IEEE/PES Transformers Committee

Spring 2010
Meeting Minutes

Unapproved

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Appendix C Standards Report

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IEEE/PES Transformers Committee Meeting
Main Committee Meeting
Thursday, March 11, 2010

Attendance Roster

Amos, Richard; CM [Unifin International]
Anderson, Gregory; CM [GWAnderson & Associates, Inc.]
Ansari, Tauhid; II [ABB Inc.]
Antosz, Stephen; CM [Pennsylvania Transformer]
Antweiler, James; AP [Square D/Schneider Electric]
Armstrong, James; AP [Siemens Energy, Inc.]
Arrascaeta, Pablo; II [Tubos Trans Electric S.A.]
Asano, Roberto; AP [ABB]
Ayers, Donald; CM [Pacific Crest Transformers]
Ballard, Robert; AP [ABB Inc.]
Bartley, William; CM [Hartford Steam Boiler]
Beaster, Barry; CM [Delta Star Inc.]
Beauchemin, Claude; CM [GE Canada]
Betancourt, Enrique; CM [Prolec GE]
Binder, Wallace; CM [WBBinder Consultant]
Blackburn, Gene; CM [Gene Blackburn Engineering]
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]
Brafa, John; AP [ABB Alamo]
Britton, Jeffrey; AP [Phenix Technologies, Inc.]
Brown, Darren; II [Howard Industries, Inc.]
Bush, Carl; CM [Pemco Corporation]
Callsen, Thomas; CM [ComEd]
Castellanos, Juan; CM [Prolec GE]
Cayachoa, Carlos; II [Siemens S.A.]
Cherry, Donald; CM [ABB Inc.]
Chhajer, Dinesh; II [Megger]
Chiu, Bill; CM [Southern California Edison]
Chun, Jung-Sik; II [SK Lubricants]
Claiborne, C. Clair; CM [ABB Inc.]
Coffeen, Larry; AP [NEETRAC]
Cooke, Henry; AP [ABB Inc.]
Corkran, Jerry; CM - LM [Cooper Power Systems]
Craven, Michael; AP [Southern Company Services]
Crouse, John; CM - LM [GE]
Darovny, William; CM [Siemens Canada]
Darwin, Alan; CM [AREVA T&D]
Davydov, Valery; AP [Monash University]
Del Rio, J. Arturo; AP [Trench Limited]
Dix, Larry; CM [Quality Switch Inc.]
Dorpmanns, Luc; II [SMIT Transformatoren B.V.]
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.]
Foldi, Joseph; CM - LM [Foldi & Associates, Inc.]
Foley, Jefferson; AP [OMICRON electronics Corp USA]
Forsyth, Bruce; CM [Southwest Electric Company]
Foster, Derek; CM [Magnetics Design, LLC]
Foster, Robert; II [Megger]
Franchek, Michael; CM [Weidmann Electrical Technology]
Gamboa, Jose; AP [Siemens Manufacturing S.A.]
Garcia, Eduardo; CM [Siemens]
Garza, Joseph; AP [Southwest Electric Company]
Ghosh, Prodipto; II [Electrical Safety Program Solutions]
Ghosh, Saurabh; AP [ABB Inc.]
Girgis, Ramsis; CM [ABB Inc.]
Golner, Thomas; II [Waukesha Electric Systems]
Graham, James; CM [Pike Energy Solutions]
Graham, John; CM [Trench UK Limited]
Graham, Richard; CM [Delta Star Inc.]
Haas, Michael; CM [Instrument Transformers, Inc.]
Hammers, Jack; CM [Oklahoma Gas & Electric]
Hammonds, Bret; II [Megger]
Harley, John; CM [FirstPower Group LLC]
Harris, David; AP LM [Waueksha Electric Systems]
Hayes, Roger; CM [Siemens Canada]
Heagerty, David; II [Megger]
Heathcote, Martin; AP [Martin Heathcote Associates Ltd]
Heinzig, Peter; CM [Weidmann Electrical Technology AG]
Henning, William; CM [Waukesha Electric Systems]
Hensley, Mikel; II [Megger]
Hochanh, Thang; CM [Hydro-Quebec IREQ]
Hoffman, Gary; CM [Advanced Power Technologies]
Holdway, Timothy; AP [Intermountain Electronics]
Holifield, Thomas; CM [Howard Industries]
Hopkinson, Philip; CM [HVOLT Inc.]
Hurley, Catherine; AP [American Electric Power]
Iman, Mike; CM [MGM Tansformer Company]
Izquierdo, Jose; II [Siemens]
James, Jr., Rowland; CM [Advanced Power Technologies]
Jarman, Paul; AP [National Grid]
Johnson, Charles; CM [ABB Inc.]
Johnson, Wayne; AP [EPRI]
Jordan, Stephen; CM [TVA]
Kadar, Laszlo; AP [Hatch]
Kalra, C J; AP LM [Southern California Edison]
Kang, Jinho; AP [Hyundai Heavy Industries]
Kennedy, Gael; CM [Nebraska Public Power District]
Kennedy, Sheldon; CM [Niagara Transformer]
Khalin, Vladimir; CM [ABB Inc.]
Klaponski, Brian; CM [Carte International Inc.]
Kraemer, Axel; AP [Maschinenfabrik Reinhausen]
Kraetge, Alexander; AP [OMICRON]
Lee, Dennis; AP [Seattle City Light]
Lemke, Eberhard; AP [Doble Lemke GmbH]

Levin, Aleksandr; II [Weidmann Electrical Technology Inc.]
Lopez, Benjamin; II [Prolec GE]
Lopez-Fernandez, Xose; AP [Universidade de Vigo]
Lundquist, Thomas; CM [Lundquist Consulting Services, Inc.]
Luo, Shawn; AP [Seattle City Light]
Machado Junior, Tamyres; AP [Siemens Ltda]
Mangum, Willie; II [Niagara Transformer]
Marek, Richard; CM [DuPont]
Marlow, Dennis; CM [TBEA Shenyang]
Matthews, John; CM [Baltimore Gas & Electric]
Matthews, Lee; CM [Howard Industries]
McBride, James; AP [JMX Services, Inc.]
McNally, Mark; AP [KCP&L]
McNelly, Susan; CM [Xcel Energy]
McShane, Charles Patrick; CM [Cooper Power Systems]
McTaggart, Ross; CM [Trench Limited]
Miller, Kent; CM - LM [T&R Electric Supply Co., Inc.]
Millward, Paul; CM [ITEC]
Moleski, Hali; AP [S.D. Myers Inc.]
Morse, Brad; II [Matzinger Keegan, Inc]
Mulkey, Daniel; CM [Pacific Gas & Electric]
Murphy, Jerry; CM [Reedy Creek Energy Services]
Mushill, Paul; AP [Ameren]
Navarro, Martin; AP [Siemens Ltda]
Niemann, Carl; CM - LM [Niemann Consulting]
Olafsson, Gylfi; AP [Waukesha Electric Systems]
Olen, Robert; CM [Cooper Power Systems]
Oommen, T.V.; AP LM [ABB Inc.]
Penny, Brian; II [American Transmission Company]
Pepe, Harry; II [Phenix Technologies, Inc.]
Perlichek, Robert; AP [Public Service Co. of New Mexico]
Peterson, Alan; AP [Utility Service Corporation]
Platts, Donald; CM [PPL Electric Utilities]
Ploetner, Christoph; CM [ABB Inc.]
Pointner, Klaus; AP [Trench Austria GmbH]
Progar, John; CM [Southwest Electric Company]
Puri, Jeewan; CM [Transformer Solutions, Inc.]
Rasmussen, Kelly; II [South Texas Project]
Rasor, Robert; AP [S.D. Myers Inc]
Rega, Margaret; AP [Roechling Machined Plastics]
Reiss IV, Clemens; AP [Custom Materials, Inc.]
Robalino, Diego; II [Megger]
Roizman, Oleg; AP [IntellPower Pty Ltd]
Roman, Zoltan; II [Areva T&D]
Roussell, Marnie; CM [Entergy]
Sandhu, Surinder; AP [Sanergy Consulting]
Sankarakurup, Dinesh; AP [Niagara Transformer Corp.]
Sarkar, Subhas; AP [Virginia Transformer Corp]
Sauzay, Mathieu; AP [JST Transformateurs SA]
Scarborough, Mark; AP [DuPont]
Schroeder, Stephen; II [ABB Inc.]
Schweiger, Ewald; CM [Siemens AG]
Sestito, John; AP [Hyundai Heavy Industries]
Sewell, Jeremy; II [Quality Switch Inc.]
Sharma, Devki; CM [Consultant / Entergy]
Sharp, Michael; AP [Trench Limited]
Sheehan, David; II [HICO America]
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, Jill; II [Bureau of Reclamation]
Snyder, Steven; CM [ERMCO]
Som, Sanjib; AP [Virginia Transformer Corp]
Spitzer, Thomas; CM [City Transformer Service Co.]
Spurlock, Michael; AP [American Electric Power]
Stahara, Ronald; CM - LM [Central Moloney, Inc.]
Stankes, David; AP [3M IPT]
Steineman, Andrew; AP [Delta Star Inc.]
Stiegemeier, Craig; CM [ABB Inc. TRES North America]
Sundin, David; II [SVB Industrial Chemicals]
Swan, Phil; II [ABB Inc.]
Swinderman, Craig; CM [Mitsubishi Electric Power Products]
teNyenhuis, Ed; CM [ABB Inc.]
Termini, Giuseppe; CM [PECO Energy]
Thompson, Jim; CM [T&R Service Company]
Thompson, Ryan; II [Burns & McDonnell]
Tolcachir, Eduardo; II [Tubos Trans Electric S.A.]
Tostrud, Mark; II [Dynamic Ratings, Inc.]
Trautmann, Frank; II [Siemens AG]
Tuli, Subhash; CM [Electrical Transmsn & Dist Apparatus Consultant Inc.]
Verdolin, Roger; CM [Enmax Power Services Corporation]
Verner, Jane Ann; CM [Pepco Holdings Inc]
Vogel, Herman; AP [GE Energy]
Wallach, David; CM [Duke Energy]
Watson, Joe; CM [HICO America]
Werelius, Peter; AP [Megger]
Wicks, Roger; CM [DuPont]
Wilks, Alan; CM [Consultant]
Williams, Charles; II [Megger]
Williams, Michael; AP [ABB Inc.]
Wimmer, William; CM [Dominion]
Yule, Kipp; CM [Bechtel Power Corp]
Zhao, Peter; CM [Hydro One]

Membership codes	Code
Active Participant	AP
Active Participant - IEEE Life Member	AP LM
Committee Member	CM
Committee Member - Emeritus Member	CM - E
Committee Member - IEEE Life Member	CM - LM
Interested Individual	II

IEEE/PES Transformers Committee Meeting
Spring 2010

Committee Members and Guests Registered for the Spring, 2010 Meeting

Abbas, Ahmad: II
Afonso, Nuno: II
Ahuja, Raj: AP
Albert, Glenn: II
Allaway, Dave: II
Allen, Jerry: AP
Alton, Henry: II
Alvarez, Jose: II
Amos, Richard: CM
Anderson, Gregory: CM
Anderson, Jeffrey: II
Ansari, Tauhid: II
Antosz, Stephen: CM
Antweiler, James: AP
Armstrong, James: AP
Armstrong, Cynthia: SP
Aromin, Venzon: AP
Arrascaeta, Pablo: II
Asano, Roberto: AP
Ayers, Donald: CM
Bae, Yongbae: II
Ballard, Jay: AP
Ballard, Janet: SP
Ballard, Robert: AP
Balma, Peter: CM
Baranowski, Derek: AP
Baranowski, Diana: SP
Barrett, Paul: II
Bartek, Allan: AP
Bartley, William: CM
Bartley, Dorothy: SP
Bartnikas, Ray: AP LM
Basore, Jerry: II
Basu, Bikash: AP
Baumgartner, Christopher: II
Beaster, Barry: CM
Beaster, Barb: SP
Beauchemin, Claude: AP
Beckwith, Thomas: AP
Beckwith, Maria Liddora: SP
Bell, Clarence: II
Berler, Zalya: AP
Bulgakova, Valentina: SP
Berthereau, Frederique: II
Betancourt, Enrique: AP
betancourt, enrique: II
Bhatt, Vivek: II
Binder, Wallace: CM
Blackburn, Gene: CM
Blackburn, Martha: SP
Blackmon, Jr., James: AP
Blackmon, Donna: SP
Blaydon, Daniel: AP
Rowe, Adrienne: SP
Boettger, William: CM
Bolduc, Leonard: II
Bolliger, Alain: AP
Boman, Paul: CM
Botti, Michael: II
Brady, Ryan: II
Brady, Ryan: II
Brafa, John: II
Britton, Jeffrey: AP
Brown, Darren: II
Brush, Edwin: AP
Buchanan, Paul: CM
Buchanan, Ela: SP
Buckmaster, David: II
Bush, Carl: CM
Bush, Shirleyann: SP
Cai, Jim: AP
Callsen, Thomas: CM
Cancino, Alvaro: AP
Carlos, Arnaldo: AP
Carlson, Todd: II
Carvalho, Carlos: II
Castellanos, Juan: CM
Cayachoa, Carlos: II
Cherry, Donald: CM
Chhajer, Dinesh: II
Chiodo, Vincent: II
Chisholm, Paul: AP
Chiu, Bill: CM
Lu, Minnie: SP
Chmiel, Frank: AP
Cho, Kevin: II
Choi, Shaun: II
Choinski, Scott: AP
Chun, Jung-Sik: II
Claiborne, C. Clair: AP
Coffeen, Larry: AP
Collins, Jerry: II
Cooke, Henry: AP
Cooper, Jeffrey: II
Corkran, Jerry: II
Corkran, Patricia: SP
Costa, Florian: AP
Craig, Douglas: II
Craven, Michael: AP
Craven, Susan: SP
Crego, Bert: II
Crotty, John: CM
Crouse, John: CM - LM
Cultrera, Joseph: II
Cultrera, Joseph: II
Cunningham, Kelcie: II
Cyr, Marc: II
Damico, Frank: CM
Daniels, Timothy: AP
Darovny, William: CM
Darwin, Alan: CM
Darwin, Sue: SP
Dave, Nikita: II
Davis, Eric: CM
Davis, Larry: CM
Davydov, Valery: AP
deFay, Richard: II
Degeneff, Robert: CM
Del Rio, J. Arturo: AP
Denton, Gary: II
Derner, Pete: II
Derner, Sara: SP
Diaby, Mohamed: II
Digby, Scott: II
Dix, Larry: CM
Dorpmanns, Luc: II
Dorris, Don: AP
Drees, Terry: II
Drexler, Charles: AP
Duckett, Don: CM - LM
Dudley, Richard: CM
Dukarm, James: AP
Dunn, James: II
Duval, Michel: AP
Ebbert, Alexander: II
Edwards, Ruben: II
Egres, Taihi: II
Elliot, Fred: II
Elliott, Fred: CM
Ellis, Keith: CM
Fairris, James: AP
Faulkenberry, Michael: AP
Faulkner, Mark: II
Faulkner, Ginger: SP
Fausch, Reto: AP
Feghali, Pierre: CM
Fernandes, Tania: II
Field, Norman: AP
Filer, Douglas: AP
Foata, Marc: II

Foldi, Joseph: CM - LM
Foldi, Rose: SP
Foley, Jefferson: AP
Forsyth, Bruce: CM
Fortin, Marcel: CM
Foster, Derek: CM
Foster, Robert: II
Franchek, Michael: CM
Frimpong, George: AP
Gagnon, Jean-Philippe: II
Gamboa, Jose: AP
Garcia, Benjamin: II
Garcia, Eduardo: CM
Gardner, James: CM
Garifalos, Stephen: II
Garner, Charles: AP
Garner, Linda: SP
Garza, Joseph: AP
Gaytan, Carlos: CM
Ghafourian, Ali: CM
Ghosh, Saurabh: AP
Ghosh, Chandana: SP
Girgis, Ramsis: CM
Golner, Thomas: II
Gomez, Lucio: II
Gonzalez de la Vega, Jorge: AP
Goodwin, David: AP
Goolgasian, Jeffrey: II
Graham, James: CM
Kuecker, Susan: SP
Graham, John: CM
Graham, Richard: CM
Griesacker, Bill: CM
Gromlovits, Mark: CM
Gruber, Myron: CM
Gruber, Carol: SP
Guerra, Jorge: AP
Haas, Michael: CM
Haasz, Jodi: II
Hachichi, Said: CM
Hakim, Shamaun: II
Hammer, Mark: II
Hammers, Jack: CM
Hammonds, Bret: II
Handley, Jason: II
Hanson, David: AP
Hardin, Michael: CM
Harley, John: CM
Ernest, Judy: SP
Harris, David: AP
Hayes, Roger: CM
Hayes, Linda: SP
Heagerty, David: II
Heathcote, Martin: AP
Heathcote, Penny: SP
Heinzig, Peter: CM
Heinzig, Barbel: SP
Henault, Paul: II
Henning, William: CM
Hensley, Mikel: II
Herrera, Miguel: II
Herron, John: AP
Herz, Josh: AP
Fried, Ruth: SP
Hochanh, Thang: CM
Hochanh, Tuyet Le: SP
Hoffman, Gary: CM
Holdway, Timothy: II
Holifield, Thomas: CM
Holsomback, Steve: AP
Hopkinson, Philip: CM
Hopkinson, Jane: SP
Houston, Bobby: II
Hurley, Catherine: AP
Iman, Mike: CM
Inkpen, Jesse: II
Ionescu, Bogdan: II
Izquierdo, Jose: II
Jacquenet, Nicolas: II
Jakob, Fredi: AP
Jakob, Karl: AP
James, Jr., Rowland: CM
Jarman, Paul: AP
Jaroszewski, Marion: AP
Jaroszewski, Stasia: SP
Jauch, Erwin: AP LM
Jauch, Beverly: SP
Jimenez, Kevin: II
Johannson, Larry: AP
Johannson, Jocelyn: SP
Lorteau, Christine: GT
Johnson, Charles: CM
Johnson, Wayne: AP
Jones, Jerry: II
Jordan, Stephen: CM
Kadar, Laszlo: AP
Kalra, C J: AP LM
Kalra, Rama: SP
Kang, Jinho: II
Kaspareit, Klaus: II
Kavanagh, Glenn: II
Kazmierczak, Jerzy: II
Kennedy, Gael: CM
Kennedy, Karen: SP
Kennedy, George: II
Kennedy, Sheldon: CM
Khalin, Vladimir: CM
Khalin, Mila: SP
Kim, Chloe: II
King, Gary: AP
Kiparizoski, Zan: II
Klaponski, Brian: CM
Klaponski, Lois: SP
Ko, Jae Cheol: II
Kobida, Dan: AP
Kraemer, Axel: AP
Kraetge, Alexander: AP
Kriska, Jeremy: AP
Krump, Reiner: AP
Kuebler, Bernd: II
Kurth, Bernhard: AP
Kwon, Wan Seop: II
Kyle, Randall: AP
Kyle, Brenda: SP
Ladroga, Richard: CM
Lambert, Doug: II
Landis, Ben: II
Lapinskas, Walter: II
Lau, Michael: CM
Lawrence, Matthew: II
Lawson, Matthew: II
Lee, Elisabeth: II
Lee, Jun Gu: II
Lee, Terence: AP
Leinhauser, George: II
Lejay, Olivier: II
Lemke, Eberhard: AP
Levin, Aleksandr: II
Lim, Ki Man: II
Locarno, Mario: II
Lopes, Ana: II
Lopez, Benjamin: II
Lopez-Fernandez, Xose: AP
Gonzalez, Maria Belen: SP
Lundquist, Thomas: CM
Luo, Shawn: AP
Machado Junior, Tamyres: AP
Macias, Alejandro: II
Maia, Mario: II
Makowski, Leo: II

Mamtora, Jitendra: AP
Mangum, Willie: II
Mao, Libin: II
Marek, Richard: CM
Marek, Halina: SP
Marlow, Dennis: CM
Martin, Gary: II
Martin, Terence: AP
Martinez, Rogelio: AP
Mathews, Kevin: II
Matthews, John: CM
Matthews, Marian: SP
Matthews, Lee: CM
Mayer, Robert: AP
Mbouombouo, Mama: II
McBride, James: AP
McCloskey, Scott: II
McIver, James: AP
McNally, Mark: II
McNelly, Susan: CM
McShane, Charles Patrick: CM
McTaggart, Ross: CM
Mehrotra, Vinay: CM
Melanson, Joseph: CM
Miller, Kent: CM - LM
Millward, Paul: CM
Millward, Aileen: SP
Molden, Arthur: CM
Moleski, Hali: AP
Moleski, Hali: II
Moore, Steven: II
Morris, Tim: AP
Morris, Sherry: SP
Morse, Brad: II
Mulkey, Daniel: CM
Mullikin, Randolph: II
Murphy, Jerry: CM
Mushill, Paul: AP
Nambi, Shankar: II
Navarro, Martin: AP
Neal, Jason: AP
Nguyen, Vuong: AP
Niemann, Carl: CM - LM
Nikoley, Ingo: AP
Nims, Joe: AP
Nordman, Hasse: AP
Nordman, Marianne: SP
Nugent, William: II
Nunes, Jr, Jayme: II
Nunez, Arturo: II
Nunn, Shawn: II
Ogajanov, Rudolf: AP
Olafsson, Gylfi: AP
Einisdottir, Inga: SP
Olen, Robert: CM
Olen, Gail: SP
Oliver, Bill: II
Oommen, T.V.: AP LM
Oommen, Anna: SP
Ortiz, Jow: II
Padilla, Axayacatl: II
Padron, Alfredo: II
Paik, Henry: AP
Paladini, Leandro: II
Panetta, Sergio: AP
Park, Kyung Yoon: II
Parkinson, Dwight: AP
Patel, Dhiru: AP
Patel, Daksha: SP
Patel, Poorvi: II
Patel, Sanjay: AP
Patel, Rajal: SP
Patni, Prem: AP
Patton, Jesse: CM - LM
Penny, Brian: II
Pepe, Harry: II
Perigaud, Guillaume: II
Perlichek, Robert: II
Peterson, Alan: AP
Pezzin, Justin: II
Pink, Tony: CM
Pitts, Chris: II
Platts, Donald: CM
Ploetner, Christoph: CM
Pointner, Klaus: II
Pointner, Karin: SP
Poulin, Bertrand: CM
Powell, Paulette: CM
Powers, Nicholas: II
Powers, Richard: AP
Prevost, Thomas: CM
Progar, John: CM
Puri, Jeewan: CM
Puri, Rani: SP
Radbrandt, Ulf: CM
Rajadhyaksha, Mangesh: II
Rasmussen, Kelly: II
Rasor, Robert: AP
Rawls, Earl: II
Ray, Jeffrey: AP
Razuvayev, Sergiy: II
Razuvayeva, Galyna: SP
Recksiedler, Leslie: AP
Reeves, Jerry: II
Rega, Margaret: AP
Reiss IV, Clemens: AP
Reitter, George: CM
Rensi, Randolph: AP
Restaino, Mario: AP
Rezai, Hossein: II
Roach, John: II
Robalino, Diego: II
Roberts, Mark: II
Roizman, Oleg: AP
Roman, Zoltan: II
Romano, Kenneth: CM
Roussell, Mamie: CM
Runewicz, John: AP
Sahin, Hakan: II
Sandhu, Surinder: AP
Sankarakurup, Dinesh: AP
Sargent, Brett: AP
Sarkar, Subhas: AP
Sauer, Daniel: II
Sauzay, Mathieu: II
Scarborough, Mark: AP
Schappell, Steven: CM
Schenk, Mario: II
Schroeder, Stephen: II
Schweiger, Ewald: CM
Schweiger, Annette: SP
Sewell, Jeremy: II
Sharma, Devki: CM
Sharp, Michael: AP
Sheehan, David: II
Shertukde, Hemchandra: CM
Shertukde, Rekha: SP
Shi, Lin: II
Shor, Andre: II
Shor, Miriam: SP
Shull, Stephen: CM
Shull, Cheryll: SP
Siebert, Stefan: AP
Sim, H. Jin: CM
Sim, Julie: SP
Simmons, Charles: II
Simmons, Donna: SP
Simmons, Mitch: GT
Sizemore, Thomas: II
Smith, Edward: CM

Smith, Jill: II
Snyder, Steven: CM
Snyder, Darlene: SP
Som, Sanjib: AP
Sordo, Salvador: II
Speegle, Andy: AP
Spitzer, Thomas: CM
Spurlock, Michael: AP
Stahara, Ronald: CM - LM
Stahara, Mary Ann: SP
Stank, Markus: II
Stankes, David: II
Stankowski, Krzysztof: II
Steineman, Andrew: AP
Stem, Gregory: AP
Stiegemeier, Craig: CM
Stiegemeier, Barbara: SP
Sullivan, Christopher: AP
Sundin, David: II
Sundkvist, Kjell: II
Swan, Phil: II
Sweetser, Charles: AP
Swinderman, Craig: CM
Swinderman, Cheryl: SP
Tanaka, Troy: II
Tarlapally, Susmitha: II
Tellez, Richard: AP
teNyenhuis, Ed: CM
Termini, Giuseppe: CM
Termini, Gina: SP
Thompson, Jim: CM
Thompson, Ryan: II
Tolcachir, Eduardo: II
Tong, Lin: AP
Tostrud, Mark: II
Traut, Alan: CM
Trautmann, Frank: II
Trivitt, Donnie: AP
Trujillo, Antonio: II
Tuli, Subhash: CM
Turvey, Terry: II
Vailoor, Vasanth: II
van den Berg, Peter: II
Varghese, Ajith: II
Vedante, Kiran: AP
Veens, Jos: II
Verdolin, Roger: CM
Verner, Jane Ann: CM
Viereck, Karsten: AP
Vijayan, Krishnamurthy: II
Vogel, Herman: AP
vonGemmingen, Richard: AP
Wagenaar, Loren: CM - LM
Wallach, David: CM
Ward, Barry: CM
Watson, Joe: CM
Weatherbee, Eric: AP
Weathington, Larry: II
Weathington, Barbara: SP
Websper, Richard: AP
Weers, Delbert: II
Werelius, Peter: AP
Wicks, Roger: CM
Wilks, Alan: CM
Wilks, Terrie: SP
Williams, Charles: II
Williams, Michael: AP
Williams, Randy: AP
Wilson, John: II
Wimmer, Jeffrey: II
Wimmer, William: CM
Xu, Shuzhen: AP
Xu, Yan: II
Yang, Baitun: II
Zhu, Fang: SP
Yang, Jaecheol: II
Yao, Yuan: II
Young, William: II
Yu, Jennifer: CM
Yule, Kipp: CM
Zarmandily, Hassan: II
Zhang, Shibao: AP
Zhao, Peter: CM
Zhu, Hanxin: AP
Zhu, Jimmy: SP
Zito, Anthony: II

Membership codes	Code
Active Participant	AP
Active Participant - IEEE Life Member	AP LM
Committee Member	CM
Committee Member - Emeritus Member	CM - E
Committee Member - IEEE Life Member	CM - LM
Guest	GT
Interested Individual	II
Spouse	SP

1.0 **Chair's Report** – J. Edward Smith

1.1 **IEEE PES Upcoming Meetings**

IEEE PES T&D Conference & Exposition
April 19-22, 2010
New Orleans, Louisiana

PES General Meeting
July 26-29, 2010
Minneapolis, Minnesota

1.2 **PES Technical Council Activities** (also see attachment A)

1.2.1 PES President's Schedule . . . Alan C. Rotz, PES President, would like to personally attend a committee meeting of the each one of the IEEE/PES Technical Committees during his tenure as president. The Transformers Committee should issue a formal invitation. ACTION TAKEN: On Behalf of the Transformers Committee, Administrative Subcommittee, and officers I issued an invitation and provided information on our next two meeting locations.

1.2.2 Standards Development . . . The IEEE-PES is being criticized for the length of time it takes to get a standard through the process. NEMA was quoted an example for the IEEE to follow to expedite the standards process. NEMA was credited for publishing a standard in 90 days. The PES wants input as to how we can expedite the Standards making process.

1.2.3 Proceedings . . . . The IEEE will provide "on-line" access ONLY to the proceedings! They will no longer produce CD ROM or USB versions

1.2.4 Transformer Committee Officers . . . Rick Taylor and Jeff Nelson needed a list of Transformer Committee officers; Chair, Vice Chair, Past Chair, Secretary, Treasurer, Standards Coordinator and Meeting Planner. Also requested was a listing of future meeting locations. They have requested that the Technical Committees continually update this information. ACTION TAKEN: I sent this information to both via e-mail following the Technical Council meeting.

1.2.5 Meetings and Marketing Committee . . . . The Technical Council is organizing a new committee, Meetings and Marketing Committee (M&M Committee). The PES hopes to do a better job of marketing the output to Technical Committees, including: standards, guides, technical reports, and white papers. This committee will report to Damir Novosel, Vice Chair, of the Technical Council. With the purpose to coordinate meeting participation and improve marketing of the technical committees output. A motion was made to

realign the name and scope of the Technical Sessions Committee to the Meetings & Marketing Committee with the appropriate adjustments in responsibility. The committee would have the current responsibility plus additional responsibilities for meeting coordination between different technical committees and marketing the technical committees output.

1.2.6 2010 PES General Meeting Paper Schedule . . . . Considerable time was spent reviewing the meeting and space requirements for Panel Session, Paper Sessions, Paper Forums, and Poster Sessions at the n 2010 PES General Meeting (Minneapolis , Minnesota).

1.3 Smart Grid Technology

1.3.1 Increased Awareness . . . . . The PES is requesting that each of the Technical Committees pay more attention, get more involved, and dedicate more time and resources on "Smart Grid" Technology. The PES is pushing to expedite the standards process to better position us for "Smart Grid" Technology.

1.3.2 New Smart Grid Website . . . The IEEE will develop a new section on its web site exclusively for "Smart Grid. www.smartgrid.ieee.org

1.4 TCPC Activities

1.4.1 Paper Presentations **. . . .** If the authors are NOT registered for the meeting where the paper is to be presented by a specific deadline, the paper will be "pulled"

1.4.2 "NO SHOWS" . . . Session Chairs (TCPC Chairs) are required to report "NO SHOWS" for Panel Sessions, Paper Sessions, Paper Forums, and Poster Sessions starting in 2010.

For all "NO SHOWS" the papers will be returned to the authors along with the copyright form submitted by the author. Copyright would remain with the author however the paper will not be published.

1.4.3 Plagiarism . . . The PES will use Cross-Check software to screen for papers that have 30% or more of the same content as previously published. Papers will need to be examined more closely before being considered.

1.5 Transformers Committee Activities

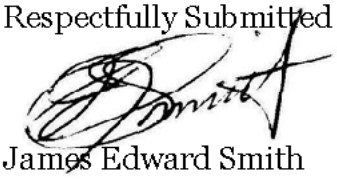
1.5.1 Development of a Transformers Committee Working Group P&P Manual . . . . The IEEE SA requires the Transformers Committee to have and maintain a Working Group P&P Manual (Practices & Procedures). To start, the IEEE SA has provided the basic template to work from. Adapting it to fit the Transformers

Committee Working Group procedures will be somewhat of a challenge. Following the last Adcom meeting in Lombard, Peter Balma volunteered to coordinate this project. He has tried to maintain as much of the IEEE SA's guide as possible, keeping in mind that some of it is mandated. He has also tried to make it consistent with the committee's O & P manual. Again, please keep in mind that some of this material and format is mandated. On behalf of the Transformers Committee, I would like to formally acknowledge Peter's efforts in coordinating this most challenging project. Peter, thank you!

1.5.2 Revision to the Transformers Committee's O&P Manual . . . . The Transformers Committee O&P Manual has been revised to specifically address two issues from the last ADCOM meeting. The revisions addressed include: Simplification of the publication of special papers and to make the process similar to Transaction paper reviews. Refer to Clause 16 of the Transformers Committee O&P Manual. Also, clarification of how many activities and references is needed on a membership application. There is space for three, but it appears the consensus and intent was that at least one subcommittee and one working group recommendation is needed. This could easily be changed to three if desired. Refer to Annex C of the Transformers Committee O&P Manual. I would again like to formally acknowledge Peter's work on this document. Peter, thanks again!

1.5.3 Establishment of Quorums . . . . . The issue of establishing quorums within our Committees is becoming increasingly more challenging. I have allotted time and resources to establish a definitive direction for resolving these challenges during our Adcom meeting in Houston. We, as a group, need to start establishing a policy and direction for our Chairs to follow during our Houston meeting.

Respectfully Submitted



James Edward Smith
Chair
IEEE/PES Transformers Committee

Attachment A

PES Technical Council Meeting
Lake Buena Vista, FL
January 11,2010
General Meeting Highlights

Conference Paper Process Issues

Problems:

- No – Show Authors
  - All accepted conference papers are included in the Proceedings whether they are presented at the conference or not
- Plagiarism
  - In many instances authors are submitting the same papers to more than one conference or publication. Or, they are submitting papers with a significant percentage of previously published material as original submissions.
- Proceedings
  - We spend approximately 6k – 10k per conference to produce CD Rom or USB proceedings

No-Show for GM 2009

	Paper Statistics for Reported Sessions			
Session Type	Number Papers Scheduled	Number Papers Presented	Number Papers Not Presented	No Show %*
Combo	10	8	2	20%
Panel	146	144	2	1%
Paper	109	93	16	15%
Paper Forum	166	133	33	20%
Poster Session	223	155	68	30%
Super Session	49	43	6	12%
Total	**703**	**576**	**127**	**18%**

*This is the No Show % for the respondents in each category

Session Type	Number Sessions Scheduled	Session Chairs Reporting % *
Combo	17	12%
Panel	52	46%
Paper	27	67%
Paper Forum	16	81%
Poster Session	4	100%
Super Session	10	90%
Total		**56%**

* This is the percentage of Session Chairs that reported the number of no shows.

