues to be made known, none were voiced.
4. The latest ballot resulted in 25 comments; 12 editorial, 7 general, 6 technical in nature. Six of the comments were negative requiring them to be addressed. The negative comments were reviewed in the meeting. Several of the more demanding comments are given below:

Comment 7 – “This document is related and written for low to medium voltage. You will never see a snubber at high voltage. Either change all the language to be relative to all voltages and list where only low to medium voltage is appropriate such as a snubber circuit.” Proposed to add voltage range up to 38 kV to title. This comment was made on the original ballot and the decision was to leave the document as it is.

Comment 8 – This phenomenon is independent of interrupting medium. Propose to remove all references to vacuum and replace with switching device. This comment was made on the original ballot and the decision was to leave the document as it is.

Comment 9 / 25 – Request to remove Annex A because complete data for case study is not provided. Will leave Annex A in the document.

Comment 13 – Request wording change in regard to fuse. Will work with the reviewer to resolve the wording.

Comment 24 – The phrase “but usually highly inductive” was questioned in regard to loading. This will be worked out with the reviewer.

Other minor editorial comments were reviewed to inform the working group of the proposed changes to the document.

5. The changes will be incorporated in the document and Draft 7 issued. The recirculation ballot is expected to be ready in November of this year.
6. There was no old or new business.
7. The meeting adjourned at 8:30 a.m.

8.5.4.5 WG on “IEEE Standard Requirements, Terminology, and Test Procedures for Neutral Grounding Devices”, PC57.32 – Steve Schappell, Chairman; Peter Balma, Vice-Chair

The Neutral Grounding Devices working group was called to order at 9:30 AM on October 27, 2009. There were 20 attendees: 9 members and 11 guests, with 1

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requesting membership. Copies of the previous minutes and Draft 7 of the standard were distributed.

1. IEEE patent policy was reviewed and the group was asked if there were any disclosures. There were none.
2. The minutes from the Miami, Florida meeting on April 21, 2009 were approved.
3. A PAR modification has been requested in order to remove Capacitors from the scope. A one year PAR extension was also requested. The goal is to have a straw ballot ready early 2010, and to have the ballot ready by April/May 2010.
4. The committee membership has been reviewed and adjusted based on attendance and contributions. Any member removed incorrectly may contact the Chair or Vice Chair for re-inclusion.
5. The working group had an extensive discussion concerning Draft 7 of the document.
 - The clauses for scope and purpose, normative references, definitions, altitude, and construction are complete.
 - Minimum temperatures will be added to service conditions. Dave Harris volunteered to do this.
 - Clause 6 concerning the K factor will be revised and will note that applications close to generators or motors may require higher factors.
 - Extensive discussion of Table 6 Insulation Classes for Neutral Grounding devices took place in regards to Columns 3 and 4 Fault Voltage Criteria.
 - The source for 4 second ratings will be investigated. Historically this rating was not in the document. There was a motion to eliminate this rating; however the group decided more investigation is needed.
 - Table 7 Limits of Top Oil Temperature Rise needs to be revised to reflect modern transformer classes.
 - Table 8 Dielectric Test Voltages will be revised based on all working group discussions. Peter Balma volunteered to do this. The group suggested adding 600 volts class.
 - The working group would like to use IEC material for ground fault neutralizers. Jodi Haasz will be contacted.
 - It was noted that the temperature discussion on page 13 also needs to be revised to reflect 65 degrees C insulation systems.
6. New Business: A note will be added to Table 6 Insulation Classes indicating that for system voltages not found in the table, the next higher voltage should be used.
7. The meeting adjourned at 10:45 am.

8.5.4.6 WG on “Semi-Conductor Rectifier Transformers”, C57.18.10 – Sheldon Kennedy, Chairman

The Working Group met on Tuesday, October 27, 2009 at 3:15 PM with 8 members (of 42 total) and 6 guests present. We did not have a quorum. Sheldon Kennedy chaired the meeting.

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The IEEE disclosure statement was discussed. There were no patents pertaining to this standards work for which any members had awareness.

The minutes of the April 20, 2009 meeting in Miami, Florida were approved.

The Chair announced that the Amendment, C57.18.10a had been approved and published in March 2008. The Errata was produced by IEEE in 2006. Along with C57.18.10 we now have these three documents as a group. C57.18.10 expired in 2008 and was sent out as a Reaffirmation Ballot. The Reaffirmation ballot of C57.18.10 along with the Errata and the Amendment, C57.18.10a were included as a group. This ballot passed with no negative votes and only one affirmative comment. The standard, amendment and errata were sent to REVCOM and approved.

The Working Group has completed its task. There is interest in keeping a Task Force to work on a few special items while we still have the group together. The Semi-Conductor Rectifier Transformers Working Group, the Performance Characteristics Subcommittee and the Dry Type Subcommittee were surveyed to get approval for this Task Force. There was only one negative vote from any of the groups.

There was a discussion about the standards being written in the Vehicular Transportation Society of IEEE. A traction rectifier transformer standard, rectifier standard and many C37 switchgear standards are being revised by this organization with emphasis on the needs of the transit and rail industry. Concerns about duplication of standards and conflicts in the standards were raised. This standard has been in pre ballot for a year and nobody knew when it may actually come to ballot.

The chair announced that the IEC Converter Transformers for Industrial Applications IEC 61378-1 standard is under revision again. The chair discussed some of the highlights of their latest draft. We will ask IEEE to request a copy of their work for harmonization with our document.

Phase shifted secondary windings with multi-pulse secondary windings such as 18 pulse, 24 pulse, 36 pulse, 48 pulse and 54 pulse are becoming a great part of the motor drive transformer applications, as well as higher current rectifier transformers. There is no discussion about these in the present C57.18.10 and this will need some work. We began to discuss how we would incorporate these circuits into C57.18.10 since this is all relatively new work since the document was originally published in 1998. Numerating additional rectifier and transformer circuits was discussed. As we began to discuss this, Dhru Patel informed us that there were patents on a lot of the methods of phase shifting windings by the drive and rectifier companies. Not wishing to have a problem with patents, the Task Force decided to just propose general discussions of phase shifting windings and not give any of the exact phase shifts that are being used in industry. This seemed the best way to accomplish this. Since there were now patent issues that were raised, the chair will discuss this with Tom Prevost.

Electrostatic ground shields are not discussed in the present standard. We discussed some general comments that can be made about them regarding their purpose and issues to be considered about them in design. The Chair will circulate some comments and the members will consider additional comments.

There were no further comments. The meeting was adjourned at 4:30 PM.

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8.5.4.7 PCS WG on “Loss Evaluation Guide for ~~Distribution and~~ Power Transformers and Reactors”, PC57.120 — Don Duckett and Al Traut, Co-Chairmen

The meeting was called to order at 3:15 pm on Monday October 26, 2009. A roll call of the membership was taken. 13 of 21 members were present therefore a quorum was established. The minutes of the Miami meeting were approved as submitted. A request was made for disclosure of any patents that may be related to the work of the WG, and there were no responses to the request for disclosure.

Chair reported that the April 2009 recommendations of the WG were implemented. On Sunday October 25, 2009, the Administrative Subcommittee approved our request to disband C57.12.33 and in its place establish a WG to revise C57.120. This new WG is under Performance Characteristics Subcommittee. The current co-chairs will continue to serve as chairs for this new WG.

The meeting next focused on discussion related to the title, scope and purpose of the revision of C57.120. The WG members unanimously approved the following.

Guide for Loss Evaluation of Distribution and Power Transformers and Reactors

1.1 Purpose

This guide offers a methodology to determine and thereby specify the economic value of no-load, load, and auxiliary losses. The use of this guide allows manufacturers to tailor the design to the unique economic situation of each user, and allows the user to evaluate multiple designs.

1.2 Scope

This guide covers the economic loss evaluation of liquid filled and dry type distribution and power transformers and reactors.

The chairs will prepare a PAR prior to the next meeting and merge the C57.12.33 and C57.120 documents prior to the next meeting.

There was no other new business.

The WG adjourned at 4:30pm and will need a meeting slot at the Spring meeting.

8.5.5 Old Business

None.

8.5.6 New Business

- 8.5.6.1** There was additional discussion regarding the no-load loss issue previously raised by Subhash Tuli in 8.8.4.2.2. Participants commented that some manufacturers perform no-load loss tests before and after impulse tests to detect imperfections in the core, particularly those resulting from a poorly cut core.

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8.5.6.2 After the PCS meeting and at the Main meeting on Thursday, Sanjib Som raised an issue stating that there was some conflict in C57.12.00 and/or C57.12.90 regarding the 85°C reference temperature for load losses on 55/65°C or 65°C rise transformers. Rather than debate this issue with no background information, the PCS Chair requested Sanjib to submit this issue in writing describing the problem, the standards and clauses affected, and most importantly with a proposed solution, so that it could be properly considered at the next meeting.

8.5.7 Adjournment

The meeting adjourned at 4:10 PM.

8.6 POWER TRANSFORMERS – TOM LUNDQUIST, CHAIRMAN

The Power Transformers Subcommittee met on Wednesday, October 28th, 2009 at 1:30 p.m. with attendance of 150; comprised of 57 members and 93 guests.

The minutes from the Spring 2009 meeting in Miami, Florida were approved with no changes.

The chairman asked if anyone was aware of any patent conflicts, none were voiced.

8.6.1 WORKING GROUP AND TASK FORCE REPORTS

8.6.1.1 TASK FORCE FOR REVISION OF C57.17, REQUIREMENTS FOR ARC FURNACE TRANSFORMERS – Dominico Corsi, Chairman

The revised document was uploaded to RevCom on Nov. 16, 2009. No meetings are scheduled until comments are received.

8.6.1.2 WORKING GROUP FOR DEVELOPMENT OF PC57.143, GUIDE FOR APPLICATION OF MONITORING TO LIQUID IMMERSSED TRANSFORMERS AND COMPONENTS – Donald Chu and Andre Lux, Co-Chairmen

Meeting started shortly after 8 AM. There were a total of 95 attendees, 27 members and 7 requesting membership.

A reminder regarding the moisture section was made reaffirming:

- The balloted version did not include the latest work of the working group (WG). Hence, this section will be replaced with the WG version for the next ballot circulation. Any comments on the moisture section should be re-submitted at that time and will be addressed in the next ballot resolution cycle.

Status of our ballot status was presented:

- The ballots from our first circulation were received and comments compiled.
- Balloting members who submitted comments: 35
- Of those who submitted comments, 21 were Approval Ballots and 14 were disapproval ballots.
- Total comments received: 426

Status of ballot resolution was presented:

- Ballot resolution committee convened 9 times since the ballot closed.
- At the present time, 91% of the submitted ballot comments have been resolved.
- Recognizing the 80/20 rule for projects such as this, we are just over half way done with the resolutions.
- There are no known contentious issues that will prohibit resolution of all outstanding comments.

Next steps were identified:

- Resolve outstanding comments (including attachments submitted) through continued meetings with the ballot resolution team.
- Assignments have recently been made for resolution of specific items. These revisions will be reviewed and incorporated once received.
- The document formatting needs review.
- The Bibliography needs to be reviewed.

We are confident that we will be ready to re-ballot the document before the end of the calendar year.

Meeting adjourned at 8:40 AM.

8.6.1.3 WORKING GROUP FOR DEVELOPMENT OF PC57.148, STANDARD FOR CONTROL CABINETS FOR TRANSFORMERS – Joe Watson, Chairman

The working group was called to order at 11:00 AM on October 26, 2009. There were 27 attendees, 15 members, and 12 guests, with 3 requesting membership.

1. Joe discussed the meeting agenda, which had been previously emailed to the group. The latest draft did not get emailed due to an apparent size issue with the AM system, and was handed out at the meeting.
2. The section on wire markers was discussed at length. Previous comments on this section concerned the size of the wire marker required to indicate both local and remote identification on the marker. It was pointed out that some manufacturers provide labels with only local identification, and others provide labels with remote identification. Users had preferences for one or the other of these methods. A user pointed out that they would not change the way they require labeling on wire markers to meet this Standard. Joe pointed out that this Standard is more for customers without specific requirements. A member requested that the Standard state this. After much discussion and voting, the group decided to go with both local and remote identification on each wire marker.
3. The section on current transformer circuits and terminals was discussed. The group discussed whether current transformer wiring was within the scope of the standard, as they are mounted outside of the control cabinet. Joe stated that he would look into this.
4. It was pointed out that the section on ground pads required the use of ground pad(s) on the control cabinet, yet contained the words “when installed”. These two extraneous words will be removed.

5. Joe informed the group that significant changes were made to sections 5.10 and 5.11, and that the group should review them and provide comments.
6. Joe stated that he would revise the document by November 4th and email it to the group. He would like comments back by November 18th.
7. The meeting was adjourned at 12:15 pm.

8.6.1.4 WORKING GROUP FOR DEVELOPMENT OF PC57.131, STANDARD REQUIREMENTS FOR TAP CHANGERS - William Henning, Chairman

Meeting minutes to be provided later.

8.6.1.5 WORKING GROUP FOR DEVELOPMENT OF PC57.150, GUIDE FOR THE TRANSPORTATION OF TRANSFORMERS AND REACTORS RATED 10,000 KVA OR LARGER –Greg Anderson, Chairman

Greg Anderson, Chair of the Working Group for Transportation Issues Guide, PC57.150, called the meeting to order at 3:21 pm. Also present was the Vice Chair Ewald Schweiger and Secretary Susan McNelly.

There were 15 of 31 members present with 54 guests and 5 guests requesting membership. Working group members will only be added to the Guide as "Participants" when they contribute to the document. The following requested membership, although approval for membership is contingent upon actually contributing.

Daniel Blaydon	Jefferson Foley
George Kennedy	Syed Aslam Rizvi
Kenneth Skinger	

Agenda:

1. Introductions/Roll Call
2. Patent Issues
3. Approval of Fall 2008 Minutes
4. Content still needed
5. Review of Contributor List
6. Adjourn

Member Roll Call and Introduction of guests present was done. Fifteen of the present 31 members were present, therefore a quorum was not achieved.

The IEEE Patent disclosure requirements were discussed and a request was made for disclosure of any patents that may be related to the work of the WG. There were no responses to the request for disclosure. Sue McNelly indicated that Rickmers has

indicated that they will provide an updated Figure of the six degrees of motion. They indicated that there is no copyright requirement for the figure.

Approval of minutes from the Spring 2009 Miami, Florida meeting was requested. A motion was made and seconded. The motion was approved.

Greg summarized the status of the Guide. The Guide is approximately 90-95% complete.

A new Draft 7 of the guide has been posted for review. Many updates have been made since the last meeting. Additional comments have been received in the past week that still need to be incorporated. Greg indicated that he would like to get any additional comments within the next couple of weeks. He would like to issue a straw ballot shortly so that the Guide can be sent out for ballot before the next meeting.

New wording for the scope and purpose were suggested. This would require a PAR modification.

Martin Heathcoat indicated that he would be willing to do an overall editorial review on flow and readability of the document.

Catherine Hurley indicated that the moving of older or existing transformers and reactors does not seem to be addressed. It appears that the guide presently only addresses new units. Also, issues like site access, rail siding condition, etc need to be addressed. It was indicated that the most recent draft has added some of the site and rail siding access items.

There was a suggestion from Joe Watson to address that intelligent reading of the impact recorder and associating the impact to a time to determine if excessive impacts are related to any specific issue such as the recorder being removed from the equipment. Also, what time zone is the impact recorder set for? This is important when trying to determine when an impact occurred.

Kipp Yule suggested that a log needs to be kept from start to finish for the move of the unit. This log may be critical to determining when a unit was moved from one transport to another, when it was offloaded etc.

Kipp Yule asked where the recommendation for mounting the impact recorder 3 m up on the tank. He indicated that he knows of an issue where the impact recorder was mounted near the top and lower impacts did not get recorded as a result.

Martin Heathcoat indicated that many of the recent changes have leaned more towards requirements, rather than recommendations. This is leaning the document away from being a guide.

Dave Wallach made a comment that often units with shipping covers don't always have the information available regarding the weight of the cover.

Meeting was adjourned at 4:16 pm.

8.6.1.6 TASK FORCE FOR FUNCTIONAL LIFE TESTS OF DE-ENERGIZED TAP CHANGERS – Phil Hopkinson, Chairman

The Task Force on Life Tests, De-energized Tap Changers was called to order at 9:35 AM on October 27, 2009. There were 42 attendees, 20 members, and 22 guests with 1 requesting membership. A quorum was not present. There were no patents to disclose. Reviewed the Agenda for the meeting, and the Minutes from the April 21, 2009, meeting in Miami, Florida, were approved.

1. A functional life test shall be performed as a Type Test to demonstrate the adequacy of the contact design to achieve long stable thermal life. No known field failures from tap changers that pass test.
2. Issues for test –
 - Test Validity. Suppose we wanted to define life as equal to oil-Cellulose. What time and temperature to have equal life as oil-cellulose (110 C for 180,000 hrs)? Calculations show that test to date not equivalent to insulation life.

Testing is currently being conducted with Ag-Sn and Sn-Sn contacts in FR3 have been stable for 14 days as of the date of this meeting. Test will need to be repeated in oil as previously unstable contacts have been stable in FR3.
 - Issue of Oil Volume. Large liquid volume important for test validity and it is important to replicate real environment
3. Extended discussion on conducting the test. Earl Rawls wants to conduct a test, but needs more details to set up the test.
4. Bengt Stenestam presentation. There are considerations that need to be better defined in conducting the test. Examples are statistical variations (material quality), oil quality, wiping effect on contacts. Pass criteria for the test may be too rigid.
5. Agree on Technical Paper – not many comments have been received. Goal is for TF paper and not solely a Phil Hopkinson paper.
6. New Business - There was no new business.

The meeting adjourned at 10:55 AM.

8.6.1.7 WORKING GROUP FOR REVISION OF C57.135, GUIDE FOR THE APPLICATION, SPECIFICATION AND TESTING OF PHASE-SHIFTING TRANSFORMERS – Jin Sim, Chairman

The WG met with at 1:45 PM on Tuesday with 13 Members and 5 Guests in attendance. This did not constitute a quorum, but no issues were submitted to a vote of the WG.

A revised Figure 15 was discussed and it was agreed to add a third descriptive current label to one of the circuit legs for consistency in style. This change will be made to a new Draft 6.

It was pointed out that a table of figures from the current dual logo version of the Guide, which provides equivalent IEC and IEEE figures, was missing from this draft and needs to be included. This will also be added to Draft 6.

All of the References in the Guide are IEEE references and the need for IEC references was discussed. The Guide will be circulated through IEC to solicit input on this question.

Draft 6 will be circulated for a straw ballot before the end of this year.

The meeting adjourned at 3:00 PM.

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

1. The meeting was opened at 9:30 AM.
2. Results of the ballot of Draft 4.3 was reviewed and reported:
 - Met 75% requirement for response rate
 - Received 87% affirmative ballots meeting the recirculation criteria
3. Status of PAR Status Reviewed
4. Fourteen person ballot resolution committee formed to resolve comments
5. Target March 2010 for ballot recirculation
6. Received two rogue comments during the question period. Once received in writing they will be reviewed by the ballot resolution committee

Meeting adjourned at 9:50 AM.

8.6.1.9 WORKING GROUP FOR THE REVISION OF IEEE STD 638-1992, IEEE STANDARD FOR QUALIFICATION OF CLASS 1E TRANSFORMERS FOR

NUCLEAR POWER GENERATING STATIONS – Craig Swinderman, Chairman

Date: Tuesday, October 27, 2009 – 11:00 am to 12:15 pm.

Attendees: 2 members + 7 guests

The meeting began at 11:00 am.

The meeting minutes from the April 2009 meeting were approved.

The IEEE patent policy slides were shown. An opportunity was provided for the attendees to identify or disclose patents that may be essential for the use of the standard. No responses were given by the attendees of the meeting.

Topics discussed:

The latest version of the P638 document is now Draft #4. This latest draft was reviewed during the meeting. This draft #4 of the document will be posted to the transformers committee website shortly. The majority of the document is nearly complete, but a few remaining items need to be addressed.

In reviewing section 6.3 of the draft document that describes the Qualification Tests and test sequence, a suggestion was made to add Frequency Response Analysis to the list of tests. It was recommended to perform a baseline FRA test prior to any potentially destructive tests such as the short circuit test and seismic test, and then repeat the FRA test after the completion of the seismic test in order to more accurately determine if any movement of the core or windings has occurred. It was agreed that this suggestion will be incorporated into the next draft of the document.

An additional suggestion was made to survey if the scope of the standard as currently written will cover the anticipated ratings of the Class 1E transformers for the next generation of new nuclear plants now being planned. The scope currently covers single and three-phase transformers rated up to 15 kV and 2500 kVA self-cooled rating. A survey will be sent out to verify if these ratings are adequate to cover the new nuclear plants, or if the ratings should be increased. If the ratings need to be increased, a modification to the existing PAR will be required.

The working group is also still working on correcting a few of the figures in the Annex of the document, and this work should be completed soon.

The draft of the document will be circulated to additional users in the industry to try and gather any additional comments or suggestions to be incorporated into the document.

The current planned schedule for the working group is to have any new comments incorporated into an updated draft of the document completed by this December 2009. We will then send the document out for a straw vote in early 2010, and then submit the

document for the Mandatory Editorial Review and hope to start balloting around the time of our next meeting in March 2010.

The meeting adjourned at 12:15 pm.

8.6.1.10 WORKING GROUP FOR DEVELOPMENT OF PC57.153, GUIDE FOR PARALLELING TRANSFORMERS – Tom Jauch, Chairman

Attendance: 17 members, 2 guests, 8 new attendees requesting guest status

Minutes were discussed and approved.

Comments were invited on the first draft of the guide.