Conference Paper Process

Solutions:

- Plagiarism
  - Use Cross-Check software to screen for papers that have 30% or more of the same content as previously published.
  - Will need to be examined more closely before response
- Proceedings
  - We will provide on line access to the proceedings only and no longer produce CD ROM or USB versions
  - Possibly move proceedings to Xplore for attendee access.

Marketing of WG Activities

- Increase internal and external awareness
- Provide brief overview
- Promote participation
- Enable Research
- Promote Use
- Use a PowerPoint format, possible 15 slides
- Template that can be used across PES
- Need to form a Taskforce to design Template

PES e-Commerce

- Digital Distribution Mechanism for Technical Committee Output
- Provide Increased Value to PES members
- Identify potential products
  - White Papers
  - Tutorials
  - Best Practices
- Quality Control Process- Committee Approval

- Copyright transfer
- Hard and Soft copy to PES EO
- Pricing for members vs. non-membersForm a TC products committee
  - Define process
  - Call to action
  - Strategy for compendium and theme offerings

2.0 Approval of Minutes from Fall, 2009 Meeting

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

Administrative Subcommittee Meeting
Lombard, Illinois
October 25, 2009

3. 0 Administrative Subcommittee – J Ed Smith

The meeting took place at the Omni Hotel in Houston, TX on Sunday March 7, 2010. The meeting was called 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.

1. Attendance of Members & Guests

The following members of the Administrative Subcommittee were present:

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

The following members were absent:

Donald Fallon	Loren Wagenaar

The following guests were present:

Jodi Haasz (IEEE Staff)	Jeremy Kriska - host
Thang Hochanh (for Loren Wagenaar)	Ross D McTagert (for Jim Smith)
Peter P Balma	
Jin Sim	

3.2 Approval of Lombard Admin SC Meeting Minutes

Review and approval of the unapproved minutes from the Lombard, IL meeting
The Chair asked for comments from the Lombard Administrative Subcommittee meeting minutes.
Hearing no comments or requests to change the draft minutes, the Chair Asked for a motion to approve.
Motion- Bartley, Second- Platts Vote Approved.

3.3 Additions to and/or Approval of the Agenda

The Chair reviewed the draft Agenda with the attendees. The Awards Subcom report was added as #10, and the original items 11 and 12 were renumbered. The Chair declared the agenda approved. The revised agenda is included below for reference.

IEEE/PES TRANSFORMERS COMMITTEE
ADMINISTRATIVE SUBCOMMITTEE MEETING
AGENDA
Sunday March 7, 2010 - Call to Order 2:00 pm

Administrative Subcommittee Meeting
Lombard, Illinois
October 25, 2009

1. Introduction of Members and Guests (:05) E. Smith
2. Approval of Lombard, IL Admin SC Meeting Minutes E. Smith
3. Additions to and/or Approval of the Agenda E. Smith
4. Chair's Report (:15) E. Smith
5. Vice Chair's Report (:10) B. Chiu
6. Secretary's Report (:10) D. Platts
7. Treasurer's Report (:10) G. Anderson
8. Meeting Planning (:10) G. Anderson
   - 8.1 - Houston arrangements & Host Report
   - 8.2 - Future meetings
9. Standards Report (:20) B. Bartley
10. Awards Subcommittee Report T. Prevost
11. BREAK (:10) Time Check - 3:30PM
12. New Business, Committee Planning
    - 12.1 - 2010 O&P Manual Revisions (:05) P. P Balma
    - 12.2 - Working Group P&P Manual (:20) P. P Balma
    - 12.3 - Transformers Committee History (:05) P. P Balma
    - 12.4 - IEEE-SA Update (:05) J. Haasz
    - 12.5 - Reaffirmation Process (:10) B. Bartley
    - 12.6 - Discussion - WG and SC rosters/membership (:15) Group
    - 12.7 - Discussion - Quorum Issue (:15) Group
    - 12.8 - Consistent guidelines for approval of documents prior to ballot S. Antosz

    Time Check - 4:45PM
13. Subcommittee Reports - Roundtable (:30)
    - 13.1 - Audible Sound and Vibration J. Puri
    - 13.2 - Bushings F. Elliott
    - 13.3 - Dielectric Test L. Wagenaar
    - 13.4 - Distribution Transformers S. Shull
    - 13.5 - Dry-Type Transformers C. Johnson
    - 13.6 - HVDC R. Dudley
    - 13.7 - Instrument Transformers J. Smith
    - 13.8 - Insulating Fluids S. McNelly
    - 13.9 - Insulation Life B. Forsyth
    - 13.10 - Performance Characteristics S. Antosz
    - 13.11 - Power Transformers T. Lundquist
    - 13.12 - UTNP C. Niemann

14. Old Business

Adjourn

3.4 Chair's Report – E. Smith

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.
Add his report.

Administrative Subcommittee Meeting
Lombard, Illinois
October 25, 2009

3.4.1 Future meetings where we will present papers
April 19-22 IEEE PES T&D Conference and Exposition 14-16 papers for T&D. Will host poster session.
July 25 - 30 PES General
Meeting Minneapolis 16 papers w/panel session

3.4.2 PES Technical Council Meeting Jan. 2010
Notes
PES President Al Rotz expressed an interest in attending one of our future meetings.
Rick Taylor chair Technical Council PES has been criticized for the time it takes to produce standards - complaints from Technical Council NEMA was cited as an example – They publish a standard in 90 days as a target.

Creating a new committee - Meetings and Marketing Committee The first chair is Damir Novosel, the present Vice Chair Tech Council. Their objective is coordinating meeting participation, Improving Marketing, and technical committee output.

3.4.3 PES is requesting that each of the Technical Committees pay more attention, get more involved, and dedicate more time and resources on "Smart Grid" Technology. The PES is pushing to expedite the standards process to better position us for "Smart Grid" Technology.

3.4.4 TCPC activities They are moving from Paper presentations to forums. Setup like paper session, author has 5 minutes for introduction of the paper. They will set up around room like a poster session. Transformer Committee has fewer papers than most, but better quality papers, so we aren't getting forced into the forums yet. Some tech committees have over 100 papers so they are going to forums. We have been getting the time slots we need for paper sessions.

Concerns over no-shows; The author doesn't show or have a representative there to present for him. This is also a problem when the rep doesn't know the material and just reads it.
To resolve issues with Plagiarism, new Software will be implemented to look for 30% or more from previous papers.

Other important topics to be discussed in detail later in this meeting

3.4.5 WG P&P manual
O&P manual.
Quorums Group discussion on the problem for all of TC activities.

3.4.6 Ed Smith made special mentioned that Transformers Committee meeting has a great reputation among the IEEE/PES organizations and are frequently referred to as the role model for all the technical committees.
Roberts Rules of Order- They are not just in our committee, but are being used in all of the technical committees, and the same issues are being seen throughout. A few copies of the books are still available for our new leaders.

3.5 Vice Chair's Report – Bill Chiu

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 value of the presentations.

April 19-22 IEEE PES T&D Conference and Exposition "Smart solutions for a changing world" 21 papers submitted 11 papers approved, 10 rejected. Papers are in full report
July 25-30 PES General Meeting Minneapolis 16 papers includes Hopkinson panel session –Title: 'Progress Report On Failure Of HV Bushing With Draw Lead'. It is really about breaker re-ignition transients and their effect on high voltage bushings.

Accepted 7- reject 1, 8 still outstanding. Many have recommendations for changes before approval. One author fighting rejection with a rebuttal. Will probably end up at 12 -14

Schedule now Mon PM Tues AM, Wed all day. Includes One panel session
Grading of papers to prioritize the time and session choices. Best to paper sessions, others to Poster category.

Roberts Rules of Order A few books are still available for new leaders. Contact Ed Smith or Greg Anderson

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

3.6 Secretary's Report – Don Platts

3.6.1 Membership Review

Voting Committee Members – Six new committee members were approved and added at the Lombard, IL Meeting as shown in the table below:

Administrative Subcommittee Meeting
Lombard, Illinois
October 25, 2009

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
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 Transformers Committee currently has three general categories of participation in our activities. These are: **Interested Individual**, **Active Participant**, and **Committee Member**. Anyone can join our AMS 123 system as the system is designed for self-registration. A new participant will automatically be assigned the role of Interested Individual when they first sign up. Based on the level of participation, the committee administrative staff will upgrade the participation status to "Active Participant" when appropriate. The Committee Member status however, can only be attained through a formal application with the sponsorship of 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.

	October 2009	March 2010
Interested Individual	775	843
Interested Individual - IEEE Life Member *	2	6
Total Interested Individuals	**777**	**845**
Active Participant	206	206
Active Participant - IEEE Life Member *	6	6
Total Active Participants	**212**	**212**
Committee Member	204	209
Committee Member - Emeritus Member *	7	7
Committee Member - IEEE Life Member *	24	25
Committee Member - Corresponding Member	1	1
Total Committee Members	**236**	**242**
TOTAL IN AMS DATABASE	**1225**	**1299**

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

Administrative Subcommittee Meeting
Lombard, Illinois
October 25, 2009

3.6.2 New Member Applications

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

Name	Affiliation	Sponsor #1	Sponsor #2	Sponsor #3	Membership Category
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
Martin Rave	ComEd	Alan Wilkes C57.12.20 WG (2 yrs)	Ron Stahara C57.12.34 WG (2 yrs)	Steve Schull Distribution Trnsf SC (2 yrs)	User
Saurabh Ghosh *	ABB	Gary Hoffman C57.12.10 WG (8 yrs)	Joe Watson PC57.148 WG (8 yrs)	Tom Lundquist Power Transf SC (2 yrs)	Producer
Michael D Faulkenberry	Georgia Power Co	Ron Stahara C57.12.34 WG (2 yrs)	Alan Wilkes C57.12.20 WG (3 yrs)	Steve Schull Distribution Trnsf SC (4 yrs)	User
Benjamin Lopez Luna	Prolec – GE	Joe Watson PC57.148 (3-4 yrs)	Jeewan Puri Aud Sound & Vib SC (3 yrs)	Jeewan Puri WG Sound Level Abatement (3 yrs)	Producer
Bipin Patel	Consultant				General interest Emeritus Member

* 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.

3.6.3 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.

3.6.4 Meeting Minutes

The minutes of the Lombard, Illinois Fall, 2010 Transformers Committee meeting were posted to the committee website on Tuesday March 2, 2010.

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 Houston meeting by June 15, 2010. Minutes should be submitted via e-mail to the Committee Secretary donplatts@ieee.org, with a copy to Susan McNelly sjmcnelly@ieee.org for posting on the Committee website. The submittal should be formatted in Word 2007 (or any earlier version) 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.

3.6.5 Split of Participation in Committee membership

AMS reports show some interesting membership issues:
Committee members that are not IEEE members – 4 Not PES -? Not SA -?
Platts and Anderson will work to update these records over next year, and will issue an Email to members asking them to keep their email addresses, and memberships up to date.

Balance of Committee membership
Now, users are less than 60—about 25%, producers are 100-- >50%, general interest 80 -- >30%.

Suggestion from Anderson –Begin a participation incentive for users to 'Bring a friend' for free. Should we do this, or something similar?
Adcom members requested to think of this issue and provide suggestions to Don Platts.

3.6.6 New Members:

All 5 attendees requesting new membership were approved. Motion- Bartley, Second by Several. Mr. Ghosh's approval is contingent upon verification of his membership in PES. [Later confirmed, and approved.]

Motion: Change the membership status for Bipin Patel to emeritus status.
Motion by Bartley, Second by several – Approved

3.7 Treasurer Report – Greg Anderson

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. Now have a balance of about $56,000.
Greg requested input on prudent ideas to use up some of the excess funding. Proposed possible use of additional funds- "Go to Meeting" - AMS system enhancements. Need additional words to justify these plans and their costs. Greg will provide the ledger and the notes.

3.8 Meeting Arrangements, Host Report– Greg Anderson

Gate crashers, those that are not registered and have no name badge. Some active WG leaders have been violators in the past. Now we have a Zero Tolerance policy. No registration-- you cannot attend.

Greg will hold an AMS system review at their offices. The Transformers Committee needs enhancements and different reports. He will be asking for the ability to produce intelligent name badges. They may soon offer Twitter accounts updates

3.8.1 Host Report - S'10 – Houston Attendance Stats

The meeting host Jeremy Kriska, Tulstar, welcomed the Transformers Committee to Houston, 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	**469**
Committee Members	128
Active Participants	144
Interested Individuals	197
Registered Companion & Guests	**67**
Main Events	
Sunday Reception	367
Monday Standards Luncheon	122
Tuesday Speaker Luncheon	185
Wednesday Dinner Social	200
NASA Rodeo	106 92
One bus for each of 3 Tech tours Tuesday	About 50 each
Companions tours	45 Mon, 47 Tues

3.8.2 Future meeting time slots and locations

Fall, 2010 ➔ (October 24 -28, 2010) – Toronto, Ontario, Canada at the Hilton Toronto Downtown hotel. Rate $159 Canadian. The meeting will be hosted by Trench Limited and Richard Dudley. Technical tours to Trench Monday night and Thursday afternoon.

Spring, 2011 ➔ (April 10-14, 2011) – San Diego, California at the Catamaran Hotel. Rate $145. The meeting will be hosted by Rob Mayer San Diego Gas & Electric.

3.9 Standards Report – B. Bartley

Bill Bartley discussed the highlights of the report of standards activities since the October, 2009 Meeting in Lombard, IL.

Bill noted the list of projects that are set to expire at the end of 2010. Also the PARS that have not been initiated to start the balloting process and will be expiring. The responsible Subcommittee chairs are requested to coordinate with each of the Working Group Chair to take appropriate actions prior to the deadline of October 18, 2010. Bill Bartley also offered to work with the activity chair to take the appropriate actions.

Chuck Johnston has commented that the list of expiring documents for this year is good, but it would be better if it also showed those to expire next year, so we have a reminder to get started promptly.

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

3.10 Committee Service Awards – T Prevost

Refer to Section 7.0 for the complete "Recognition and Awards Report."

Tom will initiate a task force of IEEE Fellows to help identify and nominate candidates for future candidates to IEEE Fellow.

3.11 New Business

3.11.1 Review of O&P Manual 2010 revisions – P Balma

Peter has revised several issues and attempted to coordinate changes to it with the new Working Group P&P documents.
He made a change to clarify the membership form to require 1 Subcommittee and 2 Working Group or Task Force signatures.
The group discussed the procedures for publishing a task force or working group paper, that portion of the draft will need to be revised again.

Action Items: P Balma to review the procedures.
Adcom needs to decide how a task force paper or report will be approved or sanctioned for publication as an IEEE Transformers Committee document.

Topic: Votes to approve a motion. Some items require a super majority, not just a majority. This must be coordinated with the WG P&P.

Discussion of the requirement to supply rosters of working group members to SA, and past practices within the Transformers Committee. Platts will investigate the methods, alternatives, and the steps to comply with the SA requirements.

2010 Revision to be updated soon. Then it will be sent to Adcom members for review and vote before the Oct 2010 meeting.

3.11.2 Working group P&P Review – P Balma

Membership of working group may produce quorum problems.
Distinction between Attending member and Corresponding member. This needs more definition, because of concerns over who can vote, and the distinction between a guest and corresponding member.

Motion by Lundquist to adopt the WG P&P as written (the Feb, 25, 2010 revision). Second Bartley.
Discussion of what is an excused absence. Corresponding member is not defined in this revision. Motion failed.
Ed Smith will establish a Task force to resolve issues. Shull, Lundquist, Prevost, Ceglia, Ed Smith, Platts, Balma will be members.

Administrative Subcommittee Meeting
Lombard, Illinois
October 25, 2009

3.11.3 IEEE History – P Balma

A spreadsheet recording officers and historical meeting attendance has been created. Old minutes going back to 1992 have been scanned and recorded. Peter is looking for older sets of minutes to add to the records.

3.11.4 IEEE SA Update – Haasz

TC14 Joint IEC IEEE document HVDC Bushing document 65700 -19-03. Scheduled one more meeting for June, and then plan to ballot, and should have comments by fall 2010 meeting.

3.11.4.1 Update Standards CD?

Yes, but later, after C57.12.00 and C57.12.90 are published as 2010 revisions.

3.11.4.2 Copyright Iissues.

All SA members must agree to copyright requirements to continue to access the 'My Ballot' system.

3.11.5 Reaffirmation Process – Bartley

Today, all it takes is a request from a Subcom chair to initiate a reaffirmation procedure.
Bartley will take first step. Send to all subcom chairs for their concurrence that it can be reaffirmed. He would like to develop a guide for the process. It would cover topics such as: Does it still reflect the state of the art, and there is no need to modify. Bill will draft proposal and send to group for review.
Discussion of WG and SC rosters/ membership
Do a better job of policing the lists. Be more selective in adding new members.
Quorum issue is addressed in WG P&P manual, and Chairs should be encouraged to comply with the requirements.

3.11.6 Discussion Of The Quorum Issue. All

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 constitutes an official member and the criteria to be used to decide whether a member is an active participant. These items will be addressed.
Everyone agrees that this is a very serious problem, it hampers our ability to take actions, and it is discouraging for the officers and the members alike. However, no one had a viable suggestion to relieve the problem.

The Chair encouraged 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.

3.11.7 Consistent guidelines for approval of documents prior to ballot. Antosz

Steve suggested that all documents should be reviewed and surveyed by the TF or WG, and then also by the SC, before it is sent to a formal ballot. This topic should be addressed in the WG P&P manual.
Actions: Balma to address this in the revision of the manual

Administrative Subcommittee Meeting
Lombard, Illinois
October 25, 2009

3.12 Subcommittee Reports

3.12.1 Jeewan Puri - Audible Sound and Vibration Subcommittee
NO REPORT

3.12.2 Fred Elliott – Bushing Subcommittee
NO REPORT

3.12.3 Thang Hochanh (for Loren Wagner) - Dielectric Test Subcommittee
NO REPORT

3.12.4 Stephen Shull - Distribution Transformer Subcommittee
NO REPORT

3.12.5 Charles Johnson - Dry Type Transformer Subcommittee
NO REPORT

3.12.6 Richard Dudley - HVDC Converter Transformers & Reactors Subcommittee
NO REPORT

3.12.7 Ross D McTaggart for Jim Smith - Instrument Transformer Subcommittee
NO REPORT

3.12.8 Sue McNelly - Insulation Fluids Subcommittee
A new task force for Particle Count (contamination of oil) wants to survey the entire Transformers Committee AMS database. Discussion, should the response be anonymous, or can a responder remain anonymous? Adcom agreed to allow the survey, and the Chair was directed to contact Greg Anderson for the email list.

3.12.9 Bruce Forsyth - Insulation Life Subcommittee
NO REPORT

3.12.10 Steve Antosz - Performance Characteristics Subcommittee
Balma raised a question about Neutral grounding resistors. This group needs to coordinate their work with Dry Type transformers and reactors groups, since they are used as grounding devices. C57.32 refers to C57.12.00. C57.12.00 states that it does not cover grounding transformers.

3.12.11 Tom Lundquist - Power Transformer Subcommittee
Tom Lundquist noted Re-affirmation of C57.116 will be done by Tim Raymond.

3.12.12 Carl Niemann - Underground Transformer & Network Protector Subcommittee
NO REPORT

3.12.13 Bill Bartley - Standards Subcommittee

NO REPORT

3.12.14 Greg Anderson - Meetings Subcommittee

NO REPORT

3.13 Old Business

No old business was brought to the committee.

3.14 Adjournment

With no further new or old business up for discussion, the meeting was adjourned at 5:55 PM.

4 Vice Chair's Report – Spring 2010

4.1 IEEE PES Calendar of Upcoming Events

2010 T&D Conference and Exposition (Sponsored by PES)
April 19 - 22, 2010
Morial Convention Center
New Orleans, Louisiana, USA
Theme: *Smart Solutions for a Changing World*

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.ieeet-d.org

2010 PES General Meeting
July 25 - 30, 2010
Minneapolis, Minnesota USA
Theme: *Power Systems Engineering in Challenging Times*
Minneapolis Convention Center
1301 Second Avenue South, Minneapolis, Minnesota 55403, 612-335-6000

Hotel Information
Hilton Minneapolis
1001 Marquette Avenue
Minneapolis, Minnesota 55403
612-376-1000

4.2 Upcoming Conference Paper Sponsored by Transformers Committee

4.2.1 2010 T&D Conference and Exposition (New Orleans, April 19-22)

A total of 21 papers were submitted, of which 11 were accepted and 10 were rejected.

List of 11 Accepted Papers

2010TD0020	Detection of Inrush Current Using S-Transform and Probabilistic Neural Network
2010TD0225	Transformer Diagnosis Using Probabilistic Vibration Models
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
2010TD0311	Investigating Short-circuit in Power Transformer Winding with Quasi-static Finite Element Analysis and Circuit-based Model
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
2010TD0528	Moisture in Transformers and Online Dryer Performance
2010TD0646	Ultra High Efficiency Distribution Transformers
2010TD0649	Development of a Fluid Structure Interaction Tool for the Study and Prevention of Transformer Tank Explosions

List of 10 Rejected Papers

2010TD0272	Review of Recent Changes to Mineral Insulating Oil Specifications
2010TD0300	HPLC method for the study of degradation products of cellulosic insulation materials in a power transformer
2010TD0387	Methods to improve cycle of vacuum-drying process for power transformers
2010TD0521	Thermal Modeling of Electrical Utility Transformer Using Finite Element Modeling Technique and Thermal-Electrical Analogy
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
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

4.2.2 2010 PES General Meeting (Minneapolis, July 25–30)

A total of 16 papers were submitted, of which seven have been accepted, one rejected, and the remaining eight papers are still being review at the time of this report.

List of Seven Accepted Papers

2010GM0826	Online UHF PD Monitoring for Transformers: Pulses Knowledge Acquisition
2010GM0879	Experimental and Simulation Analysis of Ferroresonance in Single-Phase Transformers Considering Magnetic Hysteresis Effects
2010GM0884	Analysis of Five-Legged Transformer used for Parallel Operation of Rectifiers by Coupled Circuit-Field Approach

2010GM0899	Detection of Minor Winding Deformation Fault in High Frequency Range for Power Transformer
2010GM0965	Fuzzy Logic Approach to Identify Transformer Criticality using Dissolved Gas Analysis
2010GM1320	A Novel Approach for On-Line Deformation Diagnostics of Transformer Windings
2010GM1711*	Progress Report on Failures of High Voltage Bushings with Draw Leads

*Note this paper will be present in a Panel Session Format and will be moderated by Phil Hopkinson. The panel topic will be "Breaker reignition transients and their effect on High Voltage Bushings."

List of One Rejected Papers

2010GM1567 Development of a Fluid Structure Interaction Method for Prevention of Transformer Tank Explosion

List of Ten Papers Pending Review

2010GM0299	Power Transformer Insulation Diagnosis under Measurement Originated Uncertainties
2010GM0608	Application of Polarization Based Measurement Techniques for Diagnosis of Field Transformers
2010GM0711	Prioritizing Transformers for Condition Based Asset Replacement
2010GM0902	Ontology-based Fault Diagnosis For Power Transformers
2010GM1357	Appropriate Test Conditions Proposed for Industry Standards of Measuring Transformer Noise
2010GM1381	Determination of transient phenomena during the energization of a 340 MVA transformer having a highly non linear characteristic: modeling and their validation by on site tests
2010GM1647	Dissolved Gas Analysis of a Thermally Overloaded Oil-Immersed Current Transformer
2010GM1686	High Frequency Transformer Modeling using Finite Element

4.3 "Robert's Rules of Order" Program

Copies of "Robert's Rules of Order Newly Revised', "In Brief" are available for the newly appointed activity leaders. Please contact Greg Anderson to secure a copy if you have not been issue one previously.

5.0 Treasurer's Report — Gregory Anderson

See the Treasurer's Report in Item # 3.7

6.0StandardsSubcommitteeMeeting
Unapproved Minutes

IEEE/PES Transformers Committee
March 9, 2010 Houston, Texas, 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. A new P&P Manual for Working Groups is being prepared and should help in the Chairs conduct meetings.

c. The S10 Standards Luncheon - "Back to Basics" will provide a use reference for the frequently asked questions http://www.transformerscommittee.org/info/S10/S10-StandardsLuncheonPresentation.pdf

d. The IEEE TC requirements to have quorum present was reiterated.

2. Meeting Attendance

The Standards Subcommittee met on Wednesday, March 9, 2010, at 4:30 PM. A preliminary count of members (by hand raised, 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 verified that a quorum was NOT present.

3. Approval of previous meeting minutes

Vice Chair motioned asked if there were any comments or corrections to the previous meeting minutes. There where no comments to meeting minutes from the Fall 2009 meeting in Miami, Florida, even though approval could not be obtained due to lack of quorum.

4. Working group reports.

a. **Cont. Revision of C57.12.00 – Steve Synder** reported the present status as ballot resolution continues, and that shortly the standard would be re-issued for recirculation. The following summarizes the balleting:

- Initial ballot – Open / closed Oct 2008; 193 Ballot Pool, 208 Comments, 14 negative Ballots
- 1st Recirculation - Open / closed Dec 2009; 144 Affirmative (95% Approval rate), 32 Comments, 7 negative ballots (6 old and 1 new)
- 2nd Recirculation – Opened / closed March 2010.

A new Par was approved Jan 23, 2010 to align changes to title and scope with document.

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 single negative ballot from last recirculation hopefully will change at the next recirculation.

c. **PC57.12.70 Terminal Markings Revision – S. Shull** – A quorum was present 7 of the 8 members. Prior minutes were approved. Steve Shull gave a review of examples from a paper presented at 2006 Protective Relay Conference by Lawhead, Hamilton & Horak and asked again for attendees to check with manufacturers for examples that might be using. Chuck Simmons pointed out in example 4 the phase shift should be shown as 30° positive. The working group was in agreement with Chuck and Steve stated that he would make the change. Charles Sweetser offered to provide diagrams that he had developed during his testing of transformers that cross references US vector notation to the IEC clock method. Chuck Simmons agreed to check with Sheldon Kennedy on the Semiconductor Rectifier Transformers PCS57.18.10 to provide additional examples that demonstrate multiphase outputs that can be delivered from other types of transformers. Steve volunteered to incorporate changes submitted by members and guests before the next meeting. The IEC clock method should be helpful to North America users and there is time to complete with Par Expiration being 31 Dec. 2011.

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d. **PC57.12.80 – Terminology for P & D Transformers – B. Chiu** The ballot comment resolution is nearing completion. Shortly after the meeting the ballot comment resolution spreadsheet showing the listing of comments and the details of the proposed resolution will be sent showing the changes that have been incorporated. This will be Draft 4. Your help to review the changes prior to sending this out for recirculation.

e. **WG on Revision of IEEE C57.152 (old 62) –Jane Verner** – Working Group held 7th meeting. A quorum was (34 of 55) members present with total of 48attending. No patents related to work were identified. The Fall 09 meeting minutes were approved. Oleg Riozman efforts on moisture in oil were noted. Committee membership was reviewed with regard to quorum rules. Draft 4.0 was issued and has been posted on the web. Volunteer assignments to review the various sections were made during the Fall 2009 meeting and are included on a separate spreadsheet. The spreadsheet has been updated to show progress: Induced Testing (need to add testing voltage levels and Ajith Varghese has now volunteering to assist John Herron); Safety Additions and Insulation Resistance need a volunteer to review; DGA (Poorvi Patel agreed to review). Discussion included the Diagnostic Tests for Transformers, Reactors and Regulators as well as the Test Chart Commissioning, In-Service and Post Faults. On both charts it was agreed that the order of testing should be considered and reflected in the tables. Updated charts, the DFR Annex Section 6.1.2 - Ratio/ Polarity/Phase a team comprised of John Herron, Jeff Foley Paul Salvato and Peter Werelius are continuing to work on a chart. A separate web meeting will be held to discuss further. The next web meeting will be held on May 5, 2010 at 11 AM EST

f. **TASK FORCE on IEEE-IEC CROSS REFERENCE – J. Sim** - the following was progress was reported that a quorum was not present (25 attendees, 8 members, and 17 guests with 1 requesting membership).

Discussed when the IEEE-IEC Cross reference will be updated and published. The most important documents are IEC 60076-1, C57.12.00 and C57.12.90. The cross reference will be published after these 3 documents are updated.

Progress to date follows as:

- IEC 60076-1/C57.12.00/C57.12.90 – Ajith Varghese and Vinaj Mehrotra completed their assignment. May need to be updated when FDIS is issued for IEC 60076-1
- IEC 60076-2/C57.12.00/C57.12.90 – Hasse Nordman to complete after 76-2 publication
- IEC 60076-3/C57.12.00/C57.12.90 – Revision of 76-3 has just started.
- IEC 60076-6/C57.16/C57.21/IEEE 1277/C57.32 – Richard Dudley

The complete project list and assignments will be posted on the TC webpage.

For IEC documents being updated, FDIS stage is probably safe to do the comparison with IEEE documents. There was no new business. The complete project list, cross reference list and assignments will be available in the folder for the Task Force on IEEE-IEC Cross.

g. **TASK FORCE on IEEE-IEC Harmonization – Jeewan Puri** - The following scope provide to TF for comments:

Scope: In view of the globalization of the transformer industry, this Task Force has been formed to develop clear pathways toward developing harmonized standards to meet the needs of the future. The efforts of this task force will be focused on the following:

- Define clearly as to what the harmonization of standards is supposed to accomplish.
- Develop rules and guidelines for harmonizing a standard in part or in its entirety. This will include defining the objectives, deliverables and the proposal process for obtaining authorization from the IEEE and the IEC standards making bodies.
- Identify the organizations that should be involved in channeling the flow of information to and/or from IEEE and IEC standards.

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- Define a streamlined process for using copyrighted information from IEEE and IEC standards.
- Define procedures for maintaining and updating harmonized standards.

The task force will publish a position paper summarizing the harmonization process, its deliverables and benefits to the industry

The TF discussed the outline of the position paper This outline was designed recognizing Harmonization as a goal that can be achieved by either Partial Adoption or by producing a Dual Logo document to accomplish the following:

- Remove conflicts in the technical content.
- Make transformers manufactured with IEEE and IEC standards globally acceptable.
- Make performance requirements compatible.
- Make test procedures compatible.
- Remove technological conflicts between IEEE and IEC standards.
- Adopt new technologies developed in the IEEE and / or IEC working groups.

It was proposed that the process involves Preparing formal Harmonization approval request form IEEE and IEC. This request describes the reasons, benefits and the process (Partial Adoption or Dual Logo) through which Harmonization will be achieved. Once the project approval has been obtained, the WG responsible for the harmonization should be given the complete control of the documents.

It was suggested that the harmonizing process should in no way jeopardize the local relevance nor the development process used at IEEE and IEC. These standards should therefore be maintained according to the way they were Harmonized. The standards that are harmonized through Partial Adoption should be locally controlled since their use is local. The standards that are harmonized through joint development as Dual Logo are for international applications and should be controlled jointly.

Ms. Jodi Haasz pointed out that this approach will involve changing the present agreements and philosophies at IEEE and IEC. Mr. Paul Jarman (Chairman IEC TC14) supported the idea of changing the present operating procedures for making the harmonization process more flexible and streamlined. It was agreed that Jodi Haaz, Paul Jarman and Bill Chiu will review the attached outline and prepare it for further action and circulation to the TF.

5. Old Business

No old business was raised.

6. New Business

A new business questions was raised regarding when is a new "PAR" needed? The process was explained by the Chair, and the summary is there should not be a Draft Standard without a PAR and this is for IEEE coverage regarding insurance and support. (A reference explanation is in Standards Luncheon presentation, also). It was noted the is a PAR to cover the continuous revisions of C57.12.00 and C57.12.90

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

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7.0 Recognition and Awards – Chair: Thomas A. Prevost

7.1 Committee Certificates of Appreciation

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

Name	Transformers Committee Award
Project Awards:	
Roger C. Wicks	Chair, IEEE C57.12.60-2009 Revision
Ronald J. Stahara	Co-Chair, IEEE C57.12.34-2009 Revision
Stephen D. Shull	Co-Chair, IEEE C57.12.34-2009 Revision
David W. Sundin	Reaffirmation of IEEE C57.121-1998 (R2009)
Charles Johnson, Jr.	Reaffirmation of IEEE C57.124-1991 (R2009)
Service Awards:	
Jeremy Kriska	Host - Spring 2010 Meeting, Houston, TX
Thomas A. Prevost	Chair, IEEE/PES Transformers Committee (2008-2009)
Donald W. Platts	Chair, Insulation Life Subcommittee (2001-2009)

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.

7.2 IEEE SA Standards Board Awards

In addition to the Committee Awards above, the IEEE SA SB presents its own Award to the WG Chair upon publication of a new or revised document, and offers the WG Chair the opportunity to nominate significant contributors to the project for an IEEE SA SB Certificate of Appreciation. We will recognize the following IEEE SA SB Award recipients in Houston:

IEEE SA SB Award Recipients:

Name	IEEE SA SB Award
Craig A. Colopy	Co-Chair, IEEE C57.15-2009 Revision
Gael R. Kennedy	Co-Chair, IEEE C57.15-2009 Revision
James H. Harlow	Certificate of Appreciation, IEEE C57.15-2009
Lee Matthews	Certificate of Appreciation, IEEE C57.15-2009
Marcel Fortin	Certificate of Appreciation, IEEE C57.15-2009

7.3 IEEE Standards Association (SA) Awards and Recognition

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

7.4 PES Transformers Committee Distinguished Service Award

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

Our Distinguished Service Award recipient for 2009 was Loren Wagenaar.

7.5 PES Working Group Recognition Awards

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

"The PES Working Group Recognition Awards recognize "the most outstanding and timely publications" by a PES Working Group (or Committee or Subcommittee) from among the nominations. The PES Recognition Award is divided into two categories: 1) for technical reports; 2) standards and guides. Each Technical Council Committee may nominate one report from each category, published by IEEE, during the previous three year period." This award consists of a plaque which will be presented to the Working Group Chair at the PES Summer Meeting Awards Luncheon. A framed certificate will be presented to each Working Group member at a designated meeting of the parent Technical Committee. 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 (2011) PES WG Recognition Award to my attention, ASAP, so a nominee can be selected and forwarded to PES.

7.6 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. Award nominees will be reviewed by the Awards Chair and the SC Officers.

7.7 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, was distributed in Lombard. The initial recipients were chosen from the first 50 or so Committee Members registered for the meeting 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. There will not be any Committee member certificates distributed in Houston. We do plan to pick up again in Toronto.

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.

7.8 Nominations for IEEE, PES, and Technical Council Awards

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There are no nominations in these categories at this time. Regarding IEEE Fellow Nominations, we have missed the opportunity for preparation of nominations for the 2011 Class of IEEE Fellows. We need to think about nominations for 2012. 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.

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. Special thanks to Donald Fallon, our past Awards Chair,for his help in the transition. We look forward to seeing Don at future transformer committee meetings.

Respectfully submitted,
Thomas A. Prevost
Chair, Awards Subcommittee

8.0 New Business

None

9.0 Reports of Technical Subcommittees

Insulation Life Subcommittee - Unapproved Meeting Minutes
March 10, 2009 – Houston, TX

9.1 Insulation Life Subcommittee – Bruce Forsyth, Chairman

The Insulation Life Subcommittee met in Houston, TX on March 10, 2010 at 8:00 AM.

At the commencement of the meeting there were 52 out of 110 members present, so a quorum did not exist. According to the final attendance roster the meeting was attended by 164 people, 59 of 110 members and 105 guests.

9.1.1 Approval of the Meeting Minutes

The minutes of the meeting in Lombard, IL on October 28, 2009 were reviewed but not approved since a quorum was not present at the time the minutes were reviewed. .

9.1.2 Chair's Report

The Fall 2010 IEEE Transformers Committee Meeting will be held in Toronto, ON on October 24-28. The Spring 2011 meeting will be help in San Diego on April 10-14.

The Chair reminded members and guests of the importance of establishing a quorum at meetings and suggested that individuals that want to be involved in the balloting process, but are unable to actively participate otherwise, should do so through SA membership rather than requesting membership on the activity groups. In addition, the Chair encouraged all activity chairs to review their membership rosters in an effort to ensure only active participants remain on the list.

9.1.3 Project Status Reports

9.1.3.1 C57.91 Loading Guide

C57.91 and its PAR expire at the end of this year. A PAR revision is required to ensure the wording of the PAR matches wording in the document.

8.4.3.2 C57.100 Thermal Evaluation Guide

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

9.1.4 Working Group and Task Force Reports

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

The working group was called to order by Bruce Forsyth at 9:30 am. Chair Don Duckett suffered a stroke on Friday, March 5th and therefore was not able to attend. Vice Chair Carlo

Arpino was also unable to attend. Bruce Forsyth stepped in to help with the meeting. Secretary Susan McNelly was also present.

There were 28 of 55 members were present (quorum was achieved) and 54 guests with 13 guests requesting membership to the WG. Susan explained that only guests requesting membership that actually participate in the effort to get the Guide to ballot at this point would be considered for membership. At this time, only one of the guests (Roger Verdolin) requesting membership will be considered for addition to the WG pending follow-through on his request to participate on the ballot resolution group.

Agenda:

1. **Roll Call/Introductions**
2. **Patent disclosure announcement**
3. **Previous meeting minutes approval**
4. **Status of the present Guide**
5. **Draft 7.1 Discussion**
6. **Plans for Completion**
7. **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 Fall 2009 meeting in Lombard, Illinois was requested. A motion to approve the minutes was made to approve the minutes and was passed.

Status of the present Loading Guide:

The Guide is set to expire and be withdrawn at the end of this year unless this working group is successful with getting a version of the Guide out for ballot and approved.

A PAR modification was submitted for the December NESCOM meeting requesting a two year extension as PAR was set to expire at the end of 2009. NESCOM granted a one year extention to December 2010. This means that the WG must get a draft out for Ballot soon to prevent withdrawal of the Guide at the end of this year. If the document is out for ballot prior to the end of the year, then it is likely that REVCOM would grant an additional one year extension for resolution of comments and any negative responses. The mandatory editorial review must still be done on the document before it can be sent out for ballot.

A decision was made at the Fall 2009 meeting to go with a minimal modification to insert the voltage regulation section and any other critical items such as bubble generation. In addition, the Guide would be brought up to present IEEE requirements regarding style, metrification, equation presentation, etc.

The floor was opened to discussion on the ballot and where we might go from here. Don Platts gave a synopsis of the recent changes and the need to get an interim document out that we can live with to get this to ballot.

Draft 7.1 Discussion/Review

Juan Castellanos provided a review of Draft 7. Most of his comments and corrections have been incorporated into the present draft 7.1 that is posted on the web site. There are some additional revisions pending from Juan's review that are being worked through.

A question was raised if there was a possibility of making changes to Table 7 & 8. A comment was made that if changes to these tables were made, it would definitely cause them to vote negatively on the ballot. This would also apply to Table 6.

Suggestion to add a short not to Table 7 indicating that either the temperature or the maximum load limit apply, that they do not need to both be satisfied. An amendment was made to change the word "and" in the title of 9.2.1 and Table 7 as well as in the first sentence of 9.2.1.

Discussed removing the second line of Table 8. This is a design consideration not a transformer loading issue. There were objections to removing the line. An alternate of removing the words in parenthesis in the first column was suggested. It was determined to leave the

A request was made to verify if the values in Table 6 are valid for voltage regulators or to add a column with the different values.

Jin Sim volunteered to do a technical review of the equations and variable definitions to verify that they were properly translated from the original document.

A PAR modification will be needed to make the minor changes to the Scope (addition of the word "step-" before "voltage regulator" and a missing degree symbol for the "55C" reference.

A request for volunteers to serve on a ballot resolution group was made. Dave Wallach, Juan Castellanos, Don Platts, Tom Prevost, and Roger Verdolin volunteered to help go through comments received.

The meeting was adjourned at 10:47am.

Respectfully Submitted

Susan McNelly
WG Secretary

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

1.0 Introduction and Rosters and Quorum Call

The working group met on Monday, March 8, 2010 at 11:00 AM with 28 members and 82 guests attending, with 5 guests requesting membership. At this time the membership numbers are being reduced to match those involved in the revision of the document, and only one of these guests falls into the category of those guests who will be offered to be included in the final membership list.

As there were only 28 members of the 90 on our roster, we could not conduct official business during this meeting.

2.0 Approval of minutes from October 26, 2009 meeting
The minutes of the October 26, 2009 meeting in Lombard, Illinois had no issues, but could not be formally approved due to the lack of a quorum.

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

4.0 Document Feedback
- Questionnaire Results
  - 17 questionnaires were returned by the 90 members of the working group.
  - Information from the questionnaires were reviewed and discussed during the last fall's meeting.
  - This input was used to develop a Draft 1

- Revisions C57.100 in Draft 1
  - 12 responses were received from the 350 recent attendees to our working group.
  - These responses were incorporated into Draft 2
  - Draft 2 has been submitted to IEEE for MEC review

5.0 The Ballot pool for the this document is being formed. At the time of the meeting 105 balloters had signed up, however only 12 members of the working group had signed up at this time. The chair pleaded with the members of the working group and all who attended to sign up for the ballot.

A ballot resolution team was formed for assisting the chair with resolving any potential negative ballot issues during the ballot process. These volunteers are Claude Beauchemin, Terry Drees, John Luksich, Don Platts, Tom Prevost and Roger Wicks.

Further discussions were held within the remaining time of the meeting. John Luksich provided in writing concerns about the use of 50% tensile strength as the end of life criteria, which differs from the list of options described in C57.91. This same issue was raised at our last meeting and addressed by the chair – a number of techniques can

be used to evaluate relative performance of materials, however for a standard, we need to select one method, and specifically one which is broadly applicable to as many potential materials as possible. Tensile strength retention has been found to be broadly applicable, unlike Dp (works well with cellusose only) or burst strength (doesn't work well with tape samples), etc. Additionally, the use of 50% tensile strength with the dual temperature test gave a close match to curves previously established with the distribution model test (Lockie test).

Another question was raised regarding the difference in aging data from preliminary aging work using the dual temperature method (and presented by McNutt, et. al.), vs. more recent work by Wicks/Prevost in support of this working group. The chair noted that the previous work used kraft paper of an unknown nitrogen content (which has been shown to affect the life), and the data John shared used the highest nitrogen content paper which provides much higher life. Additionally, the historical test used wrapped conductor tapes vs. precut tensile strips, which added a lot of variability to the test.

Other points were raised by Jin Sim related to the use of dual temperature vs. other methods (due to complexity of a potential power transformer model test), etc. He also noted that this method could be improved by better moisture control. Valery Davydov also noted the much different life available to insulation when moisture is present.

The chair noted that one of the things we have tried to do with this revision is to make all of the methods use similar conditions. We have added the use of moisture in all test methods (though only as an initial moisture content), as well as specifying the sealing method of the system for the test to mirror what would be used in the end application. These were not required in the past. The chair noted that future revisions could be modified to allow for new technology that would allow different modeling of the effect of moisture, but that this work would not be complete to allow this addition in this current revision of the document.

The chair noted, that again – whatever change is made to one method should be made to all of them.

6.0 The meeting adjourned at 12:10 PM

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

The Working Group met at 11:00am March 9, 2010 in Colonnade AB of the Omni Houston Hotel in Houston, Texas USA. In attendance there were fifteen members and fifty-six guest; six members requested in advanced and were granted to be excused for their absence. Subsequent to balloting activities after the Fall meeting, non-responsive members were removed from the WG. The membership now stands at twenty-eight.

There were no patent disclosures.

The minutes of the October 27, 2009 were distributed prior to the meeting and also displayed at the meeting. The minutes were approved as written.

Projects:

Modified Temperature Test

The Straw Ballot results for the proposal were presented. The ballot was unsuccessful having only a 66% return, i.e. 25 of 38 members and the majority response was negative; 15 of the returned ballots were negative. The WG expressed no interest in pursuing the proposal further.

TF – Sub-clause 11.2.2e
(Addressing scenarios wherein hot-resistant time data unsuitable for fitting to an exponential decay curve)

Sanjib Som gave a presentation on an Alternate Method for Determining Average Oil Temperature. In this methodology readings were recorded for 30 minutes. The resistance in the first five minutes followed an exponential curve, and during the last five minutes was linear. The presentation generated the following noteworthy discussion.

1. Bertrand Poulin indicated that his practice is to directly measure the oil through the headers. Bertrand noted that it is not average oil temperature that was determined; instead it is the measured oil temperature to which the winding is cooling down to – which is the oil surrounding the coil for ONAN and ONAF, or bottom oil for ODAF AND OFAF - for which we have no name. Bertrand agreed to prepare specifics on the topic.
2. Oleg Roizman concurred with Bertrand's comment and posed the question as to how the information could be used.
3. Shamaun Hakim commented on Sanjib Som's premise on radiator length indicating that the shorter height brings down the winding gradient of ONAN/ONAF transformers.
4. Baitun Yang indicated that it is not practical to extend test time to 30 minutes as it necessitates reheating the transformer between shutdowns. Bertrand Poulin concurred suggesting there may be other ways to extract the information.

11.2.2b Straw Ballot – With removal of the order of tests, the recirculation ballot for lower capacity heat runs on power transformers was successful. Clause 11.2.2 has been finalized and is posted on the Insulation Life webpage.

Unfinished Business

There was no unfinished business.

New Business

There was no new business.

The meeting adjourned at 11:45am.

Respectfully submitted,

Paulette Payne Powell, Chair
Juan Castellanos, Co-Chair

9.1.4.4 Task Force on High Temperature Transformers – Richard Marek

The fourth meeting of the WG took place on Monday, March 8, 2010 in the Regency D Meeting Room at 1:45 pm, at the Omni Houston Hotel, Houston, TX, USA

There were 18 members and 46 guests present. Introductions were made and attendance sheets were circulated. The IEEE patent policy was discussed and there were no concerns regarding patents. At 31 members, a quorum was established with 58% of the members present. Accordingly, the minutes from the Lombard meeting were approved as written.

The results of two surveys were presented by the Chair. The first survey concerned approval of the minutes from the Miami meeting, which was deferred since no quorum was established at the Lombard meeting. Due to a poor response to the surveys and the lack of a quorum from the previous meeting, 8 members were removed from the roster, bringing the total to 31. All received explanatory emails, with one response and no objections. This allowed a successful ballot of a 57% positive response and no negatives, resulting in approval of the revised minutes.

The second survey presented a proposal to revise the scope with one alternative version. 22 responses or 73% resulted in a successful ballot with 18 approving the revision. Two ballots favored the original scope and two preferred the alternate proposal.

A concern had been raised at previous meetings concerning the content of the draft and whether it should be called a standard, a guide or a recommended practice. Since the document has been changing due to revisions, the Chair 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. Don Platts stated that he felt the document is still more guide-like and suggested that the document be sent to the IEEE editors for an opinion. The chair agreed to consult with Matt Ceglia to determine how to request the review. After this review, the Chair will submit an amended PAR to revise the scope and the title, if necessary.

Attention was then directed to the many revisions made in Draft 4, with a number of those present noting that the figures had not been reproduced in the pdf document of the draft which was sent to all interested parties. The Chair stated that he would send out the MS Word doc version immediately to all on the mailing list.

The Chair displayed the definitions and Table 1 as examples of some of the changes. The temperature rise was specifically noted, since the table now shows a range of acceptable temperatures, rather than a fixed number, with a corresponding range of reference temperatures. The Chair cited the precedent set by dry-type standards where, multiple temperature rises are acceptable, depending on the temperature capability of the insulation system selected. A short discussion resulted with George Reitter clarifying that there would be only one reference temperature equal to the temperature rise plus 20°C. Don Platts stated that the range made it look more like a guide than a standard.

Dinesh Sankurakurup noted an apparent inconsistency in Table 1 which refers to "hottest spot temperature rise for conventional solid insulation", compared to "winding hottest spot temperature" found in a table in IEEE Std 1276. After comparing the wording of the two documents, the Chair presented one explanation by referring to the definition section of the document, where the modifier "conventional" is elaborated. The Chair also stated that he felt a more general limit was necessary rather than referring specifically to the winding hottest spot, since there may be other hot areas than just the winding.

The discussion moved on to written comments to Draft 4 that the Chair had received before the meeting, provided by Hasse Nordman, Michael Botti, Eduardo Tolcachir and Vijayant Krishnamurthy. Due to a shortage of time, only short presentations were made by those who had commented. The Chair noted that these comments would be sent to the group for a closer review.

A brief discussion took place concerning the preliminary natural ester annex submittal by John Luksich, which was developed along with Don Cherry. The text was reviewed by the Chair who requested that the annex be expanded to include high temperature application and support for the temperature limits established in the standard. Since John lead the effort but was not present, Patrick McShane and Jerry Corkran were requested to relate the request. The annex will be circulated to the group for comments after the upgrade.

The Chair requested ideas on how shell form technology could be included in the document after receiving a request for the addition. Mathieu Sauzay agreed to review the possibility and report back before the next meeting.

Draft 5 is expected to be circulated before the fall meeting. The WG was requested to review the draft 4 document and make comments or suggestions which would be incorporated into the next draft.

The meeting adjourned at 3:05

9.1.4.5 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 2010 Transformer's Committee meeting. Jin Sim briefly reported that the current draft does not meet the objectives of the Task Force. He commented on the following:

- some methodologies are not accurate
- the need to address moisture in the hot spot location
- adding a CIGRE evaluation report

9.1.4.6 Task Force on Furan Testing – Kent Haggerty

Don Platts reported on the meeting activity. Kent Haggerty will resign as chair of the task force due to personal issues. A volunteer to head the task force has stepped forward. The task force has been developing a document that will be completed soon. The issue today is how this paper can be presented as the document is currently over thirty pages and eight pages is the limit for IEEE Transactions. Changes to the IEEE Transformers Committee O&P manual may assist in the solution. The task force is still asking that data from all sources continue to be provided.

9.1.4.7 Task Force on Winding Temperature Indicators - Phil McClure

The Task Force on Winding Temperature Indicators did not meet during the Spring 2010 Transformer's Committee meeting.

A discussion took place regarding what to do with this Task Force. It was suggested that a vote be held to disband the Task Force due to lack of interest.

9.1.4.8 Task Force on Metallic Surface Temperatures – Jeff Ray

The meeting was called to order by the Chair.

Roll was taken and it was determined that there were 11 of the 13 members present. There were 42 guests in attendance and 6 of them requested membership in the TF. The 53 attendees were asked to introduce themselves.

An attendance roster was circulated.

Minutes of the F2009 meeting were approved.

The IEEE patent disclosure regulations were noted. No one had any items to bring forward.

The subject of this TF was reviewed by the Chair for the benefit of new guests.

The following paragraphs were introduced at proposed modifications to C57.12.00, section 5.11.1.3 to clarify temperature rise limits for non-current carrying surfaces inside a liquid-filled transformer.

C57.12.00 is rather vague on this matter, stating: "… shall not attain excessive temperature rises at max rated load".

> *5.11.1.3 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.

Suggested wording:

Metallic parts other than those described above shall not attain excessive temperature rises at maximum rated load. Excessive temperature shall be interpreted to mean a temperature that exceeds the operational temperature rating of the insulation material that is in contact with the metallic part[1]. This limit applies to all solid or liquid insulation materials.

[1] The temperature rise for non-thermally upgraded celhulose based materials shall not exceed 65C, for limits on other materials refer to C57.154-xxxx [if/when it becomes a standard]

- After much discussion, it was determined that the group present was not in favor of adding the footnote (in red) shown above.
- At this point, the group was asked whether they would support the proposed wording (in blue above), if it was presented for balloting in a future revision of C57.12.00. Six people (not sure if members or guests) said they would vote negative unless the last sentence concerning liquid insulation was deleted. They felt temperature limits for liquid insulation are already covered adequately in the IEEE standards.
- Some members indicated a preference to leave the wording about liquid insulation, but said they would not strongly object if it was deleted.
- Chair indicated, he would circulate both versions (with and w/o liquid insulation wording) to the membership to vote on which version they prefer. The results of this straw poll will be presented at the F2010 meeting in Toronto.
- The meeting was then adjourned.

9.1.5 Old Business

9.1.5.1 Should We Establish A 75 Degree C Rise?

A discussion took place regarding the need for a 75 degree C rise transformer. Jin Sim suggested that the WG on High Temperature Transformers would be an appropriate group to address the issues related to such transformers. It was recommended that the Subcommittee be surveyed regarding this issue.

9.1.6 New Business

Joe Foldi asked what the correct hot spot temperature rise is for transformers using the reduced average winding temperature rise of 55 degree C. As time ran out there was little discussion and no resolution.

9.1.7 The meeting adjourned at approximately 9:15 AM.

Bruce Forsyth
Chair, Insulation Life Subcommittee

9.2 Performance Characteristics Subcommittee – Stephen Antosz, Chairman; Ed teNyenhuis, Vice-Chair; Craig Stiegemeier, Secretary

9.2.1 Introduction / Attendance

The Performance Characteristics Subcommittee (PCS) met on Wednesday, March 10, 2010 with 62 members and 43 guests in attendance. 8 of those guests requested membership. Prior to this meeting, the total membership of PCS was 121 members; therefore with 62 present, we did have a 50% quorum.

9.2.2 Approval of Meeting Minutes

The minutes of the last meeting in Lombard, IL were approved as written.

9.2.3 Chairman's Remarks

9.2.3.1 Administrative Subcommittee Notes

Upcoming IEEE – PES Meetings

- IEEE T&D Conference & Expo: April 19-22, 2010 New Orleans, LA
- PES General Meeting: July 26 – 30, 2010, Minneapolis, MN. There will be 16 papers presented there; sponsored by the Transformers Committee.
- Next Transformer Committee meeting dates and locations is as follows:
  - Fall 2010, October 24-28, – Toronto, ON, Canada; Hilton Hotel Downtown; hosted by Trench Ltd.
  - Spring 2011, April 10-14, – San Diego, CA; Catamaran Hotel at Mission Bay; hosted by San Diego Gas & Electric.

Quorums and Rosters:

1. The Officers feel that the best way to get a quorum is to have a bona fide roster, representative of **active** members.
2. WG Chairs (or Secretary) must maintain accurate and up-to-date list of active members and attendance. AM system has tools to make this easy.
3. Admin SC is working on a Working Group Practices & Procedures (P&P) Manual, which will contain some guidance on this subject.
4. The consensus seems to be that people who have not attended the previous 2 meetings of a WG should be removed from the roster, unless they express a desire to stay on and participate. An option is to consider them a 'Corresponding Member'.
5. New members should not automatically be added unless there is a commitment of participation.

Update on status of revisions of C57.12.00-2006 and C57.12.90-2006:

- 12.00 is in (final) recirculation.
- 12.90 has been waiting for 12.00 to catch up, and now is ready for final recirculation prior to submittal to IEEE.

New WG or TF Chairmen should see Ed Smith or Greg Anderson for a copy of the handbook on Robert's Rules of Order.

The Chair accepted Craig Stiegemeier as the new PCS Secretary. Thanks to Craig for accepting this post.

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

9.2.4.1 WG on Loss Evaluation Guide C57.120 – Don Duckett, Chair; Alan Traut, Vice-Chair

PAR Status: PAR Request Submitted to IEEE

Attendance: 54 Total. 14 of 25 Members present. 1 Requesting membership. 40 Guests.

Chair reported that Don Duckett, WG Chair, was not able to attend this meeting due to sudden, unexpected health reasons and that Al Traut, WG Vice-Chair, would preside at this meeting. Alan Wilks volunteered to serve as acting Secretary for this meeting.

Attendance of membership was taken and 14 of 25 members were present therefore a quorum was established. The minutes of the Fall 2009 Lombard 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 PAR for revision of C57.120 has been submitted to IEEE and is on the March 24, 2010 NESCOM agenda. The title, scope and purpose as submitted in the PAR are as follows:

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 following participants volunteered to assist in the development of C57.120/D1 prior to the Fall 2010 Toronto meeting. David Harris, Jerry Allen, Steve Shull, Jose Izquierdo, Jerry Murphy, Gael Kennedy, C.R. Bell.

There was no other new business.

9.2.4.2 PCS WG on "Test Code C57.12.90" – Mark Perkins, Chairman; Kirk Robbins, Secretary

The meeting of the Working Group on PCS Revisions to C57.12.90 took place at 9:30am on March 8, 2010. The Chair for the meeting was Mark Perkins (Steve Antosz substitute as Mark could not attend) and Craig Stiegemeier performed Secretary duties. (Kirk Robbins was also unable to be in Houston)

1. Introduction of members and guests
   A total of 71 people attended the meeting, of which 35 were members and 36 were guests of the Working Group.
2. Patents
   - A call for knowledge of any patent issues was made, and no patent issues were identified by any of the attendees.
3. Approval of minutes of the Lombard Meeting

- Motion and second, minutes approved unanimously

4. Old Business
   - Revision of Section 6 & 7. Polarity and Phase relation tests and ratio tests – the latest changes still need to be surveyed.
     - Clause 7.1.4 Three-phase transformers with inaccessible neutrals - ratio tests was reviewed – method B will be removed from the document to address Dennis Marlowe's concern, so the new method A will be the only one in the standard.
   - Section 12 on short circuit testing – Marcel Fortin
     - Marcel's Task Force has finished their work – he was not at the WG meeting so we could not clarify the concern. He'll need to provide more information if anything else needs addressed.
   - Testing of buried tertiary windings – Ratio, polarity and resistance, review suggested change submitted by Subhash Tuli.
     - Subash suggested that buried tertiary windings be tested for:
       - Turns Ratio Test
       - Insulation Resistance (Megger) test
       - DC Resistance Test
     - Steve Snyder noted that this was brought up some time ago in the C57.12.00, and the tests were not identified as they didn't want to call out tests that cannot be repeated in the field. This was addressed and resolved in October 2008.
     - The terms "tertiary" and/or "stabilizing winding" also needs clarified in C57.12.00 as they are not necessarily the same thing.
5. New Business
   - None

9.2.4.3 PCS WG on "Guide for the Application and Interpretation of Frequency Response Analysis for Oil Immersed Transformers", PC57.149 — Chairman; Charles Sweetser

There were 58 people in attendance.

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

The minutes from the Lombard, IL 2010 meeting were approved by unanimous vote.

Draft 8 was presented to the Working Group, which the final "formatted draft" that that will be submitted for the balloting process.

Peter Balma provided the formatted draft to the group. The Working Group Chair presented a brief report on what had been prepared for this final "formatted draft." The document has not been technically edited or has additional contributions been made this time around. The only changes are as follows:

1.) The member list has been seriously edited (shortened).
2.) Line numbering has been added to each page for reference during balloting process.
3.) Several basic format changes, such as bullets and numbering; nothing technical has been edited.
4.) Add missing Introduction Section to the document format requirement:
"Frequency Response Analysis (FRA) testing has gained popularity for assessing the mechanical integrity of oil immersed transformer. Due to limited understanding and available information regarding FRA requirements and specifications for instrumentation, procedures for performing the tests, and analysis of results, the

Performance Characteristics Subcommittee formed the Working Group PC57.149. The primary objective of the Working Group PC57.149 was to compile and validate FRA experiences and techniques to develop a trail-use FRA application and interpretation guide that would benefit the industry".

Technical Comments Submitted:

- The definition in Section 2.24 - Winding Self Admittance is misleading for the FRA application; it is recommended that it be removed.
- We have changed the "wording" from Transfer Admittance TA/Inter-Winding IW to Capacitive Inter-Winding and Inductive Inter-winding. All configuration tables need to be updated
- Add a note: describe how an Auto tertiary is connected during measurement, e.g. if only two terminals brought out they should be connected together, but preferably not connected to ground.
- The applied voltage can influence the Open measurements at low frequencies. The applied voltage level should be stored in data file.

Editorial Comments Submitted:

- Add to end of statement: "Refer to clause 4.7 for details."
- Referenced clause should be "Clause 4.4."
- Some may find the explanation for item c objectionable; perhaps it could be changed to: "for procedural documentation and auditing" or something similar.
- Short circuit impedance is listed, but the relationship to FRA as noted in 6.2.2 is not provided.
- Figure 5 – the dotted box section of the figure indicates an amplitude change – to see it I had to magnify the figure to 200% - so it's not going to be very apparent once the standard is published if the intent was to show a change in impedance – if this is the case, we probably should include that in the figure title.

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

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

The WG met at 3:15 PM on Monday, March 8, 2010 with **30** members and **54** guests present. The current Working Group membership stands at **87** members ; therefore we did not have a quorum. The chairman stated that he will review and revise the working group roster before the next meeting to limit the membership to active participants. The following seven (7) guests requested membership, however new members will be accepted only after attending two (2) consecutive meetings. Therefore, their membership will be effective after attending the next WG meeting:

Jose Gamboa	Siemens
Krishnamurthy Vijayan	CG Power System Canada
Peter W.Derner	ABB Inc.
Roger Verdolin	ENMAX
Shankar Nambi	Bechtel
Steve Schroeder	ABB
Steven Schappell	Waukesha Electric Systems

Following introductions, the minutes of the October 26, 2009 Lombard meeting were noted as having been posted on the committee web site since the October meeting, but lacking a quorum at this meeting no action was taken for approval. 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. Draft 3 of the Standard was recirculated in December last year, with one new negative received. New draft 4 was launched March 2, closing March 12.

The meeting began with Old Business, WG item 82:

WG Item 82, Clause 7.1.4.4 Stabilizing Windings

Addresses an issue raised in 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.

A report was received from the Tertiary Stabilizing Windings Task Force chairman Enrique Betancourt. Enrique presented a summary of the task force work since the prior meeting, including proposed wording for a new Clause within C57.12.00 that would address the thermal rating of stabilizing windings. It was clarified that the short circuit duty of stabilizing windings was considered appropriately covered within Clause 7.1.4.4 of C57.12.00.

There was some discussion from the floor, addressing a better specification of allowable winding temperatures and additions to clarify what is meant under “unbalanced loads on the main windings”. The chairman encouraged submittal of further comments on the proposed wording, before submitting the new Clause for survey within the Performance Characteristics SC. Further discussion on the same subject would be part of the agenda for the next TF Meeting, scheduled for the following day, March 9, 2010.

The question was raised if the current scope of work for TF Tertiary Stabilizing Windings included the testing of those windings for DC resistance, ratio, phase angle, polarity, etc.. The WG chair reported that subject had already been addressed and resolved within a previous WG meeting, with the conclusion of the WG that a factory test which cannot be repeated in the field is considered a quality assurance test, and does not belong in the standard.

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

This item is based on a comment (negative ballot from 2006) that the system short circuit current levels listed in Table 18 are unrealistically high, leading to designs that may be uneconomical. The suggestion was to limit these assumed fault current levels to 63 kA and lower. This topic was first brought up for discussion at the previous meeting, where it was determined more information was needed for a proper evaluation of the suggestion. Subsequently, the chairman conducted a survey of various participants asking for their input. This feedback was presented in the meeting materials sent to the members, and is posted on the web site. One utility participant explained that the data they provided were for projected values of system short circuit currents expected for the next decades (in order of 50 years), and that today’s figures are about 60% of those levels. Discussion continued on the calculation of short circuit power based on rated system voltage (as shown today) versus maximum system voltage (a possible consideration).

While this feedback is useful, it was felt that additional information is still needed, so the chairman has made a request to the Transformers Committee Standards Coordinator to solicit feedback from other entities outside the Transformers Committee. It is expected that additional information will be available prior to the next meeting, so the topic will be continued in the next WG meeting.

Under New Business, the discussion began with WG item 90:

WG Item 90, Section 4.1.8 Step down operation

This item is based on a comment received during the 2008 ballot of C57.12.00 where the balloter suggested this clause be changed to state : "Transformers shall be designed for step-down or step-up operation or both, as specified by the user." The discussion was open to the floor. A comment was made that there is currently a note on Table 10 (Nameplate Information) in the standard that states: "the nameplate shall state when the transformer is suitable for step-up operation". It was also pointed out that the question on suitability of transformers for bidirectional flow will come up more frequently with distributed generation facilities. Finally, it was stated that the standard should set a basic requirement and not list all the possible options, forcing the user to specify. The general consensus of the WG was for leaving the wording of the standard as it is - no further action proposed.

9.2.4.4.1 Task Force on Tertiary/Stabilizing Windings Enrique Betancourt

The Task Force Group met at 11:00 AM on Tuesday, March 9, 2010 with **16** members and **51** guests present. There were **11** (eleven) guests that stated interest on further participating as members of the Task Force.

Bill Griesacker	Doble Engineering
Eduardo Tolcachir	Tubos Transelectric
Hemchandra Shertukde	University of Hartford
Jennifer Yu	Pacific Gas and Electric
Jose Izquierdo	Siemens Transformadores
Jose M. Lopez-Fernandez	University of Vigo
Kiran Vedante	ABB Inc.
Leandro Paladini	Siemens Brazil
Mark McNally	Kansas City Power and Light
Shankar Nambi	Bechtel Power
Stephen Antosz	Pennsylvania Transformer

Following introductions, with 12 of 24 members present, the minutes from the previous meeting were approved. Working Group 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.

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

The TF Tertiary Stabilizing Windings was formed to address an issue raised on 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.

Following the progress of the TF activity, a new version of the proposed clause for thermal rating of Stabilizing Windings was presented for discussion. Following text includes in bold the changes proposed during the meeting:

> "Stabilizing windings shall be designed to withstand thermal duty of the circulating current resulting from temporary load and, or voltage unbalance on the main windings, as specified by the user. Main windings' unbalanced load currents and, or supply voltages should be specified in magnitude, angle and duration by the user, 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 specification, the manufacturer shall design the stabilizing winding considering the circulating current resulting from a full single phase load in the **largest** main secondary winding (33.3% of the transformer rating, or 33.3% ~~equivalent two winding rating~~ [**to rephrase this statement**] of autotransformer) and infinite bus supply from the primary winding.
>
> The manufacturer shall verify transient and continuous loading calculations for stabilizing windings temperatures, in order to demonstrate adequacy to requirements established in foregoing clauses. Initial conditions for those calculations will be considered as the transformer or autotransformer operating at its maximum continuous rating, before switching to the single phase loading conditions specified. Manufacturer to provide the user the calculated values of hotspot and average temperatures for stabilizing winding to demostrate that they comply with maximum allowable temperatures."

As a result of the discussions, some editorial changes will be addressed by volunteers within the TF membership, and the new Clause will be circulated within the PCS for further comments.

2. New Business

2.1 A new question was then discussed: Should every delta-connected Tertiary Winding comply with what is established here for Stabilizing Windings?

The TF Chairman recommended not to change the proposed clause, as for the case of Tertiary Windings, the performance under balanced loads is specified by the users, and tested by the manufacturers. Further, as tertiary windings have terminals brought out, their performance can be tested for every combination of balanced and unbalanced loads. There were no further comments.

2.2 Discussion on the extension of the scope for the TF towards development of an Application Guide for Tertiary and Stabilizing Windings, or to start with preparation of a "Position Paper", to call attention upon the relevance of our subject matter.

A quick count within attendance gave 19 people in favor of the Guide, none for the Position Paper, and two people for "no further action".

The request will be submitted to the chairman of the PCS for evaluation.

For the next meeting of the TF, one of the members (Xose Lopez-Fernandez) will present a report on application of tertiary and stabilizing windings within an european utility, and the chairman of the TF will request inputs to compose a brief tutorial on modelling of tertiary windings. Mr. S. Patel, TF member, made a paper on Application of Tertiary Windings available for the rest of the TF participants.

In preparation for a positive response regarding development of the new guide, some topics on the New Guide were just sketched:

1. Need for the Guide
2. Function of the Stabilizing and Tertiary windings
2.1 In the Transformer (Models)
2.2 In the Network
3. Application of SWs and TWs
3.1 Network interconnection transformers and autotransformers (1P, 3P)
3.2 Primary Distribution transformers (3P)
3.3 Windfarm Collector transformers (3P)
3.4 Other
4. Behavior (performance) of transformers with SW/TW under short circuit
5. Behavior under transient and continuous unbalanced conditions on main windings
5.1 Unbalanced loads
5.2 Unbalanced voltages
6. Behaviour of Transformers and Autotransformers without SW/TW
7. (Recommendations for design and testing?)