Tom Jauch presented material to further refine the goals of paralleling equipment and proposed using the final balancing quantities for naming the methods:

- Goals of paralleling
 - Balance VARS
 - Balance reactive current
 - Balance Total Current
 - Match Taps
 - Balance PF (power factor)
 - An additional goal to minimize losses was proposed

A presentation was made for consideration of a previously proposed new method named “Circulating Reactive Current Method by Equalizing Calculated Transformer Power Factor”. This method uses measured PF to calculate the circulating reactive current as the method of control adjustment. This method was not originally included in the guide. No action was finalized.

Following the “new” method presentation and discussion, a proposal was made for consideration to remove the PF Method as a separate method. No action was finalized.

As part of the first draft, a recommended outline was proposed for use when writing the paralleling sections of the guide. Comments were requested from the members on the proposed format. A request was made to add phasor diagrams to the recommended outline for each method.

Copies of this presentation these minutes and the recommended outline will be redistributed to allow comments from those members not in attendance.

Meeting was adjourned.

8.6.1.11 TASK FORCE FOR TRANSFORMER TANK RUPTURE AND MITIGATION – Peter Zhao, Chairman

Meeting of the Task Force for Tank Rupture & Mitigation convened Tuesday morning at 8:00am. Chairman Peter Zhao presided.

Knowledge of patent concerns was requested, with none cited.

Attendance was 39 (17 members, 22 guests).

Chairman Zhao provided introductory remarks and previewed the agenda to be covered for the meeting. Present status of this effort is that a white paper has been submitted and approved for publishing, and we are presently developing a “scope” and “purpose” for submittal of a request for a PAR for the guide’s development.

Arnold Carlos indicated that in the report, we must be careful of the usage of “prevention” vs. “mitigation” as there can be legal implications by the use of the wrong word. Chairman Zhao confirmed awareness of this caution and that it will be considered in editing.

It was suggested that our focus is too much on rupture and should be more limited to fire. This suggestion received several responses that spill prevention may be just as important as fire prevention.

Reports were presented by representatives from each work team as follows:

1. Terry Lee presented suggestions for introductory sections of a possible Guide.
2. Bill Darovny presented draft wording for a section on Tank Construction.
3. Josh Hertz presented results of his team’s study of Pressure Relief Devices.
4. User Specification content was presented by Dennis Marlowe.
5. Time did not allow presentation of findings/suggestions regarding the final area of coverage - Acceptance Evaluation.

Tom Lundquist commended the task force for good work, but cautioned that we must be careful to not get ahead of the standards process by developing a Guide without IEEE approval. Tom also inquired as to our intentions in regard to a previously-discussed tutorial to be presented. Chairman Zhao confirmed our intention to request a time slot on the Spring 2010 meeting for the tutorial, and committed to provide a list of presenters for that presentation.

The meeting was adjourned at 9:15am.

8.6.1.12 TASK FORCE FOR EVALUATING THE NEEDS OF TRANSFORMERS USED WITH SVC – Peter Zhao, Chairman

The work of this task force is concluded. A report was issued and it is being considered if an educational paper should be published.

8.6.1.13 TASK FORCE FOR DVP-GRID TRANSFORMERS – Hemchandra Shertukde, Chairman

Draft Minutes of TF meeting

The meeting started at 8 am in Lilac B/D with a total of 21 attendees: members (6) and guests (15) in attendance. The Chair introduced Mr. Mathieu Sauzay as the new Vice Chair for the TF as Mr. Amitav Mukerji from ABB has indicated that he may not be able to attend consistently the IEEE IC meetings. Per the IEEE guidelines any disclosures related to existing patents associated with the TF work were enquired from the audience. Barring none Mr. M Sauzay then introduced two documents

These two documents were:

- 1) IEEE 1277 – requirement for Dry Type and DC reactors
- 2) C-57 129 General requirements of test for high voltage transformers

Interesting information on a revision of a document related to HV DC transformers and smoothing reactors was also presented.

This relates to DPV transformers, as those are continuous sources of power–
Conclusion -We have to study Standards available that may have related topics and concerns.

Several Questions were posed to the TF membership in general:

- 1) All Stds that address problems related to DC loads or DC networks?
- 2) Anything that is associated with DPV Transformers should be addressed by the TF moving forward. It was suggested that SC on HVDC Transformers - with Mr. Richard Dudley, Chair could answer these questions – as suggested by Mr. Tom Prevost. The Chair attended Mr. Dudley's session later that day and presented the help our TF needs.

Ms. Jane Verner – indicated that at the moment they deal with 5 or 6 MW load on some PV transformers. There is voltage variation related to varying load conditions resulting in AC variation.

Mr. Bill Chu indicated that SCE on the West Coast has experienced similar conditions; in its entirety it is addressed as a System interaction issue.

Mr. Tom Prevost inquired what the charge of the TF was? –
How does the TF position itself as related to a Position paper User Guide or a Standard.

Per Mr. Tom Prevost 's request specific charge was read out

- What perceived problems may exist that are not addressed by existing papers, literature etc. – list of perceived problems should be created

Mr. T Lundquist elaborated that: Are the questions in the charge to the TF answerable?

Ms. J Verner indicated that Voltage Regulation? – as experienced at a 2 MW plant in NJ Another example cited was in Washington, DC – 20 houses on the mall – competing on efficiency criterion!

There was a comment that DOE has a lot of stds related to smart grid – take a look at it.

Dr. H M Shertukde indicated that at the last Admin – Committee deliberations

- Smart Grid implications were discussed as indicated by Mr. Tom Lundquist. What Impact will this TF activity have on Smart Grid Business? Any other related activity of the OLTC group that may affect the activity and proceedings of this DPV TF.

TF on DPV Grid Transformers was also asked to take input from Paralleling of transformers WG– especially related to distribution automation, automatic segmentation of power lines and redirection of power flow.

TF was advised to take a look at projects that can have similar activities related to two directional power flow and associated with the smart grid activity. Additionally, solar power and windmill on a house creating a bi-directional power flow will have an effect on the transformer that provides the power tie resulting into a possible: dc bias on the transformer!

In summary, a matrix of perceived problems thirteen (13) and related standards seventeen (17) was created.

After the deliberations of the TF it was decided that at the next meeting of the TF at the IEEE TC meeting in Houston in Spring 2010, the results of the above evaluation of all the perceived problems related to the DPV Grid Transformers already covered or not adequately addressed in the specific standards will be presented. The aggregate coverage will be reported and cumulated to create a comprehensive document as a first part of satisfying the charge of the TF as laid down in its Porto, Portugal meeting in October of 2008.

Later this report will be submitted to the Admin committee of the IEEE IC, to pave the future course of action and further activity of the TF.

8.6.1.14 TASK FORCE FOR WIND GENERATOR STEP-UP TRANSFORMERS – David Buckmaster, Chairman

October 26, 2009 – Meeting was called to order at 9:30am.

Changed Name of TF from Alternative Energy Step-Up Transformers to Wind Generator Step-Up Transformers. Task Force discussed several items as reference documents for the TF to consider for our purpose statement.

Task Force Mission: Determine need for either a standard or guide to document the special requirements of Wind Turbine Generator Transformers and report to the Power Transformer Subcommittee.

Attendance: 13 members and 16 guests.

Resolved several issues and suspended meeting at 11:15am call to reconvene Tuesday at 11:00am.

Tuesday October 27, 2009 reconvened meeting at 11:15am. Laid out several administrative issues, reviewed the CDV document IEC 60076-16 Transformers for wind turbines applications and modeled our purpose statement accordingly as:

This standard applies to dry type and liquid immersed transformers for rated power 100 kVA up to 10000 kVA for wind turbines application having a winding with highest voltage for equipment up to and including 36 kV and at least one winding operating at a voltage greater than 1.1 kV.

Paul Jarman who is working on the IEC document has recommended that we utilize the CDV document as a joint approach and once the IEC document is ratified that the IEC committee immediately start the revision process in cooperation with IEEE TF. At that time the TF will apply to become a WG and also apply for the relevant PAR.

Work Assignments were made on a voluntary basis with a few unassigned which will be solicited via e-mail. Should no volunteers step forward they will be assigned by the chairman. The TF will have two conference calls between now and the Spring 2010 meeting in Houston. There are several assignments that are deliverables prior to the first conference call tentatively scheduled for mid December.

8.6.2 OLD BUSINESS

Regarding the motion at the last meeting to create a database of generic information for power transformer failures; the Transformers Committee Admin Committee discussed the subject and decided that the Power Transformers Sub Committee will not undertake this activity.

Previous items opened up under "New Business":

Fall 2009 - The following documents are up for balloting in the near future. The following members have volunteered to review the documents and determine if they need revisions or can be submitted on a re-approval ballot.

C57.16 – Tim Raymond
C57.125 – Wally Bender

C57.117 – Wally Bender
C57.140 – Joe Watson

8.6.3 NEW BUSINESS

EPRI is starting a research project on the through fault duty of power transformers. If you are interested in this study please contact: Ashok Sundaram by e-mail at asundara@epri.com.

8.6.4 STATUS OF “INACTIVE” GROUPS

WORKING GROUP FOR THE REVISION OF C57.93, INSTALLATION OF LIQUID-FILLED TRANSFORMERS - Michael Lau, Chairman

This group is not meeting; major work on this document is complete; waiting for publishing.

TASK FORCE FOR WIND FARM TRANSFORMERS – Joe Watson, Chairman

Work of this group is complete; the task force is inactive.

8.7 Underground Transformers and Network Protectors

Carl G. Niemann (Chair)

Dan Mulkey (Vice-Chair)

Meeting Minutes – October 28, 2009

8.7.1 Introduction/Attendance

The Underground Transformers and Network Protectors Subcommittee met on Wednesday, April 28, 2009, in the Jr. Ballroom C of the Westin Lombard Yorktown Center Hotel in Lombard, Illinois at 11:00 AM with 8 members and 5 guests present.

8.7.2 Approval of Minutes

The minutes of the April 22, 2009 meeting in Miami, Florida were approved as submitted.

8.7.3 Membership

Membership stands at 15 members, so a quorum for this meeting was met.

8.7.4 Chairman's Remarks

The following Administrative Subcommittee notes were reported to the subcommittee:

- An overview of meeting statistics was provided
- WG leaders should:
 - Should establish a quorum of > 50% of membership

8.7.5 Working Group Reports

8.7.5.1 Underground Single Phase Transformers (C57.12.23) – A. Traut, Chairman

1. The WG did not meet in Lombard. The document was published in April 2009 and is valid until 12/31/2014. The WG has no new issues to address so it will be inactive until revision or reaffirmation is required.

8.7.5.2 Three-Phase Underground-Type Transformers (C57.12.24) – Giuseppe Termini, Chairman

1. The meeting was called to order by the Chairman at 8:00 a.m. on Monday, October 26, 2009 in the Cypress A/B Room of the Westin Lombard Yorktown Hotel. Brian Klaponski acted as the recording secretary.
2. An agenda was presented and introductions were made. The meeting was attended by 14 members and 22 guests. One guest requested membership.
3. The Chairman asked if anyone in the Working Group knew or had knowledge of any existing or pending patents that may affect the work on this standard. All responses were negative.
4. The Meeting Minutes from the previous meeting in Miami on April 20, 2009 were reviewed and approved since a quorum was established with 14 members present at this meeting.
5. The Chairman had tried to email a complimentary copy of the newly published C57.12.24 – 2009 through the AM System to all members and guests but the file was

too large to be delivered. The Chairman stated that he would email a copy directly to each member and guest. Once each WG member receives the new published document, members should read it to identify any changes and improvements at the next meeting.

6. The Chairman discussed quorum requirements for future meetings based on a meeting he attended early the morning of October 26 set up by the Distribution Subcommittee. His intent is to review the WG membership list and bring it up to date to reflect the active members.
7. The meeting was adjourned at 8:45 a.m.

8.7.5.3 Liquid Filled Secondary Network Transformers (C57.12.40) – Brian Klaponski, Chairman

1. The WG met on Monday, October 26, 2009 at 09:30 am with 9 members and 9 guests. One quest requested member status.
2. The chairman reviewed the patent legal issue and asked whether there were any patents or patents pending that would affect the WG or standard. None were identified.
3. The minutes of the April 20, 2009 meeting in Miami, Florida were reviewed and approved.
4. The Chairman stated that the standard was last reviewed in 1998/1999. The goal of this meeting is to bring the standard to an acceptable level so that it can proceed to balloting.
5. The rest of the meeting consisted of a review of Draft 6 of the standard dated October 21, 2009.
 - A. Section 6.2. 2 - B. Title change from “Short Circuit Withstand of the Switch” to “Momentary Short Circuit Withstand of the Switch.”
6. The Chairman recommended he finalize the draft in the next couple of months, then circulate the draft to WG members for final comments, and then proceed to balloting prior to our March 2010 meeting. Larry Dix made a motion to this effect and Dan Mulkey seconded the motion. The motion was voted on and approved.
7. The meeting was adjourned at 10:44 am with the next meeting in Houston TX in March.

8.7.5.4 Secondary Network Protectors (C57.12.44) – Bill Wimmer, Chairman

1. The WG met on Monday, October 26, 2009 at 11:00 am with 6 members.
2. The chairman reviewed the patent legal issue and asked whether there were any patents or patents pending that would affect the WG or standard. None were identified.
3. This group has not met for several meetings. The document will expire at the end of next year and we do want to keep it active. This meeting was to determine the course of action for the document (revision or reaffirmation).
4. The chairman opened the floor for any possible changes that need to be considered for a new revision.
5. Mark Faulkner had the following comments:
 - A. 6.2.1.3b “The network relay(s) shall be tested at 1500 V at 60 Hz for 1 min.” Is this left over from the electromechanical days? The general consensus is that it is.

- B. 5.2.3.3 “At the end of the test, the network protector shall be capable of meeting its interrupting rating and capable of carrying rated continuous current without exceeding the temperature rise limit.” Does this require a second heat run test?
6. Ed Bertolini had the following comments:
 - A. 10.5.20 “The operating mechanism and relay cases shall be grounded to the enclosure through the removable breaker.” There is a general lack of detail in the requirements and in some cases customers may not be properly installing protectors and maintaining the ground connection. Suggested that a non-painted stainless pad, etc should be added.
 - B. We should consider adding a section on environmental requirements. This would include requirements for such items as CTs and Pts.
7. It was decided that there were enough issues to go forward with a revision to the document. The chair will send out a copy of the current (2005) version to all past members of the working group and solicit any additional comments.
8. The chair will also go forward with submitting for a PAR sometime after the Spring meeting.

8.7.5.5 Ventilated Dry-Type Network Transformers (C57.12.57)

1. The WG was not scheduled to meet.

8.7.6 Old Business

1. None.

8.7.7 New Business

1. Brian Klaponski had comments on the Patent Issue:
 - A. We ask the patent question at the beginning of each meeting. In all the meetings I have ever attended I have never seen anyone identify a patent. I attended the meeting of a new TF on Natural Ester Fluids. This group is just forming. When the patent question was asked there were no patents identified – yet there are clearly patents involved. So my question is: why do we ask the question?? When someone stood up and addressed the issue at that meeting their questions and concerns were addressed only in a defensive way and quite frankly they should have been duly noted and as a minimum taken under advisement. What do the minutes of that TF show in regards to that discussion?
 - B. I will attempt to now answer the question of why we ask the question. The IEEE wants to protect themselves from patent infringements and I suppose at the same time protect us the members. Also, there is another important and very fundamental reason we need to understand as people trying to write standards. We need to understand if there are issues that will affect the availability of products that are parts of our specs. We need transparency to ensure proper decision making. Should not there be full disclosure.
 - C. Should we (as the Transformers Committee) undertake to better understand why we are asking for patent disclosure?

8.7.8 Future Meetings

- The next meeting will be March 7-11, 2009 in Houston, Texas.

“AUDIBLE SOUND AND VIBRATIONS” SC

**Meeting Minutes
Lombard, IL
October 28, 2009
Chairman: Jeewan Puri**

ASV Sub Committee met at 9:30 AM on Wednesday with 15 members and 34 guests present. After the introduction of the participants and the Chairman’s remarks the following items were discussed:

- WG Report on The revision of Section 13 of Test codes IEEE C57.12.90 and IEEE C57.12.91 (Ramsis Girgis – Chairman):

The working group is presently involved in proposing changes to Section 13 of the test codes for sound level measurement procedures and for including sound intensity measurement procedure in the test code. This review is based on new work that Ramsis and his colleagues have completed toward improving the accuracy of the sound intensity measurement method. All the changes to Section 13 will be coordinated with the corresponding revisions on IEC Sound Level Measurement Standard 60078-10 so that these documents remain harmonized.

The WG discussed the following three proposals:

1. The Chairman presented data that showed a consistent / and linear relationship between $(P - I)$ as a parameter and the magnitude of error in the measured values of Noise level using the “Sound Intensity Method”. The following proposals were accepted:
 - Allowing a maximum value of $(P - I)$ of 4 dB with no penalty
 - Allowing a maximum value of $(P - I)$ of 6 dB, but applying a penalty of 1 dB when $4 < (P - I) \leq 5$ and 2 dB when $5 < (P - I) \leq 6$
2. It was proposed that the equation given in the IEC Standard 60076-10 for correcting sound pressure measurements due to sound reflections from the walls should be included in the IEEE test codes except that only two reflection coefficients of 0.2 and 0.35 should be used for calculating measurement corrections for testing in the factory and testing in rooms with sound proofing materials.

It was also proposed that the allowable correction for this effect should be limited to 3dB instead of 7dB as given in the IEC standard 60076-10.

WG was in general agreement with this proposal.

3. It was proposed that the presently prescribed equation in the IEC Standard 60076-10 does not calculate load noise power levels and should not be adopted in the IEEE

test codes for determining if winding noise levels are necessary. It was agreed that these measurements should be made if the customer specifies it.

New Business

Dr. Chris Ploetner brought up the topic of whether measuring transformer noise at 1 ft from the transformer at ONAN is the right approach. This will be discussed in the next meeting of this WG.

Next draft of Sound Abatement Guide C57.136 – Allen Darwin: Allen reported that this guide will be due for revision in 2010. This work will be done only after Section 13 of the test standards have been modified.

There being no new business, the meeting adjourned at 10:45 am.

Jeewan Puri
Chairman - ASVSC

**MINUTES OF MEETING
BUSHING SUBCOMMITTEE
OF THE
IEEE/PES TRANSFORMER COMMITTEE
Lombard, IL
Oct 28, 2009**

8.9 Bushing Subcommittee – Fred Elliott, Chair; Peter Zhao, Secretary.

8.9.1 Introduction/Attendance

Chair opened the meeting at 9:30 AM and welcomed the members and guests. There were 57 attendees with 17 members and 40 guests present. 5 guests were added to the membership after the meeting. 16 members did not attend the meeting.

Copies of the IEEE patent policy summary were circulated with the meeting agenda. The policy was addressed in the meeting and no patent conflicts were reported.

8.9.2 Approval of Minutes of Last Meeting

The minutes of last meeting in Miami, FL were approved as written.

8.9.3 Chairman's Remarks

- a) Bushing Subcommittee Meeting Attendance Policy
Attendance at a minimum of one subcommittee meeting every two years is required to remain a member of the subcommittee. The membership list will be reviewed after every meeting and non-compliant members will be removed from membership. Any exceptions to this policy require approval of the subcommittee chair. Guests who have attended two meetings in the two years prior to the current meeting will be considered for membership in the subcommittee.
- b) IEEE Std Interpretation
Interpretation request to IEEE Stds shall be forwarded to the secretary of IEEE Std Association for response.
- c) Committee request for identification on Smart Grid Issues related to Bushing Standards, and then report back to Committee prior to next meeting.

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

8.9.4.1 WG - Revision of C57.19.00 - Keith Ellis, Chair

No meeting was scheduled.

A reaffirmation ballot was conducted for this Standard which is scheduled to expire at end of 2009.

Below is the report from Keith Ellis on the reaffirmation ballot results:

The ballot was successfully with only three negative votes.

- a) One negative ballot was editorial in nature and did not rise to the level of a negative ballot. The editorial comments were noted for future consideration.
- b) A second negative ballot was also editorial in nature and did not rise to the level of a negative ballot. It did raise one issue missed when the document was published; numbering of key paragraphs were omitted, which can be confusing when referring from one clause to another. The WG Chair will look into correcting this with IEEE.
- c) The third negative ballot did raise an issue that did rise to the level of a negative ballot and will be addressed in a future revision cycle.

The first point regarding temperature rise criteria regarding allowable temperature rise of terminal connections. This will be circulated within the working group for discussion.

The second point want routine impulse testing in accordance with IEC 60137, for all bushings above 850 kV BIL being tested.

It was explained that the WG had discussed this issue during the revision process and it was agreed that experience by manufacturers did not justify the added expense imposed by such a requirement.

It is recommended that a Task Force be considered to review all the comments received and determine if there is enough in the comments to warrant a new WG to revise C57.19.00.

8.9.4.2 TF - Revision of C57.19.100 – Tommy Spitzer, Chair

No meeting. The revision was finished and ready for ballot soon.

8.9.4.3 TF – GSU Bushings – Catherine Hurley

Minutes: Meeting of the Task Force for Generator Step-Up (GSU) Bushing Standardization

October 27, 2009 1:45 pm

1. Attendance: There were 27 people in attendance, as follows: 11 Members; 6 Requesting Membership, and 16 Guests. Introductions were made by everyone.
2. Agenda: An Agenda was presented by the Chair of the Task Force.
3. Minutes: The Minutes of the last meeting in Miami, Florida were presented and approved.
4. PAR: The Chair sent out the PAR, title scope and purpose prior to the meeting for comment and voting before it is formally submitted. It was discussed that there are still remaining members that need to respond but the majority of votes are for the submittal.

5. Draft: Once the PAR is approved by IEEE then the chair will post the draft standard on the website for continuing work and this task force will become a working group.
6. Secretary: A request for a volunteer for secretary was requested due to the previous secretaries commitments. JD Brafa from ABB volunteered after the meeting.
7. Adjournment: The meeting was formally adjourned.