The meeting was adjourned at 12:00 PM.

After the minutes were read at the PCS meeting, a discussion of scope definition of this Task Force was held. The SC Chair asked the TF Chair to come up with a scope definition and to bring it to the next meeting to review and accept or modify.

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

The WG was called to order at 9:30 AM on March 9, 2010. There were 21 attendees: 7 members and 14 guests, with 2 requesting membership. Copies of the previous minutes and Draft 8 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. It was determined that a quorum was present.
3. The minutes from the Lombard, Illinois meeting on October 27, 2009 were approved.
4. The PAR has been modified to remove capacitors from the scope, and was approved. A PAR extension was also requested and approved.
5. Copyright request will be needed for use of material on ground fault neutralizers. Peter Balma volunteered to initiate this process.
6. The group would like to have a straw ballot of the Performance Characteristics subcommittee by June or July of this year
7. The working group had an extensive discussion concerning Draft 8 of the document.
   - Table 8, the dielectric table for this standard, was discussed in detail. It was suggested that a single table trying to describe all devices might not be practical.

After group discussion, a motion was made to separate the tables for each device and to include them in the appropriate clauses. The motion was seconded, and after discussion, was approved by a majority vote. The following individuals volunteered to develop the new tables.

- Resistors Sergio Panetta
- Ground fault neutralizers -Richard Dudley/Klaus Pointner
- Transformers Devki Sharma

Combination devices will refer to the individual devices of which the combination device is composed. Based on this decision the need for Table 6 was questioned, and Sergio Panetta volunteered to provide an example of including this table with the dielectric table he is preparing for resistors.

- Limiting temperatures and multipliers, Table 9 and 10 of the document, were discussed. Can the table be updated and/or if it should be eliminated. It was indicated that grounding transformers manufacturers are still using the table, but that manufacturers of other grounding devices were not utilizing it. There was also discussion of related Table 4, and it was suggested that the table could be removed and clause 6.2.1 revised accordingly. It was decided that the information could be provided in different formats for each device. The following individuals volunteered to develop new input.
  - Resistors Sergio Panetta
  - Reactors Michael Sharp
  - Ground fault neutralizers -Richard Dudley/Klaus Pointner
  - Transformers Sheldon Kennedy
- There was a discussion of Table 1, insulating material, and it will be reviewed with IEEE Std.1. Steve Schappell volunteered to do this.
- The subject of minimum temperatures for grounding devices was reviewed. A motion was made to utilize -20C as the usual minimum temperature condition for grounding devices, and was approved. Additional wording will be added to Clause 4 to clarify usual and unusual operating temperatures.
- The last sentence in Clause 8.2, stating equipment specific hot spot temperatures, will be eliminated. In addition, the paragraphs discussing DC field-testing in clause 16.2.1.3 will be removed.
- Other general updates and revisions to Draft 8 were reviewed.

8. It was requested that all that volunteered to provide input at this meeting, please complete their assignments within a month and sent to the chair or vice-chair.

9.2.4.6 TF on "Semi–Conductor Rectifier Transformers", C57.18.10 – Sheldon Kennedy, Chairman

The WG met on Tuesday, March 9, 2010 at 3:15 PM with 10 members and 5 guests present. Sheldon Kennedy chaired the meeting. We did not have a quorum.

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 October 27, 2010 meeting in Lombard, Illinois were read but could not be approved due to the lack of a quorum..

This TF is to work on a few special items while we still have the group together.

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 over 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. To date, I have not been able to get approval to share the information.

The chair made a proposal for a clause on electrostatic ground shields. After much discussion, Dhiru Patel and Subhas Sarkar volunteered to offer some revisions to this proposal and submit them before the next meeting.

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. At our meeting in Lombard, Dhiru 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. The Chair submitted a proposal of a general discussion of the topic for the Task Force to consider. It was well received but needs some polishing. Members will give comments to the chair and a more complete proposal will be submitted by next meeting.

There was a discussion about determining the losses in specific regions due to harmonics. IEC has tackled this subject already in an Annex and this should be done in our next revision, as well. An example of the response of the windings to the 5^{th}, 7^{th}, 11^{th}, and 13^{th} harmonic, for instance, is much different than the fundamental current when we examine the leakage fields and loss densities with finite element methods.

There were no further comments. Since we didn't have a quorum, we couldn't make a motion to adjourn, so we all just faded away at 4:15 PM.

9.2.4.7 WG on "Switching Transients Induced by Transformer / Breaker Interaction", PC57.142 – Robert Degeneff, Chairman; Bill Griesacker, Secretary

1. There was no meeting of the working group this session. Bob Degeneff provided a progress report to update the status on PC57.142.
2. The guide was recirculated a second time between January 29 and February 10, 2010. There were 154 eligible voters. 134 voted with 118 voting affirmative, 4 negative, and 12 abstentions. 9 comments were received. This was a 96% affirmative vote.
3. The guide was recircutated a third time between February 25 and March 7, 2010. There were 154 eligible voters. 135 voted with 120 voting affirmative, 3 negative, and 12 abstentions. 15 comments were received. This was a 97% affirmative vote.

4. The guide will be recirculated at least once more before the next meeting in a effort to conclude the balloting portion of the process.

9.2.4.8 WG on "Loss Tolerance and Measurement" – Ed teNyenhuis, Chairman; Andy Steineman, Secretary

There was no meeting of the WG at this Houston conference, but Chair Ed teNyenhuis provided a brief status report. Ed noted that this guide has gone out for ballot and two recirculations. Changes have been made to be in line with specific comments of reference to C57.12.00.

9.2.5 Old Unfinished Business

1. A question was raised whether or not the Standards should contain a requirement for no-load loss guarantee to be based on testing before or after impulse testing. The Chair noted that there's nothing in the standard to call for no-load measurements before or after impulse testing. A discussion was conducted with the following opinions:

   Phil Hopkinson suggested the measurements should be before impulse. He also suggested that a requirement to measure core losses at 100% before impulse be added to the standard.

   Ramsis Girgis noted that 1-2% additional losses would be expected after impulse testing. After some time, the core losses of a healthy transformer should return to the before impulse measurement. However, if the impulse has reduced the core interlaminar resistance the measurement will not return to the before impulse value.

   Additional discussion was held concerning experience with core losses and it was decided that this issue should be considered further. The chair will forward this subject to Mark Perkins [C57.12.90] and/or Steve Snyder's [C57.12.00] WG.

2. Load loss reference temperature conflict in 12.00 & 12.90; by Sanjib Som. C57.12.00 Clause 5.9 calls for the standard reference temperature for load losses to be 85°C. In C57.12.90 11.1.2.1.1 the temperature rise test calls for losses at rated average winding rise plus 20°C. After brief discussion, it was decided that no change is necessary.

9.2.6 New Business

None

9.3 POWER TRANSFORMERS – TOM LUNDQUIST, CHAIRMAN

The Power Transformers Subcommittee met on Wednesday, March 10th, 2010 at 1:30 p.m. with attendance of 167; comprised of 59 members and 108 guests.

The minutes from the Fall 2009 meeting in Lombard, Illinois were approved with no changes.

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

7.6.1 WORKING GROUP AND TASK FORCE REPORTS

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

The document was submitted to IEEE for editorial review. With the editorial review now complete, the document is ready to be sent out for ballot.

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

A meeting was not held.

Status of ballot resolution:

- Ballot resolution committee convened 16 times since the ballot closed in mid year 2009.
- At the present time we have resolved 414 of the 426 comments (97%).
- The outstanding issues to be resolved all reference the annex section on communications.

Next steps:

- Close out the existing ballot process.
- Open a new ballot pool.
- Complete resolution to the issues in the annex section.

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

The WG did not meet since the Standard was out for balloting during the meeting. Volunteers from the WG will be drafted to help resolve any negative ballots that may occur.

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

The Working Group on Tap Changer Performance met on Monday, March 8, 2010 at 1:45 pm with 5 members and 13 guests present.

The working group chairman asked if anyone in the room had information on patents that may be essential for the implementation of C57.131, *Standard Requirements for Tap Changers*. It was noted that no one present at the meeting expressed knowledge of essential patents.

The working group chairman asked if there were any additions or corrections to the meeting minutes of October 26, 2009. There being no corrections, the minutes were approved.

This brought the working group to the main subject of its agenda: ballot results and comment resolution of Draft 1.5 of the C57.131 revision, *Requirements for Tap Changers*.

The ballot tally was:

117	people in the ballot group
82	affirmative votes
7	negative votes
0	abstentions
89	votes returned (76% return rate)
82	approved (92% affirmative vote)

130 comments were received. Resolution of the comments will require changes to the document and will result in a recirculation ballot. Many of the comments were duplicate or covered different aspects of the same issue. These comments were combined to create a list of 68 issues, concerns, and corrections. Each of these needs to be addressed with a response.

A comment resolution committee was formed. It has five members at present. The working group chairman will contact a few working group members who were not present to see if we can add one or two more.

The 68 issues, concerns, and corrections ranged from simple corrections, like hyphens, quotation marks, and omissions, to fundamental disagreements about the numbers and quantities specified in the requirements. Many of the concerns address a need for clarification by adding words, phrases, and notes to the current text.

Most of the comments are straightforward, and the response should be straightforward. The remaining time allotted to the working group was spent in discussion of a few

comments selected for discussion because they are not straightforward. The meeting was adjourned at 3:00 pm.

7.6.1.5 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 18 of 32 members present with 57 guests and 9 guests requesting membership. Only guests requesting membership that actually participate in the effort to get the Guide to ballot at this point would be considered for membership. At this time, only one of the guests (Diego Robalino) requesting membership will be considered for addition to the WG pending follow-through on his volunteering to provide substantive review of the overall guide.

Agenda:

1. Introductions/Roll Call
2. Patent Issues
3. Approval of Fall 2009, Lombard, Illinois Minutes
4. Status and steps ahead
5. Review of Contributor List
6. Adjourn

Member Roll Call was done. Results are provided above.
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 Fall 2009 Lombard, Illinois 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.
Greg introduced the following guests present to talk to the group on ocean and rail shipping logistics.

Peter van den Berg – Rickmers-Linie (ocean)
Steve Garifalos – Rickmers-Linie (ocean)
Jerry Collins – Kavanagh Logistics Managements (rail)
Glenn Kavanagh – Kavanagh Logistics Managements (rail)

Presentation by Rickmers-Linie – Peter van den Berg

Rickmers has nine ships that operate worldwide. The ships have 320T cranes and can combine these for a maximum of 640T lifting capability. A video showing the pitching and rolling that these ships can see was presented. He discussed the 6 degrees of motion that a ship can see.

The influence of a ship's size and speed in relation to length and speed and the associated acceleration values were presented.

Transformers to be transported over the ocean may need to be capable of shoring to prevent tipping of the equipment. This needs to be considered in the design of the equipment. Transformers with waffle type bases can be problematic in the event of tipping.

Presentation by Kavenagh Logistics – Jerry Collins and Glenn Kavanagh

Jerry Collins gave a presentation on the North American railroad consolidations that have resulted in only 7 remaining railroads (BNSF, Canadian National Railway, Canadian Pacific Railroad, CSX Transportation, Kansas City Southern Railway, Norfolk Southern Railway, and Union Pacific Railroad) as well as marketing and pricing changes that are being seen. The US railroads were deregulated in 1980 (Staggers Rail Act).

Glenn Kavanaugh gave a presentation on the rail clearances and clearance parameters. Safety margins have been increased and equipment that may have previously cleared may not today. More time is required to obtain clearances and some railroads are now charging for clearance requests. Critical items are width/height, width at top and bottom, offset centers of gravity, restrictions are very route specific, and each railroad has its own clearance criteria.

Optimizing Rail Operations is a priority with the railroads. Dimensional shipments are disruptive and transit times are unpredictable. Railroads hold hi-wide cars to consolidate them and special trains now are being required more often for multiple speed restrictions in the route. A current decline in volume has not helped.

He also indicated that special rail cars are in limited supply and need to be arranged for in advance.

A request for draft document reviewers to look at the document from start to finish looking for duplication of information and organization of the document was made. Martin Heathcoat, Dick Amos, and Diego Robalino volunteered to do a general review of the document.

Meeting was adjourned at 4:23 pm.

7.6.1.6 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 March 9, 2010. There were 44 attendees, 21 members, and 23 guests with 1 requesting membership. A quorum was not present. This TF has been in existence for a number of years. According to the roster there are 113 members. Regular attendance at meetings has been much lower – approx 25 members and 25 guests. A message will be sent to the members using the listserv to confirm membership on the TF. There were no patents to disclose. Reviewed the Agenda for the meeting, and the Minutes from the October 27, 2009, meeting in Lombard, Illinois, were approved.

1. Presentation by Larry Dix on Functional Life Test

   Explored significant aspects important to each manufacturer when conducting the test.

2. Paper review of Comments by Bengt-Olof Stenestam

   General view of the functional life test
   Uncertainties
   Statistical variations
   Acceptance criteria
   Start resistance – difference between new contacts and old contacts

3. Comments by Reinhausen and others were not addressed due to time constraints.

4. Tentative paper

   Posted on the IEEE website. Members are requested to review the paper and to determine
   - Authors
   - Venue: Panel Session or Transaction
   - Timing

   It is intended for a reference in C57.131 to the paper. Could be published with a number as a trial-use guide, which would make it easier to find.

5. New Business: There was no new business.

The meeting adjourned at 10:45 AM.

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

The Working Group met on Tuesday, March 9th, 2010 with a total of 13 in attendance. The group's membership is 31 so a quorum was not reached. The latest draft had been distributed to the group for a straw ballot and to the IEEE for Mandatory Editorial Coordination and the comments from those reviews were discussed. The group discussed all of the IEEE recommendations and as many of the technical comments as possible during the meeting time and the consensus opinions of those discussions will be submitted to the full group via e-mail within the next couple of weeks for official resolution.

There were no objections to implementing all of the IEEE editorial review comments which covered standard formatting, the inclusion of an Abstract and Key Words, normative references and reference citations. All referenced citations will remain, but the reference to IEEE 100 will be deleted and the other references that are not cited in the body of the document will be moved from the Normative reference section to the Bibliography. The discussions also led to a recommendation to include dual IEEE/IEC standard references for all reference citations in the text and to include the IEC standards in the Normative reference section as well.

Several graphical formatting issues and some figure numbering errors were pointed out by the straw ballot review and the group recommended their corrections. The use of the terms "primary" and "secondary" were questioned in the comments from the review and the group recommended that the document be reviewed to be consistent in using "S" and "L" to describe the PST terminals and to only use "primary" or "secondary" where they do not refer to the PST terminals (such as "CT secondary wiring…").

The discussions of the technical comments from the straw ballot review focused on the need to include a requirement for the specifier to include any requirements that they may have for phase angle shift under load. Further discussions showed that the specification of phase shifting transformers has other criteria to consider as well, particularly if the phase shifter is required to match the operating properties of other PST's for applications like parallel operation or replacement of existing units. Mr. Sanjay Patel volunteered to draft a paragraph to include under Section 12.3 and as a brief tutorial under Section 4.8.1 to cover the details.

Jin Sim, Sanjay Patel, Joe Watson and Tom Lundquist will discuss the few remaining technical comments within the next week via conference call and include further recommendation for their resolution in the e-mail ballot.

The proposal to be put forward to the full group by e-mail will be:

- To accept the IEEE editorial review formatting and document style comments
- To add to the normative references
    - IEC 60076-1, 60076-3 and 60076-5 and include as dual references whenever C57.12.00 or C57.12.90 are cited
    - IEC 60076-7 and include as dual references whenever C57.91 is cited

    - IEC 60137 and include as dual references whenever C57.19.00, C57.19.01 or C57.19.100 are cited
    - No IEC standard will be dual-referenced for C57.12.10
- To keep the following standards in the Normative references
    - C57.12.00 w/o the date reference
    - C57.12.10 with the date reference (list in Clause 7)
    - C57.12.70 w/o the date reference (list in Clause 7)
    - C57.12.80 with the date reference
    - C57.12.90 w/o the date reference
    - C57.19.00 w/o the date reference(list in Clause 7)
    - IEEE 693 w/o the date reference
    - C37.90.1 with the date reference
    - C57.131 w/o the date reference (list in Clause 7)
- To move the following standards from the Normative references to the Bibliography
    - C92.1
    - C57.93
    - C57.19.100
    - C57.19.01
    - C57.91
- To delete IEEE 100 from the Normative references and do not include in the Bibliography
- To change the word “specifical” in the Abstract to “specific”
- To renumber Figure 4 on page 16– it should be Figure 5
- To reformat the figures and equations per Mathieu Sauzay comments
- To include the additional text under sections 4.8.1 and 12.3 (phase shift under load, impedance, control, etc). The revised document will be included with the proposal
- To move second sentence of 3.1 to end of 4.2
- To approve the revisions dealing with the terms “primary” and “secondary.”
- Bibliographic citations in the body of the document will be redone per the recommendation

Note that a revised draft will be attached with the e-mail proposal for review, and additional recommendations may be included following the review of the remaining technical comments.

Having no quorum, the meeting was unable to adjourn.

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

1. No meeting was held.
2. The Ballot Resolution Committee has completed their work and submitted their review and recommendations to the Chair.
3. Proposed Time Table for Re-Circulation is as follows:
   - The Chair will be getting in touch with negative balloters with regard to obtaining agreement with changes proposed which were different from their suggested change.
   - C57.12.10 Draft 5.0 will be edited in parallel and readied for re-circulation
   - Goal is to move the new draft to re-circulation in April

7.6.1.9 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, March 9, 2010 – 11:00 am to 12:15 pm.

Attendees: 2 members + 5 guests

The meeting began at 11:00 am.

The meeting minutes from the October 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 #6. This latest draft was reviewed during the meeting. 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 previously made to add Frequency Response Analysis to the list of tests. The latest draft #6 has a total of four points in the test sequence where FRA test is performed on a prototype transformer for qualification. The reason

for including the four separate FRA tests was 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 both the short-circuit test and the seismic test in order to more accurately determine if any movement of the core or windings has occurred. Since there are not yet any published standards or guides on FRA testing, a note will be added to explain the reason for including the FRA testing in the test sequence, and that interpretation of the FRA testing results should be discussed between the user and the manufacturer.

The current planned schedule for the working group is to have the document finished within the next month. We will then send the document out to working group members for a vote to submit the document for Mandatory Editorial Review in June 2010. At this time we will also start developing a balloting pool for this document. The IEEE PES Nuclear Power Engineering Committee (NPEC) will be included in the list of committees to participate in the balloting pool.

The meeting adjourned at 12:15 pm.

7.6.1.10 WORKING GROUP FOR DEVELOPMENT OF PC57.153, GUIDE FOR PARALLELING TRANSFOREMRS – Tom Jauch, Chairman

Members: 16
Guests: 12
New Attendees Requesting Membership: 4
New attendees requesting guest status: 4
Introductions
No patent issues
Polled the audience to ensure we met quorum requirements
Minutes from fall, 2009 were discussed, motioned and approved
General discussion during the meeting included the following:

- Original par schedule required first ballot in January, 2010 so we need to get this back on track.
- Reviewed proposed outline and asked for comments. A proposal was made to move 2.6 (Reasons for Paralleling) after 2.1 (Definition of Paralleled Transformers). No negative comments so we will proceed with this.
- Under goals of paralleling – a proposal was made to add “Minimize Losses” – No objections so this will be added.
- Phase diagrams should be used as necessary when describing paralleling methods.
- The names and the number of paralleling methods. Presently, the following methods will be covered in this guide:

  4.1 Master / Follower Method
  4.2 Power Factor Method

4.3 Negative Reactance Method
4.4 Circulating Current Method
4.5 Circulating Reactive Current (var Balancing) Method

- The section prepared for Master/Follower was reviewed by the working group. Discussions during the presentation included the following:
    - Follower feedback methods
        - Discussed variations of cam switch inputs that could be used in place of odd/even
        - Other methods used will be considered
- The working group discussed the definition and operation of matched impedances
    - C57.12.10 defines matched impedances as +/-10%. Since our definition of matched impedances differs from what is defined in other standards, we will need to define matched impedances in the guide.
    - The guide needs to identify what base (rating) impedances should be matched at. Matched impedances should allow all transformers to carry their maximum load
    - The effect of manufacturing tolerances needs to be considered. The impedance of "identical" transformers will typically vary by 2-3% (i.e. 10% and 10.2 %). This is the normally acceptable manufacturing tolerance.
    - The version of C57.12.10 presently out for ballot includes examples of impedance matched transformers. Our guide should include the same examples. Dave Harris to follow up.
- The working group decided this guide would not cover the use of a single control to operate multiple phases such as regulators or single phase transformers. This operation, although a Master/Follower type of operation, does not constitute transformer paralleling.

Working group adjourned at 4:30pm.

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

The task force met Monday Mar 8, 2010 at 11:00 AM.

Attendance was 74 (16 members, 58 guests). We did not have a quorum.

Peter Zhao as Chairman presented the agenda.
Knowledge of patent disclosures was requested, none cited.
Peter briefly outlined the past work of this TF and the IEEE paper that was published.
He then explained that one of the next steps was to create a PAR.
He presented a draft of wording for Title, Scope and Purpose that would be used in a PAR. Since there was not a quorum, a vote could not be made. In lieu of this, suggestions as to content were solicited from the attendees.

Concerning the Title, the attendees voted 42 in favour of version 1 and 9 in favour of version 2. Roland James suggested that the words “mineral oil” be replaced by “liquid immersed” as he had to do the same when developing C57.140. Several others had similar suggestions.

Concerning the Scope, it was suggested to add reactors, add topics related to the consequence of rupture, add instrument transformers and add radiators and piping.
Tom Lundquist advised that the scope must have content specific to the document and not contain definitions.

Concerning the Purpose, it was suggested to eliminate the first sentence and to simplify and reduce the content.

Tom Lundquist suggested that the TF members only work and agree on the wording for the PAR and resubmit for approval. He also suggested a review of the working group membership to ensure that only the active people are members.

Mark Fota summarized the work on CIGRE TF A2.33 entitled Transformer Fire Safety Practices. This is still in the development phase and includes topics such as fire walls, spill containment and fire suppression systems.

Peter outlined the status of the submissions to the application guide. As it stands, this is an unofficial document because a PAR has not been approved and as such can’t be circulated beyond the participating members. Arnold Carlos gave an overview of the section on acceptance evaluation that was drafted by Dan Perco. Arnold explained that one of the key problems is how to define testing of the final product.

Comments from the floor included how to evaluate whether the relief systems will function after years of service and that certification of the welding should be included.

Peter advised of the upcoming tank rupture tutorial Mar 9 at 4:45 PM

The meeting adjourned at 12:15

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

TF DPV Grid Transformers – Spring 2010 – Houston – Monday March 8

Patent disclosure: no problem raised

Rosters & Quorum:
13 members (out of 20 existing), 8 guests were present. 5 requested membership; 6 attended as observers.
We had a quorum.

Minutes of the previous meeting where approved.

Homework
6 members had done their home work (see completed table below), and 3 proposed to review unaffected standards for the next meeting (see completed table below for both subject coverage and homework). Std 1547.1.3 was corrected to Std 1547.4.
This table shows that, at this stage and unless we discover new subject to be addressed, no subject is totally uncovered.

The question was asked whether anyone had had problem with a transformer directly related to the solar panels. No one answered “yes”.

It was suggested we invite Experts from PV solar panel manufacturers and Inverter pack manufacturers to enlighten us of the technology available in the market.

Joe Watson moved a motion “that we start the drafting of a position paper to list the available standards that influence this application for photovoltaic sites and grid transformers.”

After a discussion about the difference between “position” and “technical” paper, and whether the TF should write one or the other, the motion was approved.

Among other subjects that came to discussions were:
- Do we just provide a list of standard?
- Is this a common issue of distributed generation, whatever the kind of sources?
- Are we at a system or equipment level? We must not forget that we are in the PES Transformers Committee

New business: none

Meeting adjourned at 9:0 am.

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

The Task Force on Wind Power Transformers was called to order at 8:05 AM on March 8. There were 110 attendees, 13 members, 97 guests with 25 requesting membership. A survey of members present was conducted and a quorum was present (13 of 21 official members, excluding 2 corresponding members). There were no patents to disclose. The minutes from the meeting held October 26-27, 2009 was accepted as written.

6. Arc Flash Findings Report

John Crotty reported that the survey circulated received only 1 response. The survey will be re-circulated to the manufacturers and users again to see if it gets more responses.

Switchgear documents may have information on arc flash that may be of interest. Marcel Fortin to identify Switchgear documents for arc flash. This list will be submitted to Phil Hopkinson, who will request the documents from Matt Ceglia for TF use.

7. IEC 60076-16 Progress Report

Paul Jarman, IEC TC14 Chairman, reported that the Committee Draft for Voting (CDV) was circulated and closed in January. It received a positive vote and comments received will be addressed by the IEC WG at a future meeting.

Most of the TF members have not seen this document. Jodi Haasz will request permission from IEC for use of the document. The document is not expected to be published until early 2011, so the CDV will be posted. It will be put on a password-protected area of the IEEE website.

8. Discussion on when this TF can become a WG and membership.

The TF will remain a TF until the IEC document is published.
Title/Scope/Purpose of document submitted to the Subcommittee for approval to become a WG. A PAR is then submitted.
TF can review IEC document and develop recommended comments when work begins on the future document. Topics may be:

- Corrosion for offshore
- Arc Flash
- Other topics

Attendance is required at 2 consecutive meetings to become a member. Would become a voting member at the 3rd meeting attended. Electronic meetings held between IEEE Transformer Committee meetings count for this requirement.

IEEE has individual memberships so one cannot designate someone else from their company to represent him in the committee. It is not clear if proxy votes are in the procedures for voting for a member who cannot attend a meeting.

Further discussion on converting this TF to a WG was tabled until the fall meeting. WG status will depend on the progress of the IEC document.

9. Review of 14/618/CDV - Proposed IEC 60076-16

Phil Hopkinson reviewed some highlights of the proposed IEC 60076-16
Table 1 Insulation levels
Clause 4.6 Transient overvoltage

10. New Business: There was no new business.

7.6.2 OLD 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 – Roland James is undertaking the reaffirmation of this standard.

The Working Group for C57.93 was disbanded and will be reinstated when reapproval of the document comes due.

7.6.3 NEW BUSINESS

The TF on Tank Rupture will be changed to a WG starting in the Fall 2010 meeting in Toronto.

7.6.4 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.

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

Fall 2009 - The work of this task force is concluded. A report was issued and it is being considered if an educational paper should be published.

9.4 Underground Transformers and Network Protectors – Carl G. Niemann (Chair), Dan Mulkey (Vice-Chair)

Meeting Minutes – March 10, 2010

9.4.1 Introduction/Attendance

The Underground Transformers and Network Protectors Subcommittee met on Wednesday, March 10, 2010, in the Regency B room of the Omni Houston Hotel in Houston, Texas at 11:00 AM with 7 members and 10 guests present.

9.4.2 Approval of Minutes

The minutes of the October 28, 2009 meeting in Lombard, Illinois were approved as submitted.

9.4.3 Membership

Membership stands at 15 members, so a quorum for this meeting was not met.

9.4.4 Chairman's Remarks

The following Administrative Subcommittee notes were reported to the subcommittee:

- An overview of meeting statistics was provided
- Admin Committee is still finalizing the O&P manual

9.4.5 Working Group Reports

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

1. The WG did not meet. 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.

9.4.5.2 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, March 8, 2010 in the Regency A/B Room of the Omni Houston Hotel. Brian Klaponski acted as the recording secretary.
2. The first discussion was about the roster and membership on this WG and a quorum. There was a quorum for this meeting.
3. An agenda was presented and introductions were made. The meeting was attended by 12 members and 24 guests. One guest requested membership.
4. 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. No one responded as having knowledge about any patents affecting this WG.
5. The Meeting Minutes from the previous meeting in Lombard on October 26, 2009 were reviewed and approved.
6. The Chairman asked if the WG members felt a need to start a new review of this standard as it was just published. Discussion about this ensued. Topics suggested for starting a new review were:
   A. Comments and negative ballots from the latest ballot

B. Tank rupture requirements
C. Review of the Scope and Purpose to see if that suggested any need for change
D. Use of natural esters and the possibility of 75C rise instead of 65 C rise – would that need additions to this spec
E. Should this specification include vault types
F. Should this specification include side mounted bushing type submersibles are there enough users to try to standardize?

7. It was agreed to meet in Toronto at the October meetings to discuss the above. Marcel Fortin volunteered to look into rupture requirements to make a recommendation to this WG. Marcel also volunteered to do a presentation in Toronto at the next meeting on rupture.
8. The meeting was adjourned with the next meeting in Toronto in October 2010.

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

1. The WG met on Monday, March 8, 2010 at 09:30 am with 14 members and 9 guests. One guest requested member status. Giuseppe Termini acted as recording Secretary.
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 October 26, 2009 meeting in Lombard, Illinois were reviewed and approved.
4. The Chairman gave an overview of the highlights of Draft 7. During this discussion the following additional changes were agreed upon:
   A. Add the width (W), length (L), and Height (H) as per Table 7 to Figure 1 for clarification.
   B. Clause 3.1 – change the 80C hotspot rise in the last sentence of the 2nd paragraph to 110C hotspot temperature.
   C. Clause 6.2.2.1 – change the 3rd sentence to: "…15000 amperes rms per phase (average of the 3 phases to be 15000 amperes) …"
   D. Clause 6.2.2.2 - change the 3rd sentence to: "… 45000 amperes rms per phase (average of the 3 phases to be 45000 amperes) …"
   E. Clause 6.2.2.2 – Add a last sentence to read: "This can be accomplished with one test or multiple tests."
5. A motion was made to approve these changes and the motion was carried.
6. The Chairman agreed to now take this Draft revised as above through the Ballot procedures ASAP.
7. The meeting was adjourned at 10:55 am with the next meeting in Toronto Canada in October.

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

1. The meeting was called to order and a review was made of the members present. The working group consists of 8 members and 6 of those members were present. A quorum of the members was present. Introductions were made of all members and guests present.
2. A call was made of the attendees to disclose any patents that may have an impact on the activities of this working group. No patents were brought forward.

3. A brief review was made of the minutes of the last meeting at Lumbar, Ill. The chair indicated that the minutes would be amended to include the names of all persons attending. The minutes were approved.
4. Old Business
   A. There was no old business to discuss
5. New Business
   A. PAR
   B. The group reviewed the proposed PAR for the revisions to the document. Dan Mulkey commented that item 4.2 "Expected Date of submission of draft to the IEEE-SA for Initial Sponsor Ballot" should be 11/2014. Item 4.3 should be one year later also (4/2015).
   C. The Scope and Purpose sections were reviewed in detail and determined to be acceptable.
   D. The PAR will be submitted with these changes.
6. Revisions to Document
   A. Section 6.2.1.3b "The network relays(s) shall be tested at 1500 V at 60Hz for 1 min." Is this left over from the electromechanical days? (Mark Faulkner) .
      A motion was accepted to change the terminology from network relay to electromechanical relay. (Any electromechanical relay shall be tested at 1500 VAC.)
      A list of minimum standards that all digital network relays must comply to. Eaton and Richards to provide minimum set of standards.
   B. Section 5.2.3.3 "At the end of the test, the network protector shall be capable of meeting its interruption rating and capable of carrying rated continuous current without exceeding the temperature rise limit." Does this require a second heat run test? (Mark Faulkner)
      A motion was accepted to qualify the required repeat thermal test after interruption. Thermal re-test is only required if the post micro-ohm test fails to fall in X% of original micro-ohm test. Doug Craig will submit a revision for working group review.
   C. Section 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 case customers may not be properly installing protectors and maintaining the ground connection. Suggest that a non-painted stainless pad, etc should be added. (Ed Bertolini)
      The working group decided that the section should be changed to "The removable breaker shall be grounded through at least all mounting bolts to the enclosure.
   D. We should consider adding a section on environmental requirements. This would include requirements for such items as CTs and PTs (Ed Bertolini). Consensus was that environmental improvements fall outside the minimum required standards for secondary networks.
7. Other Items
   A. Mark Faulkner requested clarification on 5.1.1 on wording and specific 12" interval spacing between thermocouples on incoming and outgoing bus work. The group was unable to reach a consensus before time expired.
8. The meeting was adjourned with the next meeting in Toronto in October 2010.

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

1. The WG was not scheduled to meet.

9.4.6 Old Business

1. Brian Klaponski's comments on the Patent Issue from the :October 2009 meeting has yet to be resolved. While some limited conversations have been held the disclosure of involved patents is still not a transparent:

   "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 (of patents)."

9.4.7 New Business

1. None

9.4.8 Future Meetings

- The Fall 2010 meeting will be October 24-28, 2010 in Toronto, Ontario, Canada.
- The Spring 2011 meeting will be April 10-14, 2011 in San Diego, California

9.5 AUDIBLE SOUND AND VIBRATIONS

Subcommittee

Meeting Minutes
Houston, TX
March 10, 2010
Chairman: Jeewan Puri

The subcommittee met at 9:30 am with 18 members and 32 guests present.

TF for Revising Section 13 of C57.12.90 and 91 (Ramsis Girgis –Chairman) : TF met Tuesday with 24 participants present. This task force is presently reviewing proposals for sound pressure and sound intensity measurements.

- Ramsis reviewed the following proposals in his Task Force meeting based on work done by him and his colleagues:

  - 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 $5 < (P - I) \leq 6$

  This proposal is presently being considered for inclusion in IEC standards also.

  - Allow only 0.2 and 0.35 sound absorption coefficients concrete walls and walls covered with sound absorbing materials respectively for computing sound level correction sue to reflections..
  - Limit this correction to be no more than 4dB.

  IEC standards do not wish to place a limit on the correction due to wall reflections.

  - Discard the use of the equation given in the IEC standards for predicting if Load Noise measurements are necessary. Instead, these measurements should be made only when asked by the customer.
  - Winding noise measurement at reduced current ratings.