8.9.4.4 C57.19.03 – DC Bushing Standard – Les Recksiedler, Chair

This working group is being replaced by the new IEC/IEEE Maintenance Team JMT-5 for Revision of DC bushing standards IEC 62199 and IEEE C57.19.03. The new standard which will replace these two documents will be numbered IEC/IEEE 65700-19-03. The IEEE PAR for the revision of C57.19.03 will be modified to reflect this change.

The meeting was chaired by Pierre Riffon since Les was not able to attend.

SC36A/JMT5 met on October 29, 2009 from 13:30 to 17:00. Three (3) IEEE WG members, and one IEC MT member from Germany (Reiner Krump, member common to both groups) and five (5) guests attended the meeting. Two (2) guests requested for IEEE WG membership (Mr. Chris Stankowski from Weidman and Ulf Radbrandt from ABB Ludvika). The meeting was chaired by Mr. Pierre Riffon (IEEE WG vice-chair) because the IEC JMT Governor, Mr. John Graham, and the IEEE WG Chair, Mr. Les Recksiedler, were both not able to attend the meeting.

IEEE staff was represented by Mrs. Jodi Haasz.

This was the first meeting of SC36A/JMT5.

The agenda was accepted without changes.

The first item of business was related to a presentation of IEC JMT5 membership and IEEE DC Bushings membership. The members of IEC JMT5 are nominated by their respective National Committees while IEEE members are individuals nominated by the WG Chair.

The IEC working approach has been explained. Contrary to IEEE WGs, the meetings are not a "one man show". Documents need to be reviewed by all participants and decisions are either taken directly during the meeting by all participants or for more complex subjects, assignments are given by the Governor (chair) to members in order to produce proposals that can be discussed in between meetings by correspondence in order to speed up the process.

Mrs. Jodi Haasz from IEEE Staff did present the implantation flowchart showing how both organizations have to process the draft documents up to the final standard (development, voting process, negative comments resolution, etc.). Her presentation is shown in the Annex of the minutes of meeting.

The IEC numbering method has been explained. The proposals shall be numbered as follow:

36A(JMT5/YYYY)XX

Where:

YYYY: is the name of the person making the proposal (ex. RIFFON)

XX: is the incremental number of proposals made by one individual, for example if this is the fifth proposal from Reiner Krump the document number will be 36A(JMT5/KRUMP)05. If it is his first proposal then the numbering will be 36A(JMT5/KRUMP)01.

Then the remaining part of the meeting was dedicated to the review of the comments received on the first draft sent by John Graham. JMT5 and IEEE members observations and individual assignments are shown in the annexed Compilation of Comments.

Because the meeting ran out of time, only a part of the comments have been reviewed and the remaining comments need to be review during the next meeting.

The next meeting will be probably in Europe (to be confirmed by JMT5 Governor) and it has been pointed out that IEEE members could have problems to attend the next meeting.

The meeting adjourned at 17:00 on October 29, 2009.

8.9.4.5 IEC Bushing Standards Activity - John Graham of Trench Ltd., UK

No report.

8.9.4.6. IEEE 693- Interaction of Bushings and Transformers During Seismic Events – Lonnie Elder

No meeting was scheduled.

Some findings and conclusions from the seismic event studies might have a potential impact to IEEE Bushing Standards. At end of the meeting, Keith Ellis presented a video - bushing seismic test performed recently by the study group.

8.9.5. Old Business

8.9.5.1 Task Force on PD Measurement on Bushings & CTs

This TF was formed under Dielectric Tests Subcommittee.

The TF Chair reported that, from next meeting, the TF will start to work on a Guide, and participation from Bushing Subcommittee members is encouraged.

8.9.5.2 Bushing Oil Standardization – Copper Migration Issues

- a) No requests for additional presentations have been received since the Spring 2009 Meeting.
- b) Is there a need for future action to include Bushing Oil Requirements in the bushing standards? Keith Ellis agreed to take this request to Insulation Fluid Subcommittee for comments and report during next meeting.

8.9.5.3 Technical Papers

No activity was reported for this meeting.

8.9.6 New Business

8.9.6.1 Discussion of temperature rise limits for external connections to bushing terminal – Carlo Arpino

Carlo Arpino of EXCELON Commonwealth Edison requested a discussion of the temperature rise of substation bus connections to the top of transformer bushings as a followup to their C57.19.100 interpretation request. The text of his request follows:

“Can you address and comment in the interpretation of the IEEE Bushings Standards IEEE C57.19.100-1995 ? See below word document .

"IEEE C57.19.100-1995 section 4.1.1 indicates that temperature limitations for bushings are based on average 24-hour insulating oil temperatures (for transformers). It is also noted that section 4.1.3 (e) indicates that the temperature of external connections do not greatly impact bushing hot-spot temperatures unless loading beyond nameplate rating. The loading of our typical transmission facility varies with the daily load cycle and is not continuous over a 24-hour period; therefore the average loading over a 24-hour period will be substantially less than the rated value.

Based on these observations, we are looking to clarify interpretation of the standards regarding the temperature of external conductors connected to bushings. Specifically, is it acceptable that the average conductor temperature, e.g., over a 24-hour period, remain below 70oC (for transformers) or 85°C (for circuit breakers), or should conductors connected to bushings never exceed these temperatures " . “

The major points mentioned in the meeting discussion included the following:

- a) Pierre Riffon - IEC 137 provides some coverage on the limits of bushing connector temperature rise, and suggested to look into this std to see if it will answer the question.
- b) Catherine Hurley – they had experienced overheating problems on GSU bushings, and solutions: shield around the transformer turret to redirect the leakage flux.
- c) Craig Steigemeier – overheating on bus-side bushing connections will flow back to bushings, accelerating insulation and gasket aging.

Further review and clarification of this issue may be needed in a future revision of the Application Guide C57.19.100.

8.9.6.2 Bushing Service Conditions – Devki Sharma and Tommy Spitzer

The question was raised by Devki and Tommy regarding the coordination between the bushing standard C57.19.00-2004 and the application guide C57.19.100-1995.

Standard C57.19.00 Clause 4.1 includes usual service conditions as follows:

- Ambient air temperature not to exceed 40 deg C and average over 24 hours not to exceed 30 deg C.
- Temperature of transformer insulating oil in which the inboard end of the bushing is immersed not to exceed 95 deg C average over 24 hours.
- The external terminal and bus connections not to exceed 30 deg K rise over ambient.

Application Guide C57.19.100 clause 4.1.1.1 contains advice stating that rated temperatures in the bushing may be exceeded during some high temperature loading conditions resulting in reduced bushing life expectancy. Clause 5.2 gives advice for derating of bushings under this high temperature condition.

The concerns expressed during the discussion are that these two items are confusing and may even appear to be in conflict with each other. The wording and advice may need to be better coordinated in future revisions of the documents. This item will be carried forward to the next meeting for further discussions.

8.9.6.3 Breaker Bushings – Activity in Breaker Committee

It was reported that Switchgear Committee will ballot a Standard for Circuit Breaker Bushings (PC37.017, Standard for Bushings for High Voltage (over 1000 Volts ac) Circuit Breakers and Gas Insulated Switchgear). Interested individuals should join the balloting group.

8.9.7 Adjournment

The meeting adjourned at 10:45 PM.

Minutes submitted respectively by,

Peter Zhao

Secretary
Bushing Subcommittee

8.10 Dry Type Transformers SC

Chair Charles Johnson
Secretary Lewis Powell

8.10.1 Introductions and Approval of Minutes

The Dry Type Transformer Committee meeting began at 1:30pm Wednesday, October 28 in the Jr. Ballroom C of The Westin Lombard Yorktown Center with introductions of members and guests. There were 18 members and 6 guests present. Mike Haas made a motion to approve the minutes of the Miami meeting; Paulette Powell seconded and the WG approved. The Chair then asked if anyone knew of any patent related issues; none were identified.

8.10.2 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:

8.10.2.1 IEEE PC57.12.01 - Dry Type General Requirements

Chair Tim Holdway

The working group met in the Magnolia B/C room of The Westin Lombard Yorktown Center. The meeting was called to order at 11:00am.

The meeting was convened with twelve (12) members and seven (7) guests present.

The minutes of the Miami April 20, 2009 meeting were approved.

Motion: Mark Gromlovits

Second: Mark Haas

No patent issues were identified.

Old Business

Partial Discharge

Rick Marek formally suggested that the standard be changed to adopt IEC 60076-11 partial discharge levels and durations. Mark Gromlovits and Charles Johnson suggested separate partial discharge and pre-stress limits for cast coil and open ventilation transformers. Table 6 partial discharge and pre stress limits will be updated to include a separate column for cast coil and separate column for open ventilation transformers.

Altitude correction in 4.2.5 is vague on dielectric tests that are affected at altitude greater than 3300 feet. Ensuing discussion resulted in recommended corrections for higher to lower altitude and lower to higher altitude. Rick Marek is to prepare the draft.

Table 5

Note "a" was only applicable to the two tables published in the previous edition of C57.12.01. Table 5 replaced these two tables in C57.12.01-2005. Note "a" will be removed from the draft.

Proposal for a change to paragraph 4.2.5

Rick Marek presented his proposal to revise clause 4.2.5 at the Charlotte meeting. Rick was not present at this meeting and his proposal was not discussed. Rick will be asked to attend the next meeting by Charles Johnson to describe his proposal in detail.

New business

The PAR is being prepared; the scope and purpose will be updated as well as the standard title changed. As it has been suggested to remove cast coil and resin encapsulated windings from the title and these products are still within the standard scope.

With no further business, the meeting was adjourned at 12:10 PM.

As follow-up to the WG report, the Chair commented that removal of the wording cast coil and resin encapsulated windings from the title is suggested as the winding types were originally added to the title when the technology became available on the market.

8.10.2.2 IEEE PC57.12.91 - Dry Type Test Code

Chair Derek Foster

The working group met in the Cypress A/B room of The Westin Lombard Yorktown Center. The meeting was called to order at 3:15 PM on Monday October 26, 2009.

- 1 There were 11 members and 5 guests present.
- 2 The minutes of the last meeting, held in Miami, were approved as written.
- 3 There were no patent issues regarding this standard.
- 4 Old Business

Draft will be ready for WG review by November and expect to ballot it by the end of the year. The hot resistance reading will be kept at six minutes rather than the 4 minutes recommended by C57.12.90 Section 11.0 WG for oil-filled transformers.

5. There being no new business, the meeting was adjourned.

Following presentation of the WG report, there was a question on how to deal with the impulse wave shape being long enough for low impedance circuits. Chuck Johnson stated that the verbiage in the draft is almost verbatim to the Impulse Test Guide. What is presently in the standard correlates well with what is in the Impulse Test Guide.

8.10.2.3 IEEE PC57.12.52 - Sealed Dry Type Power Transformers

Chair Sheldon Kennedy

The Working Group met on Monday, October 26, 2009 at 9:30 AM with 12 members and 6 guests present. Sheldon Kennedy chaired the meeting.

The IEEE disclosure statement was read. There were no patents pertaining to this standards work for which any members had awareness.

Minutes of the April 20, 2009 meeting in Miami, Florida were reviewed and approved.

Draft 2 of the document was placed on the IEEE Transformers Committee website. The working group reviewed Draft 2.

It was decided to add the words "at the time of filling" where we first mention that the transformers shall be filled with dry air or nitrogen. The concern was that the air may not stay dry over the life of the transformer.

Tables 2 and 3 which give voltages and BIL tables will be eliminated and we will refer back to C57.12.01.

In clause 6.4.3 we will remark that the neutral will be insulated to the values given in IEEE C57.12.01, since Table 3 will be removed.

Clause 9.4.3.1 will eliminate the reference to Table 2 and instead refer to IEEE C57.12.01.

This completed the review of Draft 2. There were no other comments. The chair will make the revisions noted and produce Draft 3. This will be surveyed with the Working Group members. We should be able to shortly send the document out for an official ballot, if all goes well in the survey.

There was no other old business or new business.

The meeting was adjourned at 10:45 AM.

8.10.2.4 WG for Revision of IEEE C57.16: Dry Type Reactors

Chair Richard Dudley

The W.G. for the Revision of IEEE C57.16 (Dry Type Reactor T.F.) met on Monday, October 26, 2009 from 8:00 a.m. to 9:15 a.m. in the Magnolia A/B Meeting Room, of the Westin Lombard Yorktown Center in Lombard, Illinois. There were 13 members and 5 guests present. The following are the highlights:

1. Introductions were made.
2. No patent issues were identified.
3. The minutes of the W.G. meeting in Miami were approved.

Note: The minutes of the WG meeting in Lombard will not be approved until the WG meeting in Houston, Texas.

4. Draft #4 and other inputs to the revision of IEEE C57.16 were discussed. The key points are as follows:
 - (i) The issue of possible CB TRV issues associated with switching filters especially during capacitor bank faults or bus faults were deemed to be more systems related and will not be included in a note in A.3.1.
 - (ii) Annex F “TRV Considerations in the Application of Current Limiting Reactors” will be reviewed once again to ensure there are no references to CB type and performance. The focus of the annex must be on use of capacitors supplied with reactors to mitigate the TRV seen by the CB. It was also agreed the inclusion of the annex is essential to IEEE C57.16 as the capacitors used for mitigation are usually within the scope of supply of the reactor manufacturer. IEEE C37.011, the circuit breaker application guide, has been referenced.
 - (iii) The “notes” below Table 3 will be converted to “footnotes” or “blocked in” to ensure they become a normative part of the standard as “notes” are considered to be informative.
 - (iv) “2. References” will be relabeled “2.Normative references”. References that are cited in a very specific way will remain “normative references”. Those that are cited in a

general way will be moved to the bibliography. The Chairman will review this issue and also asked for input from WG members.

- (v) The terminology “shunt capacitor reactors” will remain. However, a note will be added in B.1.1 that in IEC 60076-10 the terminology used is “damping” reactors although their function is in-rush or out-rush current limiting and do not provide damping.
- (vi) The reference to capacitor standards in B.4.1 of Annex B is not correct. The basis for the continuous current rating of shunt capacitor reactors needs to be determined and documented. During the WG meeting clause 20 of IEC 60871-1 “Shunt capacitors for power systems” was briefly reviewed re the tolerance factor for capacitors of 1.43. Clause 5.3 of IEEE Standard 18-2002, “IEEE Standard for Shunt Power Capacitors” (standard under the jurisdiction of Substations Committee) was reviewed; capacitor tolerance of 135%.

B.3.3 should state that capacitors are manufactured to IEEE (ANSI) and IEC standards. The impact on the current rating of the shunt capacitor reactor should be stated as a range; 1.35 to 1.49. K. Papp, M. Sharp and Peter Balma will review and suggest appropriate changes.

- (vii) Three phase stacked filter reactors were discussed. It was determined that 20% to 25% of filter reactors are provided in a three phase stack arrangement. The inherently higher coupling (vs. a “side by side” arrangement) and associated larger mutual reactances has a greater impact on effective reactances. In the case of low Q filters coupling in a three phase stack arrangement should be minimized. In the case of high Q filters, stacking should be avoided. One paper authored by Xiangfu Guo and another authored by Klaus Papp et al will be referenced. Klaus Papp and Mike Sharp will review the material in Draft #4, including input from Xiangfu Guo and others, and produce a revised draft of Annex A. Notes will also be added re stacked 1/3 and 1/6 harmonic filter reactors and the impact of zero sequence currents.

The Chairman agreed to produce Draft #5 before the end of 2009. The revision to Annex A discussed above should be sent to the Chairman as soon as possible. The Chairman stated that his objective is to circulate Draft #5 to WG members, obtain their approval and ballot Draft #5 in advance of the WG meeting in Houston so that ballot results can be discussed at the WG meeting. The WG adjourned at 9:15 a.m.

8.10.2.5 WG Dry Type Thermal Evaluation C57.12.56/60

Chair Roger Wicks

The WG had a successful ballot, resolved comments and completed the recirculation ballot with no additional issues. The balloted draft has been sent to the Standards Board for approval.

8.10.3 Old Business

There was no old business.

8.10.4 New Business

The chair provided the following status of standards:

Dry Type Transformers Subcommittee – Unapproved Meeting Minutes October 28, 2009 – Lombard Illinois

Expiring in 2009: C57.12.60 , C57.96, C57.124, and C57.259.

C57.12.60 has been sent to the Standards Board for approval. C57.96 has Rick Marek assigned as Chairman, and Henry Cooke as Secretary. The PAR has been submitted for approval. C57.124 reaffirmation has been submitted to REVCOM for approval. A WG will be formed for revision of the standard. IEEE 259 has Dave Stankes leading the reaffirmation; the ballot pool is being formed.

Expiring in 2010: C57.12.01 and C57.94. C57.12.01 PAR has been initiated and the standard has 3 more years before expiring. C57.94 looking for volunteers to review the document for revision or reaffirmation. Paulette Powell mentioned she may have the comments from the last approval and will lead the effort.

Expiring 2011 C57.12.52, C57.12.59, and C57.134. A Chairman is designated for C57.12.52, and reaffirmation leaders are needed for C57.12.59 and C57.12.134.

Expiring In 2013 C57.12.51, C57.12.58

The Chair mentioned the opportunity to piggy back on work of other groups, such as oil-filled WG efforts, but prefers to have final documents in place first. Then the Dry Type WGs can review and determine relevancy for dry technology. We will continue to work on keeping Dry Type standards updated.

Being no other business, the meeting was adjourned at 2:08pm.

- 12.34 – 3-phase Pad-Mount Transformers
 - ◆ The document has been balloted, gone through comment resolution, recirculation ballot, and has been submitted to REVCOM. The Working Group will submit a new PAR to increase the rating limit of the standard from 5 MVA to 10MVA. A comment obtained during the balloting raised a concern that the tank rupture limit and pressure relief was in conflict. A task force was formed to review these requirements, reporting back to the Working Group at the next meeting. Carlos Gaytan was appointed to lead this group. The rest of the members of this task force are Ali Ghafourian, Dan Mulkey, Marty Rave and Marcel Fortin.
- C57.12.37 – Electronic Test Data Reporting
 - ◆ The document was ready for editorial review and ballot. Rich Hollingsworth has announced his retirement and John Crotty was selected to take this position.
- C57.12.38 – 1 phase Padmount transformers
 - ◆ The document was balloted and submitted to REVCOM. A new PAR was discussed. The result was that a new PAR would be submitted with the top kVA rating of 250 kVA and top voltage rating of 480/240 volt. The final wording of the PAR will be sent to the group for review. There was a discussion concerning three comments that were received during balloting. These were the possible conflict concerning the pressure relief and tank with-stand pressure, AWG wire gauge concerning connector capacity as opposed to a measured diameter specification, and oil expulsion test wire gauge. These will be covered in the development of the new standard.
- C57.15 – Step Voltage Regulators
 - ◆ This standard was recirculated with the negatives being resolved which resulted in a 100% affirmation. The document was submitted to REVCOM. Since this document is seeking dual logo status, a lot of work has been done with IEEE staff and TC14. At this point a meeting of TC14 is planned in Washington on November 18th of this year with this document being submitted in with hope that it can obtain the dual logo status.
- TF Transformer Efficiency and Loss Evaluation (DOE)
 - ◆ A general presentation of the DOE Rule was presented by Phil Hopkinson. The two types of testing, 100% testing and AEDM, were discussed. There was discussion on the definition of “Model” as it applied to testing covered by the DOE rule. There wasn’t a resolution to this discussion. It was pointed out that the highest possible loss connection will be tested. No labeling was required by the rule but we have provided for the optional nameplate labeling in C57.12.00 which calls out a statement of “DOE Complaint”.

There was no Old Business.

Under new business, a motion was made by Marcel Fortin to move the TF studying the pressure relief issue in C57.12.34 working group to the Distribution Subcommittee. This was seconded by Ron Stahara. In the discussion, Marcel added that this issue affects all of our products. He also requested a meeting slot for the next meeting to discuss this issue and finalize the report. This motion was passed by acclamation without any negative voice.

Jerry Corkran asked to address the committee concerning some issues with the C57.12.90. He stated that in his opinion heat run tests proposed will conflict with distribution transformer current testing practices and will take undue time in the test procedure. Marcel Fortin rebutted this comment by saying that the type test should include all windings to determine the troublesome winding pair. He said that he was not opposed to a routine test only doing the troublesome

Distribution Transformer Subcommittee Report

winding pair. Jerry urged us all to sign up for the ballot and become familiar with the issue and vote accordingly to our own understanding.

Steve asked if anyone was doing PD testing on distribution transformers and if they were that they get with him after the meeting. Marcel pointed out that PD testing will be the topic of the next meeting's tutorial and urged us to attend this presentation so that we might see how this might play a role in distribution transformer testing.

Ali Ghafourian commented that the quorum requirement was onerous and was causing difficulty in getting the work done on our standards. Alan Wilks pointed out that this requirement also required quite a bit of time thus making it difficult to complete our business. Since Ed Smith was in attendance, Steve asked if Ed could address this issue. There was quite a bit of discussion concerning this subject. Ed pointed out that if an issue was voted in the working group and this item was seen to be an issue during balloting, a quorum in a working group makes this vote hold good weight in a REVCOM review. Bill Chui concurred with these comments and spoke in support of this position. Ed suggested to the working group chairs that they review their rosters and determine who should be considered for membership. The Transformer Committee O&P manual gives guidance concerning this issue.

Brian Klaponski asked that the Transformer Committee leadership look at some method to encourage our companies to support our work. He indicated that the quorum issue might be resolved if the members could attend.

Steve stated that some late arrivals had allowed us to reach a quorum. A motion was made by Lee Mathews and seconded by Ron Stahara to approve the minutes as written. There was not any discussion and the motion passed.

The meeting adjourned at 10:45 AM.

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8.12 Dielectric Test Subcommittee – Loren Wagenaar, Chair; Thang Hochanh, Vice-Chair; Dennis Marlow, Secretary

The Dielectric Test Subcommittee (DISC) met on Wednesday, October 28, 2009 at 11:00 am in Lombard IL, with 58 of 122 members, and 76 guests present. 5 of the guests who requested membership will have their participation status reviewed prior to acceptance

8.12.1 Chair's Remarks

- 1) Loren Wagenaar was again unable to attend for personal reasons. Thang Hochanh. Chaired the meeting
- 2) The Chair briefly reviewed highlights of the Administrative Subcommittee meeting held on Sunday:
 - a) The next meetings:
 - 1) Spring 2009, March 7-11 (Omni Houston \$139) – Houston TX, Tulstar Products
 - 2) Fall 2010 , (Oct or Nov) – location to be determined in North America
- 3) After introductions a count showed 58 members were in attendance. The new quorum requirements were not met. The membership participation will be reviewed prior to the next meeting to include only active members
- 4) The minutes of the spring 2009 meeting in Miami were approved as written, and are available on the IEEE Transformers Committee Web Site.

8.12.2 Working Group Reports

8.12.2.1 Working Group on Revision of Low Frequency Tests – Bertrand Poulin, Chair; Bill Griesacker, Secretary

At 1:45 PM on October 27, 2009 the meeting was called to order by Chairman B. Poulin. The meeting was attended by 16 members and 22 guests. After introductions were made, the IEEE patent disclosure set of slides was presented. No patent issues were raised. The agenda was presented and the minutes of the March 2009 Miami meeting were accepted as issued. The next order of business was the Task Force reports:

A) TF Electrical Partial Discharge Measurements Guide C57.113

Dr. Lemke reported on the Task Force for the Revision of C57.113. A proposal for a tutorial for the Transformers Committee on technical aspects of PD measurements including a historical review was discussed. The document has been reviewed and prepared for balloting, a recirculation of the ballot will be sent out very shortly after this meeting.

B) Task Force Partial Discharge in Bushings and PTs/CTs

Thang Hochanh presented the minutes for the Task force for PD in other devices such as CTs and Bushings. The Task Force was asked to determine if we need a separate document separate from IEEE C57.113 for PD detection on devices such as PTs, bushings and CTs. Professor Lemke gave a presentation to the task force on one approach for measuring PD on these devices which has been used successfully in noisier environments. The group concluded that there are other applicable methods and that an additional document should be

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prepared to cover the options for PD testing for other devices. Dr. Lemke's presentation will be made available on the Committee web site.

C) Old Business: Survey to Manufacturers re 69 kV Transformer Testing

Subash Tuli sent out a survey regarding the testing of 69 kV transformers asking if they are tested as Class I or Class II transformers. 20 manufacturers were contacted, 12 responded and the results showed that the majority of 69 kV transformers were tested as Class II transformers. This working group will recommend to the Dielectric Test Sub Committee that 69 kV transformers should be tested as a Class II transformer for the induced test.

The working group will review standards C57.12.00 and C57.12.90 to determine if there are sections that need to be added, modified or updated to help with the effort to continually revise these standards.

There was no **New Business**.

The meeting adjourned at 2:10 p.m.

8.12.2.2 Working Group on Revision of Impulse Tests – Pierre Riffon, Chair; Peter Heinzig, Vice-Chair

The WG met on October 27, 2009, from 3:15 pm to 4:30 pm. Sixteen (16) members and thirty-seven (37) guests attended the meeting. Six (6) guests requested membership. The meeting was chaired by Pierre Riffon, chair of the WG.

The agenda has been reviewed and accepted as written.

The minutes of the Miami meeting were approved as written.

The IEEE patent disclosure requirement policy was discussed. None of the members and guests present during the meeting was aware of any patents related to the work of this WG.

The first technical item of business was to discuss the comments received on the 2nd survey made within the WG and within the Dielectric Tests SC on a revised proposal concerning the tap changer position during lightning impulse tests. The proposal was motivated by two principal reasons: testing different tap positions for reflecting service conditions and for a possible harmonization with IEC testing practices.

Decisions made during the meeting from the comments received are:

- A unique single-phase unit equipped with a reactor-type tap-changer shall be tested at a tap position giving a bridging position;
- Contrary to the IEC practice, a single test procedure will be required independently of the tap changer range;

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- The initial wave shape adjustment shall be performed on the prescribed tap position having the lowest impedance;
- An example of possible testing combinations for transformers having tap changers on both HV and LV windings will be given in a note;
- The proposed test procedure should also apply during impulse type tests on distribution transformers. Since distribution transformer manufacturer and user representatives were not well represented during the meeting, this particular point will be highlighted in the next survey in order to get feedback from distribution transformer manufacturers and users;
- Tests in bridging position for transformers equipped with a reactor-type tap-changer apply only for cases where the bridging position can be used in continuous operation;
- A general rule will be given if more than one single-phase transformer are to be impulse tested.

The number of returns was extremely low as usual on surveys. The return rates were 31.3% from the SC membership and 17.7% from the WG membership. Approval rate were respectively 83.3% and 81.8%.

Although the proposal was well accepted by those individuals having returned their ballot and comments (83% approval rate), some of the members and guests present during the meeting were strongly against the proposal. They have proposed either to keep the actual procedure e.g. testing at the minimum effective turns or to make the impulse tests at a single tap position.

The WG chair requested these individuals to send their comments in the upcoming survey. For the upcoming meeting and to get a constructive work, the WG chair will restrict the discussion to the comments received from the survey and not those arising from the floor during the meeting. The WG chair pointed out that the responsibility of all WG and SC members is to answer surveys. A "no show" during the upcoming survey will be considered as an acceptance of the proposal.

The WG chair will prepare a third proposal and will be surveyed within the WG and Dielectric Subcommittee memberships.

Due to lack of time, the comments received were not fully discussed and the remaining subjects on the agenda were not discussed and will be postponed to the upcoming meeting in Houston.

The meeting adjourned at 4:30 pm on October 27, 2009. Submitted by Pierre Riffon P. Eng.

SC Vice Chair Note : It is notice able that there has been little participation from the Distribution Subcommittee. These proposed changes to the Impulse test will also impact their standard(s)

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8.12.2.3 Working Group for Revision of the Impulse Test Guides C57.98 and C57.138 Art Molden, Chair; Joe Melanson, Co-Chair

The meeting started at 9:30 AM on Tuesday October 27, 2009, with 45 attendees present of which 11 were members and 34 were guests.

In keeping with the IEEE patent policy the members were asked if they were aware of any patent or copyright infringement issues in the present draft of the Impulse Guide. No issues were identified and the meeting proceeded with group introductions.

The last meeting held by this WG was spring of 2008 and the first order of business was to call for a motion to approve the minutes of that meeting. The motion was proposed by Jim McBride and seconded by Joe Melanson.

Draft 3 of the guide had been placed on the Transformers Committee website in March of 2008 for review by members of the Dielectric Test subcommittee. Three members responded with editorial and technical comments. The technical comments returned were reviewed and discussed at this meeting, as outlined below.

Comments by Loren Wagenaar:

- To include a sentence in a clause relating to FOW chopped waves and why they had been removed from the C57.12.00 test table
- To modify the Transformer LI Test Form by including provision to record the tap position used during the impulse test.

Comments by Jim McBride:

- To include some additional information on the Coherence Function paragraphs at the end of Annex A of the guide

Comments by Gustav Preininger:

- 1) To include an SI wave on the figure 1 wave shape collection.
- 2) To include reference to T1 and T2 time parameters on figure 1.
- 3) To change the wording in the guide to the same as used in C57.12.90 regarding the voltage level above which all impulse applications must be logged.
- 4) To propose that when low impedance windings must be tested by “alternative means”, that two tests be performed using both Method 2 and Method 3 rather than just one test based on choosing just one of those methods.
- 5) To include a comment in the section on chopping gaps that sphere gaps when used to produce chopped waves produce faster rates of voltage collapse than do rod gaps.
- 6) To point out that the example calculation of inductance in clause 7 was not correct.

Comments by Loren Wagenaar were accepted by the members and will be added to the next draft of our guide.

Jim McBride reviewed his comments at the meeting but Bertrand Poulin, the author of Annex A was not in attendance and so discussion of this item will be continued via email and the outcome included in the next draft of our guide.

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Gustav Preininger comments 1, 3, 5 and 6 were accepted by the members and, with some additional wording will be included in the next draft. Comments 2 and 4 were not favorably accepted by the members. Art Molden will pass on this outcome to Gustav and continue discussion with him.

There being no further business the meeting was adjourned at 3:45PM.

Art Molden & Joe Melanson.

8.12.2.4 Task Force on External Dielectric Clearances Eric Davis, Chair; Dennis Marlow, Secretary

The TF met on Oct 26, 2009 at 11:00 am at the Westin Lombard. Forty-three people attended this fourth meeting, 8 members and 34 guests (12 repeat guests) were present with Peter Zhao of Hydro One accepted as a new member, bringing the total membership to 17.

The minutes from the spring 2009 meeting in Miami were approved as submitted without the attached comments.

The IEEE patent disclosure requirement policy was discussed. Reference to the package posted on the IEEE Transformers Committee Web site was made. None of the members and guests present during the meeting was aware of any patents related to the work of this TF.

The TF reviewed the progress in determining the technical basis of the clearances contained in CAN/CSA C88 and IEC 60076-3.

Roger Hayes reported he has received some documentation from Dan Perco to support the origins of the CAN/CSA C88 clearances is indeed based on CAN/CSA C308, "The Principles and Practices of Insulation Coordination."

A maintenance group has been established for IEC 60076-3. The TF will contact the maintenance group regarding the basis for their clearances.

The remainder of the meeting focused on clearances at 230-kV and below.

The Chair presented the old NEMA TR-1-1980 electrical clearance table which showed phase to ground, phase to phase and bushing shed to bushing shed clearances. The current Table 14 phase to phase and phase to shed values match the NEMA TR-1-1980 values. It was noted that the table 14 230-kV values correspond to the TR1 196-kV values. An attendee pointed out that at that time, 196-kV was 900-kV BIL and 230-kV was 1050-kV BIL

In general, for system voltages ≤ 230 kV, the NEMA TR-1 phase to ground values are lower than those contained in the IEC and Canadian standards. The NEMA TR-1 phase to phase values are similar to the values contained in the IEC standard. The phase to phase values in both of these standards are lower than the values contained in the Canadian standard.

A table was presented for discussion with proposed phase to phase and phase to ground clearances which basically was based on typical BIL values used at various voltage classes. There was a good discussion about this pointing out some problems with only using BIL as a reference since the Low Frequency tests may require larger clearances.

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There was also some discussion regarding the use of switching surge values at 230-kV. The IEC transformer clearances for 169 kV and below appear to be based on voltage class and BIL while higher kV classes are based on voltage class and switching surge. The CSA clearances for 230-kV and below are based on BIL with higher kV classes based on switching surge. It was suggested that we survey the TF for interest in basing the 230-kV clearances on switching surge.

A straw vote was 18 to 0 in favor of using the old TR1 table for phase to phase, phase to ground and bushing shed to bushing shed clearances.

A survey will be sent out to the members and interested guests so that comments can be obtained about the proposed clearance table with 230-kV clearances and above based on switching surge.

The proposed clearance table incorporating comments received at this meeting, the IEC and CSA clearances will be summarized and included with the survey for reference.

Meeting adjourned 12:15 pm respectfully submitted, Dennis Marlow

8.12.2.5 Task Force on Special Dielectric Test Issues – Bruce Forsyth, Chair

The Task Force on Special Dielectric Test Issues met in Lombard, IL on October 26, 2009 at 1:45 PM. There were 39 people in attendance, 17 members and 42 guests, with 9 guests requesting membership, bringing the total membership to 51.

After introductions of attendees the minutes of the spring 2009 meeting in Miami, FL were approved as written. The purpose of the TF, which is to make recommendations to the Chairman of the Dielectric Test Subcommittee regarding how to proceed with certain dielectric test issues, was reviewed before moving on to regular business.

The first item of business was to revisit to TF's recommendation from the Miami meeting regarding the issue of impulse tests on neutral terminals. Specifically, at the Miami meeting the TF recommend no further action be taken, however the SC asked that the issue be revisited in part because of low TF member attendance at the Miami meeting.

Since there were only 17 members attending the meeting, the Chair suggested without opposition that the focus of the discussion be to identify specific technical issues and/or concerns related to testing neutral terminals, and that those issues be summarized in a survey of the entire TF membership after this meeting. Some of the issues raised (in no particular order of importance) included:

1. Clause 5.10.8.1 of PC57.12.00/D2c2008 states, "When required, lightning impulse tests shall be performed on line and neutral terminals for power transformers." The previous revision required impulse tests on neutral terminals neutral terminals rated 200 kV BIL and higher. It was unclear what justification went into the removal of the 200 kV limit, but it was noted that the current wording effectively requires impulse tests on all neutral terminals if impulse tests are required (based on transformer type and class). It was suggested that the removal of the 200 kV BIL limit may have been a part of recent work performed to revise the dielectric test tables.

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2. Assigning a BIL designation to a terminal defines an insulation class and does not imply that the terminal will be or should be impulse tested.
3. There was some discussion related to the relative value of impulse testing neutral terminals and that in most cases, especially when the neutral is solidly grounded, the neutrals will not see the same type of impulse stresses as line terminals.
4. A participant questioned whether every neutral terminal should be tested or only those that are not solidly grounded.
5. A member commented that a neutral terminal impulse test on a terminal that will be solidly grounded in service may produce oscillatory voltage stresses that in all likelihood will never occur in service, and therefore the test should not be performed.
6. There was some discussion about factory test floor failures that have occurred on neutral terminals and whether the defect would have been discovered during an applied potential test if the impulse test did not take place. Since the impulse tests precede applied potential tests the answer to that question cannot be determined for certain, however it was pointed out that while all of the dielectric tests tend to produce electrical stresses in the entire insulation system under test, each of the dielectric tests is designed to verify different parts of the insulation system so it is not correct to assume an applied potential test will have the same result as the impulse test.
7. A member noted that a neutral terminal impulse test is a good quality control test for manufacturers to consider. The Chair expressed his opinion that quality assurance and quality control tests should be defined by each factory based on their experience and that it is not the role of the TF to define factory quality control tests.
8. It was suggested that the TF look into the IEC requirements for neutral terminal impulse tests.

The Chair brought the discussion to a close and reiterated his plan to survey the entire TF in order to ensure the TF recommendation is supported by a majority of the TF members.

The second item of business was a general discussion of the impact of eliminating the terms "Class I" and "Class II" on issues falling under the Dielectric Test Subcommittee. A brief review of definitions and discussions from previous TF meetings took place. The dielectric test tables in the most recently balloted revision of C57.12.00 were reviewed as well as a table showing the clauses in the recently balloted revisions of C57.12.00 and C57.12.90 where the terms "Class I" and "Class II" appear. Some of the comments made included:

1. Distribution transformers have a routine impulse test requirement, but Class I power transformers do not.
2. This TF previously recommended the definition of Class II be changed to include 69 kV transformers.
3. One user noted that his company routinely requires impulse testing and Class II induced potential testing on 34 kV transformers.

Dielectric Test Subcommittee – Unapproved Meeting Minutes
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4. A member noted that some confusion can occur when a partial discharge test is requested on a Class I transformer. Specifically there are different opinions regarding the enhancement voltage level and the specific procedure to be followed.

As time was running out the Chair brought the discussion to an end and asked the attendees if there was a strong feeling that there was anything to be gained by eliminating the Class I and Class II definitions. There were no comments. Since a quorum did not exist there was no vote.

There was no new business raised and the meeting adjourned at 3:00 PM.

Respectfully submitted, Bruce Forsyth

8.12.3 Liaison Reports

8.12.3.1 High Voltage Test Techniques (HVTT), IEEE Standard 4 - Arthur Molden

Editorial work on the new revision of High Voltage Testing Techniques, IEEE Standard 4 continues. The latest draft document is currently in circulation for review by the active members of the working group. A Molden. 10/27/2009

8.12.4 Old Business

A tutorial on **Dielectric Frequency Response Testing** was held as scheduled. The Dielectric Test SC thanks Mark Perkins and the other presenters for their participation. The participation and feedback about this new technology was very positive. Mark Perkins indicated that there may be a need for a guide to help new users in the necessary procedures and interpretation of the results. It may be a good addition to the field testing guide C57.92.

8.12.5 New Business :None

8.12.6 Meeting adjourned 1:15 PM Respectfully submitted: Dennis Marlow

Editor's Report – Fall 2009 Lombard Meeting

Oct 28, 2009
Ed teNyenhuis

Between April 19, 2009 and Oct 28, 2009, a total of 40 new & resubmitted papers in the transformer area were submitted to IEEE Transactions on Power Delivery for possible publication. For the 35 reviews completed during this period, the recommendations were:

Accept without changes:	3
Revise and Resubmit:	7
Reject:	6

Another 19 papers are under review and 5 papers are waiting to be processed for their initial review. A summary of the accepted papers is at the end of this report. I should note that John Crouse, the former editor, is still following through for a few remaining papers.

I did attend a meeting the PES editors meeting at the Calgary General Meeting in July 2009. I was told that PES has reviewed 582 papers in 2009 so far.

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. In fact several members approached me after the last meeting to offer to review papers, which was appreciated.

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 below.

Respectfully Submitted,
Ed teNyenhuis
Editor, IEEE Transactions on Power Delivery
edt@ieee.org

All members and attendees of the IEEE Transformer Committee are invited to review technical papers. Please sign up at: <http://tpwr-d-ieee.manuscriptcentral.com/>

INSTRUCTIONS FOR SIGNING UP TO REVIEW IEEE TRANSACTIONS PAPERS

1. Before you create a new account, please check for an existing account by clicking on: "Check for Existing Account"
2. Assuming that you do not get an existing account notification email, click on "Create New Account" and enter in your information.
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
4. Please specify any "Key Words" such as: distribution transformers, core losses, oil DGA, or thermal, for example.
5. Submit your information.
6. Click on "Request Reviewer Status" to be enabled as a reviewer.

	Number	Title	Key Words	Author	Decision	Date
1	TPWRD-00839-2008.R1	Transformer Design and Optimization: a Literature Survey	Transformers, Design, Optimization, Modeling, Numerical Techniques, Analytical Methods, Hybrid Methods	Marina Tsili	Accept	06/15/09
2	TPWRD-00123-2009	Modeling and Analysis of a Single-phase Distribution Transformer with Mid-tap on the Secondary Side	Distribution transformer, mathematical model, power flow analysis, short circuit analysis	Chen, Tsai-Hsiang	Accept	09/07/09
3	TPWRD-00938-2008.R2	Ageing Performance and Moisture Solubility of Vegetable Oils for Power Transformers	Insulation, Power transformers, Aging, Moisture, Oil insulation	Stefan Tenbohlen	Accept	10/04/09

October 28, 2009

**IEEE PES Transformers Committee
Liaison Report
For General Session Meeting – October 29, 2009**

Standards Coordinating Committee on Electrical Insulation – SCC 04

1. Scope:

- To formulate guiding principles for the evaluation of insulation materials and systems for electrical and electronic applications.
- To formulate principles for the identification of insulation materials and systems based on functional tests and/or experience.
- To coordinate the preparation of standards for functional test programs and diagnostic methods for the evaluation of insulation materials and systems.

2. Publications:

- 2.1. IEEE 1-1986 (R2005) Recommended Practice – General Temperature Limits in the Rating of Electrical Equipment and for the Evaluation of Electrical Insulation
- 2.2. IEEE 98-1984 (R2007) Standard for the Preparation of Test Procedures for the Thermal Evaluation of Solid Electrical Insulating Materials
- 2.3. IEEE 99-2007 Recommended Practice for the Preparation of Test Procedures for the Thermal Evaluation of Insulation Systems for Electrical Equipment

3. Activities: IEEE 1 – The Committee is ready to initiate the process of reaffirmation and has established a Working Group for resolution ballot comments.

Anyone interested in joining the Subcommittee or Working Group should contact:

Paulette Payne Powell
Chairperson SCC 04
papayne@ieee.org

Respectfully submitted,
Paulette Payne Powell

U.S. National Committee of the International Electrotechnical 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:

The Westin Lombard Yorktown Center
70 Yorktown Center
Lombard, IL 60148
Room: Magnolia A

DATE AND TIME:

Monday, October 26, 2009
8:15 AM

PRESIDING OFFICER:

P. Hopkinson, Technical Advisor

Members Present:

C. Colopy
L. Dix
P. Hopkinson
J. Foldi
S. Kennedy
R. Marek
H.J. Sim
S. Choinski

Cooper Power Systems
Quality Switch
Hvolt, Inc., Technical Advisor
Foldi & Associates
Niagara Transformer
Dupont Advanced Fibers Systems
Waukesha Electric Systems
NEMA Staff, TAG Administrator

Members Absent:

J. Corkran

Cooper Power Systems

Others present:

R. Ahuja
D. Allen
J. Alvarez
A. Bartek
N. Brush
A. Cancino
D. Corel
D. Cherry
R. Gauser
R. Girgis
J. Haasz
T. Holdway

Waukesha Electric Systems
Consultant
Prolec GE
C-K Composites
Consultant
IEM-Mexico
Sola/Hevi-Duty
ABB
Consultant
ABB
IEEE
Intermountain Electronics

M. Heathcote
T. Holifield
A. Kraemer
P. Jarman
C. Johnson
K. Livingston
M. Locarno
D. Marlow
J. Melanson
A. Molden
H. Nordman
S. Norman
P. Powell
L. Powell
C. Ploetner
R. Szewczyk
R. Thompson
E. Tolachir
T. Turvey
D. Vir
R. Wicks

Martin Heathcote Associates LTD
Howard Industries
Reinhausen
National Grid, IEC TC14 Chairman
ABB
Great River Energy
Doble Engineering
TBEA Transformer
J. Melanson, Inc
AMEESCO
ABB Oy, Transformers
AK Steel
3P
PHI-Pepco
ABB
DuPont Poland
RST Consulting, P.C.
Tubos trans Electric
Specialty Switch
Waukesha Electric Systems
DuPont

1. CALL TO ORDER

The meeting was called to order, meeting guidelines reviewed and attendance recorded

2. APPROVAL OF THE AGENDA

The Agenda was approved as written.