- It was agreed that Ramsis Girgis may continue to discuss the next proposal in the Subcommittee meeting since it is important that his TF starts writing the text of Section 13 for balloting the TF members and then the ASV Subcommittee.
  - It was proposed that sound level measurements should be made at 1 or 2 meters from the transformer in order to avoid the error caused by the near field effects in the present measurements.
  - It was agreed that the measurement distance should be changed to 1 meter.
- Paul Jarman proposed that sound level measurement procedures should be identical to what is being proposed in the IEC standards. There is no reason why these standards cannot be identical.

- Ramsis Girgis pointed out the IEEE and IEC standards are produced through different processes and are therefore difficult harmonize. After some discussion, it was agreed that Chris Ploitner and Ramsis Girgis will make every effort to harmonize these documents.

- **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. Allen Darwin will apply for a new PAR for the revision of this document.

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
Houston, TX
March 10, 2010

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

9.6.1 Introduction/Attendance

Chair opened the meeting at 9:30 AM and welcomed the members and guests. A quorum was formed by confirmation of member attendance. There were 57 attendees with 20 members and 37 guests present.

IEEE patent policy was addressed in the meeting and no patent conflict was reported.

9.6.2 Approval of Minutes of Last Meeting

The minutes of last meeting in Lombard, IL was approved as written.

9.6.3 Chairman's Remarks

a) 2010 Spring meeting was moved forward due to T&D Show at April, 2010.
b) 2010 Fall meeting will be held in Toronto, Canada on October 24-28, sponsored by Trench. And San Diego, California USA will be the location for 2011Spring mtg.
c) Working Group Practice and Procedure Manual is under construction and review, shall be ready soon. This manual will provide the practice guide for WG and TF in IEEE Transformer Committee.
d) Copyright Policy is under drafting, and by end of March, will be signed off.

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

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

REAFFIRMATION REPORT:

All ballot comments and negative ballot issues have been addressed with no objections from the voters.

During this process it was found that a number of paragraph numbers were not provided in the final published version of the documents. The missing numbers make it confusing when one clause refers to another specific clause in the document.

IEEE is looking into how this happened and will likely publish ERRATA with the missing paragraph numbers re-inserted.

IEEE has not gotten back to me since our discussions last fall.

The reaffirmation process was extended for one year to resolve this issue.

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

The meeting was called to order at 11:00 am on March 9, 2010 with 17 members and 17 guests.

A quorum was present. After introductions the minutes of the spring 2009 minutes were approved. There were no patent disclosers.

Changes in draft 3 were discussed. These changes will be addressed with other written comments in draft 4 to be sent out by the end of March. Remaining comments will be addressed by e-mail in order to complete the guide and have it balloted by year end.

The meeting adjourned at 12:15.

9.6.4.3 TF – GSU Bushings – Catherine Hurley, Chair

March 9, 2010 (1:45pm)

1. Attendance: The meeting consisted of 37 people in attendance: 23 Members and 14 Guests. 7 of those guests requested membership.

2. Agenda: An Agenda was not presented by the Chair of the Task Force, but was distributed to the TF by email prior to the meeting.

3. Minutes: The Minutes of the last meeting in Lombard, IL were not presented or approved. The Chair will present and approve the minutes from this meeting and the Lombard, IL meeting from the Fall 2009 at the Fall 2010 meeting in Toronto.

4. PAR: A draft copy of the PAR and standard was presented in hardcopy to the group. During the meeting this version of the PAR was modified. Some changes were unanimous, but others are still a topic of discussion. As a result, a second, alternative PAR with a modified scope was created. Both scopes (options A & B), differ slightly and will be distributed to the members for vote/comments by email prior to the Fall 2010 meeting. The consensus among the TF is a standard needs to be created for bushings with rated current in excess of 5000A which require thermal upgrading because they are used in an environment which does not concur with the usual service conditions defined in IEEE C57.19.00. More specifically, a standard is needed for bushings enclosed and connected to a bus which routinely operates at a bus hot spot temperature not limited to 70C at a distance of 1 meter from the bushing top terminal. Additionally, this elevated bus temperature subjects the enclosed bushings to “ambient” temperatures inside the bus duct/enclosure which are in excess of the usual service conditions also defined in C57.19.00 (max 40C, min. -30C, and 24hr average of 30C). This type of application is typical of the LV bushings on a Generator Step-Up Transformer (GSU). The main topics of dissent were how to word this in the best way possible. Conference call(s) will be scheduled among the members prior to the Fall 2010 meeting in Toronto in hope of finalizing the scope and purpose before the Fall 2010 meeting in Toronto in preparations of a live vote.

5. Adjournment: The meeting was adjourned.

9.6.4.4 C57.19.03 – DC Bushing Standard – Les Recksiedler (IEEE) and John Graham (IEC), Chair

IEC/IEEE JMT5 Dual Logo Standard IEC/IEEE 65700-19-03
Report of Meeting Houston, Texas, USA

The second meeting of the Joint Maintenance Team was held on Saturday, March 6th 2010 from 9.00 to 17.30. A total of nine persons attended including seven IEEE members and four IEC members (three being common to both groups). IEEE staff was represented by Jodi Haasz. The meeting was chaired by joint convenors Les Reckseidler (IEEE) and John Graham (IEC).

The first item of business related to group membership. Requests for membership of the IEEE group, made at the Lombard meeting, by Chris Stankowski and Ulf Radbrant have not been confirmed and Les Reckseidler promised to review the situation. John Graham stated that the present IEC representation also had to be confirmed by the results of a request for experts made to National Committees in October 2009.

Following the Lombard meeting the results of comment discussed have been included in a second draft (IEC/IEEE 65700-19-03 Draft) and was circulated to members together with a revised compilation of comments in January 2010. These documents were reviewed at the meeting.

A total of 68 editorial and technical comments were discussed and many issues resolved. Actions on open comments were assigned to individual members. Details of decisions made are included document 36A(JMT5/Graham)03.

The following work schedule was agreed to meet the target for discussion of a Committee Draft (CD) at the next IEEE Transformer Committee meeting in Toronto in October;
- Unconfirmed minutes of meeting: March 12th 2010.
- Working draft 3: April 5th 2010.
- 3rd JMT5 Group meeting at HSP, Cologne, Germany June 9th 2010.
Note depending on comments received this meeting may be held as a web-conference.
- Circulation of Committee Draft : June 30th 2010.
- IEC NC / IEEE Membership comments: Sept. 30th 2010.
- 4th JMT5 Group meeting in Toronto: Oct 24/28th 2010.

There was no other old or new business.

The meeting was adjourned at 5.30pm.

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

No report.

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

No report

9.6.4.7 Task Force on PD Measurement on Bushings & CTs

No report

9.6.5. Old Business

9.6.5.1 Busing 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.

Loren Wagenaar will be contacted for his comments on the subject and Fred will follow up with him.

9.6.5.2 Breaker Bushings – Activity in Breaker Committee

The Switchgear Committee is balloting 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.

A suggestion was discussed to move the historic Transformer-Breaker Interchangable Bushings information from the informative annex in C57.19.01 to the new PC37.017 document so that all of the breaker bushing information is in one place. The Chair will survey the Subcommittee for opinons on this suggested move.

9.6.6 New Business

9.6.6.1 Re-affirmation or Revision of C57.19.01

Chair states that action on this standard is required by the end of the year. What action to take was discussed. The Chair will survey the Subcommittee to get a sense of the need for either reaffirmation or revision so that the appropriate PAR can be submitted for action.

The title word – Apparatus was suggested to change to Transformers since this standard doesn't cover new bushings for breaker application anymore.

9.6.6.2 PF Correction Factor for Temperature

The question was raised during the mtg, and shall the standard provide such information? Considering the factor is the bushing structure related, it is suggested to consult the bushing manufactures for it.

9.6.7 Adjournment

The meeting adjourned at 10:45 PM.

Minutes submitted respectively by,

Peter Zhao

Secretary
Bushing Subcommittee

Dry Type Transformers Subcommittee – Unapproved Meeting Minutes
March 10, 2010 – Houston, Texas

9.7 Dry Type Transformers SC — Chair Charles Johnson, Secretary Lewis Powell

9.7.1 Introductions and Approval of Minutes

The Dry Type Transformer Committee meeting began at 1:30pm Wednesday, March 10 in Regency C of the Omni Houston Hotel with introductions of members and guests. There were 13 members and 5 guests present. Tim Holdway made a motion to approve the minutes of the Lombard meeting; Mark Haas seconded and the WG approved. The Chair then asked if anyone knew of any patent related issues; none were identified.

9.7.2 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:

9.7.2.1 IEEE PC57.12.01 - Dry Type General Requirements — Chair Tim Holdway

1. The working group met in the Regency C Room of the Omni Houston Hotel
2. The meeting was called to order at 11:01 AM by Chairman Tim Holdway
3. The meeting was convened with seventeen (17) members and seven (7) guests present.
4. The minutes of the Lombard October 26, 2009 meeting were approved.

   Motion: Chuck Johnson
   Second: Mark Gromlovits
5. Attendees were asked if they knew of any patents that may be related to the work of this working group. No patents or patent claims pertinent to C57.12.01 were identified by working group members.
6. Old business
   a. PAR

      The Chairman stated this Working Group had an approved PAR that expires in 2013. The proposed changes from the Fall 09 meeting were incorporated into the Title, Scope, and Purpose portions of the PAR.

   b. Altitude Correction
      i. Rick Marek stated that Section 4.2.5 is vague on what dielectric tests are affected for altitudes above 3300ft (1000m). Marcel Fortin stated that the dielectric test equipment could be adjusted at each facility and corrected for the air density. General discussion revolved around both correcting from a lower altitude to a higher altitude and from higher altitude to lower altitude.
      ii. The decision was made to keep Table 1 in some format. A suggestion was made to include the inverse of the current correction factors to better explain their usage. Additionally the members are to submit their suggestions for replacing the existing text in 4.2.5 to Tim Holdway before the next meeting.

   c. Partial Discharge
      i. Rick Marek formally suggested that the standard be changed to adopt the PD levels and measurement durations from IEC 60076-11 section 22 for Cast Coil Technology only. Charles Johnson and Mark Gromlovits suggested that different

PD levels in pC be developed for Cast Coil and Open Ventilated windings. Table 6 —Partial discharge limits and pre-stress limits will be updated with (1) column for Cast Coil and (1) column for Open Ventilated.

ii. A motion was made by Rick Marek that Cast Coil use 10pC. The motion was seconded by Chuck Johnson and the group voted affirmative.

iii. The Open Ventilated test levels were not set, but Mark Gromlovits volunteered to submit a suggested level.

7. New business
   a. Purpose
      i. Chuck Johnson made a motion to add the work 'underground' before the words 'mine transformer' in 1.2 f) that lists the exceptions. The motion was not seconded and Tim Holdway tabled the discussion.
      ii. Marcel Fortin proposed that 'e) general purpose' transformers be removed from the exception list. The group discussed the definition of 'general purpose transformer' without a formal resolution. No formal motion was made, but Tim will investigate if an additional change to the PAR can be made at this time. He will inform the members of the group via email once he has determined the feasibility of modifying the PAR.
   b. Nameplate
      i. Chuck Johnson informed the group that the C57.12.00 WG had proposed to add the words 'DOE Compliant' to their nameplates. Aleksandr Levin agreed to serve as the liaison to this group and to determine the details. He will inform Tim Holdway via email and Tim will distribute to the WG.
8. Next meeting: Fall 2010: October 24-28 in Toronto, Ontario Canada
9. With no further business, the meeting was adjourned at 12:17 PM.

   Motion: Chuck Johnson
   Second: Mike Haas

9.7.2.2 IEEE PC57.12.91 - Dry Type Test Code **Chair Derek Foster**

1. The working group met in Regency C of the Omni Houston Hotel. The meeting was called to order at 3:15 PM on March 8.
2. The working group met with 11 members and 9 guests present.
3. There were no patent issues regarding this standard.
4. The minutes of the last meeting, held in Lombard, were approved as written.
5. Old Business
   a. The final draft of the revised sections of this standard was circulated to members of the working group for review in December. Four members replied with comments. Most of these comments have now been incorporated into the standard, which is currently with IEEE for the Mandatory Editorial Coordination review. After completion of the editorial review, the standard will be sent out for ballot.
   b. Marcel Fortin had provided several comments for consideration during the next revision of the standard, and these comments were presented and discussed briefly during the

meeting. A copy of Marcel's comments will be sent to all working group members after this meeting. Marcel also suggested the formation of a task force to review section 11 of the standard, on temperature rise test procedures, in view of similar work being carried out on section 11 of C57.12.90, the liquid filled transformer test standard.

c. Marcel Fortin agreed to give his presentation at the next meeting on the loading back method of temperature rise testing.

d. Rick Marek had made proposals for two revisions to C57.12.01 regarding corrections for dielectric strength at altitudes above 3300 feet, and also for partial discharge levels and test procedures, and it was agreed that this working group would work closely with the C57.12.01 working group to coordinate any revisions regarding these proposals, in both standards,

6. There being no new business, the meeting was adjourned at 4:00 pm.

9.7.2.3 IEEE PC57.12.52 - Sealed Dry Type Power Transformers Chair Sheldon Kennedy

1. The Working Group met on Monday, March 8, 2010 at 9:30 AM with 10 members and 6 guests present. Sheldon Kennedy chaired the meeting. There were four new members added during this Working Group meeting bringing the total WG membership to 12. We had a quorum for the meeting.
2. The IEEE disclosure statement was read. There were no patents pertaining to this standards work for which any members had awareness.
3. Minutes of the October 26, 2009 meeting in Lombard, Illinois were reviewed and approved.
4. Draft 3 of the document was placed on the IEEE Transformers Committee website. A survey was circulated to the Working Group of Draft 3 before the meeting. Returns are minimal so far, but it still has 20 days to run.
5. The Working Group reviewed the changes made in Draft 3.
6. 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.
7. Tables 2 and 3 which give voltages and BIL tables will be eliminated and we will refer back to C57.12.01.
8. 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.
9. Clause 9.4.3.1 will eliminate the reference to Table 2 and instead refer to IEEE C57.12.01.
10. This completed the review of Draft 3. There was a review of construction features with questions from some of the new Working Group members.
11. If the results of the Working Group Survey are successful, the document will be sent out for a survey of the Dry Type Subcommittee. This should all be accomplished before the next meeting. If there are comments in the surveys, we will resolve those at the next meeting. If there are no comments, we hope to proceed to an official ballot.
12. There were no other comments.
13. There was no other old business or new business.
14. The meeting was adjourned at 10:10 AM.

9.7.2.4 WG for Revision of IEEE C57.16: Dry Type Reactors **Chair Richard Dudley**

1. The W.G. for the Revision of IEEE C57.16 (Dry Type Reactor T.F.) met on March 8, 2010, at 8:00 a.m. in the Regency C Meeting Room of the Omni Hotel in Houston, Texas. There were 11 members and 4 guests present. The following are the highlights of the meeting:
2. Introductions were made and the attendance list circulated.
3. IEEE patent policy was reviewed and no issues were raised.
4. The minutes of the W.G. meeting in Lombard, Illinois were approved.

   Note: The minutes of the WG meeting in Houston, Texas will not be approved until the WG meeting in Toronto.
5. The revision process for IEEE C57.16 was reviewed, specifically Draft #6. The following are the highlights:

   a. The test code for the T-T test has been revised to reflect the impact of the changing circuit design. The total test period will be such as to ensure the application of 7200 crest voltages of required magnitude. Typically only the first crest voltage of each decaying sinusoidal train is critical. However the second peak can also be counted providing it is of required magnitude; this implies that the first overvoltage peak is above specified magnitude.

   b. Annex F and final input from the IEEE Switchgear Committee was discussed. Devki Sharma suggested sending the latest draft to the Chairman of the HV Circuit Breaker SC, Richard York. Input could also be solicited from Bill Bergman (who provided input during the initial stages of development of Annex F, and Dennis Dufournet (also provided early input). The Chairman stated that he would contact these people and would copy the WG on all e-mails. Devki Sharma stated that the next IEEE Switchgear Committee meeting would be April 26, -29, 2010. Devki Sharma also stated that his perception when attending the last meeting of the IEEE Switchgear Committee was that many of the engineers involved in CB TRV issues were not aware that mitigation capacitors could be mounted inside distribution class CRs. IEEE C37.011, which includes CB TRV application issues, is being revised and will include information on reactors and possible CB TRV issues.

   c. To save time, the Chairman agreed to send Draft #6 of the revision of IEEE C57.16 to IEEE for Mandatory Editorial Co-coordination.

   d. Work is being done in IEC on their sound measurement guide. A clause will be included on dry-type air-core reactors.

   e. Clause B.1.3 "References" should be retitled "Supporting Documentation".

   f. Since the "notes" in Table #4 are "boxed in", they are considered normative and the use of "shall" is okay. The Chairman will "double check" with IEEE.

   g. In general all notes are informative and the use of "shall" is not allowed. On this basis the "note" in A.4.2 should be made part of the main text.

   h. The Chairman will ensure that the "purpose" and "scope" are as exactly on the PAR.

   i. The WG felt this information now included on 3 phase stacked reactors is okay. It was also noted that in most cases 3 phase stacked FRs are not grounded and hence there is no zero sequence current.

j. Shall is used in the "note" on Page 59. The "note" will be made part of the normative test.

k. "Shall" is used in a "note" on Page 44.

l. The "note" in Figure 5 will be converted to normative text; "in the above figure the following guidelines shall be considered".

m. In ANNEX G [B10] to [B12] are incorrectly formatted.

n. The Chairman stated his intention to complete Draft #7 in Early May, the latest, and will distribute to the WG for approval. If okayed by the WG, then a formal IEEE ballot will commence.

o. Copyright permission will have to be obtained from IEEE for the "excerpted" information in F11; excerpted from ANSI C37.0721-1971.

6. The meeting adjourned at 9:15 a.m.

9.7.2.5 WG Dry Type Loading Guide C57.96 **Chair Rick Marek**

1. The first meeting of the working group was held in the Regency G Room of the Omni Houston Hotel at 11:00 with 13 in attendance. Introductions were made, and the attendance sheet was passed around. 11 requested membership. There were no patent issues.
2. The Chair announced that the PAR had been approved and 2013 is the completion date. In summarizing the PAR, no changes were made to the title of the document. However, there were some apparent discrepancies between the approved PAR version of the old scope and purpose. This was compared to the current document scope. The current document does not have a purpose. Chuck Johnson volunteered to check on the history of the document to see what happened.
3. The Chair reviewed the current loading guide highlighting key sections and the general perspective of the document. Several issues were noted with some of the curves and the computer program. The document also includes cast transformers, but only in the annex, rather than in the main body. All of these issues must be addressed during the revision.
4. He then reviewed the current IEC loading guide, IEC 60076-12. He stated that as a member of the IEC working group, he had provided official copies of C57.96 to the working group. The resulting document has many similarities.
5. Both documents were discussed and compared at length. The question posed, was could we adopt the IEC loading guide as it is without change? It would be different, but would it be sufficient for the needs of our users who are really the ones who need this document. Permission to use the IEC document has been requested for standards development purposes and members will have access to a copy.
6. The task then could be one of three choices: Revise, correct and re-write the IEEE document, adopt the IEC document intact without changes or some combination of the two, using portions of the IEC document in a new IEEE document. This document appears to be a very good candidate for adoption since the two key differences which are issues for other documents are not an issue in this one. Those differences are the ambient and the dielectric testing. All were requested to review the IEC document very closely and compare it to the IEEE document. The group was strongly encouraged to consider adoption.
7. During the discussion at the Subcommittee meeting, Paulette Powell was thought to have conducted the last reaffirmation. She will check to see if she has balloter comments from that reaffirmation.

8. The meeting was adjourned at 3:00

9.7.3 Old Business

There was no old business.

9.7.4 Chairman's Remarks

1. The Chair provided the following status of standards:
    a. Expiring in 2009: C57.12.60 approved and to be published this month. C57.96 PAR is approved and expires Dec 2013. C57.124 the reaffirmation has been approved by REVCOM. There are comments on the state of the technology. The Chair proposes a TF to review and if necessary to revise, a PAR will be taken out. C57.259 reaffirmation is with REVCOM for approval.
    b. Expiring in 2010: C57.12.01 – the PAR has been extended to Dec 2013. C57.12.91 has a Chairman established and development is proceeding. C57.16 – development is proceeding. C57.94 - Paulette Powell to lead the reaffirmation.
    c. Expiring 2011 C57.12.52 – WG Chairman established and development is proceeding. C57.12.59 – a reaffirmation leader is needed. C57.134 – a reaffirmation leader is needed.
    d. Expiring In 2013 C57.12.51 and C57.12.58 were recently approved; no activity is anticipated at this time unless issues rise warranting review.
2. Working Group Practices and Procedures Manual is being developed as an operating and procedures manual for WG officers as guidelines for conducting meetings.
3. The Chair reminded that a quorum is needed in order to conduct meeting business; no decisions can be made unless a quorum is established. He urged the WG Chairs to clean up their rosters purging non-participating individuals.
4. The Chair suggested that WG/SC officers have a back-up in event they are unable to attend so that standard development work can continue.

9.7.5 New Business

1. Discussion ensued on coordination of partial discharge between C57.12.01, C57.12.90 and C57.124. C57.12.01 addresses BIL levels, C57.12.90 specifies how to test, and C57.124 which no longer represents state of art, addresses how to measure. A TF may be needed to address partial discharge coordination among the three documents. Comments on the state of C57.124 included adoption of IEC 60270 and patterning the revision based on C57.113 liquid-immersed document. Marcel Fortin suggested retaining C57.124 as he stated no standard includes recent digital systems.

Being no other business, the meeting was adjourned at 2:30pm.

9.8 Distribution Transformer Subcommittee Report

Chairman: Stephen Shull

Meeting Date: 03/10/2010 **Time:** 9:30 – 10:45

Attendance:

Members	**33**
Guests	**36**
Guests Requesting Membership	**2**
Total	**71**

Meeting Minutes / Significant Issues / Comments:

Steve opened the meeting; rosters were passed out, introductions were made & a roll call of members showed we had quorum with 36 of the 56 members in attendance.

The minutes of the fall 2009 meeting of the subcommittee were presented and a motion was made by Gael Kennedy, seconded by Ron Stahara to approve the minutes; the motion carried by unanimous acclamation.

Steve made a request and encouraged all attendees who were not members of the IEEE, Power and Energy Society, Standards Association, Transformers Committee and the Distribution Transformers subcommittee to please consider doing so. Steve point out for those who think they are members to check their badges. If they find they don't have Committee Member ribbons on their nametags, they are not Transformer Committee members.

The following are the highlights of the reports that were submitted by the Working Groups and Task Forces. For further, detail please consult the individual reports.

- C57.12.20 – Overhead Distribution Transformers
  - The group accepted the recommendation developed from a manufacturer survey to specify the spacing of the arrester pads on the transformer to locate the top arrester mounting pad 17" +/- 2" from the top edge of the tank rim and the lower arrester mounting pad 2.5" below the top pad. Marcel Fortin presented his findings on the lid retention test fault procedure. The result which was presented was adopted noting that if the manufacturer had done this test to the previous described method, the design would meet the requirements of this revised section. The Working Group voted to move the document to MEC and ballot.
- C57.12.28, 29, 30 & 31 – Enclosure Integrity
  - C57.12.28 and C57.12.29 will be at the end of life on December 31, 2010. The Working Group voted to request new PARs for both of these documents. The PAR for C57.12.28 will use the existing Scope and Purpose. The PAR for C57.12.29 will use the same Scope and a slightly modified Purpose. C57.12.30 and C57.12.31 were balloted, negatives were received and addressed, and a recirculation was completed with no change from the negative balloters. These documents will be sent to REVCOM to be considered for approval.
- C57.12.35 – Distribution Transformer Bar Coding
  - This standard will be at the end of life on December 31, 2012. The working group voted to request a new PAR for this document using the existing Scope and Purpose.

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- C57.12.37 – Electronic Test Data Reporting
  - This Working Group had one of the co-chairs resign in the fall of 2009. A co-chair was appointed and he discovered that the document was ready to ballot. He stated that he would move the document to MEC and Ballot.
- C57.12.38 – 1 phase Padmount transformers
  - A new PAR has been approved for this document. The working group gathered suggested changes and ideas that could be incorporated in the next version. Two points were made both concerning the secondary bushing placement. One was the clearance of the X3 bushing to hood cover and the other was the elimination of one bushing in the 277 volt application which had been added to this document's scope.
- TF – Transformer Efficiency and Loss Evaluation (DOE)
  - The group was informed that the DOE may review the efficiency standards due to settlement of an Environmental lawsuit against DOE on the grounds that carbon was not adequately monetized in the rulemaking. A settlement was reached to open the rulemaking process earlier, though the effective date for the new rules would remain unchanged. The rulemaking dates were picked to ensure rulemaking would occur under the current Administration. We may be able to influence assumptions for material costs, loading, energy costs, payback periods. Dates for the DOE Rulemaking as a result of lawsuit settlement are as follows:
    - NOPR October 2011
    - Final Rule October 2012
    - Effective date 1/1/2016

    Contractors involved in the original round of rulemaking have received new contracts for this round of rulemaking. DOE may be considering labeling which would include the efficiency from the DOE table along with Manufacturer certification number.
- TF – Tank Pressure Coordination
  - This was the first meeting of this working group. The purpose of the group was to address three issues.
    - Editorial inconsistencies in the references to pressure levels in the product standards of the Distribution Transformers SC.
    - A potential conflict between withstand requirements of 50 kPa (7 psig) for the enclosures without permanent distortion, and pressure relief valve requirements of 69 kPa ± 13 kPa (10 psig ± 2 psig).
    - The standards for single and three phase padmounts had no reference to a requirement for a fault current capability test.

    After quite a bit of discussion, the working group agreed on the following course of action for the task force:

    a) Define a proposed standardized text for the tank withstand and PRV requirements which could be considered for adoption in future revisions to the product standards of the Distribution Transformers SC, and

    b) Prepare a document that would capture the history of this topic so that it could serve as a reference to provide the technical arguments supporting the current definitions and could be adopted as an informative annex on future

Submitted By: Stephen Shull
Date: 03/11/2010

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revisions of the distribution transformer product standards to provide this background for future groups.

There was no Old Business.

Under new business Steve recognized Marcel Fortin for his recent Distinguished Service Award from the IEEE Switchgear Committee. The subcommittee commended Marcel with a round of applause. Steve asked Marcel and he agreed to a 10 minute presentation to the subcommittee at the next meeting in Toronto on the physics of fault interruption.

Jerry Corkran informed the subcommittee that the Insulation Life Subcommittee is preparing a survey for the Insulation Life subcommittee members regarding increasing the temperature rise rating to 75°C and he wanted the Distribution Transformers subcommittee to prepare its own survey. Jerry made a motion to survey the Distribution Transformer subcommittee on this topic and Phil Hopkinson seconded the motion. A lot of discussion was done on this topic from Brian Klaponski, Joe Cultrera, Ali Ghafourian and Phil Hopkinson about how this might affect efficiency requirements of the DOE. Said Hachichi stated the WG for C57.154, "Design, Testing & Application of Liquid-Immersed Transformers with High-Temp Insulation" was already working on this issue. Bill Chu explained that this was an Insulation Life Subcommittee topic and we should not follow this action because it was beyond the scope of this subcommittee. Our concerns should be presented to the Insulation Life Subcommittee concerning the though that the survey be shared with the full transformers committee. There was obvious confusion on the floor in the discussion about whether this extended range would be a nameplate rating or a test level to allow for transformer overloading to the higher temperature. Ron Stahara called the question and the motion was defeated. Jerry and Phil were the only ones who voted for the motion.

Brian Klaponski made a motion that this survey be presented to the full committee for their consideration and that there be careful wording added to any survey to avoid the confusion we were experiencing. Jerry Corkran seconded this motion and it carried by unanimous consent.

Therefore Steve will carry a recommendation from the Distribution Transformer Subcommittee to the Insulation Life Subcommittee that if any survey is made on extending the transformer operating temperature above 65°C that that the survey be extended to the full transformer committee and that a very careful discussion be included concerning distribution transformers which would enlighten the members on the DOE efficiency requirements as applied to the nameplate rating information.

A motion was made and seconded to adjourn the meeting with unanimous consent.

The meeting adjourned at 10:40am.

Submitted By: **Stephen Shull**
Date: **03/11/2010**

9.9 Dielectric Test Subcommittee – Loren Wagenaar, Chair; Thang Hochanh, Vice-Chair; Dennis Marlow, Secretary

The Dielectric Test Subcommittee (DISC) met on Wednesday, March 10, 2010 at 11:00 am in Houston Texas, with 149 persons in attendance. There were 66 of 111 members, and 83 guests present. 14 of the 60 returning guests who requested membership will have their participation status reviewed prior to acceptance

9.9.1 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) Fall October 24-28, 2010 , (Hilton $159 CAD) – Toronto, Ontario- hosted by Trench
      2) Spring 2011 , April 10-14– Hotel Mission Bay hosted by San Diego Gas & Electric

3) After introductions a count showed 66 members were in attendance. The new quorum requirements were met. The membership participation will be again reviewed prior to the next meeting to include only active members. All WG and TF should update their rosters prior to the next meeting.

4) The minutes of the fall 2009 meeting in Lombard were approved as written, and are available on the IEEE Transformers Committee Web Site.

9.9.2 Working Group Reports

9.9.2.1 Task Force on External Dielectric Clearances
Eric Davis, Chair; Dennis Marlow, Secretary

The TF met on Mar 8, 2010 at 9:30 am at the Omni. 50 people attended this fifth meeting, 6 members and 44 guests (13 repeat guests) were present with 4 accepted as new members, bringing the total membership to 23. We did not have a quorum.

The minutes from the fall 2009 meeting in Lombard, IL were approved as submitted.

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.

Clearances < 230-kV

- Discussion of how IEEE 1427 determines recommended minimum clearances in air insulated substations
- Review of last meeting's discussion regarding 230-kV clearance table organized by BIL, kV or both
- A survey will also be sent out to the members and interested guests for review so that comments can be obtained about the proposed clearance table.

Clearances > 230-kV

- Discussion of IEEE 1427 determines recommended minimum clearances in air insulated substations based on switching surge.
- Discussion of the configuration of the unit during test. (i.e. which terminals get grounded)
- A quick straw vote in favor of 9 to 3 was taken to revise the clearances for voltages above 230-kV.
- Discussion of bushing clearances and the area of influence.

Meeting adjourned 10:45 am respectfully submitted, Dennis Marlow

9.9.2.2 Task Force on Special Dielectric Test Issues – Bruce Forsyth, Chair

The Task Force on Special Dielectric Test Issues met in Houston, TX on March 8, 2010 at 1:45 PM. There were 52 people in attendance, 22 members and 30 guests, with 4 guests requesting membership. At the commencement of this meeting the TF membership count stood at 31 so a quorum was present.

After introductions of attendees it was noted that the minutes of the fall 2009 meeting in Lombard, IL had been posted in the Transformers Committee website. There were no negative comments related to the Lombard minutes, but at that time it was unclear as to whether a quorum existed because several attendees could not recall whether they were members. The Chair asked participants to confirm their status by checking the attendance rosters that were circulating and tabled further review or approval of the minutes until later in the meeting. Although it was later established that a quorum existed, the minutes were not reviewed again prior to the end of the meeting. As such the minutes of the Lombard meeting were not approved.

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 unfinished or new business.

The first item of unfinished business was to review the results of a recent survey of the Dielectric Test Subcommittee regarding neutral impulse tests. Specifically, the survey asked, "When impulse tests are required on the line end terminals, should impulse tests be performed on the corresponding neutral terminals regardless of the BIL rating of the neutral terminal?" Of the 90 responses from the subcommittee, 64 were "yes", 23 were "no", and 3 were "abstain." After some discussion, the TF focused its attention on clause 5.10.7.1 (Lightning impulse tests) in PC571200_D4Finalrev3-2-2101, which states:

> "When required, lightning impulse tests shall be performed on line and neutral terminals for at the specified levels per Columns 1 and 2 of Table 6, as selected from either Table 4 or Table 5."

Several members expressed concern that this wording does not adequately clarify whether impulse tests on neutral terminals is mandatory. A motion was made (Matthews/Melanson) as follows:

> In the next revision of C57.12.00, the first sentence of clause 5.10.7.1 (Lightning impulse tests) should be revised to read "When lightning impulse tests are required

they shall be performed on both line and neutral terminals at the specified levels per Columns 1 and 2 of Table 6, as selected from either Table 4 or Table 5."

The motion was adopted after debate and by inclusion in these minutes shall be forwarded to the SC Chair as the recommendation of the TF. This concludes the TF review of this issue pending further direction from the SC Chair.

Under New Business the Chair opened discussion on the issue of test levels on Class I and Class II transformers. Specifically the Chair commented that during past discussions on whether 69 kV transformers should be considered Class I or Class II it appeared there was greater concern over the tests to be performed than what specific label was given to the transformer. The Chair asked whether there was any merit in considering classifying the test levels rather than the transformer and allowing the user to designate the transformer as distribution or power, and then select the from a two or three test groups based in the specific application of the transformer. A member expressed concern about this approach specifically in cases where the purchaser may not have sufficient technical knowledge to make the best decision. After a short discussion the Chair asked for a hand vote of the TF members on the question of whether there was any desire for the TF to pursue this issue further. No such interest was expressed and the issue will not be discussed further.
The final item of discussion was regarding the future of the TF. The major issues that were assigned to the TF initially have been addressed during the past several meetings and at this time there are no new action items before the TF. The Chair asked the TF members if there were any pressing issues that they believe the TF should add as new items of business. It was noted that one new item had recently been brought to the SC Chair's attention that may be appropriate for the TF. The Chair will discuss this with the SC Chair and seek guidance regarding future activity.

The meeting adjourned at approximately 2:50 PM.

Respectfully submitted,

Bruce Forsyth

9.9.2.3 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 March 10th, 2010. The total number of attendees was 50. The numbers of members and guests are not yet known since membership rules are in a state of flux.
Based to our present membership role we did not have a quorum.

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.

A revised version of our guide, Draft 6 included the changes agreed upon at the last meeting in the fall, had been placed on the Transformers Committee website and on the grouper website. Those changes were presented to the attendees and comments were solicited. The general consensus was that this embodiment of our guide was complete and ready for ballot.

Invitations to ballot have already been initiated and all that remains is to present this draft to the IEEE for editorial review.

The working group members were reminded that C57.138, the Guide for Routine Impulse Tests of Distribution Transformers is also included in our scope and that we need to begin a review of that document.

There being no further business the meeting was adjourned at 10:40 AM.

Art Molden & Joe Melanson. 3/10/10

9.9.2.4 Working Group on Revision of Low Frequency Tests – Bertrand Poulin, Chair; Bill Griesacker, Secretary

1. The WG met on March 9, 2010 at 1:45.There were 59 attendees, 17 members and 42 guests. There are 55 official members of the working group; therefore there a quorum was not present to permit voting.

2. The minutes from the October 2009 meeting in Lombard, IL were brought to the table; there were no objections although the minutes were not approved since a quorum was not present.

3. There was a request for any patent issues to be made known, none were voiced.

4. Dr. Lemke reported on the Task Force for the Revision of C57.113. The document was sent for ballot and passed successfully. The document was submitted to Rev-Com in February 2010 and the outcome of this review is expected. Some issues of the document PC 57.113 will be incorporated in the Field Test Guide (PC 57.152) as well as in the Guide for PD measurements in Bushings, PT´s and CT´s. Dr. Lemke is congratulated on his accomplishments over the last 4 years.

5. Thang Hochanh presented the minutes for the Task force for PD in other devices such as CTs and Bushings. Reviewed sections of Draft, including Annex A and B. Discussed the digitization of signals and changes in instrumentation technology in the industry. A survey will be sent out to collect information regarding the size of corona shields used according to voltage class. Vladimir Khalin offered to prepare a draft for the next meeting regarding test configurations for CTs and PTs.

6. Loren Wagenaar sent out a survey with two questions: 1) should the neutral terminals of transformers be impulse tested and 2) should 69 kV transformers be tested per Class II requirements. About 70 % were interested in including these tests. It is expected that if this vote is taken to the Transformers Committee for vote we would get about the same percentage response. The working group will recommend that 69 kV transformers are Class II transformers and the 1 hour PD/RIV test will be a routine test. Discussion took place over this topic but was not conclusive. We are trying to provide the information for those who ask the question of “how should I specify my transformer?”

7. Tutorial on PD was requested. This will be a future topic but there is a long waiting list of subjects identified for the tutorial sessions held at the Transformers Committee meetings Monday and Tuesday afternoon.

8. New Business: It was requested to require that induced testing for reactance LTC transformers with a preventive autotransformer (PA) shall be tested in a bridging position so that the PA has induced volts/turn. Series transformers will be brought into the discussion, i.e. "the series transformer may conflict with attaining the desired line terminal voltage in the transformer during the test".

9. The meeting adjourned at 2:35 p.m.

9.9.2.5 Working Group on Revision of Impulse Tests – Pierre Riffon, Chair; Peter Heinzig, Vice-Chair

The WG met on March 9, 2010, from 3:15 pm to 4:35 pm. Twenty (20) members and forty-three (43) guests attended the meeting. Five (5) guests requested membership. The meeting was chaired by Peter Heinzig, vice-chair of the WG.

The agenda has been reviewed and no changes were requested.

The minutes of the Lombard meeting could not be approved because only 20 out of 45 members attended the meeting.

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 3rd 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 three different tap positions for reflecting service conditions and for a possible harmonization with IEC testing practices. The changes agreed during the Lombard meeting were implemented in the new proposal.

The number of returns was low as usual on surveys but higher as last time. The return rates were 42.0% from the SC membership and 27.4% from the WG membership. Approval rate were respectively 89.0% and 87.0%.

All affirmative comments received could be discussed during the meeting. The results are listed below and will be included as discussed in a revised version of the proposal.

Only two (2) out of totally four (4) negative comments could be discussed during the meeting. Both cannot be resolved because there are in general against the idea to perform impulse test on different tap positions. They have proposed either to keep the actual procedure e.g. testing at the minimum effective turns or to perform the impulse tests at a single tap position which give the "highest stress".

Based on the high affirmation rate of 89.0% and 87.0% and elaborately discussion of the negative comments during the meeting and the Lombard meeting the vice chair informed that this negative votes remain unresolved and the new proposal will be included in the new draft for C57.12.90.

At the end of the discussion a proposal was made to add a hint that the tap position can be agreed between the manufacturer and the buyer to achieve the best possible test conditions for a certain transformer.

Due to lack of time, this proposal and 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 4:35 pm on March 9th, 2010.

Outcome of the discussion during the meeting regarding the comments received on 3rd survey made within the WG:

- comment from Barry Beaster requesting new wording - rejected by the group.
- comment from J. Britton - accepted
- comment from Bill Chui - accepted.
- comment from J. Crotty - no change proposed.
- comment from R. Dudley - accepted
- Comments from J. Graham - accepted`
- comments from Laszlo Kadar - No change required
- comment from S. McGovern - accepted
- comment from Susan McNelly - accepted
- comment from Bipin Patel - editorial accepted. rated tap instead of middle tap rejected, already discussed. Note for reactor type TC - we keep the note
- last comment from Patel - add word "ohmic impedance"
- comment from Dan Perco - no change in wording
- comments from Don Platts - editorial, will be considered
- comments from Hossein Rezai - no change
- comments from Steve Snyder – editorial no change in wording
- comment from S. Tuli - already covered
- comment from Peter Werelius - already covered.
- comment from Jim Zhang - not accepted
- negative vote from Yang Baitun - cannot be resolved
- negative vote from Joe Foldi - cannot be resolved

Peter Heinzig, WG Vice-Chair March 9, 2010

9.9.2.6 Task Force on Electrical Partial Discharge Measurements Guide C57.113 - E. Lemke Chair

The task force met on Monday March 8 at 8:00 am. No minutes were presented. The latest corrections were discussed and the chairman will revise the document in preparation for a ballot. Other relevant comments are included with the minutes of **Working Group on Revision of Low Frequency Tests – Bertrand Poulin, Chair**

9.9.2.7 Task Force on Partial Discharge in Bushings and Voltage/Current Transformers- T. Hochanh Chair

The task force met on Monday March 8 at 3:15 pm. No minutes were presented. The TF has now made their recommendation to proceed with the new Guide on PD measurement on Bushing and Instrument transformers. Other relevant comments are included with the minutes of **Working Group on Revision of Low Frequency Tests – Bertrand Poulin, Chair**

9.9.3 Liaison Reports

9.9.3.1 High Voltage Test Techniques (HVTT), IEEE Standard 4 - Arthur Molden

Editorial work continues. This revision of Standard 4 has been extensively rewritten and rearranged into a more informative and more tightly integrated standard. Additional information concerning testing and measuring techniques, measuring system performance, calibration methods, atmospheric correction and statistical treatment of uncertainties, has been added. The latest draft document is currently in circulation for review by the active members of the working group.

A Molden. 3/10/2010

9.9.4 Old Business

None

9.9.5 New Business :

1. Guide for Dielectric Frequency Response Testing. Special appreciation was given to Mark Perkins and other participants for the tutorial on this interesting subject. Discussion about this new technique was not conclusive. It appeared that a guide is not needed at this time but since it can also detect moisture in insulation that it may have some merit in the future. A motion to NOT prepare a guide at this time was made by Don Platts and seconded by Bill Chui was carried by a vote of 50 to 3.
2. Tutorial for Electrical Partial Discharge Measurements should be considered for future meetings.
3. Test Levels for 69 kV class transformers as Class I or II was discussed.
    - B. Poulin fielded some questions from the membership. Topics included, "there is no evidence from the field that the present induce test connections need to be changed.
    - Re 69 kV impulse tests. Many manufacturers are not necessarily setup to perform this as a routine test. Time (notice) may be needed (i.e. 5 years) for manufacturers to accommodate this request if it is implemented.
    - The TF for special dielectric test issues chaired by B. Forsyth has already recommended to the SC that 69 kV class transformers be tested as class II transformers.
    - It should be noted that C57.12.36 covers 69 kV class distribution transformers but only up to 10 MVA size.
    - NO MOTION was received from the membership with regard to these issues.

9.9.6 Meeting adjourned 12.06 PM respectfully submitted: Dennis Marlow

9.10 MINUTES OF THE MEETING OF THE HVDC CONVERTER TRANSFORMERS & SMOOTHING REACTORS S.C. IN HUSTON, TEXAS, MARCH 8, 2010

On March 8, 2010, the HVDC Converter Transformers and Smoothing Reactors S.C. met at 8:00 a.m., in the Regency C Meeting Room of the Omni Houston Hotel, in Houston Texas. There were 9 members and 14 guests present; 4 of the guests requested membership. The following are the highlights of the meeting:

1. Introductions were made and the attendance list circulated.

2. The minutes of the Lombard, Illinois meeting were approved.

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

3. IEEE patent policy was reviewed and no issues were raised.

4. The Chairman provided a synopsis of the Administrative SC meeting.

5. The Chairman reported on the status of the revision process for IEEE 1277. The second recirculation ballot was successful and Draft #7 will be on the agenda of the March 21, 2010 meeting of the RevCom. The Chairman thanked SC members for their help in making the revision process a success.

6. Since all current revision work on IEEE C57.129 and IEEE 1277 is complete, the Chairman requested input from SC members and guests re future revision work. Should future revision work focus on HVDC voltage levels > 500 kV? Key revision subjects include dielectric test levels and test code methodology (including standardization of test methods). Discussions took pace re who should set dielectric test levels and standard HVDC system voltages. It was agreed that this was outside the scope of the HVDC SC as it was a systems issue. It was reported that CIGRE WG B4-52 and IEC WG 60183 were studying HVDC system voltages and dielectric test levels. A number of SC members stated (including Klaus Pointner) that they would report at the SC meeting in Toronto on the work of CIGRE WG BA – 52; the CIGRE general meeting will be held in Paris in August 2010. A number of 800 kV HVDC projects are now in operation. Mario Schenk of Siemens stated that he could prepare a presentation on two projects in China. Members of the SC from ABB are requested if they can make a similar presentation. Such presentations to the SC can provide direction for future revision work. Presentation content and duration will be firmed up prior to the SC meeting in Toronto.

7. Consensus of the SC was that no additional information need be included in IEEE C57.129 on transformers used in conjunction with VSC based HVDC schemes as they are basically covered by ac power transformer standards.

The Chairman announced that since he was retiring from full time employment with his company on April 30th, and will work part time as a technical advisor, his future participation in the IEEE Transformer Committee would be finite. He, therefore, requested that he was looking for a SC member to volunteer to be secretary so as to facilitate a future transition to Chairman.

The meeting adjourned at 2:15 p.m.

R. Dudley
:cb
(08303)

UNAPPROVED MINUTES
SC Insulating Fluids Meeting
March 10, 2010
Houston, Texas

9.11 Insulating Fluids Subcommittee

Susan McNelly, Chair, Jerry Murphy Vice-Chair, C. Patrick McShane, Secretary

7.3.1. Introduction/Attendance

The Insulating Fluids Subcommittee meeting in Houston was called to order by the Chair at 3 PM on Wednesday, March 10, 2010. All the officers of the SC were present. There were 20 members and 54 guests present. The quorum requirement was met. The following 2 guests requested membership: Edwardo Garcia W. (Manufacturer) and John Crotty (Manufacturer).

7.3.2. Introduction/Attendance, F08 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. Question was asked if there were any ABB patents that should disclosed. ABB attendees did not respond that there were any patents that needed to be disclosed.

The Minutes of the Fall 2009 Lombard, IL meeting were approved as written.

7.3.3. WG & TF Reports Presented at the SC Meeting:

7.3.3.1. <u>C57.104 – IEEE Guide for the Interpretation of Gases Generated in Oil – Immersed Transformers</u>
WG Chair: Rick Ladroga, Vice-Chair: Claude Beauchemin

The WG Report Given at the Sub-Committee Meeting:

The WG report was presented by Claude Beauchemin. The WG met on Tuesday with 35 of 94 members present, therefore a quorum was not achieved. Claude Beauchemin has agreed to step in as Vice-Chair of the WG.

PAR for revision of the Guide was submitted and approved at the December NESCOM meeting. The PAR will expire Dec of 2014

There is an extensive Bibliography in the present version of the Guide. There was discussion on whether the Bibliography should be kept. General consensus was that the Bibliography should be kept. A new TF was developed to determine whether the present documents are still appropriate or if there are new references that should be added. Jerry Murphy agreed to chair this TF.

An aggressive schedule has been developed with the expectation that a draft document will be available for review before the Fall 2010 WG meeting in Toronto.

Michel Duval gave a presentation on a diagnostic methods questionnaire which resulted in considerable discussion regarding the Table 1 concentration values and the Table 2 rate of generation values. A poll was taken on whether the concentration values or the generation rates should be listed first. The consensus was that the present order should be kept.

There was also a discussion regarding concentration values versus volume of oil. Submittal of data has been requested in order for this issue to be investigated.

No questions were asked.

The Minutes (unapproved) of WG Meeting as Submitted:

The meeting was called to order by Chair Rick Ladroga at 1:50pm. Secretary Susan McNelly and Claude Beauchemin, who has agreed to be Vice-Chair of the WG, were also present.

There were 35 of 94 members present, 48 guests, and 10 guests requesting membership. A membership quorum was not achieved. The membership roster will be pared down before the next meeting based on attendance and participation.

Guests requesting membership were:

John Crotty	Pierre Feghali
Shawn Luo	Libin Mao
Terence Martin	Hali Moleski
Arturo Nunez	Robert Rasor
Andy Speegle	Peter Zhao

Agenda

1. Welcome & Roll Call
2. Introduction

Approval of Minutes from Fall 2009 Lombard, Illinois meeting

3. Patent Disclosure
4. Revised PAR
5. 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 Fall 2009 Lombard, Illinois meeting was requested. Since a quorum was not present, approval of the minutes will be deferred to the next meeting.

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.

Rick announced that the request for the PAR for the revision of C57.104 was approved by NESCOM in December. The PAR will expire in December of 2014.

Task Forces:

Rick went through the TFs that are in place and the present chairs for each. He then indicated a desire to have vice-chairs assigned to most of the task forces to ensure that the work keeps progressing. Dave Hanson was asked to be vice-chair of the Framework TF. Paul Boman has agreed to chair the Case Studies TF.

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, Vice-Chair Dave Hanson
3. Data – Chair Norman Field, Vice-Chair Pierre Feghali
4. Case Studies – Chair – Paul Boman, Vice-Chair Arturo Nunez
5. Diagnostic Methods – Chair Michel Duval, Vice-Chair Dave Wallach
6. Bibliography – Chair Jerry Murphy

There is an extensive Bibliography in the present Guide. The question was asked if there is anyone that feels we do or don't need the Bibliography. A comment was made that if there is something that is no longer valid, it should probably be removed, but otherwise they should stay. Jerry Murphy agreed to Chair a TF on review of the Bibliography

Schedule:

Rick indicated a need to keep the revision process moving. The following are the planned dates for information to be provided:

1. Diagnostic Methods – final input by Friday, April 30, 2010
2. Statistical analysis - Friday, May 28, 2010
3. Issue compiled draft for TF Review by Friday, June 25, 2010
4. Continue meeting bi-weekly, editing and refining the document in preparation for the Fall 2010 WG meeting in Toronto.
5. Provide draft to entire WG for review and comment – Monday, Sept 13

Task Force reports:

Presentation on Diagnostic Methods Questionnaire – Michel Duval

A copy of Michel's presentation is included at the end of the minutes.

There was much discussion on whether the concentration or rate information should be the primary focus. There seemed to be much consensus that relying on a single sample and result would not be advisable and that the rate of gas increase is the primary tool for determining whether there is a problem.

Rick asked for a poll on whether people would prefer to see the Concentration values 1st and the rates second in the Guide or vice versa. The consensus was that the Concentration limits should be listed first with the generation rates as second.

Other issues:

A question was raised for concentration values for distribution units based on volume of oil. There are differing opinions on this topic and Rick requested data be submitted so that this can be actively investigated.

The meeting was adjourned at 3:00 pm.

Rick Ladroga
WG Chair

Susan McNelly
WG Vice-Chair and Secretary

C57.104 Presentation by Michel Duval:

IEEE C57.104
QUESTIONNAIRE ON DIAGNOSTIC METHODS

COMPILATION OF ANSWERS
Prepared by M.Duval, TF on Diagnostic Methods
March 7, 2010

Section of Gas Guide	Changes/investigations proposed	I agree	I disagree
4.2	Re-write this section along the lines of Draft C57.104-C8	MW	
Table 1, condition 1 (concentrations limits)	Use average US values of Table A1 for condition 1 of Table 1, if no other typical values of gas concentrations are available from the US.	MWCD	
	Request TF on Data to calculate typical values of gas concentrations on other US networks.	WC	M
	Use ranges of values in Table 1 rather than single average values.	WC	M
New Table 1a, condition 1 (gassing rates limits)	Use CIGRE/IEC typical values of gassing rates in Table A2 for new Table 1a, condition 1, if no values from the US are available	MCD	W
	Request TF on Data to calculate typical values of gassing rates on some US networks.	WC	
Table 1, conditions 4,3,2 (concentration limits)	Use pre-failure concentration values of CIGRE in Table A3 for condition 4, if no such values can be calculated in the US.	MWCD	
	Request TF on Data to calculate pre-failure values of gas concentrations on some US networks, following CIGRE method.	WC	M
New Table 1a, conditions 4,3,2 (gassing rate limits)	Use pre-failure gassing rates of CIGRE in Table A2 for condition 4, if no such values can be calculated in the US.	MWCD	
	Request TF on Data to calculate pre-failure values of gassing rates on some US networks, following CIGRE method.	WC	C
Table 3	Replace by Table A4, based on limits for individual gases rather than TDCG	MW	
Table 2	Delete Table 2		
4.5 Key gas method	Delete this method		MWC

4.6.1 Dornenburg method	Keep this method but indicate its limitations Delete this method	MWC MWCD	
4.6.2 Rogers method	Delete this method	M	WC
	Keep this method but indicate its limitations	WCD	
4.6.3 New Triangle method	Delete fault 0 in Table 6 Delete Figures 5 and 4 Introduce the general Triangle method (Triangle 1) Introduce the new versions of the Triangle for low temperature faults Introduce the new versions of the Triangle for non-mineral oils	C C MWCD MWC WC	 M
4.6.4 Other ratios	Introduce the CO2/CO ratio with its limitations	MWCD	
	Introduce the C2H2/H2 ratio	MWCD	
	Introduce the O2/N2 ratio	MWC	
	Introduce new section on stray gassing of oil and catalytic reactions	MWCD	
5. Gas monitors	Re-write this section indicating the capabilities and limitations of commercial monitors Other changes that you would like to propose: **-use rates as primary indicator and concentrations as secondary one (D).** **-consider using histograms for Table 1 to show distributions (W).** **-differentiate between routine and very frequent sampling (C).** **-indicate minimum levels to attempt Triangle and Rogers diagnosis (C).** **-indicate that Rogers and IEC have same limitations (C).** **-move less used methods to an Annex rather than delete them (W).** **-describe how to follow fault evolution with Triangle (D).** **-section 5 on gas monitors should be deleted (MK).**	WC	MK

ANNEX A

Table A1

90% Typical concentration values observed in the US

		H_2	CH_4	C_2H_4	C_2H_6	C_2H_2	CO	CO_2	TDCG
IEEE Table 1	Condition 1	100	120	50	65	2	350	2500	687
California	Weidmann	96	88	57	79	3	613	5990	936
Arizona	APS	80	45	70	30	2	950		1177
	GE	80	50	73	28	2	950		1183
	Average US	85	61	67	46	2.5	840	(5990)	1101

Table A2

Sampling intervals and **gassing rates limits in ppm/ year** calculated for an average CIGRE/ IEC power transformer

Gassing rate	H_2	CH_4	C_2H_4	C_2H_6	C_2H_2	CO	CO_2	TDCG	Sampling intervals
Typical	85	65	89	47	2	660	5850	948	Yearly
Level 2	180	175	220	175	7	1740	15380	2500	Monthly
Level 3	280	315	370	380	20	3050	27010	4415	Weekly
Level 4	510	680	745	1075	50	6490	57350	9950	Daily
Pre-failure	1095	1825	1825	4015	182	17000	150000	26000	Hourly

Table A3
Sampling intervals and **gas concentration limits in ppm**
calculated for an average US power transformer

Concentration	H_2	CH_4	C_2H_4	C_2H_6	C_2H_2	CO	CO_2	TDCG	Sampling intervals
Typical	85	61	67	46	2.5	840	5990	1101	Yearly
Level 2	165	115	140	120	10	1050	11280	1600	Monthly
Level 3	240	160	210	200	30	1250	16300	2090	Weekly
Level 4	390	240	380	390	100	1570	26700	3070	Daily
Pre-failure	725	400	800	900	450	2100	50000	5380	Hourly

Table A4
Sampling Intervals based on Combined Gassing Rates and
Gas Concentrations Levels of the **Individual Gases**

		Sampling Intervals based on Combined Gas Rate and Concentration Levels				
Rate Level #	Conc. Level #	Daily	Weekly	Monthly	Quarterly	Yearly
4	4	X				
4	3	X				
4	2		X			
4	1		X			
3	4	X				
3	3		X			
3	2		X			
3	1			X		
2	4		X			
2	3			X		
2	2			X		
2	1				X	
1	4			X		
1	3			X		
1	2				X	
1	1					X

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

The Report Given at the Sub-Committee Meeting:

David Sundin presented. No meeting was held. The standard was reaffirmed and valid through 2014.

7.3.3.3. <u>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</u>
WG Chair: Fredi Jacob

The WG Report Given at the Sub-Committee Meeting:

The presentation was made by Jim Thompson, No meeting was held. Draft 18 from the previous WG will be the starting point for the new WG.

The PAR for this Guide expired at the end of 2009 and the document was withdrawn. A new PAR was submitted this week and Bill Bartley had forwarded this on for the next REVCOM meeting. The WG for this Guide intends to meet at the Fall meeting in Toronto.

7.3.3.4. IEEE C57.139 IEEE Dissolved Gas Analysis in Load Tap Changers
WG Chair: Fredi Jacob, Vice-Chair: David Wallach

The WG Report Given at the Sub-Committee Meeting:

Dave Wallach presented. The WG met Tuesday, a quorum was not achieved. Draft 12 of the Guide with an example spread sheet went to ballot after the Fall 2009 meeting. A PAR extension to the end of 2010 was received in December.

There were many comments and some negative ballots received. As a result, the ballot resolution group has made some revisions to the Guide. Annex C has been completely revised and Annex D removed. Further refinement of the example spreadsheet has also been made thanks to Mick Bayer.

The document will be sent for recirculation ballot within the next few weeks. A PAR modification was submitted this week for modification of the purpose as required as a result of the IEEE legal review.

The WG Minutes (unapproved) of WG Meeting as Submitted:

Fredi Jakob called the WG meeting to order at 11:00am. WG Vice-Chair Dave Wallach and Secretary Susan McNelly were also present. There were 16 of 35 members (Quorum requirement not met) and 26 guests present with 5 guests requesting membership.
New members are not being accepted at this time as the document has already been balloted.

Agenda:

1. Welcome and Member Roll Call
2. Patent Disclosure Request
3. Approval of Minutes from Fall 2009 Lombard, Illinois meeting
4. Review of WG Ballot Resolution Group - Comments/Actions - Presentation by Dave Wallach
5. Automated Data Analysis – Jim Dukarm
6. Safety Issue - Claude Beauchemin
7. Submittal for Recirculation Ballot
8. Adjourn

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 Fall 2009 Lombard, Illinois meeting was requested. Since there was not a quorum present, the minutes were not approved.

The PAR was set to expire 12/31/2009, since the ballot process would not be completed prior to the PAR expiration. A PAR extension request was submitted for NESCOM review at their December 8, 2009 meeting. A one year PAR extension was granted.

Review of WG Ballot Resolution Group - Comments/Actions - Presentation by Dave Wallach:

Rowland James, Claude Beauchemin, Norman Field, Fredi Jacob, Dave Wallach, Jim Dukarm, Shuzhen Xu, and Mick Bayer worked on comment resolutions for the ballot.
Dave reviewed the changes that were made to the Scope and Purpose for which a PAR modification request will be submitted in parallel to the recirculation ballot effort.

Automated Data Analysis – Jim Dukarm

Jim discussed the work that was done on the example spreadsheet and the improvements done by Mick Bayer. Jim demonstrated the revised spreadsheet. .

Safety Issue - Claude Beauchemin:

Claude made a presentation on how the number that was used in the warning statement was determined. A task force made up of Jack Harley, Paul Griffin, and Claude Beauchemin met to determine a worst case value of DGA that could create a flammable mixture when at equilibrium with air. Claude's presentation will be posted on the WG web page.

Tom Prevost indicated that if limits are to be provided, then technical basis needs to be provided as a reference for how these values were determined. A reference to the Baker paper will be added, which he indicated would satisfy his negative ballot.

Submittal for Recirculation Ballot

There was discussion on submitting a new PAR request for continuing work on future versions. A comment was made that this can't be done until the present PAR is completed. A PAR modification will need to be submitted as soon as possible. The document will be sent for recirculation ballot in parallel with the PAR modification request.
Documents to be included in the Recirculation Ballot:

- C57.139 Draft 14
- Example Spreadsheet

The Ballot will be sent out within the next month or so to be able to meet the year end deadline.

Plans for Fall 2010 Toronto Meeting:

- Review Recirculation Ballot comments/results

The meeting was adjourned at 12:00pm.

Fredi Jakob
Chair
Dave Wallach
Vice-Chair
Susan McNelly
Secretary

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

The WG Report given at the Sub-Committee Meeting:

The report was presented by Jim Thompson. The WG met Tuesday and did achieve a quorum. The work on the Guide is progressing. There were no questions or comments from participants.

The Minutes (unapproved) of the WG Meeting as Submitted:
The working group meeting was conducted at 8 am on April 9, 2010 with 28 people in attendance with 16 of the 20 working group members present. This document was reaffirmed in 2007 and the PAR for revision was 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.

There was a motion to approve the October 27, 2009 Working Group minutes by Don Cherry and a second by Derek Baronowski. The approval of the minutes was unanimous. The discussion of the meeting included a. Juan Castenellos' revision language on the introduction regarding the recommendation of new oil, rather than used reclaimed oil, in new electrical apparatus, and b. Claude Beauchemin's text on the sulfuric compound testing and Polychlorinated Biphenyl testing per ASTM methods, to be inserted as footnotes of Table 2, and c. Dave Sundin's text on the sections for definitions and askeral tradenames.

Ray Bartnikas asked if the life of the used oil was discussed in the guide. Currently the guide does not address that issue.

The current working group membership is:

Baranowski	Derek
Bartnikas	Ray
Beauchemin	Claude
Boman	Paul
Castellenos	Juan
Cherry	Don
Claiborne	Claire
Garza	Joe
Hernden	Rodney
McNally	Mark
Moleski	Hali
Oommen	TV
Pellon	Verena
Peterson	Alan
Rasor	Bob
Stiegemeier	Craig
Sundin	David
Tenyenhuis	Ed
Thompson	Jim
Thompson	Ryan

Respectfully submitted,

Chair Jim Allen Thompson
Co Chair TV Oommen

7.3.3.6. 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.

The TF Report given at the Sub-Committee Meeting:

The WG met Tuesday with 18 of 45 members were present, so there was not a quorum. The PAR is going before NESCOM at the next meeting, however there is a correction to the scope that is required which may require withdrawing it until the next NESCOM meeting.

No patent issues were raised at the meeting, however there are patent issues with the natural ester fluids, that may need to be addressed. A letter of assurance may be required for any applicable patents. More research into this is required.

A subset of the TF has been very active between meetings collecting data. They are obtaining samples from the natural and synthetic ester manufacturers of the fluids and are getting analysis done from 3 separate labs, focusing on repeatability of testing, such as for spray gassing ASTM 7150.

The group has settled on three different methods of interpretation of gases: The Duval Triangle, rate of change, and key gases. They are still looking for NE or Synthetic esters case studies.

The group would like to determine if trade names of the oils can be used in place of calling them high oleic or soybean oil to avoid confusion by users who may not know the difference in what they have other than by the trade name.

Minutes (unapproved) of the TF meeting as submitted:

Attendance: 18 members out of 45 members were in attendance, total attendance was 72 and 8 people requested membership.

The meeting was called to order at 9:30AM. Attendance rosters where circulated and we did introductions. The following agenda was followed:

The IEEE Patent Disclosure policy was reviewed. No patents were disclosed.

Status Update:

NESCOM to meet soon to consider upgrading status to WG

6 webinars since last meeting with task force subset group.

Soybean based fluid already tested, stray gas ASTM7150 with High Oleic fluid and synthetic (UK) samples being sent.

Looking at 3 interpretation methods, Duval Triangle, Rates of Change, and Key Gases.

Goal before next meeting draft one issued for straw ballot.

Claude Beauchemin cautions on moisture monitors and how they calculate relative saturations. The gas readings are ok.

Michel Duval: Need failure information to make more refined analysis for triangle method.

ABB Presentation: George Frimpong

High Energy Arcing Tests for the high oleic natural ester fluid 8,000A 3 cycles 1" gap. Very difficult to control energy input. Combustible gas produced by mineral oil generated violent explosion but mild reaction from high oleic natural ester fluid for similar conditions.

Film did not work so stated presentation. Bolted cover went into air followed by burning gases and oil spray however the remaining oil self extinguished after a few minutes, fluid sprayed into large area, most of the energy occurs in first instants, but checking gases of both oils after DGA fit for D2 area of Duval triangle. Some test almost the same, but others much less. Presentation not available until published submittal expect in 2010.

Question: Any impact on viscosity.

Ray Bartnikas, Hydro Quebec IREQ researched partial discharges in several types of dielectric fluids like synthetic and natural esters. Measuring is quite different at of fluid vs. equipment. Cavities are under tremendous pressure above 50 MPa then cavities collapse, disappear, 2 to 10 micro meters in diameter, all fluids seem to behave similarly. Discharge inception voltages are roughly the same, some differences but do not know how significant they are. Series of papers on power delivery

Chair reminded members to provide feedback on ballets to maintain workgroup membership.

The meeting was adjourned at 10:15AM.

7.3.3.7. TF Guide for Field Application of Natural Esters

Jim Graham – Chair, Jerry Murphy Vice-Chair

The TF Report Given at the Sub-Committee Meeting:

Jim Graham presented the TF meeting summary. The meeting met Tuesday, March 9. and had a quorum with 11 members and 38 guests. 4 guests requested membership. The TF is working on Draft 1, dated March 2008. The Chair spoke of the TF discussion regarding the option including all field related issues in one standard guide even if they directly or indirectly cross-link with other standards. The consensus was to have a single document and provide cross references as needed.

PAR title, scope, and purpose were approved and a motion made to request approval from the SC to establish a WG. The motion passed.

The TF meeting minutes (unapproved) as received:

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 have a quorum. The chair asked if there were any patent disclosures, and none were disclosed. The fall 2009 task force minutes were sent out prior to the meeting for comments and no corrections were submitted. A motion to approve the Fall 2009 minutes was approved.

Membership requirements for the task force were reviewed. Members are required to attend two of the past four meetings and actively participate to gain and maintain membership. Corresponding members are exempt from the attendance requirement.

The list of topics developed in previous meetings was reviewed. After some discussion, a topic covering revised nameplates and/or adding informational labels to alert users of the presence of an alternative fluid was added. A question was raised re the use NE fluids in LTC's.

The chair asked the task force for opinions of creating a single, centralized guide covering the application of NE fluids as opposed to modifying any applicable existing guides. Steve Moore expressed strong support of creating a single guide document. A poll of the members present supported this approach. No support was offered to modify existing standards documents.

Derek Baranowski volunteered to create a draft covering NE fluid handling/processing:

Sanjib Som volunteered to create a draft covering NE fluid filling of new units.

The task force recommends keeping the word "Field" in the document title.

A draft of the PAR application based on previously approved task force recommendation of scope and purpose was presented and reviewed. No substantial changes were proposed (see below). A consensus among the task force members was reached to present the current PAR draft to the fluids subcommittee and ask for approval to submit a PAR.

There was no new business.

The meeting adjourned at 4:30 PM.