4. APPROVAL OF THE PREVIOUS MINUTES

The Minutes of the meeting held April 20, 2009 in Miami, Florida were approved as written.



Mnotes TC-14 TAG
Apr 09.doc

5. REVIEW AND UPDATE OF USNC ROSTERS FOR TC 14

A roster was circulated and corrections were noted. The official roster of paying TAG members:

Craig Colopy
Jerry Corkran
Larry Dix
Joe Foldi (Liaison to Canada)
Phil Hopkinson (Technical Advisor)
Sheldon Kennedy
Rick Marek

Jin Sim
Scott Choinski (TAG Secretary)

Raj Ahuja has requested membership on the TAG. Mario Locarno, Matthew Kennedy and Subash Tuli inquired about becoming official TAG members.

6. STANDARDS ACTIVITIES

- 6.1 IEC 60076-1 Ed. 3.0 - Power transformers - Part 1: General (MT5 Convenor: P. Hopkinson)

14/612/CDV Circulated and voting closes on October 30. Some editorial comments that were addressed by the MT were not reflected in the draft circulated as CDV.

- 6.2 IEC 60076-2 Ed. 3.0 - Power transformers - Part 2: Temperature rise for oil-immersed transformers (MT6 Convenor: A. Bossi)

14/613/CDV circulated and voting closes on October 30. We need more US participation in this MT. Rick Marek provided some US comments that have been submitted, and Ramses Girgis has some comments to submit. The MT has seen these comments previously but have not been adequately addressed.

- 6.3 IEC 60076-3: Power transformers - Part 3: Insulation levels, dielectric tests and external clearances in air: (Convenor: Yukiyasu Shirasaka)

14/611/INF: Comments received to 14/460/MCR. MT will meet November 17-18 at NEMA. It was noted that there are no US experts on the MT. Our expert used to be Loren Waagenar, but he lost his employer's support. Our new expert will be Raj Ahuja.

- 6.4 IEC 60076-10 Ed. 2.0 - Power transformers - Part 10: Determination of sound levels (Convenor: Dr. C. Ploetner)

Will meet for the first time in January in Japan.

- 6.5 IEC 60076-16 Ed. 1.0 - Power transformers - Part 16: Transformers for wind turbines applications (WG31 Convenor M. Sacotte)

14/593A/CC - Revised - Compilation of comments on 14/582/CD.

14/618/CDV Circulated and voting closes in January.

Document looks good as it is, but will need some more work. Dave Buckmaster is leading a TF on wind farm transformers in IEEE. An immediate revision of the IEC document may be necessary and will be discussed at the Plenary. Chuck Johnson raised some concerns with the CDV.

- 6.6 IEC/TR 60076-17 Ed. 1.0 - Evaluation of electromagnetic fields around power transformers

This is based on a CENELEC document, but there is not WG assigned yet. May need to review if there is still support for this project at the Plenary next month.

- 6.7 IEC 60076-18 Ed. 1.0 - Power transformers - Part 18: Measurement of frequency response (Convenor: Paul Jarman)

Paul Jarman reported that there have been 2 meetings of this group and is getting close to issuing a CD.

- 6.8 IEC 61378-1 Ed. 2.0 - Convertor transformers - Part 1: Transformers for industrial applications (MT7 Convenor U. Piovan)

14/610/CDV Circulated, closed October 9.
14/623/RVC - Voting result on 14/610/CDV

Sheldon Kennedy is the US expert for this document and reported that this is a very good document.

- 6.9 Other proposed standards

- 6.9.1 CLC EN 50216-9: Power transformer and reactor fittings - Part 9: Oil-to-water heat exchangers

Has been offered to IEC/TC 14 by CENELEC with the aim of its inclusion into the international standardization process.

14/615/INF - Compilation of comments on document 14/605/DC

This will be discussed at the Plenary in November. Normally, IEC rejects component standards.

- 6.9.2 CLC EN 50216-10: Power transformer and reactor fittings - Part 10: Oil-to-air heat exchangers

Has been offered to IEC/TC 14 by CENELEC with the aim of its inclusion into the international standardization process

14/616/INF - Compilation of comments on document 14/606/DC

This will be discussed at the Plenary in November. Normally, IEC rejects component standards.

7. OTHER ISSUES

- 7.1 Plenary Meeting 2009

The US will host the next TC14 Plenary meeting November 19-20, 2009, in Washington, DC.

14/617/DA -Draft agenda for the meeting to be held in Washington/DC, USA, on Thursday 19 November 2009 and Friday 20 November 2009.

MT5 will meet November 16-17, 2009.

MT 60076-3 will meet November 17-18, 2009.

Some MT members may not have received notification of the MT meetings.

A revised agenda was circulated as 14/617A/DA, and was reviewed.

The proposed dual logo IEEE C57.15- *IEEE Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators* is on the agenda for discussion.

9. NEW BUSINESS

There was no new business.

9. DATE AND PLACE OF THE NEXT MEETING

The next meeting will be held in March, 2010, in Houston, Texas during the IEEE Transformer committee meetings.

10. ADJOURN

Meeting adjourned at 9:25 am.

Reported By:

S. Choinski

October 26, 2009

11.3. Cigré liaison

The next session will welcome a new chairman from Canada: Mr. Claude Rajotte.

11.3.1. *Last Cigré colloquium*

The last Cigré colloquium was in Cape Town in South Africa in August (17th to 21st).
The main issues covered were:

- Maintenance issues
- Efficiency and reliability
- Short circuit Behavior
- Diagnostic techniques
- Condition assessment
- Assets management
- Theoretical reliability issues
- Safety issues
- Procurement process

11.3.2. *Next meeting Paris session 22nd to 27th August 2010*

The transformer session will be on Thursday the 26th.

The special reports will be available on the Cigré web site in March.

<http://www.cigre.org/gb/events/session.asp>

If you wish to make a spontaneous contribution you must answer to one of the questions raised in the special reports and submit it to the special reporter before the session. Your contribution will be reviewed conjointly with the special reporter during an individual meeting on Wednesday.

The preferential subjects of the 2010 transformers session are:

- PS1 In service incident and failure
 - Fire
 - Oil spill
 - Risk mitigation
- PS2 Transformer life
 - Specification
 - Procurement
 - Maintenance and diagnostics
- PS3 Transformer modeling
 - Thermal models
 - Transient models

11.3.3. *New working groups*

The terms of reference are available through your national member.

- Transportation issues
- Oil conductivity under DC conditions
- Shunt reactors

11.3.4. *New publications*

The brochure are available freely for the Cigré members.

You can download them from the e-Cigré web site with your Cigré member card number : <http://www.e-cigre.org/>

Search for A2 brochures.

- Corrosive sulfur brochure N° 378
- Thermal aspects brochure N° 393

11.3.5. Expected publications

- HVDC converter transformers
- Fire safety practices (2011)
- Guide for transformer maintenance (2011)

11.3.6. Activity report

The full reports of the working group activities are accessible with the links below

- A2 34 Maintenance guide
<http://www.cigre-a2.org/Site/What/download/WG%20A2.34ID12VER137.pdf>
- A2 35 Experience with new insulating liquids
<http://www.cigre-a2.org/Site/What/download/WG%20A2%2035ID12VER137.pdf>
- A2 36 Transformer procurement process
<http://www.cigre-a2.org/Site/What/download/WG%20A2.36ID12VER137.pdf>
- A2 37 Reliability survey
<http://www.cigre-a2.org/Site/What/download/WG%20A2.37ID12VER137.pdf>
- A2 38 Thermal modeling
<http://www.cigre-a2.org/Site/What/download/WG%20A2.38ID12VER137.pdf>
- A2-C4 39 Transient interaction between transformer and system
http://www.cigre-a2.org/Site/What/download/WG%20A2_C4-39ID12VER137.pdf
- A2 40 Copper sulphide long term risk mitigation report to come group just started

11.3.7. Next colloquium 2011:

Next colloquium will be in Kyoto (Japan) from October 30th to November 4th 2011.

IEEE/PES TRANSFORMERS COMMITTEE

General Session - Fall 2009 Meeting Thursday, 29 October 2009

Chair: Thomas A. Prevost

Vice Chair: J. Edward Smith

Secretary: Bill Chiu

- | | | |
|-------|---|----------------------------|
| 1. | Chair's Remarks and Announcements | Thomas A. Prevost |
| 2. | Approval of Minutes from Spring 2008 Meeting | Thomas A. Prevost |
| 3. | Administrative Subcommittee | Thomas A. Prevost |
| 4. | Vice Chair's Report | J. Edward Smith |
| 5. | Transformer Standards | William H. Bartley |
| 6. | Recognition and Awards | Donald J. Fallon |
| 7. | New Business (continued below) | Thomas A. Prevost |
| 8. | Report of Technical Subcommittees | |
| 8.1. | HVDC Converter Transformers & Reactors | Richard F. Dudley |
| 8.2. | Instrument Transformers | James E. Smith |
| 8.3. | Insulating Fluids | Susan J. McNelly |
| 8.4. | Insulation Life | Donald W. Platts |
| 8.5. | Performance Characteristics | Steven Antosz |
| 8.6. | Power Transformers | Thomas G. Lundquist |
| 8.7. | Underground Transformers & Network Protectors | Carl G. Niemann |
| 8.8. | Audible Sound and Vibration | Jeewan L. Puri |
| 8.9. | Bushings | Fred E. Elliott |
| 8.10. | Dry Type Transformers | Charles W. Johnson |
| 8.11. | Distribution Transformers | Steven D. Shull, reporting |
| 8.12. | Dielectric Tests | Loren B. Wagenaar |
| 9. | Editor's Report | Edward G. teNyenhuis |
| 10. | Meetings Planning Subcommittee | Gregory W. Anderson |
| 11. | Reports of Liaison Representatives | |
| 11.1. | Standard Coordinating Committee No. 4 | Paulette Payne Powell |
| 11.2. | IEC TC-14 Technical Advisor to USNC | Philip J. Hopkinson |
| 11.3. | CIGRE | Jean-Christophe Riboud |
| 12. | Old Business | Thomas A. Prevost |
| 13. | New Business (further discussion as needed) | Thomas A. Prevost |

Final Issue - 4 September

IEEE/PES TRANSFORMERS COMMITTEE

www.transformerscommittee.org

Fall 2009 Meeting; 25-29 October 2009

Hosted by Thomas Callsen and ComEd, an Exelon Company
The Westin Lombard Yorktown Center; Lombard, Illinois USA

NOTES: See Page 5 for a key to abbreviations. A vertical line in the left margin indicates a noteworthy revision since last revision.

<u>DATE/TIME</u>	<u>ACTIVITY</u>	<u>SUB-COM</u>	<u>ACTIVITY CHAIR</u>	<u>ROOM CAP/ARR/AV</u>	<u>MEETING ROOM (Floor)</u>
Saturday, October 24					
No Meeting Registration, No Transformer Committee Meetings, No Social Events					
Sunday, October 25					
8:00 am - 12:30 pm	<u>Technical Tour:</u> S&C Complex and Advanced Technology Center (similar tour on Thursday afternoon, Oct 29) Indicate your desire to attend while registering on-line for the Committee Meeting. <u>Limited attendance.</u> Bus will depart the Westin at 8:00 am and return before 12:30 pm. Box breakfast provided on the bus. Contact Michael Kilpatrick at 773.338.1000 x2306 or <mkilpatrick@sandc.com> for more details.				
1:00 pm - 5:30 pm	Meeting Registration				Jr. Ballroom Foyer
2:00 pm - 5:30 pm	Administrative SC -- closed meeting, by invitation only	Admin.	T. Prevost	24 US (w/snack buffet)	Magnolia A
2:00 pm - 5:30 pm	NEMA Transformers -- closed meeting, by invitation only	++	C. Drexler	15 US (w/beverages)	Magnolia B/C
6:00 pm - 8:00 pm	Welcome Reception			350 Reception	Jr. Ballroom A/B/C
Monday, October 26 -- Monday Breaks Sponsored by OMICRON electronics ***					
7:00 am - 5:00 pm	Meeting Registration				Jr. Ballroom Foyer
7:00 am - 6:00 pm	Internet Cafe'			12 SQ	Oak
<u>7:00 am</u> - 7:50 am	<u>Newcomers Orientation</u> Breakfast Mtg (<u>arrive early!</u>) -- Newcomers & Guests are encouraged to attend!		E. Smith	50 CL	Grand Ballroom J
7:00 am - 7:45 am	Distribution SC Leaders Coordination Meeting (by invitation only)		S. Shull	14 CONF	Water Wall Room in Holy Mackerel
7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			250 RT (8/tbl)	Grand Ballroom F
8:00 am - 9:00 am	Breakfast - Spouses/Companions (no meeting attendees please)			75 RT (8/tbl)	Sheffield Room in Harry Caray's Private Ballroom
9:15 am - 4:30 pm	<u>Spouses/Companion Tours:</u> "Chicago Highlights Tour". Includes lunch at Blueprint Restaurant. -- Advance registration required. Bus departs the Westin Hotel at 9:15 am and returns around 4:30 pm.				
<u>8:15 am</u> - 10:45 am	IEC TC-14 Technical Advisory Group (all interested individuals welcome)	++	P. Hopkinson	50 CL	Magnolia A
8:00 am - 9:15 am	WG Dry-Type Reactors C57.16	Dry	R. Dudley	40 CL	Magnolia B/C
8:00 am - 9:15 am	WG 3-ph Underground Distribution Transformers C57.12.24	UTNP	G. Termini	40 CL	Cypress A/B
8:00 am - 9:15 am	(TBD)			80 CL	Lilac A/C
8:00 am - 9:15 am	TF DPV Grid Transformers	Power	H. Shertukde	80 CL	Lilac B/D
8:00 am - 9:15 am	TF Electrical Partial Discharge Measurements Guide C57.113	DiTests	E. Lemke	100 CL S3	Jr. Ballroom C
8:00 am - 9:15 am	WG Transformer Monitoring C57.143	Power	D. Chu	150 CL S3	Jr. Ballroom A/B
9:15 am - 9:30 am	<i>Break (beverages only)</i>				Jr. Ballroom Foyer

*** Contact Joe Watson (joe_watson@ieee.org) if you are interested in sponsoring coffee-breaks at a future meeting.

<u>DATE/TIME</u>	<u>ACTIVITY</u>	<u>SUB-COM</u>	<u>ACTIVITY CHAIR</u>	<u>ROOM CAP/ARR/AV</u>	<u>MEETING ROOM</u>
Monday, October 26 (continued)					
9:30 am - 10:45 am	WG Sealed Dry-Type Power Transformers C57.12.52	Dry	S. Kennedy	40 CL	Magnolia B/C
9:30 am - 10:45 am	WG Liquid-immersed Secondary Network Transformers C57.12.40	UTNP	B. Klaponski	50 CL	Cypress A/B
9:30 am - 10:45 am	WG Overhead Distribution Transformers C57.12.20	Dist	A. Wilks/ T.Cooper	80 CL	Lilac A/C
9:30 am - 10:45 am	WG Revision of C57.12.10	Power	G. Hoffman	80 CL	Lilac B/D
9:30 am - 10:45 am	TF Furan Tests	IL	K. Haggerty	100 CL S3	Jr. Ballroom C
9:30 am - 10:45 am	WG PCS Rev. to Test Code C57.12.90	PCS	M. Perkins	150 CL S3	Jr. Ballroom A/B
10:45 am - 11:00 am	<i>Break (beverages only)</i>			Jr. Ballroom Foyer	
11:00 am - 12:15 pm	TF IEEE-IEC Cross Reference	Stds	J. Sim	50 CL	Magnolia A
11:00 am - 12:15 pm	WG Dry-Type Gen. Require. C57.12.01	Dry	T. Holdway	40 CL	Magnolia B/C
11:00 am - 12:15 pm	WG Std Requires for Sec. Network Protectors C57.12.44	UTNP	B. Wimmers	50 CL	Cypress A/B
11:00 am - 12:15 pm	WG 1-ph Padmount Distribution Transformers C57.12.38 (12.21 & 12.25)	Dist	A. Ghafourian/ M. Faulkenberry	80 CL	Lilac A/C
11:00 am - 12:15 pm	WG Control Cabinets PC57.148	Power	J. Watson	80 CL	Lilac B/D
11:00 am - 12:15 pm	TF External Dielectric Clearances	DiTests	E. Davis	100 CL S3	Jr. Ballroom C
11:00 am - 12:15 pm	WG Thermal Evaluation of Power and Distribution Transformers C57.100	IL	R. Wicks	150 CL S3	Jr. Ballroom A/B
12:15 pm - 1:30 pm	<u>Lunch Meeting</u> : Standards Development Review -- All SC/WG/TF leaders are encouraged to attend. -- Advance reservation required (\$20 for box lunch). -- No paper tickets. Admission verified at the door.		B. Bartley	120 (8/tbl)	Grand Ballroom F
1:45 pm - 3:00 pm	SC HVDC Converter Transformers and Smoothing Reactors	HVDC	R. Dudley	50 CL	Cypress A/B
1:45 pm - 3:00 pm	WG 3-ph Padmount Distribution Transformers C57.12.34	Dist	R. Stahara/ S. Shull	80 CL	Lilac A/C
1:45 pm - 3:00 pm	WG Tap Changer Performance C57.131	Power	W. Henning	80 CL	Lilac B/D
1:45 pm - 3:00 pm	WG Procedures for Harmonizing IEEE & IEC Standards	Stds	J. Puri	80 CL	Magnolia A/B/C
1:45 pm - 3:00 pm	TF Special Dielectric Test Issues	DiTests	B. Forsyth	100 CL S3	Jr. Ballroom C
1:45 pm - 3:00 pm	WG Frequency Response Analysis (FRA) Guide PC57.149	PCS	C. Sweetser	150 CL S3	Jr. Ballroom A/B
3:00 pm - 3:15 pm	<i>Break (beverages and treats)</i>			Jr. Ballroom Foyer	
3:15 pm - 4:30 pm	WG Dry-Type Test Code C57.12.91	Dry	D. Foster	50 CL	Cypress A/B
3:15 pm - 4:30 pm	WG Loss Evaluation Guide for Distribution Transformers	Dist	A. Traut/ D. Duckett	80 CL	Lilac A/C
3:15 pm - 4:30 pm	WG Transformer Paralleling Guide	Power	T. Jauch	80 CL	Lilac B/D
	TF PD in Bushings and PTs/CTs	DiTests	T. Hochanh	80 CL	Magnolia A/B/C
3:15 pm - 4:30 pm	TF Moisture in Oil (New!)	IF	B. Rasor	100 CL S3	Jr. Ballroom C
3:15 pm - 4:30 pm	WG PCS Revisions to C57.12.00	PCS	S. Snyder	150 CL S3	Jr. Ballroom A/B
4:30 pm - 4:45 pm	<i>Break (beverages only)</i>			Jr. Ballroom Foyer	
4:45 pm - 6:00 pm	<u>Presentation</u> : "Electrical Steel and Core Performance", by R. Girgis, M. Hastenrath, and J. Schoen. Sponsored by SC Performance Characteristics **			200 CL S3 (add 50-75 TH seats in rear)	Jr. Ballroom A/B
6:30 pm - 10:00 pm	<u>Technical Tour</u> : MacLean Power Systems Surge Arrester Facility; Franklin Park, Illinois -- Indicate your desire to attend while registering on-line for the Committee Meeting. <u>Limited attendance.</u> -- Bus will depart the Westin at 6:30 pm and return before 10:00 pm. Dinner will be served at the facility. -- Contact Paul Lindemulder at 847-451-2813 or <plindemulder@macleanpower.com> for more details.				

** Contact N. Kent Haggerty (n.kent.haggerty@ieee.org) if you are interested in making a technical presentation at a future meeting.

<u>DATE/TIME</u>	<u>ACTIVITY</u>	<u>SUB-COM</u>	<u>ACTIVITY CHAIR</u>	<u>ROOM CAP/ARR/AV</u>	<u>MEETING ROOM</u>
Tuesday, October 27 -- Tuesday Breaks Sponsored by TBEA Shenyang Transformer Group ***					
7:00 am - 12:00 pm	Meeting Registration				Jr. Ballroom Foyer
7:00 am - 6:00 pm	Internet Cafe'			12 SQ	Oak
7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			250 RT (8/tbl)	Grand Ballroom F
8:00 am - 9:00 am	Breakfast - Spouses/Companions (no meeting attendees please)			75 RT (8/tbl)	Sheffield Room in Harry Caray's
9:15 am - 4:45 pm	<u>Spouses/Companions Tour</u> : "Chicago Museums & Shopping District ". Advance registration required. -- Bus departs Westin at 9:15 am and returns by 4:45 pm. Drop-off at "Museum Campus" (Shedd Aquarium, Field Museum, Adler Planetarium) and at Michigan Avenue & Chestnut. Pick-up at same location at Michigan & Chestnut at 3:00 pm, and at Museum Campus at 3:30 pm. Lunch and entry fees not included.				
	WG HV Instrument Transformer Tests	C57.13.5 document complete.			
8:00 am - 9:15 am	WG Oil Reclamation Guide PC57.637	IF	J. Thompson	50 CL	Cypress A/B
8:00 am - 9:15 am	WG Enclosure Integrity C57.12.28, C57.12.29, C57.12.31, C57.12.32	Dist	R. Olen/ D. Mulkey	80 CL	Lilac A/C
8:00 am - 9:15 am	TF Heating of Metallic Parts in contact with Insulation (New!)	IL	J. Ray	80 CL	Lilac B/D
8:00 am - 9:15 am	WG PC57.152 Field Test Guide	Stds	J. Verner	80 CL	Magnolia A/B/C
8:00 am - 9:15 am	TF Transf. Tank Rupture & Mitigation	Power	P. Zhao	100 CL S3	Jr. Ballroom C
8:00 am - 9:15 am	WG Switching Transients Induced by Transf./Breaker Interaction PC57.142	PCS	R. Degeneff	150 CL S3	Jr. Ballroom A/B
9:15 am - 9:30 am	<i>Break (beverages only)</i>				Jr. Ballroom Foyer
	WG HVDC Bushings C57.19.03	Joint IEC-IEEE WG HVDC Bushings will meet on Saturday, 10/24			
9:30 am - 10:45 am	WG Terminal Markings C57.12.70	Stds	S. Shull	50 CL	Cypress A/B
9:30 am - 10:45 am	WG Neutral Ground. Devices PC57.32	PCS	S. Schappell	80 CL	Lilac A/C
9:30 am - 10:45 am	TF Functional Life Tests, De-energized Tap Changers (DETC)	Power	P. Hopkinson	80 CL	Lilac B/D
9:30 am - 10:45 am	WG Impulse Test Guide C57.98/138	DiTests	A. Molden	80 CL	Magnolia A/B/C
9:30 am - 10:45 am	TF DGA Natural Ester Fluids	IF	P. Boman	100 CL S3	Jr. Ballroom C
9:30 am - 10:45 am	WG Revision to Loading Guide C57.91	IL	D. Duckett	150 CL S3	Jr. Ballroom A/B
10:45 am - 11:00 am	<i>Break (beverages only)</i>				Jr. Ballroom Foyer
11:00 am - 12:15 pm	WG Revision to IEEE 638	Power	C. Swinderman	50 CL	Cypress A/B
11:00 am - 12:15 pm	WG Voltage Step Regulators C57.15	Dist	Colopy/Kennedy	80 CL	Lilac A/C
11:00 am - 12:15 pm	(TBD)			80 CL	Lilac B/D
11:00 am - 12:15 pm	TF Tertiary/Stabilization Windings (New!)	PCS	E. Betancourt	80 CL	Magnolia A/B/C
11:00 am - 12:15 pm	WG Guide for DGA in LTCs C57.139	IF	F. Jakob	100 CL S3	Jr. Ballroom C
11:00 am - 12:15 pm	WG Temperature Rise Test Procedures in Section 11 of C57.12.90	IL	P. Powell	150 CL S3	Jr. Ballroom A/B
12:15 pm - 1:30 pm	<u>Speaker Luncheon</u> : Rick Bush, Editor in Chief, T&D World Magazine -- Topic: "The Dumb Grid, Connecting Generators and Refrigerators in the Era of Green". Advance registration is necessary. -- Paper tickets are not provided. Admission verified at the door.			200 (8/tbl) with elevated table for 5	Grand Ballroom F
	WG Dielectric Test Tables, Liquid-filled	Work is complete			
1:45 pm - 3:00 pm	WG Phase-shift Transf. Guide C57.135	Power	J. Sim	50 CL	Cypress A/B
1:45 pm - 3:00 pm	TF Transformer Efficiency and Loss Evaluation (DOE Activity)	Dist	P. Hopkinson	80 CL	Lilac A/C
1:45 pm - 3:00 pm	TF GSU Bushing Standardization	Bush	C. Hurley	80 CL	Lilac B/D
1:45 pm - 3:00 pm	WG Sound Level Measurement Guide	ASV	R. Girgis	80 CL	Magnolia A/B/C
1:45 pm - 3:00 pm	WG Revision to Gas Guide C57.104	IF	R. Ladroga	100 CL S3	Jr. Ballroom C
1:45 pm - 3:00 pm	WG Revision to Low Frequency Tests	DiTests	B. Poulin	150 CL S3	Jr. Ballroom A/B
3:00 pm - 3:15 pm	<i>Break (beverages and treats)</i>				Jr. Ballroom Foyer

*** Contact Joe Watson (joe_watson@ieee.org) if you are interested in sponsoring coffee-breaks at a future meeting.

<u>DATE/TIME</u>	<u>ACTIVITY</u>	<u>SUB-COM</u>	<u>ACTIVITY CHAIR</u>	<u>ROOM CAP/ARR/AV</u>	<u>MEETING ROOM</u>
Tuesday, October 27 (continued)					
	WG Bushing Applic. Guide C57.19.100		Work is nearly complete.		
3:15 pm - 4:30 pm	TF Semiconductor Rectifier Transformers C57.18.10	PCS	S. Kennedy	50 CL	Cypress A/B
3:15 pm - 4:30 pm	WG Electronic Test Data Reporting C57.12.37	Dist	Hollingsworth/ Callsen	80 CL	Lilac A/C
3:15 pm - 4:30 pm	WG High Temp. Transformers PC57.154	IL	R. Marek	80 CL	Lilac B/D
3:15 pm - 4:30 pm	WG Revisions to Impulse Test Sections of C57.12.00 and C57.12.90	DiTests	P. Riffon/ P. Heinzig	80 CL	Magnolia A/B/C
3:15 pm - 4:30 pm	TF Guide for Field Application of Natural Ester Fluids	IF	J. Graham	100 CL S3	Jr. Ballroom C
3:15 pm - 4:30 pm	WG Transportation Issues Guide	Power	G. Anderson	150 CL S3	Jr. Ballroom A/B
4:30 pm - 4:45 pm	<i>Break (beverages only)</i>			Jr. Ballroom Foyer	
4:45 pm - 6:00 pm	<u>Presentation:</u> "Dielectric Frequency Response Testing (DFR)", by D. Chu, D. Kim, P. Patel, M. Perkins, P. Werelius. Sponsored by SC Dielectric Tests **			200 CL S3 (add 50-75 TH seats in rear)	Jr. Ballroom
6:30 pm - 10:30 pm	<u>Technical Tour:</u> E.O. Schweitzer Manufacturing Facility (a division of SEL); Lake Zurich, Illinois -- <u>Restricted attendance;</u> by invitation only (EOS will send invitations separately). -- Bus will depart the Westin at 6:30 pm and return before 10:30 pm. Dinner served at the factory. -- Contact Gayle Yauch at 847-540-8480 or <gayle_yauch@eosmfg.com> for more details.				

Wednesday, October 28 -- Wednesday Breaks Sponsored by HICO ***

No Meeting Registration, No Technical Tours					
7:00 am - 6:00 pm	Internet Cafe'			12 SQ	Oak
7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			200 RT (8/tbl)	Grand Ballroom F
8:00 am - <u>9:30 am</u>	Breakfast - Spouses/Companions (no meeting attendees please)			75 RT (8/tbl)	Sheffield Room in Harry Caray's
9:15 am - 4:00 pm	<u>Spouses/Companions Tour:</u> "Shopping at Oakbrook Center " -- Westin bus will shuttle throughout the day, beginning at 9:15 am, but advance registration required. -- See Bell Stand desk in the Westin lobby to request the shuttle. Shuttle will pick-up at Macy's. -- Optional lunch at Maggiano's Restaurant at 12:30 pm. Last shuttle departs Oakbrook Center at 4:00 pm.				
7:00 am - 7:45 am	SC Meetings Planning Get breakfast in Grand Ballroom F and take to Grand Ballroom G. Arrive early!	Meetings	G. Anderson	30 CL	Grand Ballroom G
8:00 am - 9:15 am	EL&P Delegation (Users only meeting)	++	S. Shull	50 CL	Lilac D
8:00 am - 9:15 am	SC Instrument Transformers	IT	J. Smith	100 CL S3	Jr. Ballroom C
8:00 am - 9:15 am	SC Insulation Life	IL	D. Platts	200 CL S3	Jr. Ballroom A/B
9:15 am - 9:30 am	<i>Break (beverages only)</i>			Jr. Ballroom Foyer	
9:30 am - 10:45 am	SC Audible Sound & Vibration	ASV	J. Puri	50 CL	Lilac D
9:30 am - 10:45 am	SC Bushings	Bush	F. Elliott	100 CL S3	Jr. Ballroom C
9:30 am - 10:45 am	SC Distribution Transformers	Dist	S. Shull	200 CL S3	Jr. Ballroom A/B
10:45 am - 11:00 am	<i>Break (beverages only)</i>			Jr. Ballroom Foyer	
11:00 am - 12:15 pm	SC UG Transf. & Network Protectors	UTNP	C. Niemann	100 CL S3	Jr. Ballroom C
11:00 am - 12:15 pm	SC Dielectric Tests	DiTests	L. Wagenaar	200 CL S3	Jr. Ballroom A/B
12:15 pm - 1:30 pm	Lunch (on your own)				
1:30 pm - 2:45 pm	SC Dry Type	Dry	C. Johnson	100 CL S3	Jr. Ballroom C
1:30 pm - 2:45 pm	SC Power Transformers	Power	T. Lundquist	200 CL S3	Jr. Ballroom A/B
2:45 pm - 3:00 pm	<i>Break (beverages and treats)</i>			Jr. Ballroom Foyer	

** Contact N. Kent Haggerty (n.kent.haggerty@ieee.org) if you are interested in making a technical presentation at a future meeting.

*** Contact Joe Watson (joe_watson@ieee.org) if you are interested in sponsoring coffee-breaks at a future meeting.

KEY

Note: A PC projector will be furnished in each meeting room. Arrive early to ensure that equipment operates/synchs correctly. Overhead projectors are available in the meeting registration area.

> -- activity continued into another session / from another session
 ++ -- not a Transformers Committee activity TBD = "To Be Determined"
 FC = flip chart; S1 = sound (see note)
 S2 = stand mic in front only; S3 = one stand mic in front & stand mic(s) at mid-room

CL -- classroom seating (w/head table for 2-3)
 TH -- theater seating (with head table for 2-3)
 RT -- multiple roundtables (8-9/table)
 US -- U-shape table

<u>DATE/TIME</u>	<u>ACTIVITY</u>	<u>SUB-COM</u>	<u>ACTIVITY CHAIR</u>	<u>ROOM CAP/ARR/AV</u>	<u>MEETING ROOM</u>
Wednesday, October 28 (continued)					
3:00 pm - 4:15 pm	SC Insulating Fluids	IF	S. McNelly	100 CL S3	Jr. Ballroom C
3:00 pm - 4:15 pm	SC Performance Characteristics	PCS	S. Antosz	200 CL S3	Jr. Ballroom A/B
4:15 pm - 4:30 pm	<i>Break (beverages only)</i>				
4:30 pm - 5:30 pm	SC Transformer Standards	Stds	B. Bartley	100 CL S3	Jr. Ballroom C
6:30 pm - 10:00 pm	<u>Dinner Social</u> : "Cantigny; Robert R. McCormick Museum and Cantigny First Division Museum". -- Advance registration is necessary. Indicate meal selection when you register. -- Buses begin boarding at 5:45 pm. The last bus departs at 6:15 pm. All buses return before 10:00 pm. -- Paper tickets will not be provided. Admission will be verified with a registration list as you board the bus.				

Thursday, October 29

No Meeting Registration, No Spouses/Companions Tours, No Internet Cafe', No EPRI Meeting

7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			200 RT (6/tbl)	Grand Ballroom F
8:00 am - 9:30 am	Breakfast - Spouses/Companions (no meeting attendees please)			60 RT(8/tbl)	Sheffield Room in Harry Caray's
8:00 am - 9:45 am >	General Session, Transformers Committee		T. Prevost	200 CL S1 75 TH elevat. table for 4	Jr. Ballroom A/B/C
9:45 am - 10:00 am	<i>Break (beverages only)</i>				
> 10:00 am - 11:30 am	General Session, Transformers Committee		T. Prevost	200 CL S1 75 TH	Jr. Ballroom A/B/C
12:00 pm - 7:30 pm	<u>Technical Tour</u> : Waukesha Electric Systems; Waukesha, Wisconsin Transformer Facility -- <u>Restricted attendance</u> ; by invitation only (Waukesha Electric will send invitations separately). -- Bus will depart the Westin at 12:00 pm and return before 7:30 pm. Box lunches provided on the bus. -- Arrangements can be made with WES to provide transportation to Chicago airports after the tour. -- Contact Tammy Behrens at 262.513.5401 or <tammy.behrens@waukesha.spx.com> for more details.				
12:00 pm - 4:00 pm	<u>Technical Tour</u> : S&C Complex and Advanced Technology Center (similar tour on Sunday morning, Oct 25) -- Indicate your desire to attend while registering on-line for the Committee Meeting. <u>Limited attendance</u> . -- Bus will depart the Westin at 12:00 pm and return before 4:00 pm. Box lunches provided on the bus. -- Arrangements can be made with S&C to provide transportation to Chicago airports after the tour. -- Contact Michael Kilpatrick at 773.338.1000 x2306 or <mkilpatrick@sandc.com> for more details.				
1:30 pm - 5:00 pm	Joint WG HVDC Bushings IEEE PC57.19.03/ IEC 62199	Bush	J. Graham	40 CL	Magnolia A

Friday, October 30

No Transformer Committee Meetings, No Internet Cafe', No EPRI Meeting, No Tours.

FUTURE COMMITTEE MEETINGS

SPRING 2010 - March 7-11; Houston, Texas. Hosted by Jeremy Kriska and Nynas USA

FALL 2010 - date and location to be determined

The Westin Lombard Yorktown Center

70 Yorktown Center; Lombard, Illinois 60148 USA





IEEE / PES / TRANSFORMERS COMMITTEE

Standards Report

To: Members of IEEE Transformers Committee

From: William H. Bartley, Standards Coordinator

Date: October 19, 2009

Re: Transformer Standards Activity

Executive Summary

This report covers the Transformer Standards activity for the six-month period of April 1 2009 to Oct 1, 2009. The Transformer Committee is responsible for approximately 96 active standards, plus 45 projects for new standards and revisions. In the last six months, one new standard and three Revisions were approved by REVCOM; and NESCOM approved two PAR modifications, and one PAR extension.

In this Report:

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I. Standards News

IEEE Editorial Satisfaction Survey

All WG Chairs: You are invited to participate in an editorial process satisfaction survey! The survey is designed to examine ways in which the editorial staff can better meet our needs. This is your time to voice any comments or suggestions you may have regarding their editorial services, tools, resources, etc. Below is the survey link. It will take only a few minutes to complete. Your responses are completely confidential and will only be presented in aggregate.

https://www.surveymonkey.com/s.aspx?sm=TxMMHeihTbI2QqTr6KE3NA_3d_3d

II. NESCOM and PAR Activities

NOTE: The deadline to submit PARs to Nescom for the December meeting was Oct 19.

PARs approved for New Standards or Revisions

None

PAR Modifications approved

PC57.113 Rec. Practice for PD Measurement in Liquid-Filled Transformers

Approved a modified PAR, expiring in December 2011

C57.12.10 Standard Requirements for Liquid-Immersed Power Transformers

Approved modified

PAR Extension Requests approved

C57.12.10 Standard Requirements for Liquid-Immersed Power Transformers

Approved an extension until December 2010

PARs to be WITHDRAWN December 31, 2009

- PC57.130** Trial-Use Guide for DGA During Factory Temperature Rise Tests
- PC57.133** Guide for Short-Circuit Testing of Distribution & Power Transformers

Other Recent PAR Activity

- C57.12.01** Standard General Requirements
A PAR for REVISION was submitted by Tim Holdway on Oct 15
- C57.32** Requirements, Terminology, and Test Procedures for Neutral Grounding Devices
A PAR Modification and Extension Request was submitted by Steve Schapell on Oct 16
- 1277** General Requirements and Test Code for Dry-Type and Oil-Immersed Smoothing Reactors for DC Power Transmission - Ballot closed Sept. Currently in resolution. A PAR Extension Request was submitted by R.Dudley on Oct 13.
- C57.91** Guide for Loading Mineral-Oil-Immersed Transformers [*Also Cor 1-2002 (R2004)*]
A PAR Extension Request was submitted by Don Duckett on Oct 13
- C57.96** Guide for Loading Dry-Type Distribution and Power Transformers
A PAR for REVISION was submitted by Richard Marek on Oct 12
- C57.98** IEEE Guide for Transformer Impulse Tests
A PAR Extension Request was submitted by Art Molden on September 14, and is on the Nescom October agenda for early consideration.
- C57.131** Standard Requirements for Load Tap Changers
Ballot launched Oct 15. PAR Modification & Extension Request submitted by W Henning on Oct 8.
- C57.139** Guide for DGA in Load Tap Changers
PAR Extension Request was submitted by D. Wallach on Oct 8.
- C57.151** Guide for Sound Level Measurement Guide
PAR Extension Request submitted by Jeewan Puri Sept 21; now on the Nescom October agenda for early consideration.

III. REVCOM and Standards Activities

NOTE: The deadline to submit Standards to REVCOM for the December meeting was Oct 19.

NEW Transformer Standards Approved

- C57.12.38** Standard for Padmounted, Single-Phase Distribution Transformers

Revisions Approved

- C57.13.5** Standard of Performance and Test for Instrument Transformers > 115 kV
- C57.15** Standard Requirements, Terminology, & Test Code for Step-Voltage Regulators
- C57.12.24** Standard for Submersible, Three-Phase Transformers, <3750 kVA,

Standards to be Withdrawn Dec 31 '09

- C57.56** Thermal Evaluation of Ins. Systems for Ventilated Dry-Type
This standard was merged with C57.12.60, which is on the Revcom October agenda for early consideration.

Other Recent Standards Activity

- 259** Standard Test Procedure for Evaluation of Insulation Systems for Dry-Type Transformers
 Reaffirmation ballot invitation opened Oct 7. Have requested a 1-year extension to complete the ballot.
- 1277** General Requirements and Test Code for Smoothing Reactors for DC Power Transmission
 Ballot closed Sept 6. Currently in resolution. PAR Extension was submitted.
- C57.12.34** Requirements for Pad-Mounted, 3-Phase Distribution Transformers, <2500 kVA
 Ballot completed. Standard submitted by S Shull on Oct 13. Now on Dec REVCOM agenda
- C57.12.60** Thermal Evaluation of Insulation Systems for Dry-Type Transformers
 Ballot completed Aug 28. Submitted to Revcom. On the October agenda for early consideration.
- C57.19.00** Standard General Requirements and Test Procedure for Power Apparatus Bushings
 Ballot closed Sept 18. Currently in resolution. Have requested 1-year extension to complete the ballot.
- C57.121** IEEE Guide for Acceptance and Maintenance of Less-Flammable Hydrocarbon Fluids
 A Reaff Recirculation ballot launched Oct 15. All negatives resolved. Now on Dec REVCOM agenda.
- C57.124** Rec Practice for Detection of P.D. & Measurement of Apparent Charge in Dry-Types
 Ballot completed. Standard submitted by C Johnson on Oct 8. Now on Dec REVCOM agenda
- C57.131**-IEEE Standard Requirements for Load Tap Changers
 Ballot launched on Oct 15. PAR Modification & Extension Request submitted by W Henning
- C57.144** Guide to Metric Conversion of Transformer Standards
 A Reaffirmation ballot invitation was opened Sept 18. Ballot will commence right after Invitation closes. Have requested a 1-year extension to complete the ballot.