PROPOSED TOPICS TO BE ADDRESSED BY FIELD GUIDE TASK FORCE:

1. Types of Equipment Covered by Task Force **(Should NE Fluid be used in LTC's?)**
2. Applications Needing Guidance on "Do's & Don't's"
3. NE Fluid Handling vs. Mineral Oil - **(Derek Baranowski volunteered)**
4. Transportation and Storage Requirements for NE Fluids vs. Mineral Oil
5. Short, Medium, & Long Term Storage of NE Fluid-Filled Equipment
6. Condition Assessment of Existing Equipment **(How will NE fluid react with heat exchangers, pumps, insulation materials?)**
7. Retro-Filling Existing Equipment
    a. NE Fluid Filling Procedures **(Be wary of reusing gaskets for retrofills.)**
    b. Post Fill Procedures – Recommended Tests **(May need to bring in relevant transformer subcommittees.)**
    c. Start-Up Procedures
    d. Expected Key Properties Change of NE fluid as it ages **(should key property changes of equipment using NE fluids also be address, and if so is this within the task force scope?)**
8. Filling New Equipment – **(Sanjib Som)**
    a. NE Fluid Filling Procedures
    b. Post Fill Procedures - Recommended Tests **(May need to bring in relevant transformer subcommittees.)**
    c. Start-Up Procedures
    d. Expected Key Properties Change. **(should key property changes of equipment using NE fluidsalso be address, and if so is this within the task force scope?)**
9. Cold Start Operations
10. Recommended Monitoring
11. Proper NE Fluid Disposal Procedures
12. **Nameplate changes and/or informational labels**

Draft PAR for Guide for Field Application of Natural Esters
Submittal Email: jimgraham@ieee.org
Type of Project: PAR for a New Guide
1.1 Project Number: P
1.2 Type of Document: Guide for
1.3 Life Cycle: Trial
1.4 Is this project in ballot now? No
1.5 Is the balloting group aware of the PAR modification?
2.1 Title of Standard: Guide for ???
3.1 Name of Working Group: () **Contact information for Working Group Chair** Jim Graham jimgraham#ieee.org 412-251-2928
3.2 Sponsoring Society and Committee:IEEE Power Engineering Society/Transformers(PE/TR) **Contact information for Sponsor Chair:** Tom Prevost 379 Sadie Roberts Rd. St. Johnsbury, VT 05819 US tprevost@ehv-weidmann.com **Contact information for Standards Representative:** William Bartley One State St. Hartford, CT 06102 US william_bartley@hsb.com
4.1 Type of Ballot: Individual
4.2 Expected Date of Submission for Initial Sponsor Ballot:
4.3 Projected Completion Date for Submittal to RevCom:
5.1 Approximate number of people expected to work on this project:
5.2 Scope of Proposed Standard: This guide recommends procedures for the field use of natural ester fluids (NE) used as dielectric coolant in liquid-immersed transformers and other electrical apparatus. This guide is not intended to determine the suitability of these fluids in specific equipment.
5.3 Is the completion of this standard is dependent upon the completion of another standard: No **If yes, please explain:**
5.4 Purpose of Proposed Standard: The purpose of this guide is to provide information for the application of natural ester fluids for insulating and cooling. This will include field procedures for filling new equipment, retro-filling and handling natural ester fluids in existing equipment.
5.5 Need for the Project: The use of natural ester fluids as an insulating medium in liquid-immersed equipment is increasing. Detailed knowledge of the handling and testing of natural ester fluids is not widespread among

users.
5.6 Stakeholders for the Standard: Stakeholders in this project include utilities, industrial, government agencies & commercial users, transformer & component manufacturers, field service organizations, repair facilities, re-manufacturers, and suppliers of natural ester fluids.
Intellectual Property **6.1.a.** Has the IEEE-SA policy on intellectual property been presented to those responsible for preparing/submitting this PAR prior to the PAR submittal to the IEEE-SA Standards Board? Yes If yes, state date: 2007-10-15 If no, please explain: **6.1.b.** Is the Sponsor aware of any copyright permissions needed for this project? No If yes, please explain: **6.1.c.** Is the Sponsor aware of possible registration activity related to this project? No If yes, please explain:
7.1 Are there other standards or projects with a similar scope? No If yes, please explain: **and answer the following:** Sponsor Organization: Project/Standard Number: Project/Standard Date: 0000-00-00 Project/Standard Title:
7.2 **Future Adoptions** **Is there potential for this standard (in part or in whole) to be adopted by another national, regional, or international organization?** Do not know at this time If Yes, the following questions must be answered: Technical Committee Name and Number: **Other Organization Contact Information:** **Contact person:** **Contact Email address:**
7.3 Will this project result in any health, safety, security, or environmental guidance that affects or applies to human health or safety? No If yes, please explain:
7.4 Additional Explanatory Notes: (Item Number and Explanation)

7.3.3.8. TF on Particle Count Limits in Mineral Oil - Chair: Mark Scarborough

The Report given at the Sub-Committee Meeting:

The TF report was presented by Mark Scarborough. The TF members met 5 times via web conference between the F09 and S10 meetings. The TF drafted a web ready survey to gather information on the current industry practices. The invitation with the web link to take the survey will be sent to all names on the current TC master list.

Some recommendations for the survey topics were suggested by attendees including: New oil vs. aged oil samples, metallic vs. cellulosic particles, noting the sample port flush volume, and indication of where sample was taken (top or bottom of the transformer).

The TF Meeting Minutes (unapproved) as Received:

Mark Scarborough – Chair, T.V. Oommen – Vice-chair, Paul Boman - Secretary

Meeting Date: 3/8/2010 Time: 8:00 – 9:15 AM

Attendance: 10 members out of 20 members (2-members are oil refiners and rarely attend the IEEE conference) were in attendance, total attendance was 73, 14 requesting membership. See the list below:

John Crouse, Jaun Castellanos, Don Platts, Ajith Varghese, Andy Steineman, Eduardo Garcia, Bill Boettger, Paul Boman, Dave Hanson, Don Cherry, Rugen Huyes, Bill Daronvny, Saurasbh Ghosh, Baitum Yang

The meeting was called to order at 8:05AM. Attendance rosters where circulated and we did introductions. The following agenda was followed:

1. Introductions & Roster
2. Patent Disclosure
3. Purpose
4. Activities to Date
5. Particle Basics
6. Standards / Calibration
7. Available Guidance
8. Test Results of New Oil
9. Survey
10. Open Discussion
11. Invitation to Participate
12. Adjournment

The IEEE Patent Disclosure policy was reviewed. No patents were disclosed. Mark Scarborough presented a MS Power Point presentation per the agenda above. The main purpose of the presentation was to provide a general background on particle count to meeting attendees.

The purpose of the TF is to investigate particle counts in new transformer oil and to see if limits need / can be established. The TF has had five (5) teleconference / web meetings on the subject, gathered information on industry standard methods for counting particles and calibration standards, and reviewed known IEC and IEEE conference paper guidance on particle counts in transformers. The TF had the particles counted in samples taken directly from a transformer mineral oil refiner's bulk storage after passed through a 0.5 micron filter. The results of the testing were presented. The test showed that there was about 60 particles / mL >5 um in the sample tested per ASTM D 6786.

The TF developed a web based survey on particle count limits in new transformer insulating fluid. The purpose of the survey is to gather information in the transformer community about particle count testing methods, filtering, and manufacturer/owner established limits in new transformer insulating fluid. The web link for the survey was presented and a business style card containing the survey link was circulated. In addition, the survey link will be circulated via e-mail through the IEEE Transformers Committee e-mail list. Per request of the IEEE Transformers Committee, entry of contact information / company is optional in the survey. The only required field is "Country."

During the open discussion portion of the meeting, the following topics / concerns were raised:

- There was a discussion on dielectric strength and what we want in an insulating fluid is high dielectric strength. Particle count alone should not determine the health of the insulating fluid or transformer.

- A discussion was held about how the shape and type of particles (i.e. cellulose, metals, etc) effect dielectric strength.

- The chair was asked if a written TF scope had been developed. A scope has not been fully defined. The main purpose of the TF was to first become educated and gather data on what

has been occurring in the industry. Most of the TF members had very limited knowledge of particle counts. Once the results from the survey are gathered, then a scope statement will be formulated. It was decided during our first TF meeting that the focus of the TF would be on particle limits on new mineral oil in new transformers. This may still be the scope, but it depends on the results of the survey. Some of the TF members have particle count limits in their purchase specifications for new transformers. Typically, when particle count limits are in a specification, samples may be taken before and after heat runs. The main reason for particle counting at the manufacturing stage is to determine the cleanliness of the transformer and not a diagnostic tool.

- There was a discussion on using particle count in insulating fluid as a diagnostic tool for in-service transformers. To use particle count in this way, the types of particles would need to be defined and then the source could be identified based on the material type. There are several documents / papers that discuss this subject, but using particle counts as a diagnostic tool was not something that the TF was originally chartered to study. It could be added at a later date.

- Paul Boman volunteered to be TF Secretary.

- A suggestion was made to add a question about how sample bottles are prepared for particle testing. Mark Scarborough is not sure if the survey can be changed if people have taken the survey. Mark to investigate.

- The meeting presentation has been sent to the Insulating Fluids Subcommittee chair for posting on the IEEE Transformers Committee / Insulating Fluids Subcommittee web site.

The meeting was adjourned at 9:15AM.

7.3.3.9. TF on Moisture in Oil - Chair: Bob Rasor

The TF Report given at the Sub-Committee Meeting:

SD Meyer ran data on 600,000 moisture samples since 2003. From this data, ~4700 transformers were found to have experienced swings above and below 35ppm for the <69kV class indicating a need for guidance in addition to ppm levels. An evaluation of the data based on various ranges of % saturation, transformer average age, average ppm of moisture, average sample temperature, and average total furans in ppb. A word of advice was given regarding the mining of data is that variations of sampling methods and temperatures can cause a large variation in results.

The TF has met via conference calls since the Fall meeting and has developed a scope.

The TF is very interested in obtaining on-line monitoring data.

A question was asked if there was any resolution to the original negatives expressed to forming the TF, the response was that the meeting went well and the concerns with how the data is mined are understood.

The TF Meeting Minutes (unapproved) as Received:

TF on Moisture in Oil, Monday, March 8, 2010 3:15 pm, Houston, Texas

The meeting was called to order by Chair Bob Rasor at 3:20 pm. There were approximately 70-80 attendees. The roster indicates 65 attendees signed in. 12 of the 25 members were present. And 9 requested membership.

Members attending were:

Bob Rasor	Claude Beauchemin
Hali Moleski	Juan Castellanos
Tony Pink	Jim Thompson
Subhas Sarkar	Paul Boman
Dave Hanson	Dinesh Chhajer
Oleg Roizman	Jin Sim

Attendees requesting membership were:

Valery Darydou
Shuzhen Xu
Mark Scarborough
T.V. Oommen
James Gardner
Mark Tostrud
Terry Martin
Zan Kiparizoski
Libin Mao

Agenda

1. Meeting called to order at 3:20pm
2. Roster
3. Introductions
4. Reviewed minutes from Fall 2009 meeting
5. Reviewed minutes from Feb 2010 conference call
6. Reviewed scope
7. Comments were given
8. SDMI presented 2 data examples
9. Comments were given
10. Action items for TF members are to provide data
11. Meeting was adjourned at 4:14pm

Comments provided throughout the meeting include the following:

After the scope was read, it was asked if dielectric test D877 was still widely used. It was stated that labs still offer the test. And although many manufactures do not use it, that others still do.

Bob explained the data examples in the agenda. He explained that some may look at data two different ways. Acute aging such as bubble evolution is a major concern. However, some also look at longer term aging factors that can be indicated by moisture and furan trends. It was also mentioned that IEC currently corrects their relative saturation and uses 20 C as a baseline. It was stated that the current revision will likely not keep the current way of calculating back to 20C. The current IEC 296 draft only provides ppm. IEC 60422 provides different equations to calculate relative saturation if temperatures are below 20C.

It was also stated the IEEE C57.106 gives warning and equations for cold start up of transformers.

It was suggested that the relative saturation presented should be adjusted to include used transformer oil and take IFT, color and acid into consideration when using a relative saturation equation, as coefficients will vary.

Additional comments that followed:

- Data collection performed by one guest indicated a very large standard deviation even though conditions were very similar. He looked at why there was such a difference, and it was very difficult to get accurate results from data mining.

- Another member commented that a difference of 10-50% can be common. But agreed that data mining will be difficult because if there is any error in temperature or ppm measurement, it will largely affect the results.

- Data from new transformers can be expected to be very different than used transformers due to the relative saturation of used oil vs. new.

- Relative saturation is desired over ppm, but issues have been seen with using relative saturation. It is not desired to return to the old guidance documents that looked at relative saturation, because manufacturer had new transformers not pass the standard. It was stated that when temperatures are low, the error in calculating relative saturation can be huge. It was restated that the relative saturation equation should be corrected for each oil. Temperature used in the equations should also carefully be evaluated.

7.3.4. Old Business:

- None

7.3.5. New Business:

- Field Guide for natural and synthetic ester fluids: Jim Graham recommended the TF be elevated to WG status. A PAR is ready for submittal. The requested WG scope and purpose were read and a motion was made to approve the formation of the WG.

  A question was asked whether this Guide will provide any different information than can be obtained from the fluid manufacturers; the answer was yes.

  The motion passed unanimously. The next step will be for the request for WG to be presented to the Administrative Committee.

- A note was sent to the SC Chair from Jimmy Rascoe Chair of ASTM D1, and Chair of ASTM D27 SC looking for IEEE guidance for sub-zero viscosity to be applied to transformer oil. There are no specific references to viscosity at low temperatures in the IEEE guides that attendees to the SC meeting were aware of. C57.637 and C57.106 will be reviewed and any references found will be forwarded to Mr. Rascoe.

SC IF Adjournment 4:15PM

Respectfully Submitted:

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

10.0 Editor's Report – Spring 2010 Houston Meeting

March 11, 2010
Ed teNyenhuis

Between Oct 28, 2009 and March 10, 2010, a total of 77 new & resubmitted papers in the transformer area were submitted to IEEE Transactions on Power Delivery for possible publication. For the 45 reviews completed during this period, the recommendations were:

Accept without changes:	11
Revise and Resubmit:	23
Reject:	11

Another 32 papers are under review and 3 papers are waiting to be processed for their initial review. A summary of the accepted papers is at the end of this report.

There is now a second editor supporting this editor task as it was identified that by IEEE PES that the paper load for transformers was very high. Dr Francisco De Leon of Polytechnic Institute of NYU is reviewing many of the papers which has helped greatly.

I would like to thank all of the reviewers who volunteered for this effort and donated their time, and would like to encourage everyone associated with IEEE Transformers Committee activities to consider becoming a Reviewer.

I would like to encourage those Reviewers that already have an account on IEEE Manuscript Central to keep their profile information updated and complete the areas for key words and areas of interest. We need more reviewers and I encourage any of you that have not signed up as reviewers to sign up per the instructions 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://tpwrd-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	Paper ID	Title	Submitting Author	Decision
1	TPWRD-00232-2009	A Permeance-Based Transformer Model and its Application to Winding Inter-Turn Arcing Fault Studies	Oliveira, Luis	Accept without changes
2	TPWRD-00328-2009	Thermal Modeling of an Oil-Immersed Current Transformer	Mahajan, Satish	Accept without changes
3	TPWRD-00123-2009	Modeling and Analysis of a Single-phase Distribution Transformer with Mid-tap on the Secondary Side	Chen, Tsai-Hsiang	Accept without changes
4	TPWRD-00673-2009	Vibration Analysis Using Envelope-Wavelet for Detecting Faults in the OLTC Selector Switch	García, Juan	Accept without changes
5		Analytical Algorithm for the Calculation of Magnetization and Loss Curves of Delta Connected Transformers		Accept without changes
6		Transformer Model for Inrush Current Calculations: Simulations, Measurements and Sensitivity Analysis		Accept without changes
7		Novel Approach for Reducing Transformer Inrush Currents. Laboratory Measurements, Analytical Interpretation and Simulation Studies		Accept without changes
8		A Hybrid Measurement Approach For Wide-Band Characterization And Modeling of Power Transformers		Accept without changes
9		A Novel Three-phase To Five-phase Transformation Using Special Transformer Connection		Accept without changes
10		A New Algorithm to Identify Magnetizing Inrush Condition Based on Instantaneous Frequency of Differential Power Signal		Accept without changes
11		Study of Transformer Resonant Overvoltages Caused by Cable-Transformer High-Frequency Interaction		Accept without changes

11.0 Meetings Planning

None

12.0 Liaison Report

12.1 Standards Coordinating Committee on Electrical Insulation - SCC 04

None

12.3 CIGRE Liaison Report

None

U.S. National Committee of the International Electrotechnical Commission,
A Committee of the American National Standards Institute

12.2 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:	Omni Houston Hotel 4 Riverway Houston, TX 77056
DATE AND TIME:	**Monday, March 8, 2010** 8:15 AM
PRESIDING OFFICER:	P. Hopkinson, Technical Advisor

Members Present:

R. Ahuja	Waukesha Electric Systems
P. Hopkinson	HVolt, Inc., Technical Advisor
M. Kennedy	Doble Engineering
S. Kennedy	Niagara Transformer
M. Locarno	Doble Engineering
R. Marek	Dupont Advanced Fibers Systems
H.J. Sim	Waukesha Electric Systems
S. Choinski	NEMA Staff, TAG Administrator

Members Absent:

C. Colopy	Cooper Power Systems
J. Corkran	Cooper Power Systems
L. Dix	Quality Switch
J. Foldi	Foldi & Associates

Others present:

J. Alvarez	Prolec GE
P. Arrascaeta	Cordoba-Argentina
R. Asano	ABB
N. Brush	Consultant
A. Cancino	IEM-Mexico
R. deFay	Copper Development Association
R. Girgis	ABB
M. Gromlovits	Federal Pacific
J. Haasz	IEEE

T. Holdway	Intermountain Electronics
M. Heathcote	Martin Heathcote Associates LTD
A. Kraemer	Reinhausen
P. Jarman	National Grid, IEC TC14 Chairman
B. Lopez	Prolec GE
D. Marlow	TBEA Transformer
H. Nordman	ABB Oy, Transformers
D. Patel	Hammond Power Solutions
C. Ploetner	ABB
J. Puri	Transformer Solutions, Inc.
E. Rawls	Howard Industries
O. Rolzman	Intellpower, Australia
Z. Roman	Areva T&D
D. Sawer	Cooper Power Systems
M. Schenk	Siemens
E. Smith	H-J Enterprises, IEEE Transformer Committee Chairman
E. Tolachir	Tubos trans Electric
S. Tuli	Delta-Star, Inc
T. Turvey	Specialty Switch

1. CALL TO ORDER

The meeting was called to order, meeting guidelines reviewed and attendance recorded. The requirements for official TAG membership was discussed.

2. APPROVAL OF THE AGENDA

The Agenda was approved as written. The Technical Advisor noted that the Agenda was well prepared.

4. APPROVAL OF THE PREVIOUS MINUTES

Minutes of the meeting held October 26, 2009 in Lombard, Illinois, are submitted for approval.


Minutes TC-14 TAG Oct 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:
Raj Ahuja
Craig Colopy
Jerry Corkran
Larry Dix
Joe Foldi (Liaison to Canada)

Phil Hopkinson (Technical Advisor)
Matt Kennedy
Sheldon Kennedy
Mario Locarno
Rick Marek
Jin Sim
Scott Choinski (TAG Secretary)

6. REPORT ON 2009 PLENARY MEETING

Highlights of the 2009 Plenary meeting of IEC TC14 held in Rosslyn, Virginia. Discussion occurred in the individual agenda items below.


14_628e_RM.pdf

7. STANDARDS ACTIVITIES

7.1 IEC 60076-1 Ed. 3.0 - Power transformers - Part 1: General (MT5 Convenor: P. Hopkinson)

Comments from CDV were addressed by MT5. An editorial team addressed the editorial comments in January. A review of the comments and document version are needed and it will then be prepared/circulated as FDIS. If all goes well, document will be published late this year.

There was a lot of discussion at the Plenary meeting on the meaning of frequent energization. A questionnaire was circulated to the National Committees and the consensus was more than 24 energizations per year. This was put into the document.

7.2 IEC 60076-2 Ed. 3.0 - Power transformers - Part 2: Temperature rise for oil-immersed transformers (MT6 Convenor: A. Bossi)

A meeting was held in January 2010 in Milan. Technical comments were addressed. The FDIS should be available for vote this year.

7.3 IEC 60076-3: Power transformers - Part 3: Insulation levels, dielectric tests and external clearances in air: (MT 60076-3 Convenor: Yukiyasu Shirasaka)

First meeting of MT held November 17-18 at NEMA. The expected target dates for the development or IEC 60076-3 are as follows:
CD 2010-06, CDV 2011-04, FDIS 2012-01, IS 2012-04
It is expected that Dielectric test tables from the IEEE document will be included. Next meeting scheduled for Paris in a few weeks.
Mr. Raj Ahuja is the US expert

7.4 IEC 60076-10 Ed. 2.0 - Power transformers - Part 10: Determination of sound levels (MT 60076-10 Convenor: Dr. C. Ploetner)

The WG has not met yet, No US expert identified.
Jeewan Puri has done a lot of work in the IEEE on sound levels. There was extended discussion on harmonization between IEC and IEEE documents and the value of establishing Joint WGs.

7.5 IEC 60076-16 Ed. 1.0 - Power transformers - Part 16: Transformers for wind turbines applications (WG31 Convenor M. Sacotte)

The commenting period for the CDV closed on 08 January 2010.
No US expert identified.
IEEE TF Wind Power Transformers is looking at this document and the next meeting is Tuesday morning at 8 am. Will consider becoming a WG.

7.6 IEC/TR 60076-17 Ed. 1.0 - Evaluation of electromagnetic fields around power transformers

Revised draft due to the Secretary /Central Office by 2010-02. Once the comments have been incorporated the document can be published. There was a discussion about the incorporation of calculation of electromagnetic fields into the document, but it was agreed to invite the Canadian NC to make a proposal for a new work item to include these changes if a suitable convenor is found.

7.7 IEC 60076-18 Ed. 1.0 - Power transformers - Part 18: Measurement of frequency response (PT 60076-18 Convenor: Patrick Picher)

Convenorship was transferred from Paul Jarman to Patrick Picher. This document has now been progressed to the CD stage. (14/626/CD). Deadline 19 February 2010.
Matt Kennedy and Mario Lozano are the US experts.
This document is similar to C57.149, which is almost ready for ballot. C57.149 seems to be more of an application guide.

7.8 IEC 61378-1 Ed. 2.0 - Convertor transformers - Part 1: Transformers for industrial applications (MT7 Convenor U. Piovan)

The next MT meeting was planned for February 2010. The FDIS will be submitted to the TC 14 Secretary by 2010-06.
Sheldon Kennedy has been identified as the US expert for this standard.

7.9 Other proposed standards

7.9.1 CLC EN 50216-9: Power transformer and reactor fittings - Part 9: Oil-to-water heat exchangers

The Chairman suggested that either all parts of the EN 50216 series or none of the parts should be adopted. Most comments within 14/615/INF show that the majority of members are in favor of the adoption. It was agreed to circulate all 16 parts of the EN 50216 series to NCs asking for comments and a proposal for a Project Leader. The Chairman agreed to consider all comments on the CENELEC documents and reports back during the next meeting.

7.9.2 CLC EN 50216-10: Power transformer and reactor fittings - Part 10: Oil-to-air heat exchangers

See above

7.9.3 CLC/EN/TR 50462 (Rules for the determination of uncertainties in the measurement of the losses on power transformers and reactors)

A Project Team will be formed with Antonio Bossi (IT) as a project leader to simplify the European Standard and to introduce this Standard as IEC Technical Specification into the IEC/TC 14 work program.

7.10 New Projects

7.10.1 IEC 60214-1: Tap-changers – Part 1: Performance requirements and test methods

Revision, Convenor: Axel Kraemer

7.10.2 IEC 61378-2 (Convertor transformers - Part 2: Transformers for HVDC applications)

It was agreed to start the revision of IEC 61378-2 once the outcome of the CIGRE joint working group A2/B4.28 has been published. The Convenor will be Anders Lindroth

7.10.3 IEC 61378-3 (Converter transformers - Part 3:Application guide)

No information available on this project.

7.10.4 IEC 62032 (Guide for the application, specification, and testing of phase-shifting transformers)

This is a dual logo standard (IEC/IEEE). IEEE is revising this Standard (PC57.135). As a dual logo standard the procedure of AC 24/2007 needs to be followed. The Secretary agreed to circulate document PC57.135 as a DC document. This DC will also serve as a call for experts to participate in the joint group to revise IEC 62032. Jin Sim agreed to convene the joint group. This work should begin when the IEEE document is complete.

7.10.5 Develop a Standard for distribution transformers

There was a general agreement that a new standard for distribution transformers would be useful. However, no Convenor has been identified so the work will not commence. Will be revisited once IEC 60076-1 is completed.

If this is to proceed, power ratings will need to extend beyond the existing limit of 2.5 MVA up to 10 MVA, voltage ratings up to 69 kV.

A JWG between IEC and IEEE should be considered. Dave Aho did a lot of work in the past, but is no longer active in the transformer committee. Perhaps he could be coaxed back for this project. Mr. Hopkinson will seek other candidates for the Convenor.

8. OTHER ISSUES

8.1 Scope change for TC14 and 60076-1

A comment from the Italian NC results in certain low voltage transformers being excluded from IEC 60076-1 that had previously been procured against it. It was agreed that these transformers be included, which requires a change to IEC 60076-1 and to the scope of TC14. Consultation with TC96 is required, and a DC will be circulated to the NCs for comment.

8.2 Energy efficiency

Work is already going on in CENELEC/Europe. It was agreed to start work with Michel Sacotte as a Project Leader. Michel Sacotte will circulate the new work item proposal.
It seems that there would be a common methodology for determining energy efficiency, though each country may have different efficiency levels.
A lot of work is underway in the US with DOE rulemaking. MV and Liquid rulemaking is being opened early due to a lawsuit by environmental groups who were looking for the effects of CO_2 reductions to be considered.

8.3 IEC 60076-6-1 to cover variable and saturable reactors.

Russia agreed to issue a new work item proposal to produce a standard. Prof. Andrey Lokhanin will be the project leader.

8.4 Transformers for Off-shore power transmission

No action needed from TC14 at this time, but this may be appropriate for Wind Transformers to consider.

8.5 Transformers for nuclear installations

Proposed to start work on a new IEC standard based on the existing IEEE standards (IEEE 638, 323, 344). It was agreed to issue a DC which will also include a request for nomination of a project leader.

8.6 Upgrade IEC TS 60076-14 (Power transformers - Part 14: Design and application of liquid-immersed power transformers using high-temperature insulation materials) to a full Standard.

Finland proposal. Work could start next year at the earliest, as the MRD is 2012. An MCR will be issued with the US (Rick Marek) as a Project Leader. Rick Marek agreed to send some documentation to the Secretary for circulation with the MCR.

C57.154 is the complementary IEEE document, but is diverging from -14. Becoming more of a standard rather than a guide.

8.7 IEEE C57.15 D8.3 - IEEE Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators

It was agreed to circulate a DC asking National Committees for their opinion on whether to issue this draft as a dual logo Standard and to ask the question if they see any conflict with other Standards. Craig Colopy (US) is proposed as a Project Leader and he will consider the comments on the DC.

8.8 TC14 Liaison to ISO/TC 108/SC 5 - Condition monitoring and diagnostics of machines

Matthew Kennedy (US) agreed to take over from Paul Jarman.

8.9 Establishment for Category D liaison with IEEE

It was requested that a category D liaison be established with IEEE – Power and Energy Society Transformers Committee – with several WGs/MTs of IEC/TC 14. The meaning of Category D liaison is described in the ISO/IEC Directives Part 1 (1.18.3.1). IEEE will need to send a letter to IEC/TC 14 (Secretary/Chairman) requesting the liaison and giving reasons for this liaison. The IEC SMB would need to vote on the liaison. Delegates present were unanimously in favor of establishing this liaison.

Jodi Haasz wasn't sure if Cat D Liaison is the path to proceed. The liaisons are for specific WGs and a higher level liaison may be needed. More discussion between IEEE and IEC is needed.

8.10 JWG between IEC/TC 10 (Fluids for electrotechnical applications) and IEC/TC 14 to revise IEC 61181 (Mineral oil-filled electrical equipment - Application of dissolved gas analysis (DGA) to factory tests on electrical equipment) and IEC 60076-2 (Power transformers, Part 2 Temperature rise for liquid-immersed transformers)

It was agreed to invite IEC/TC 10 to revise IEC 61181. A joint working group would need to be created and the US (Tom Prevost) will offer to lead this project or to assist in the development of the work. US to propose the revision.

8.11 Plenary Meeting 2010

The Chinese NC offered to host the next meeting in China. The provisional date for the Plenary meeting will be the 18/19 November 2010. The preceding three days will be used for MT/WG meetings.

9. NEW BUSINESS

There was no new business.

9. DATE AND PLACE OF THE NEXT MEETING

The next meeting will be held in October, 2010, in Toronto, Canada during the IEEE Transformer committee meetings.

9. ADJOURN

Meeting adjourned at 9:45 am.

Reported By: S. Choinski March 8, 2010

FINAL ISSUE - March 3

IEEE/PES TRANSFORMERS COMMITTEE

www.transformerscommittee.org
Spring 2010 Meeting; March 7-11
Hosted by Jeremy Kriska and Tulstar Products, Inc.
Omni Houston Hotel; Houston, Texas USA

NOTES: See Page 5 for a key to abbreviations. A vertical line in the left margin indicates a noteworthy revision since last revision.

DATE/TIME	ACTIVITY	SUB-COM	ACTIVITY CHAIR	ROOM CAP/ARR/AV	MEETING ROOM (Floor)
Saturday, March 6					
	No Meeting Registration, No Social Events				
9:00 am - 5:00 pm >	Joint WG HVDC Bushings IEC/IEEE 65700-19-03			24 CL	Windsor
Sunday, March 7					
> 9:00 am - 12:00 pm	Joint WG HVDC Bushings IEC/IEEE 65700-19-03			24 CL	Windsor
9:00 am - 4:00 pm	Day Tour: NASA Space Center -- Indicate your desire to attend while registering on-line for the Committee Meeting. -- Bus will depart the Omni at 9:00 am and return around 4:00 pm. Eat breakfast before boarding bus. -- Arrangements will be made to return certain individuals to the hotel by 1:30 pm if necessary.				
1:00 pm - 5:30 pm	Meeting Registration				Regency Foyer
2:00 pm - 5:30 pm	Administrative SC -- closed meeting, by invitation only	Admin.	E. Smith	24 US (w/snack buffet)	Essex
2:00 pm - 5:30 pm	NEMA Transformers -- closed meeting, by invitation only	++	C. Drexler	16 US (w/beverages)	Windsor
6:00 pm - 8:00 pm	Welcome Reception (reception hosted by Nynas USA)			375 Reception	Regency Ballroom
Monday, March 8 – Monday Breaks Sponsored by Dynamic Ratings ***					
7:00 am - 4:00 pm	Meeting Registration (staff for on-site registration provided by Nynas USA)				Regency Foyer
7:00 am - 6:00 pm	Internet Cafe'			12 SQ	Bristol
7:00 am - 7:50 am	Newcomers Orientation Breakfast Mtg (arrive early!) -- Newcomers & Guests are encouraged to attend! -- food will be served in the room		B. Chiu	40 CL	Westbury
7:00 am - 7:45 am	Distribution SC Leaders Coordination -- closed meeting, by invitation only		S. Shull	12 CONF	Noe Private Dining Room
7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			250 RT (8/tbl)	Grand Salon
8:00 am - 9:00 am	Breakfast - Spouses/Companions (no meeting attendees please)			72 RT (8/tbl)	Palm Court
9:15 am - 3:30 pm	Spouses/Companions Tour: "Houston City & Medical Center Tour and Butterfly Center". Includes lunch. -- Advance registration required. Bus departs the Omni Hotel at 9:15 am and returns around 3:30 pm.				
8:15 am - 10:45 am	IEC TC-14 Technical Advisory Group (all interested individuals welcome)	++	P. Hopkinson	40 CL 20 TH (wall)	Westbury
8:00 am - 9:15 am	WG Dry-Type Reactors C57.16	Dry	R. Dudley	48 CL	Regency C
8:00 am - 9:15 am	WG 3-ph Underground Distribution Transformers C57.12.24	UTNP	G. Termini	48 CL	Regency G
8:00 am - 9:15 am	TF Particle Count **(New!)**	IF	M. Scarborough	80 CL	Regency AB
8:00 am - 9:15 am	TF DPV Grid Transformers	Power	H. Shertukde	80 CL	Regency EF
8:00 am - 9:15 am	TF Electrical Partial Discharge Measurements Guide C57.113	DiTests	E. Lemke	100 CL S3	Regency D
8:00 am - 9:15 am	WG Loss Evaluation Guide C57.120	PCS	A. Traut/ D. Duckett	150 CL S3	Colonnade AB
9:15 am - 9:30 am	*Break (beverages only)*			Regency Foyer	

*** Contact Joe Watson (joe_watson@ieee.org) if you are interested in sponsoring coffee-breaks at a future meeting.

DATE/TIME	ACTIVITY	SUB-COM	ACTIVITY CHAIR	ROOM CAP/ARR/AV	MEETING ROOM
Monday, March 8 (continued)					
	~~WG Revision of C57.12.10~~	Will not meet. Ballot resolution process.			
9:30 am - 10:45 am	WG Sealed Dry-Type Power Transf. C57.12.52	Dry	S. Kennedy	48 CL	Regency C
9:30 am - 10:45 am	WG Liquid-immersed Secondary Network Transformers C57.12.40	UTNP	B. Klaponski	48 CL	Regency G
9:30 am - 10:45 am	WG Overhead Distribution Transformers C57.12.20	Dist	A. Traut/ C. Simmons	80 CL	Regency AB
9:30 am - 10:45 am	TF Furan Tests	IL	TBD	80 CL	Regency EF
9:30 am - 10:45 am	TF External Dielectric Clearances	DiTests	E. Davis	100 CL S3	Regency D
9:30 am - 10:45 am	WG PCS Rev. to Test Code C57.12.90	PCS	M. Perkins	150 CL S3	Colonnade AB
10:45 am - 11:00 am	*Break (beverages only)*			Regency Foyer	
	~~WG Control Cabinets PC57.148~~	Will not meet. Ballot resolution process.			
11:00 am - 12:15 pm	WG Dry-Type Gen. Require. C57.12.01	Dry	T. Holdway	48 CL	Regency C
11:00 am - 12:15 pm	WG Std Requires for Sec. Network Protectors C57.12.44	UTNP	B. Wimmers	48 CL	Regency G
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	Regency AB
11:00 am - 12:15 pm	TF Transf. Tank Rupture & Mitigation	Power	P. Zhao	80 CL	Regency EF
11:00 am - 12:15 pm	TF IEEE-IEC Cross Reference	Stds	J. Sim	100 CL S3	Regency D
11:00 am - 12:15 pm	WG Thermal Evaluation C57.100	IL	R. Wicks	150 CL S3	Colonnade AB
12:15 pm - 1:30 pm	Lunch Meeting: 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 Salon
	~~WG 3-ph Padmount Distrib. C57.12.34~~	Document is approved. Will meet again in the fall.			
1:45 pm - 3:00 pm	**SC HVDC Converter Transformers and Smoothing Reactors**	HVDC	R. Dudley	48 CL	Regency C
1:45 pm - 3:00 pm	WG Tap Changer Performance C57.131	Power	W. Henning	48 CL	Regency G
1:45 pm - 3:00 pm	WG Dist. Transf. Bar Coding C57.12.35	Dist	L. Matthews	80 CL	Regency AB
1:45 pm - 3:00 pm	TF Special Dielectric Test Issues	DiTests	B. Forsyth	80 CL	Regency EF
1:45 pm - 3:00 pm	WG High Temp. Transformers PC57.154	IL	R. Marek	100 CL S3	Regency D
1:45 pm - 3:00 pm	WG Frequency Response Analysis (FRA) Guide PC57.149	PCS	C. Sweetser	150 CL S3	Colonnade AB
3:00 pm - 3:15 pm	*Break (beverages and treats)*			Regency Foyer	
3:15 pm - 4:30 pm	WG Dry-Type Test Code C57.12.91	Dry	D. Foster	48 CL	Regency C
3:15 pm - 4:30 pm	WG Harmonizing IEEE & IEC Standards	Stds	J. Puri	48 CL	Regency G
3:15 pm - 4:30 pm	WG Transformer Paralleling Guide	Power	T. Jauch	80 CL	Regency AB
3:15 pm - 4:30 pm	TF PD in Bushings and PTs/CTs	DiTests	T. Hochanh	80 CL	Regency EF
3:15 pm - 4:30 pm	TF Moisture in Oil	IF	B. Rasor	100 CL S3	Regency D
3:15 pm - 4:30 pm	WG PCS Revisions to C57.12.00	PCS	S. Snyder	150 CL S3	Colonnade AB
4:30 pm - 4:45 pm	*Break (beverages only)*			Regency Foyer	
4:45 pm - 6:00 pm	Presentation: "Geo-magnetically Induced Currents (GIC) and the Effects on Power Transformers", by P. Balma, L. Buldoc, R. Girgis, and H. Nordman. Sponsored by SC Power Transformers **			250 S3 (add 100 TH seats)	Colonnade AB
6:15 pm - 12:00 am	Social Event: "A Night at the Houston Livestock Show and Rodeo", with Tim McGraw concert. -- Rodeo starts at 6:45 pm. Concert starts ~9:00 pm. -- Advanced registration required. Indicate your desire to attend while registering for the Committee Meeting. -- Paper tickets can be collected at the Committee Meeting registration desk. -- Buses will depart the Omni Hotel at 6:15 pm and return around midnight.				