IV. 2010 IEEE Standards Board Calendar

2010 DEADLINES for NESCOM and REVCOM Submissions:

March	February 12, 2010
June	May 7, 2010
September	August 20, 2010
December	October 18, 2010

IV. 2010 Standards Board Meeting Schedule

2010

IEEE Standards Association Governance Meetings Schedule



JANUARY	JULY
	15 BAC - San Diego, CA
FEBRUARY	AUGUST
9-14 IEEE BoD Series - Atlanta, GA	17-18 CAG - Piscataway, NJ
23 Int'l Ad-Hoc - Piscataway, NJ	SEPTEMBER
24 Bus. Dev Ad-Hoc - Piscataway, NJ	28-30 Sids&d/Cmle Migs - Europe Location TBD
24 BoG PM caucus - Piscataway, NJ	OCTOBER
25 BoG - Piscataway, NJ	
MARCH	NOVEMBER
8-12 CAG - India	16-21 IEEE BoD Series - New Brunswick, NJ
23-25 Sids&d/Cmle Migs - Piscataway, NJ	30 CAG - Piscataway, NJ
APRIL	DECEMBER
	1 CAG - Piscataway, NJ
MAY	2 Int'l Ad-Hoc - Piscataway, NJ
11-12 CAG - Piscataway, NJ	3 Bus. Dev Ad-Hoc - Piscataway, NJ
24 Int'l Ad-Hoc - Beijing, PRC	3 BoG - PM caucus - Piscataway, NJ
25 Bus. Dev Ad-Hoc - Beijing, PRC	4 BoG - Piscataway, NJ
25 BoG PM caucus - Beijing, PRC	5 Awards Ceremony - New Brunswick, NJ
26 BoG - Beijing, PRC	6-8 Sids&d/Cmle Migs - Piscataway, NJ
JUNE	
15-17 Sids&d/Cmle Migs - Piscataway, NJ	
22-27 IEEE BoD Series - Montreal, Canada	

Deadlines for AudCom/NewsCom/RevCom
 Submissions:
 12 February
 7 May
 20 August
 18 October

V. Transformer Committee Ballot Status *(as of Oct 19, 2009)*

Standard	Subcommittee	Status
1277	HVConv	Ballot closed Sep 6, PAR ext submitted
C57.12.00	Std. WG	Ballot closed Oct '08 Recirc ballot to launch Oct 26
C57.12.10	PwrTrans	PAR mod & ext to Dec 2010
C57.12.24	UG	approved
C57.12.30	Dist	Ballot closed Oct 14 - in resolution
C57.12.31	Dist	Ballot closed Oct 14 - in resolution
C57.12.34	Dist	Complete - on Dec REVCOM agenda
C57.12.38	Dist	approved
C57.12.60	Dry Type	Complete - on Oct REVCOM agenda
C57.12.80	Stds	Ballot closed Apr '08 - in resolution
C57.12.90	Stds	Ballot complete - holding for 12.00
C57.13.5	Instrument	approved
C57.15	Dist	approved
C57.19.00	Bushing	Ballot closed Sep 17 - in resolution
C57.113	Dielectric	Ballot closed Mar '09 - in resolution - PAR Mod app'd to 2011
C57.121	Ins Fluid	Reaff ballot closes Oct 25 -Negs resolved - On Dec REVCOM agenda
C57.123	Perf Charac	Ballot complete - holding for Dual Logo
C57.124	Dry Type	Complete - on Dec REVCOM agenda
C57.131	Pwr Trans	Ballot closes Nov 15 09 - PAR mod + ext submitted
C57.139	Ins Fluid	PAR ext submitted
C57.142	Perf Charac	Recirc closed Sep 25 09 in resolution
C57.143	Pwr Trans	Ballot closed May '09 - in resolution

VI. Transformer Committee - Active PARs *.....as of Oct 19, 2009*

PAR Number	Title	Expiration
P638	Qualification of Class 1E Transformers for Nuclear Power Generating Stations	Dec 2011
P1277	General Requirements & Test Code for Smoothing Reactors for DC Power Transmission	PAR ext submitted
PC57.12.00	Std General Requirements for Liquid-Immersed Dist, Power, and Reg Transformers	Dec 2011
PC57.12.10	Std Requirements for Liquid-Immersed Power Transformers	Dec 2010
PC57.12.20	Std for Overhead Transformers, 500 kVA and Smaller:	Dec 2010
PC57.12.30	Std for Pole-Mounted Equipment - Enclosure Integrity for Coastal Environments	Dec 2011

Transformer Committee Active PARs - Continued		
PAR Number	Title	Expiration
PC57.12.31	Std for Pole Mounted Equipment - Enclosure Integrity	Dec 2011
PC57.12.37a	Electronic Reporting of Dist Transformer Test Data - AMENDMENT to Include Efficiency	Dec 2013
PC57.12.40	Std for Network, 3ph Transformers,< 2500 kVA; Subway and Vault Types	Dec 2011
PC57.12.52	Std for Sealed Dry-Type > 501 kVA 3ph, HV: 601 to 34.5kV, LV: 208Y/120 to 4160 Volts	Dec 2011
PC57.12.70	Std Terminal Markings and Connections for Distribution and Power Transformers	Dec 2011
PC57.12.80	Std Terminology for Power and Distribution Transformers	Dec 2012
PC57.12.90	Std Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers	Dec 2011
PC57.12.91	Std Test Code for Dry-Type Distribution and Power Transformers	Dec 2010
PC57.16	Std Requirements, Terminology, and Test Code for Dry-Type Air-Core Series-Reactors	Dec 2010
PC57.17	Std Requirements for Arc Furnace Transformers	Dec 2011
PC57.19.03	Std Requirements, Terminology, & Test Code - Bushings for DC Apps rated > 110 kV BIL	Dec 2011
PC57.19.100	Guide for Application of Power Apparatus Bushings	Dec 2010
PC57.32	Std Requirements, Terminology & Test for Neutral Grounding Devices <i>(old IEEE std 32)</i>	PAR ext submitted
PC57.91	Guide for Loading Liquid Immersed Transformers and Voltage Regulators	PAR ext submitted
PC57.98	Guide for Transformer Impulse Tests	PAR ext submitted
PC57.100	Std Test Procedure for Thermal Evaluation of Insulation Systems for Liquid-Immersed	Dec 2010
PC57.113	Partial Discharge Measurement in Liquid-Filled Power Transformers and Shunt Reactors	Dec 2011
PC57.123	Guide for Transformer Loss Measurement	Dec 2011
PC57.131	Std Requirements for Tap Changers	PAR ext submitted
PC57.135	Guide for the Application, Specification and Testing of Phase Shifting Transformers	Dec 2011
PC57.139	Guide for Dissolved Gas Analysis in Transformer Load Tap Changers	PAR ext submitted
PC57.142	Guide to Describe the Occurrence and Mitigation of Switching Transients	Dec 2011
PC57.143	Guide for Monitoring Equipment to Liquid-Immersed Transformers and Components	Dec 2010
PC57.148	Std for Control Cabinets for Power Transformers	Dec 2010
PC57.149	Application & Interpretation of Frequency Response Analysis for Oil Immersed transformers	Dec 2010
PC57.150	Guide for the Transportation of Transformers and Reactors Rated 10,000 kVA or larger	Dec 2010
PC57.151	Sound Level Measurement Guide for Transformers and Reactors	PAR ext submitted
PC57.152	Guide for Diagnostic Field Testing of Fluid Filled Power Transformers, Regulators etc	Dec 2012
PC57.153	Guide for Paralleling Power Transformers	Dec 2012
PC57.154	Design, Testing and App of Liquid-Immersed Transformers with High-Temp Insulation	Dec 2013
PC57.637	Guide for the Reclamation of Insulating Oil and Criteria for Its Use	Dec 2012
<end>		

IEEE/PES TRANSFORMERS COMMITTEE
Status Report of PE/TR Standards

10/18/2009

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	AUDIBLE SOUND & VIBRATION <i>Puri J.</i>	(704) 821-6638 manopuri@worldnet.att.net			
P57.151	IEEE Guide for Sound Level Measurement for Liquid Immersed Transformers and Reactors	Puri J. (704) 821-6638 manopuri@worldnet.att.net		12/07/2005 12/31/2009	New Project - Active PAR Std under development IEC granted permission for use of IEC documents
C57.136	IEEE Guide for Sound Level Abatement and Determination for Liquid- Immersed Power Transformers and Shunt Reactors Rated Over 500 kVA	Darwin A.W. 44 1785 274370 alan.darwin@areva-td.com	2000 12/31/2010		Approved - Reaffirmed September '05 Reaffirmation approved by RevCom on 9/21/2005

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	BUSHING <i>Elliott F. E.</i>	(360) 418-2269 felliott@ieee.org			
NONE					
C57.19.00	Standard General Requirements and Test Procedure for Power Apparatus Bushings	Ellis K. P. (615) 847-2157 keithcota@aol.com	2004 12/31/2009		Approved Formerly Std. IEEE 21 Previous revision 1991. D6.1 approved by RevCom in Dec., 2004 NEEDS REAFFIRMATION or PAR for REVISION
C57.19.01	IEEE Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings	Elliott F. E. (360) 418-2269 felliott@ieee.org	2000 12/31/2010		Approved Formerly Std. IEEE 24 Reaffirmed in 2005.
C57.19.03 PC57.19.03	IEEE Standard Requirements, Terminology, and Test Code for Bushings for DC Applications	Recksiedler 204 474 3192	1996 12/31/2007	12/05/2007 12/31/2011	Approved with Corrigenda See Corrigenda -1, Published in 2006 New PAR for revision submitted 10/2007 PAR approved by Nescom Dec07 Std extended until PAR expiration of Dec 2011
C57.19.03-1996/	Standard Requirements, Terminology, and Test Code for Bushing for DC Applications - Corrigendum 1	Recksiedler 204 474 3192	12/31/2007		Approved Published 6/6/2006
C57.19.100 PC57.19.100	IEEE Guide for Application of Power Apparatus Bushings	Spitzer T. (817) 215-6457 tommy.spitzer@oncorgroup.com	1995 12/31/2010	03/30/2006 12/31/2010	Approved - Active PAR for Revision Revision for C57.19.101-1992 New PAR requested and approved to 12/31/2010.

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	DIELECTRIC TESTS <i>Wagenaar L. B.</i>	(614) 552-1759 lbwagenaar@ieee.org			
C57.113 PC57.113	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 12/31/2007	05/07/2007 12/31/2011	Active PAR for revision New PAR approved on 5/7/2007. Ballot closed March 26, 09 - in comment resolution Modified PAR approved 5/7/09
C57.127	IEEE Guide for the Detection of Acoustic Emissions from Partial Discharges in Oil-Immersed Power Transformers	Harley J. W. (330) 657-2471 jack@harleyinc.com	2007 12/31/2012		Approved - D10.0 approved - in final edit PAR to Revise IEEE Std C57.127-2000 D10.0 approved by SA Board 3/22/2007
C57.138	IEEE Recommended Practice for Routine Impulse Test for Distribution Transformers	Molden A. (845) 225-0993 a.molden@ieee.org	1998 12/31/2010		Approved - Reaffirmed in June '05 Reaffirmation approved by RevCom on 6/8/05.
C57.98 PC57.98	IEEE Guide for Transformer Impulse Tests	Molden A. (845) 225-0993 a.molden@ieee.org	1994 12/31/2009	09/12/2002 12/31/2009	Approved - Active PAR for Revision PAR to Revise IEEE Std C57.98-1994 PAR extension requested and approved to 12/31/2009.

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	DISTRIBUTION TRANSFORMERS <i>Shull S.</i>	(417) 625-6110 sshull@empiredistrict.com			
PC57.12.30	Standard for Pole-Mounted Equipment - Enclosure Integrity for Coastal Environments	Olen O. (262) 835-3362 rolen@cooperpower.com		03/22/2007 12/31/2011	New Project New project: covers conformance tests and requirements for the enclosure integrity of pole-mounted equipment in coastal locations
PC57.12.33	Guide for Distribution Transformer Loss Evaluation	Pekarek T. J. (330) 761-7800 tjekarek@firstenergycorp.com		06/25/1998 12/31/2004	PAR Withdrawn - Inactive WG Decision made at Las Vegas Meeting to discontinue project. PAR administratively withdrawn by Nescom Dec '04
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	Wilks A. L. (731) 285-9121 awilks@ermco-eci.com	2005 12/31/2010	09/15/2006 12/31/2010	Approved - Active PAR for Revision New PAR requested and approved to 12/31/2010.
C57.12.28 PC57.12.28	Standard for Pad Mounted Equipment - Enclosure Integrity	Olen O. (262) 835-3362 rolen@cooperpower.com	2005 12/31/2010		Approved Previously NEMA/ANSI C57.12.28-1999 Published 9/30/2005
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 12/31/2010		Approved Previously NEMA/ANSI C57.12.29-1991 Current standards Published 10/10/2005.
C57.12.31 PC57.12.31	IEEE Standard for Pole Mounted Equipment - Enclosure Integrity	Olen O. (262) 835-3362 rolen@cooperpower.com	2002 12/31/2011	03/22/2007 12/31/2011	Approved - Active PAR for Revision Published 3/6/2003. New PAR approved 3/22/2007
C57.12.32	Standard for Submersible Equipment - Enclosure Integrity	Olen O. (262) 835-3362 rolen@cooperpower.com	2002 12/31/2013		Approved Published 3/7/2003. Reaffirmation approved 03/28/08
C57.12.34 PC57.12.34	Requirements for Pad-Mounted, Compartmental-Type, Self-Cooled, Three-Phase Distribution Transformers, 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	12/31/2009	03/20/2005 12/31/2009	Approved - Active PAR for revision Originally Std. 1447, Combined C57.22-1980 & C57.12.26-1992 Approved by RevCom 9/22/2004; published 3/8/05 New PAR for revision approved 3/19/2005.

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	DISTRIBUTION TRANSFORMERS <i>Shull S.</i>	(417) 625-6110 sshull@empiredistrict.com			
C57.12.35	IEEE Standard for Bar Coding for Distribution Transformers	Matthews P (601) 422-1533 lmatthews@howard-ind.com	2007 12/31/2012		Approved Formerly P1265. C57.12.35-1996 reaffirmation 6/23/2004. Approved by SA Board 9/27/2007
C57.12.36 PC57.12.36	Standard Requirements for Liquid-Immersed Distribution Substation Transformers	Rossetti J. R. (901) 528-4743 jrossetti@mlgw.org	2007 12/31/2012		Approved PAR extended to 12/31/2008. Approved by SA Board on 9/27/2007
C57.12.37 PC57.12.37A	IEEE Standard for the Electronic Reporting of Transformer Test Data	Hollingsworth R. (601) 422-1105 rhollin@howard-ind.com	2006 12/31/2011	03/19/2009 12/31/2013	Approved Formerly C57.132, IEEE Std 1388-2000 Approved on 3/30/2006. Published 7/21/2006 PAR for AMENDMENT approved by NESCOM Mar 09
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 Smaller Requirements	Ghafourian A. A. (731) 285-9121 aghafourian@ermco-eci.com	2009 12/31/2014		Approved - Active Approved 9/11/09
C57.15 PC57.15	IEEE Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators	Colopy C. A. (262) 896-2342 ccolopy@cooperpower.com	2009 12/31/2014		Approved - Active Approved 9/11/2009

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	DRY TYPE TRANSFORMERS <i>Johnson, Jr. C. W.</i>	(276) 688-1512 charles.w.johnson@us.abb.com			
C57.12.01	IEEE Standard General Requirements for Dry-Type Distribution and Power Transformers Including Those with Solid Cast and/or Resin Encapsulated Windings	Sullivan J. C. (813) 884-5424 jcsullivan@ieee.org	2005 12/31/2010		Approved Previous 1998 version was successfully revised and approved in 2005. Published 5/19/2006
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	2008 12/31/2013		Approved Previously NEMA document C57.12.51, original publication by NEMA in 1981, Reaffirmed in 1998, document transferred to IEEE in Dec 2002. New PAR approved in 2006 Revised Standard approved 9/27/08 Published 3/9/2009
C57.12.52 PC57.12.52	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	05/07/2007 12/31/2011	Active PAR for revision Previously ANSI C57.12.52-1981 NEW PAR approved for revision to Dec 2011
C57.12.56 PC57.12.60	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	12/10/2003 12/31/2009	Extended to Dec 2009 Revcom recommended ADMINISTRATIVE WITHDRAWAL 12.56 AND 12.60 are being MERGED
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 12/31/2013		Approved - Active Reaffirmation approved 9/27/2008
C57.12.59	IEEE Guide for Dry-Type Transformer Through-Fault Current Duration	Powell P. A. (202) 388-2335 papayne@ieee.org	2001 12/31/2011		Approved Reaffirmation approved in 12/5/2006.
C57.12.60 PC57.12.60	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 12/31/2007	12/10/2003 12/31/2008	Approved - Active PAR for Revision PAR to Revise IEEE Std C57.12.56-1986 and IEEE Std C57.12.60-1998 PAR extended to 12-31-09
C57.12.91 PC57.12.91	IEEE Standard Test Code for Dry-Type Distribution and Power Transformers	Foster D. R. (815) 678-2421 dfoster@olsun.com	2001 12/31/2010	12/05/2006 12/31/2010	Approved - Active PAR for Revision New PAR for Revision approved 12/5/2006 PAR for Amendment withdrawn

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee DRY TYPE TRANSFORMERS		(276) 688-1512			
Chair	Johnson, Jr. C. W.	charles.w.johnson@us.abb.com			
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 12/31/2009		Approved Need to initiate reaffirmation and request extension. Expiration extended by Revcom to 12-31-09 Reaff Ballot closed Mar 11 2009 No negatives
C57.134	IEEE Guide for Determination of Hottest Spot Temperature in Dry Type Transformers	Powell P. A. (202) 388-2335 papayne@ieee.org	2000 12/31/2011		Approved Reaffirmation approved 3/30/2006
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 12/31/2010	11/02/2006 12/31/2010	Approved PAR for revision approved 11/2/2006.
C57.94	IEEE Recommended Practice for Installation, Application, Operation, and Maintenance of Dry-Type General Purpose Distribution and Power Transformers	Lewis T. D. (910) 738-4251 tlewis@acmepower.com	1982 12/31/2010		Approved Reaffirmation approved 12/6/2006
C57.96	IEEE Guide for Loading Dry Type Distribution and Power Transformers	Prevost T. A. (802) 751-3458 tprevost@ieee.org	1999 12/31/2009		Approved - Active Reaffirmation approved 9/22/2004 Previous revision in 1994.
IEEE 259	IEEE Standard Test Procedure for Evaluation of Systems of Insulation for Dry-Type Specialty and General-Purpose Transformers	Simpson, Jr. R. W. (603) 286-4362 bsimpson@quin-t.com	1999 12/31/2009		Approved Reaffirmation approved 9/22/04 REAFFIRMATION or PAR for REVISION NEEDED
SubCommittee HV CONVERTER TR & REACTORS		(416) 298-8108			
Chair	Dudley R. F.	richardd@ca.trenchgroup.com			
C57.129 PC57.129	IEEE General Requirements and Test Code for Oil Immersed HVDC Converter Transformers	Dudley R. F. (416) 298-8108 richardd@ca.trenchgroup.com	2008 12/31/2012		Approved Trial use std published 6/6/2000; upgraded to full use 3/2002 PAR for revision approved on 6/24/2004 Approved 9/27/2007 Published 1/29/2008
IEEE 1277 P1277	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 12/31/2005	11/10/2005 12/31/2009	Approved. Active PAR for revision Active PAR for revision.

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	INSTRUMENT TRANSFORMERS <i>Smith J. E.</i>	(601) 346-9104 jes1@ieee.org			
C57.13	IEEE Standard Requirements for Instrument Transformers	Nelson T. N. (301) 975-2986 thomas.nelson@nist.gov	1993 12/31/2013		Approved PAR to Revise IEEE Std C57.13-1993 PAR extended to 12-31-08 Revision Ballot closed 10-23-07 Revision Approved 3/28/08
C57.13.2	Conformance Test Procedure for Instrument Transformers	Khalin V. M. (859) 879-2797 vladimir@kuhlman.com	2005 12/31/2010		Approved C57.13.2-1991 revised to harmonize with C57.13-1993 Approved by RevCom on 6/8/2005 Published 9/29/2005.
C57.13.5	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	2009 12/31/2014		Approved - Active Approved 9/11/2009
C57.13.6	Standard for High Accuracy Instrument Transformers	Ten Haagen C. W. (603) 749-8433 chris.tenhaagen@indsys.ge.com		12/31/2010	Approved Document published in 12/9/2005

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	INSULATING FLUIDS <i>McNelly S.J.</i>	(612) 330-6904 sjmcnelly@ieee.org			
PC57.130	IEEE Trial-Use Guide for the Use of Dissolved Gas Analysis During Factory Temperature Rise Tests for the Evaluation of Oil-Immersed Transformers and Reactors	Ladroga R. K. (617) 393-3133 rladroga@doble.com		01/30/2000 12/31/2009	New Project - under development currently under ballot resolution. PAR extension requested and approved to 12/31/2009.
PC57.139	Guide for Dissolved Gas Analysis in Transformer Load Tap Changers	Jakob F. (916) 455-2284 fjakob@weidmann-acti.com		12/11/2002 12/31/2009	New Project - under development Orig PAR to expire 12/31/2006. Deferred PAR withdrawal to 3/2007. PAR extended to Dec 2009
C57.104 PC57.104	IEEE Guide for the Interpretation of Gases Generated in Oil-Immersed Transformers	Ladroga R. K. (617) 393-3133 rladroga@doble.com	1991 12/31/2013	06/30/2006	Approved Original PAR and document withdrawn in Dec. 2005. New PAR approved in June 06. Ballot closed 10/10/07 Revision approved 09/27/08 Published Feb 2009
C57.106	IEEE Guide for Acceptance and Maintenance of Insulating Oil in Equipment	Thompson J. A. (605) 534-3571 serve1@svtv.com	2006 12/31/2011		Approved D6 pproved 12/6/2006 Previously version in 2002, 1991 (R1998), 1977
C57.111	IEEE Guide for Acceptance of Silicone Insulating Fluid and Its Maintenance in Transformers	Ladroga R. K. (617) 393-3133 rladroga@doble.com	1983 12/31/2014		Approved Reaffirmation approved by SB Mar 2009
C57.121	IEEE Guide for Acceptance and Maintenance of Less-Flammable Hydrocarbon Fluid in Transformers	McShane C. P. (262) 524-4591 cpmshane@cooperpower.com	1998 12/31/2009		Approved Was to be administratively withdrawn in Dec., 2004 Insulating Fluids Subcommittee decided on 10/17/2007 to withdraw this standard. However in 2008 Reaffirmation ballot in July; currently in Resolution
C57.146	Guide for Interpretation of Gasses Generated in Silicone-Immersed Transformers	Bartley W. H. (860) 722-5483 william_bartley@hsb.com	2005 12/31/2010		Approved D3a - approved by RevCom on 9/21/05. Published 3/10/2006
C57.147 PC57.147	Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers	McShane C. P. (262) 524-4591 cpmshane@cooperpower.com		12/10/2003 12/31/2007	Approved 1st Ballot closed - 98% approval rating. Approved by Early Consideration May 14, 2008 Published July 2008

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	INSULATING FLUIDS <i>McNelly S.J.</i>	(612) 330-6904 sjmcnelly@ieee.org			
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 12/31/2012	12/10/2008 12/31/2012	Approved - Reaffirmed - Active PAR for Revision Reaffirmation approved by SA Board 9/27/2007 PAR for revision approved Dec 10 2008 New PAR number assigned: PC57.637

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	INSULATION LIFE <i>Platts D. W.</i>	(610) 774-4686 donplatts@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	06/25/1998 12/31/2004	PAR Withdrawn Previously P1524 Modified PAR to expire in 2004 PAR administratively withdrawn in December, 2004
C57.100 PC57.100	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 12/31/2008	12/08/2004 12/31/2010	Approved - Active PAR for Revision Requested PAR for revision on 10/18/2004. PAR approved 12/8/2004 PAR Extension Request granted until Dec 2010
C57.119	IEEE Recommended Practice for Performing Temperature Rise Tests on Oil Immersed Power Transformers at Loads Beyond Nameplate Ratings	Tuli S. C. (262) 547-0123 x1428 subhash.tuli@waukeshaelectric.spx.com	2001 12/31/2013		Approved Previously IEEE 838. Published 3/12/2002. Reaff approved 03/28/08
C57.91 PC57.91	IEEE Guide for Loading Mineral-Oil-Immersed Transformers	Raymond T. (518) 884-0297 tc.raymond@ieee.org	1995 12/31/2009	05/02/2005 12/31/2009	Approved - Active PAR for revision Combined C57.91-1981, C57.92-1981 & C57.115-1991 Reaffirmation approved 6/23/2004 New PAR for revision approved 5/2/2005. Revision to include Corr. 1
C57.91-1995/Co	IEEE Guide for Loading Mineral-Oil-Immersed Transformers--Corrigendum 1	Pierce L. W. (706) 235-1805 piercelw@aol.com	2002 12/31/2007	12/31/2009	Approved - Active PAR for Revision In conjunction with C57.91 - reaffirmed in 6/2004. Currently under revision
IEEE 1276	IEEE Guide for the Application of High-Temperature Insulation Materials in Liquid-Immersed Power Transformers	Franchek M. A. (802) 751-3539 mfranchek@weidmann-systems.com	1997 12/31/2011		Approved Upgrade from trial use to full use on 3/30/2000 Reaffirmation approved by SA Board in 3/30/2006
IEEE 1538	IEEE Guide for Determination of Maximum Winding Temperature Rise in Liquid Filled Transformer	Platts D. W. (610) 774-4686 donplatts@ieee.org	2000 12/31/2010		Approved Original approval in 2000. Reaffirmed in 2005.
PC57.154 PC57.154	Std for the Design, Testing and App of Liquid-Immersed Transformers Using High-Temperature Insulation	Marek R. P. (804) 383-2376 Richard.P.Marek@usa.dupont.com		03/19/2009 12/31/2013	New Project - Active PAR Std under development PAR approved by NESCOM Mar 2009

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	PERFORMANCE CHARACTERISTICS <i>Antosz S.</i>	(412) 498-3916 santosz@ieee.org			
PC57.133	Guide for Short-Circuit Testing of Distribution and Power Transformers	Fortin M. 450-922-0925 fortin.marcel@ieee.org		03/04/2005 12/31/2009	Active PAR for revision of SC Test Guide New PAR for revision approved on 2/22/05. PAR Extension Request granted until Dec 2010
PC57.142	A Guide To Describe The Occurrence And Mitigation Of Switching Transients Induced By Transformer-Breaker Interaction	Ballard D. E. (828) 464-1093 donb@twave.net		05/07/2007 12/31/2011	New Project - Active PAR Std under development PAR extension granted 9/23/2004 - new expiration @2006 Balloted in 2005 -many negatives PAR extended to 2011 Balloted again Feb 2009; 91% approval; now in Ballot Resolution
PC57.149	Guide for the Application and Interpretation of Frequency Response Analysis for Oil Immersed Transformers	Sweetser C.L. (617) 393-2966 csweetser@doble.com		06/24/2004 12/31/2010	New Project - Active PAR PAR approved by NesCom 6/23/2004 PAR Extension Request Approved Sept 08 to 12/31/2010
C57.105	IEEE Guide for Application of Transformer Connections in Three-Phase Distribution Systems	Reitter G. J. (650) 508-2850 greitter@deltastar.com	1978 12/31/2013		Approved Was to be administratively withdrawn in Dec., 2004. Reaffirmation approved 03/28/08
C57.109	IEEE Guide for Liquid-Immersed Transformers Through-Fault-Current Duration	Patel B. K. (205) 987-8012 bkpatel8012@charter.net	1993 12/31/2013		Approved Reaffirmation ballot invitation opened Oct 2005. Extension approved to 12/31/2007 Reaff Recirc ballot closed 2/23/08. Reaff approved 03/28/08
C57.110 PC57.110	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 12/31/2013	11/18/2004 12/31/2008	Approved Revision approved 03/28/08 Revision published 8/15/08
C57.123 PC57.123	IEEE Guide for Transformer Loss Measurement	TeNyenhuis E.G. (519) 837-4691 ed.g.tenyenhuis@ca.abb.com	2002 12/31/2011	02/20/2007 12/31/2011	Approved - Active New PAR for revision Ref Std. IEEE 1098 Revision ballot pool formed. Ballot closed Dec 2008 Delay due to Dual Logo process
C57.18.10	IEEE Standard Practices and Requirements for Semiconductor Power Rectifier Transformers	Kennedy S. P. (716) 896-6500 skennedy@niagaratransformer.com	1998 12/31/2014		Approved Replaced C57.18-1964 pool cathode mercury-arc rectifiers. New PAR for Amendment approved 2/22/05 Amendment approved March 28/08 Reaffirmation Ballot approved by SB Jan 2009

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	PERFORMANCE CHARACTERISTICS <i>Antosz S.</i>	(412) 498-3916 santosz@ieee.org			
C57.21	IEEE Standard Requirements, Terminology, and Test Code for Shunt Reactors Rated Over 500 kVA	Dudley R. F. (416) 298-8108 richardd@ca.trenchgroup.com	2008 12/31/2013		Approved Reaffirmation approved on 6/23/2004. Balloted in 2007 Recirc ballot closed 1/6/2008 Approved by SB 03/21/08 Published 8/1/2008
IEEE 32 PC57.32	IEEE Standard Requirements, Terminology, and Testing Procedures for Neutral Grounding Devices	Schappell S. M. (919) 580-3240 schappell@ieee.org	1972 12/31/2009	12/11/2002 12/31/2009	Approved - Active PAR for revision Dec. 2002 - Sponsor changed from PES/SPD to PES/TR PAR to revise PC57.32 approved 2002 to expire on 12/31/2006. PAR - expiration date extended to 12/31/2009

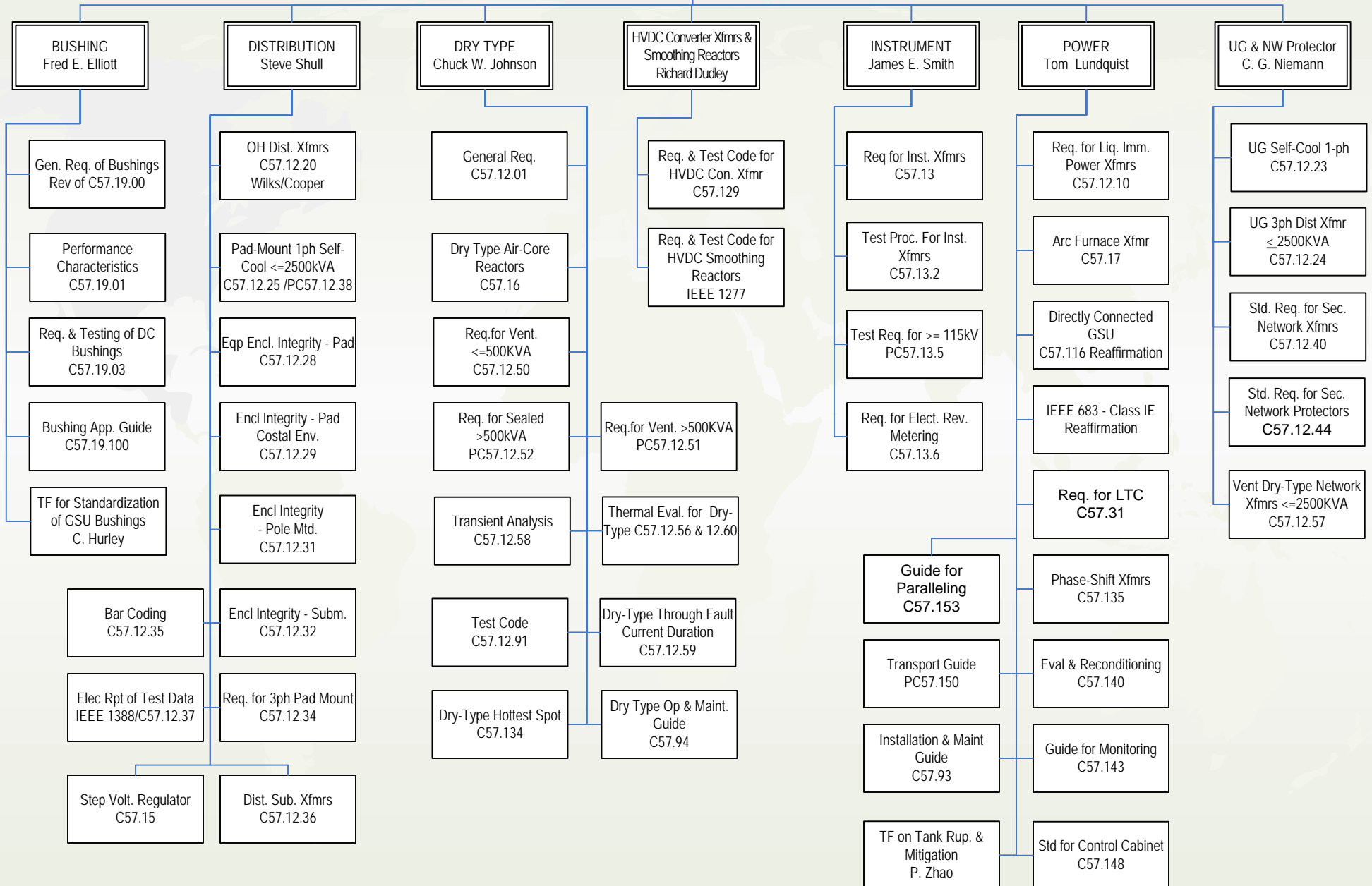
STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	POWER TRANSFORMERS <i>Lundquist T.</i>	(602) 236-8617 tom.lundquist@ieee.org			
PC57.12.10	Standard Requirements for Liquid-Immersed Power Transformers	Hoffman G. (973) 621-6600 grhoffman@advpowertech.com	1997	06/13/2002 12/31/2010	New Project - Std under development Formerly NEMA/ANSI document. PAR modification approved 9/11/09 + extension granted to Dec 2010
PC57.143	Guide for Application for Monitoring Equipment to Liquid-Immersed Transformers and Components	Chu D. (212) 460-3456 chud@coned.com		03/21/2002 12/31/2010	New Project - Active PAR Std under developemnt PAR extension requested approved on 12/5/2006. Ballot pool opened Mar 3; closes April 2 '09
PC57.148	Standard for Control Cabinets for Power Transformers	Watson J.D. (561) 691-2206 joe_watson@ieee.org		02/27/2004 12/31/2010	New Project - Active PAR Std under development PAR Extension Request granted in Sept 08, until 12/31/2010
PC57.150	Guide for the Transportation of Large Power Transformers and Reactors	Anderson G. W. (402) 680-1111 gwanderson@ieee.org		11/18/2004 12/31/2010	New Project - PAR approved in Nov. 2004 PAR approved by NesCom in 11/18/2004 PAR Extension Request Approved Dec 08 to 12/31/2010
PC57.153	Transformer Paralleling Guide	Jauch E.T. (727) 866-0632 jauch@ieee.org		03/27/2008 12/31/2012	New Project - Active PAR PAR approved 3/27/08
PC57.17	Standard Requirements for Arc Furnace Transformers	Corsi D. (330) 875-3333 dom.corsi@sdmyers.com		03/22/2007 12/31/2011	NEW PAR for revision PAR for revision of old ANSI Std approved Mar 22/08.
C57.116	IEEE Guide for Transformers Directly Connected to Generators	Raymond T. (518) 884-0297 tc.raymond@ieee.org	1989	12/31/2010	Approved Reaffirmation approved in Dec. 2005
C57.117	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	12/31/2006	Approved Previously IEEE 786-1986, original approval date 6/19/1986 Reaffirmation ballot pool formed. Need WG Chair
C57.120	IEEE Loss Evaluation Guide for Power Transformers and Reactors	Lau M. Y. (604) 528-3201 mike.lau@bchydro.bc.ca	1991	12/31/2011	Approved Ref Std. 842 Reaffirmation approved by RevCom 6/8/2006.

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	POWER TRANSFORMERS <i>Lundquist T.</i>	(602) 236-8617 tom.lundquist@ieee.org			
C57.125	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 12/31/2010		Approved Std reaffirmed 5/10/2005
C57.131 PC57.131	IEEE Standard Requirements for Load Tap Changers	Henning W. R. (262) 547-0121 whenning@ieee.org	1995 12/31/2007	05/15/2003 12/31/2009	Approved - Active PAR for Revision PAR to Revise IEEE Std C57.131-1995 PAR extension approved in 2007 until 12/31/2009
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 12/31/2011	02/20/2007 12/31/2011	Approved - Active PAR for Revision Approved for IEEE/IEC Dual Logo Dec. 2005 - IEC 62032 Ed. 1
C57.140	Evaluation and Reconditioning of Liquid Immersed Power Transformers	James R.I. (504) 576-6246 r.james@ieee.org	2006 12/31/2010		Approved Approved by RevCom 11/16/2006
C57.93 PC57.93	IEEE Guide for Installation of Liquid-Immersed Power Transformers	Lau M. Y. (604) 528-3201 mike.lau@bchydro.bc.ca	2008 12/31/2013		Approved Rev of ASA C57.93-1958, IEEE Std C57.12.11-1980, & C57.12.12-1980 Previous version IEEE Std C57.93-1995, reaffirmed in 2001. RevCom approved on 12/4/07 - published 3/31/08
IEEE 638 P638	IEEE Standard for Qualification of Class 1E Transformers for Nuclear Power Generating Stations	Swinderman C. (724) 778-5234 craig.swinderman@meppi.me.com	1992 12/31/2011	06/07/2007 12/31/2011	Approved - Active - with errata dated 4/7/1999 Reaffirmation approved by SA Board 3/30/2006. New PAR for revision approved 6/7/2007.

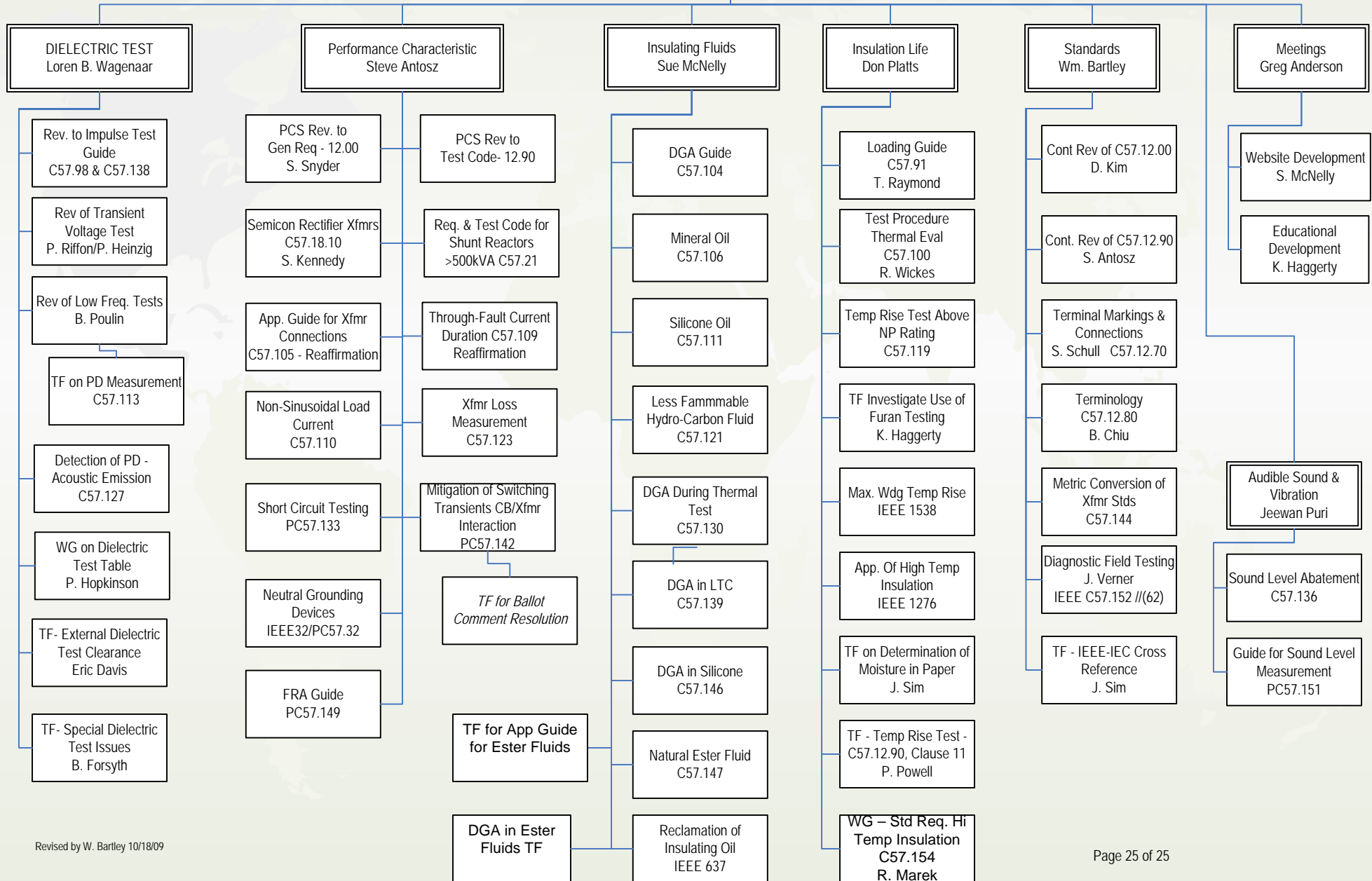
STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	STANDARDS <i>Bartley W. H.</i>	(860) 722-5483 william_bartley@hsb.com			
C57.12.00 PC57.12.00	IEEE Standard General Requirements For Liquid-Immersed Distribution, Power, and Regulating Transformers	Kim D. (626) 302-8049 dong.kim@sce.com	2006 12/31/2011	06/07/2007 12/31/2011	Approved - New PAR Active Previous revision approved September, 2006. Published 2/28/2007. New PAR approved on 6/7/2007 for 2008 revision; Ballot opened Sept 30, '08 closed Oct 30 '08 Currently in Resolution
C57.12.70 PC57.12.70	IEEE Standard Terminal Markings and Connections for Distribution and Power Transformers	Shull S. (417) 625-6110 sshull@empiredistrict.com	2000 12/31/2011	05/07/2007 12/31/2011	Approved - Active PAR for Revision Reaffirmation approved by RevCom 3/30/2006. Published 3/16/2001. New PAR for revision approved by SA Board 5/7/2007
C57.12.80 PC57.12.80	IEEE Standard Terminology for Power and Distribution Transformers	Chiu B. 626-302-7313 bill.chiu@sce.com	2002 12/31/2007	06/12/2008 12/31/2012	Approved - Active PAR Amendment PAR approved 2005 PAR for Amendment withdrawn June 2008 PAR for Revision approved June 2008 until December 2012 Ballot closes April 4th 2009
C57.12.90 PC57.12.90	IEEE Standard Test Code for Liquid-Immersed Distribution, Power, and Regulating Transformers	Antosz S. (412) 498-3916 santosz@ieee.org	2006 12/31/2011	05/07/2007 12/31/2011	Approved - New PAR active for next revision Previous revision approved 9/15/2006 /Published 2/15/2007 New PAR active for 2008 revision; Ballot closed Oct 30 08 Resolution achieved and Recirc Ballot closed Mar 27 09
C57.144	Guide for Metric Conversion of Transformer Standards	Olson T. (204) 474-4080 tolson@hydro.mb.ca	2004 12/31/2009		Approved Published 10/22/2004
IEEE 62 PC57.152	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 12/31/2010	05/19/2008 12/31/2012	Approved Reaffirmation was approved on 3/19/05. New WG formed to revise document on a continuous basis New PAR number assigned: PC57.152 PAR approved 5/19/08

STANDARD PROJECT	TITLE	Working Group Chair Phone Email	Pub Year Rev Due Date	PAR Issue Date PAR Expiration	Standard Status Remark
SubCommittee Chair	UNDERGROUND TR & NW PROTECT <i>Niemann C. G.</i>	(847) 683-2145 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. (859) 879-2912 alant@kuhlman.com	2002 12/31/2014		Approved - Approved by SB March 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 12/31/2014		Approved - Active Existing standard withdrawn by IEEE on 1/15/2001. New std Approved 6/17/09
C57.12.40 PC57.12.40	Standard for Requirements for Secondary Network Transformers - Subway and Vault Types (Liquid Immersed)	Klaponksi B. (204) 633-7220 brian.klaponksi@carte.ca	2006 12/31/2011	03/27/2007 12/31/2011	Approved - New PAR for Revision Active D4 approved by RevCom 3/30/3006. Standard Published 9/15/2006. New PAR approved 3/27/2007
C57.12.44 PC57.12.44	IEEE Standard Requirements for Secondary Network Protectors	Mulkey D. H. (415) 973-4699 DHM3@PGE.COM	2005 12/31/2010		Approved PC57.12.44/D2.1 approved by RevCom in December 2005. Published 6/07/2006 Previous revision in 2000.
C57.12.57 NONE	Requirements for Ventilated Dry-Type Network Transformers 2500 kVA and Below, Three-Phase with High Voltage 34 500 Volts 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. New working group formed to address revision. Need new PAR.

IEEE/PES Transformers Committee - Activity Organization Chart
 Chair: Tom Prevost
 Vice Chair: J. Ed Smith Secretary: Bill Chiu Std. Coordinator: Bill Bartley



IEEE/PES Transformers Committee - Activity Organization Chart
Chair: Tom Prevost
Vice Chair: J. Ed Smith Secretary: Bill Chiu Std. Coordinator: Bill Bartley



Revised by W. Bartley 10/18/09