** Contact Greg Anderson (gwanderson@ieee.org) if you are interested in making a technical presentation at a future meeting.

DATE/TIME	ACTIVITY	SUB-COM	ACTIVITY CHAIR	ROOM CAP/ARR/AV	MEETING ROOM
Tuesday, March 9 -- Tuesday Breaks Sponsored by Weidmann * **					
7:00 am - 12:00 pm	Meeting Registration (staff for on-site registration provided by Nynas USA)				Regency Foyer
7:00 am - 6:00 pm	Internet Cafe'			12 SQ	Bristol
7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			250 RT (8/tbl)	Grand Salon (lobby level)
8:00 am - 9:00 am	Breakfast - Spouses/Companions (no meeting attendees please)			72 RT (8/tbl)	Palm Court
9:15 am - 2:30 pm	Spouses/Companions Tour: "Bayou Bend and Gardens Tour". Includes lunch. -- Advance registration required. Bus departs the Omni Hotel at 9:15 am and returns around 2:30 pm.				
	~~WG Switching Transients PC57.142~~	Document recirculation is complete; will meet in fall.			
8:00 am - 9:15 am	TF Milli-ampere Current Transf. **(New!)**	IT	Alton/Nguyen	48 CL	Regency C
8:00 am - 9:15 am	WG PC57.152 Field Test Guide	Stds	J. Verner	48 CL	Regency G
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	Regency AB
8:00 am - 9:15 am	TF Wind Power Transformers **(New!)**	Power	D. Buckmaster	80 CL	Regency EF
8:00 am - 9:15 am	WG Oil Reclamation Guide PC57.637	IF	J. Thompson	100 CL S3	Regency D
8:00 am - 9:15 am	TF Temperature Limits for Non-current Carrying Metallic Surfaces	IL	J. Ray	150 CL S3	Colonnade AB
9:15 am - 9:30 am	*Break (beverages only)*			Regency Foyer	
9:30 am - 10:45 am	WG Neutral Ground. Devices PC57.32	PCS	S. Schappell	48 CL	Regency C
9:30 am - 10:45 am	WG Terminal Markings C57.12.70	Stds	S. Shull	48 CL	Regency G
9:30 am - 10:45 am	TF Functional Life Tests, De-energized Tap Changers (DETC)	Power	P. Hopkinson	80 CL	Regency AB
9:30 am - 10:45 am	WG Impulse Test Guide C57.98/138	DiTests	A. Molden	80 CL	Regency EF
9:30 am - 10:45 am	TF DGA Natural Ester Fluids	IF	P. Boman	100 CL S3	Regency D
9:30 am - 10:45 am	WG Revision to Loading Guide C57.91	IL	D. Duckett	150 CL S3	Colonnade AB
10:45 am - 11:00 am	*Break (beverages only)*			Regency Foyer	
	~~WG Voltage Step Regulators C57.15~~	Document published in December. Will meet in the fall.			
11:00 am - 12:15 pm	WG Revision to IEEE 638	Power	C. Swinderman	48 CL	Regency C
11:00 am - 12:15 pm	WG Bushing Application Guide C57.19.100	Bush	T. Spitzer	48 CL	Regency G
11:00 am - 12:15 pm	TF Tank Pressure Coordination **(New!)**	Dist	C. Gaytan	80 CL	Regency AB
11:00 am - 12:15 pm	TF Tertiary/Stabilization Windings	PCS	E. Betancourt	80 CL	Regency EF
11:00 am - 12:15 pm	WG Guide for DGA in LTCs C57.139	IF	F. Jakob	100 CL S3	Regency D
11:00 am - 12:15 pm	WG Temperature Rise Test Procedures in Section 11 of C57.12.90	IL	P. Powell	150 CL S3	Colonnade AB
12:15 pm - 1:30 pm	Speaker Luncheon: Jim "Mattress Mack" McIngvale -- Topic: "Overcoming Adversity ". Advance registration is necessary. -- Paper tickets are not provided. Admission verified at the door.			240 (8/tbl) with elevated table for 5	Grand Salon
1:45 pm - 3:00 pm	WG Phase-shift Transf. Guide C57.135	Power	J. Sim	48 CL	Regency C
1:45 pm - 3:00 pm	WG Dry-type Loading Guide PC57.96 **(New!)**	Dry	R. Marek	48 CL	Regency G
1:45 pm - 3:00 pm	TF Transformer Efficiency and Loss Evaluation (DOE Activity)	Dist	P. Hopkinson	80 CL	Regency AB
1:45 pm - 3:00 pm	TF GSU Bushing Standardization	Bush	C. Hurley	80 CL	Regency EF
1:45 pm - 3:00 pm	WG Revision to Gas Guide C57.104	IF	R. Ladroga	100 CL S3	Regency D
1:45 pm - 3:00 pm	WG Revision to Low Frequency Tests	DiTests	B. Poulin	150 CL S3	Colonnade AB
3:00 pm - 3:15 pm	*Break (beverages and treats)*			Regency Foyer	

*** Contact Joe Watson (joe_watson@ieee.org) if you are interested in sponsoring coffee-breaks at a future meeting.

DATE/TIME	ACTIVITY	SUB-COM	ACTIVITY CHAIR	ROOM CAP/ARR/AV	MEETING ROOM
Tuesday, March 9 (continued)			Work		
3:15 pm - 4:30 pm	TF Semiconductor Rectifier Transformers C57.18.10	PCS	S. Kennedy	48 CL	Regency C
3:15 pm - 4:30 pm	WG Electronic Test Data Reporting C57.12.37	Dist	J. Crotty	48 CL	Regency G
3:15 pm - 4:30 pm	TF ASV Revision to Test Code C57.12.90	ASV	R. Girgis	80 CL	Regency AB
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	Regency EF
3:15 pm - 4:30 pm	TF Field Application of Natural Ester Fluids	IF	J. Graham	100 CL S3	Regency D
3:15 pm - 4:30 pm	WG Transportation Issues Guide	Power	G. Anderson	150 CL S3	Colonnade AB
4:30 pm - 4:45 pm	*Break (beverages only)*			Regency Foyer	
4:45 pm - 6:00 pm	Presentation: "Transformer Tank Rupture and Mitigation", by W. Darovny, M. Foata, J. Herz, W. Johnson, C. Swinderman, and P. Zhao. Sponsored by Power Transformers SC **			250 S3 (add 100 TH seats)	Colonnade AB
6:30 pm - 10:00 pm	Technical Tour: Weidmann Diagnostic Testing Laboratory. Everyone is invited. -- Indicate your desire to attend while registering on-line for the Committee Meeting. -- Bus will depart the Omni at 6:30 pm and return around 10:00 pm. Dinner will be served at the facility. -- For more details, contact Tom Prevost at +802.751.3458 or <tom.prevost@wicor.com>.				
6:30 pm - 10:00 pm	Technical Tour: ABB Marine Services and Azipod Workshop -- Attendance limited to Committee Members and Active Participants. -- Indicate your desire to attend while registering on-line for the Committee Meeting. -- Bus will depart the Omni at 6:30 pm and return around 10:00 pm. Dinner will be served at the facility. -- Contact Craig Muirhead at +713.453.1253, ext. 102 or <craig.muirhead@us.abb.com> for more details.				
6:30 pm - 10:00 pm	Technical Tour: Huntsman Advanced Technology Center (HATC). -- Restricted attendance; by invitation only (Huntsman will send invitations separately) -- Bus will depart the Omni at 6:30 pm and return around 10:00 pm. Dinner will be served at HATC. -- For more details, contact Dawn Adair at +281.719.4490 or <dawn_adair@huntsman.com>.				
Wednesday, March 10 -- Wednesday Breaks Sponsored by AREVA T&D * **					
	No Meeting Registration, No Technical Tours, No Spouse/Companion Tour				
7:00 am - 6:00 pm	Internet Cafe'			12 SQ	Bristol
7:00 am - 8:00 am	Breakfast - Attendees (no spouses/companions please)			200 RT (8/tbl)	Grand Salon
8:00 am - 9:30 am	Breakfast - Spouses/Companions (no meeting attendees please)			72 RT (8/tbl)	Palm Court
7:00 am - 7:45 am	**SC Meetings Planning** -- breakfast buffet in room	Meetings	G. Anderson	30 CL	Essex
8:00 am - 9:15 am	EL&P Delegation (Users only meeting)	++	S. Shull	50 CL	Regency BC
8:00 am - 10:45 am	**SC Instrument Transformers**	IT	J. Smith	30 CL	Essex
8:00 am - 9:15 am	**SC Insulation Life**	IL	B. Forsyth	200 CL S3	Colonnade AB
9:15 am - 9:30 am	*Break (beverages only)*			Regency Foyer	
9:30 am - 10:45 am	**SC Audible Sound & Vibration**	ASV	J. Puri	75 CL	Regency BC
9:30 am - 10:45 am	**SC Bushings**	Bush	F. Elliott	100 CL S3	Regency D
9:30 am - 10:45 am	**SC Distribution Transformers**	Dist	S. Shull	200 CL S3	Colonnade AB
10:45 am - 11:00 am	*Break (beverages only)*			Regency Foyer	
11:00 am - 12:15 pm	**SC UG Transf. & Network Protectors**	UTNP	C. Niemann	50 CL	Regency A
11:00 am - 12:15 pm	**SC Dielectric Tests**	DiTests	L. Wagenaar	200 CL S3	Colonnade AB
12:15 pm - 1:30 pm	Lunch (on your own)				

** Contact Greg Anderson (Greg Anderson) 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/syncs 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

DATE/TIME	ACTIVITY	SUB-COM	ACTIVITY CHAIR	ROOM CAP/ARR/AV	MEETING ROOM
Wednesday, March 10 (continued)					
1:30 pm - 2:45 pm	**SC Dry Type**	Dry	C. Johnson	50 CL	Regency A
1:30 pm - 2:45 pm	**SC Power Transformers**	Power	T. Lundquist	200 CL S3	Colonnade AB
2:45 pm - 3:00 pm	*Break (beverages and treats)*			Regency Foyer	
3:00 pm - 4:15 pm	**SC Insulating Fluids**	IF	S. McNelly	75 CL	Regency BC
3:00 pm - 4:15 pm	**SC Performance Characteristics**	PCS	S. Antosz	200 CL S3	Colonnade AB
4:15 pm - 4:30 pm	*Break (beverages only)*			Regency Foyer	
4:30 pm - 5:30 pm	**SC Transformer Standards**	Stds	B. Bartley	200 CL S3	Colonnade AB
6:00 pm - 10:00 pm	Dinner Social: Goode's Armadillo Palace. Advance registration is necessary. -- Buses begin boarding at 5:45 pm. The last bus departs at 6:00 pm. All buses will 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, March 11					
	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)	Regency EFG
8:00 am - 9:30 am	Breakfast - Spouses/Companions (no meeting attendees please)			64 RT(8/tbl)	Palm Court
8:00 am - 9:45 am >	General Session, Transformers Committee -- All attendees are encouraged to attend. -- See separate document for meeting agenda.		E. Smith	250 CL S1 50 TH elevat. table for 4	Regency ABCD
9:45 am - 10:00 am	*Break (beverages only)*			Regency Foyer	
> 10:00 am - 11:30 am	General Session, Transformers Committee		E. Smith	250 CL S1 50 TH	Regency ABCD
12:00 pm - 5:00 pm	Technical Tour: Boat Tour of Houston Ship Channel Refineries & Chemical Plants. Hosted by Tulstar Products, Inc. Includes "lunch-and-learn" presentation on "The Manufacture of Transformer Fluids". -- Bus will depart the Omni at 12:00 pm and return before 5:00 pm. -- Indicate your desire to attend while registering on-line for the Committee Meeting. -- See flyer for additional security measures.				
Friday, March 12					
	No Transformer Committee Meetings, No Internet Cafe', No EPRI Meeting, No Tours.				

FUTURE COMMITTEE MEETINGS

FALL 2010 - October 24-29; Toronto, Ontario CANADA. Hosted by Trench Electric.
SPRING 2011 - March 10-14; San Diego, California USA. Hosted by San Diego Gas & Electric

IEEE/PES TRANSFORMERS COMMITTEE

General Session - Spring 2010 Meeting
Thursday, March 11

Chair: Ed Smith Vice Chair: Bill Chiu Secretary: Don Platts Treasurer: Greg Anderson

1.	Chair's Remarks and Announcements		J. Edward Smith
2.	Approval of Minutes from Fall 2009 Meeting		J. Edward Smith
3.	Administrative Subcommittee		J. Edward Smith
4.	Vice Chair's Report		Bill Chiu
5.	Treasurer's Report		Gregory W. Anderson
6.	Transformer Standards		William H. Bartley
7.	Recognition and Awards		Thomas A. Prevost
8.	New Business (continued below)		J. Edward Smith
9.	Report of Technical Subcommittees		
	9.1.	Insulation Life	Bruce I. Forsyth
	9.2.	Performance Characteristics	Stephen Antosz
	9.3.	Power Transformers	Thomas G. Lundquist
	9.4.	Underground Transformers & Network Protectors	Carl G. Niemann
	9.5.	Audible Sound and Vibration	Jeewan L. Puri
	9.6.	Bushings	Fred E. Elliott
	9.7.	Dry Type Transformers	Charles W. Johnson
	9.8.	Distribution Transformers	Stephen D. Shull
	9.9.	Dielectric Tests	Loren B. Wagenaar
	9.10.	HVDC Converter Transformers & Reactors	Richard F. Dudley
	9.11.	Instrument Transformers	James E. Smith
	9.12.	Insulating Fluids	Susan J. McNelly
10.	Editor's Report		Edward G. teNyenhuis
11.	Meetings Subcommittee		Gregory W. Anderson
12.	Reports of Liaison Representatives		
	12.1.	Standard Coordinating Committee No. 4	Paulette Payne Powell
	12.2.	IEC TC-14 Technical Advisor to USNC	Philip J. Hopkinson
	12.3.	CIGRE	Jean-Christophe Riboud
13.	Old Business		J. Edward Smith
14.	New Business (further discussion as needed)		J. Edward Smith

IEEE / PES /TRANSFORMERS COMMITTEE

Standards Report

To: Members of IEEE Transformers Committee

From: William H. Bartley, Standards Coordinator

Date: March 1, 2010

Re: Transformer Standards Activity

Executive Summary

This report covers the Transformer Standards activity for the five-month period of Oct 1 2009 to Mar 1, 2009. The Transformer Committee is responsible for approximately 90 active standards, plus 44 projects for new standards and revisions. In the last five months, one Revision and two Reaffirmations were approved by RevCom. In this same period, NesCom approved three PARs for Revisions, three PAR modifications, five PAR extensions and two PAR Withdrawals.

In this Report:

Important Announcement from IEEE SA

The IEEE-SA has implemented a notification of the Obligations for Participation in IEEE Standards Development, which will be launched on 31 March 2010. This notification to all IEEE standards participants outlines the expectations for any person that participates in IEEE standards development. Participants may be required to acknowledge that they are bound by the Obligations for Participation in IEEE Standards Development prior to accessing IEEE-SA systems, e.g., myProject™ and myBallot™. The text of the Obligations is available on the preview site at http://standards.ieee.org/board/pro/2009changes-31Mar2010.pdf

NOTE: After March 31, until you accept the Obligations for Participation agreement, you will no longer have access to IEEE-SA tools (for example myProject or myBallot) and will not be able to participate in the IEEE Sponsor ballot process.

I. NESCOM \ PAR Activities

PARs approved for New Standards

None

PARs approved for Revisions

PC57.12.01 Std for General Requirements for Dry-Type Distribution and Power Transformers -*until Dec 2013*

PC57.96 Guide for Loading Dry-Type Distribution and Power Transformers -*until December 2013*

PC57.104 Guide for Interpretation of Gases Generated in Oil-Immersed Transformers -*until December 2014*

PAR Modifications

PC57.12.00 Std for General Requirements fo Dist, Power, and Regulating Transformers - *until December 2011*

PC57.131 Standard Requirements for Tap Changers - *Modified PAR approved until December 2010*

PC57.32 Standard Requirements, Terminology and Test Procedures for Neutral Grounding Devices
This was approved until Dec 2011, contingent on PAR project plan changed to show an October 2011 submission.

PAR Extension Requests

P1277 Std General Requirements & Test Code for Dry-Type and Oil-Immersed Smoothing Reactors for DC Power Transmission *Extension Request Approved until December 2010*

PC57.91 Guide for Loading Liquid Immersed Transformers and Voltage Regulators
Extension Request Approved until December 2010

PC57.139 Guide for Dissolved Gas Analysis in Transformer Load Tap Changers
Extension Request Approved until December 2010

PARs WITHDRAWN

PC57.133 Guide for Short-Circuit Testing of Distribution & Power Transformers – *withdrawn Dec 2009*

PC57.151 Guide for Sound Level Measurement Guide for Liquid & Dry Type Transformers and Reactors
This PAR will be withdrawn in March 2010. A significant amount of new information needs to be evaluated and incorporated into the current sound measurement procedures. The work may involve making major modifications to all the work that has been done so far. NesCom and the PAR submitter have agreed that it would be best to withdraw this PAR, regroup and then take out a new PAR which will provide four years to accomplish this work.

II. REVCOM \ Standards Activities

NEW Transformer Standards Approved

None

Revisions Approved *until 2014*

PC57.12.34 Std for Requirements for Pad-Mounted, 3ph Distribution Transformers, <5 MVA

Reaffirmations *until 2014*

C57.121- Guide for Acceptance and Maintenance of Less Flammable Hydrocarbon Fluid in Transformers

C57.124 - Rec Practice for Detection of Partial Discharge &Measurement of Apparent Charge in Dry-Type Transformers

Other Standards Activity

REVCOM approved an extension of the following TC standards, because of Work in Progress.

32-Standard Requirements, Terminology, and Test Procedures for Neutral Grounding Devices *PAR mod approved until 2011. Revcom: Extend for duration of the modified PAR.*

259- Std Test Procedure for Evaluation of Systems of Insulation for Dry-Type Specialty & General-Purpose Transformers *Reaffirmation ballot is in progress. Revcom: Extend until December 2010.*

1277- General Requirements & Test Code for Dry-Type and Oil-Immersed Smoothing Reactors -
Revision ballot in progress & PAR extension submitted. Revcom: Extend for duration of the PAR (Dec 2010)

C57.19.00 - Std General Requirements & Test for Power Apparatus Bushings -
Reaffirmation ballot in progress. Revcom: Extend until December 2010.

C57.91- Guide for Loading Mineral-Oil-Immersed Transformers
PAR extension request submitted to NesCom. Revcom: Extend for the duration of the PAR (Dec 2010)

C57.96 - Guide for Loading Dry-Type Distribution & Power Transformers
Revision PAR submitted to NesCom. Revcom: Extend for the duration of the PAR. (Dec 2013)

C57.131- Std Requirements for Load Tap Changers
PAR extension request submitted to NesCom. Revcom: Extend for the duration of the PAR. (Dec 2010)

III. Standards Board March Agenda

The following Transformer Standards & PARs are on the March Agenda for consideration

REVCOM

Revision of P1277/D7 Standard General Requirements and Test Code for Dry-Type and Oil-Immersed Smoothing Reactors for DC Power Transmission

Reaff of 259-1999 (R2004) Standard Test Procedure for Evaluation of Systems of Insulation for Dry-Type Specialty and General-Purpose Transformers

Reaff of C57.144-2004 IEEE Guide for Metric Conversion of Transformer Standards

NESCOM

PAR Modification for **P65700-19-03** Standard for Bushing for DC application

New PAR for **PC57.155** Guide for Interpretation of Gases Generated in Natural Ester and Synthetic Ester Immersed Transformers

PAR for **Revision** of **PC57.12.38** Standard for Pad-Mounted-Type, Self-Cooled, Single-Phase Distribution Transformers; HV 34 500 GrdY/19 920 V and below, LV 480/240 V; 250 kVA and Smaller

PAR for **Revision** of PC57.13 Standard Requirements for Instrument Transformers

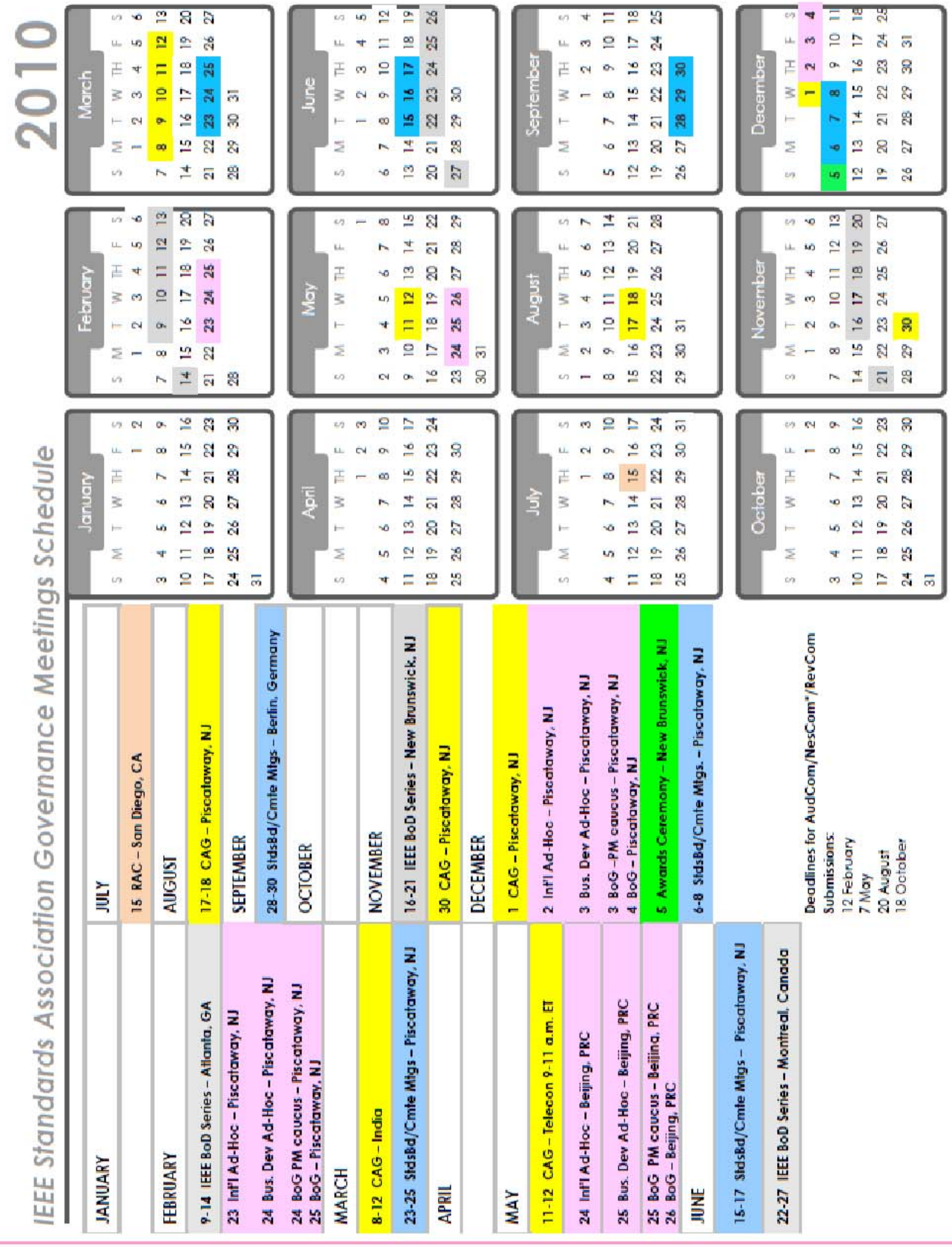
PAR for **Revision** of PC57.120 Guide for Loss Evaluation of Distribution and Power Transformers and Reactors

IV. 2010 IEEE Standards Board Meeting Schedule

2010 DEADLINES for NESCOM and REVCOM Submissions:

March Meeting	February 12, 2010
June Meeting	**May 7, 2010**
September	**August 20, 2010**
December	**October 18, 2010**

IV. 2010 Standards Board Meeting Schedule



V. Transformer Committee Ballot Status *(as of Mar 1, 2010)*

Subcommittee	*Standard*	*Status*	*Ballot Closed*
Bushing	C57.19.00-2004	Comment Resolution Extended until Dec 2010	17-Sep-09
Dielectric	PC57.113	Submitted to Revcom	2/7/10
Dist	PC57.12.30	Comment Resolution 1	2/21/10
Dist	PC57.12.31	Comment Resolution 1	2/21/10
Dist	PC57.12.34	Revision APPROVED Dec 09	09-Oct-09
DryType	C57.124	Reaff Approved Dec 09	3/11/09
DryType	259-1999	On March Agenda @ Revcom	12/21/09
HVConv	P1277	On March Agenda @ Revcom	1/5/10
InsFluid	PC57.139	Comment Resolution	12/3/09
InsFluid	C57.121-1998	Reaff Approved Dec 09	10/25/09
Instrument	C57.13.2-2005	Ballot	3/6/10
Instrument	C57.13.6-2005	Ballot	3/16/10
PerfChar	PC57.142	Recirculation 3	3/7/10
PerfChar	PC57.123	Comment Resolution 2 Needs 1 more Recirc	5/1/2009
PwrTrans	PC57.12.10	Comment Resolution	7/10/2009
PwrTrans	C57.117-1986	Comment Resolution	12/20/09
PwrTrans	C57.125-1991	Comment Resolution	12/20/09
PwrTrans	PC57.131	Comment Resolution Extended until Dec 2010	11/15/09
PwrTran	PC57.143	Comment Resolution	5/27/2009
PwrTrans	PC57.148	Ballot	3/19/10
Standards	PC57.12.00	Recirculation 3 in progress	12/21/09
Standards	PC57.12.80	Comment Resolution	4/4/2009
Standards	PC57.12.90	Comment Resolution	5/27/2009
Standards	C57.144-2004	On March Agenda @ Revcom	11/19/09

VI. Transformer Standards Expiring December 2010

1538-2000 (R2005) Guide for Determination of Maximum Winding Temperature Rise in Liquid-Filled Transformers
C57.12.20-2005 Standard for Overhead Type Distribution Transformers, 500 kVA and Smaller
C57.12.28-2005 IEEE Standard for Pad Mounted Equipment - Enclosure Integrity
C57.12.29-2005 IEEE Standard for Pad Mounted Equipment - Enclosure Integrity for Coastal Environments
C57.12.44-2005 IEEE Standard Requirements for Secondary Network Protectors
C57.12.91-2001 IEEE Standard Test Code for Dry-Type Distribution and Power Transformers
C57.13.2-2005 IEEE Standard for Conformance Test Procedure for Instrument Transformers
C57.13.6-2005 IEEE Standard for High Accuracy Instrument Transformers
C57.16-1996 (R2001) Std Requirements, Terminology, & Test Code for Dry Air-Core Series-Connected Reactors

C57.19.00-2004 Standard General Requirements and Test Procedure for Power Apparatus Bushings
C57.19.01-2000 (R2005)Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings
C57.19.100-1995 (R2003) IEEE Guide for Application of Power Apparatus Bushings
C57.91-1995 (R2004) IEEE Guide for Loading Mineral-Oil-Immersed Transformers
[Also C**57.91-1995/Cor 1-2002 (R2004)**]
C57.98-1994 (R1999) Guide for Transformer Impulse Tests
C57.100-1999 Standard Test Procedure for Thermal Evaluation of Liquid-Immersed Dist and Power Transformers
C57.116-1989 (R2005) Guide for Transformers Directly Connected to Generators
C57.117-1986 (R2005) Guide for Reporting Failure Data for Power Transformers and Shunt Reactors
C57.125-1991 (R2005) Guide for Failure Investigation, and Analysis for Power Transformers and Shunt Reactors
C57.131-1995 Standard Requirements for Load Tap Changers
C57.136-2000 (R2005) Guide for Sound Level Abatement and Determination for LIP Transformers and Reactors
C57.138-1998 (R2005) Recommended Practice for Routine Impulse Test for Distribution Transformers
C57.146-2005 Guide for Interpretation of Gases Generated in Silicone-Immersed Transformers

VII. Transformer Committee - Active PARs *.....as of Mar 1, 2010*

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	Dec 2010	←
PC57.12.00	Std General Requirements for Liquid-Immersed Dist, Power, and Reg Transformers	Dec 2011	
PC57.12.01	Std General Requirements for Dry Type Dist, Power, and Reg Transformers	Dec 2013	
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	
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	
PC57.12.38	Std for Pad-mounted, Single phase Dist Transformers	*March agenda	
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	←
PC57.13	Standard Requirements for Instrument Transformers	March agenda	
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	

Active PARs - *continued*			
PAR Number	**Title**	**Expiration**	
P65700-19-03	Replaces PC57.19.03	March agenda	
PC57.19.100	Guide for Application of Power Apparatus Bushings	Dec 2010	←
PC57.32	Std Requirements, Terminology & Test for Neutral Grounding Devices *(old IEEE std 32)*	Dec 2011	
PC57.91	Guide for Loading Liquid Immersed Transformers and Voltage Regulators	Dec 2010	←
PC57.96	Guide for Loading Dry-Type Distribution and Power Transformers	Dec 2013	
PC57.98	Guide for Transformer Impulse Tests	Dec 2010	←
PC57.100	Std Test Procedure for Thermal Evaluation of Insulation Systems for Liquid-Immersed	Dec 2010	←
PC57.104	DGA Guide or Liquid Immersed Transformers	Dec 2014	
PC57.113	Partial Discharge Measurement in Liquid-Filled Power Transformers and Shunt Reactors	Dec 2011	
PC57.120	Guide for Loss Evaluation of Dist and Power Transformers	March agenda	
PC57.123	Guide for Transformer Loss Measurement	Dec 2011	
PC57.131	Std Requirements for Tap Changers	Dec 2010	←
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	Dec 2010	←
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	Frequency Response Analysis for Oil Immersed transformers	Dec 2010	←
PC57.150	Guide for Transportation of Transformers & Reactors Rated >10,000 kVA	Dec 2010	←
PC57.151	Sound Level Measurement Guide for Transformers and Reactors	WITHDRAWN	
PC57.152	Guide for Diagnostic Field Testing of Fluid Filled Power Transformers, Regulators	Dec 2012	
PC57.153	Guide for Paralleling Power Transformers	Dec 2012	
PC57.154	Design, Testing & App of Liquid-Immersed Transformers with High-Temp Insulation	Dec 2013	
PC57.155	DGA Guide for Esters	March Agenda	
PC57.637	Guide for the Reclamation of Insulating Oil and Criteria for Its Use	Dec 2012	
<end>			

* Denotes PAR is on the NESCOM March 2010 agenda for consideration

← denotes Par will Expires the end of 2010

IEEE/PES TRANSFORMERS COMMITTEE
Status Report of PE/TR Standards

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** *Puri J.*	(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 PAR Extension denied by NESCOM; PAR to be withdrawn
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
SubCommittee Chair	**BUSHING** *Elliott F. E.*	(360) 418-2269 felliott@ieee.org			
C57.19.00	Standard General Requirements and Test Procedure for Power Apparatus Bushings	Ellis K. P. (615) 847-2157 keithcota@aol.com	2004 12/31/2010		Approved Formally Std. IEEE 21 Previous revision 1991. D6.1 approved by RevCom in Dec., 2004 Reaff ballot in progress -REVCOM extended until Dec 2010
C57.19.01	IEEE Standard Performance Characteristics and Dimensions for Outdoor Apparatus Bushings	Singh P. (731) 696-5228 pritpal.singh@us.abb.com	2000 12/31/2010		Approved Formally Std. IEEE 24 Reaffirmed in 2005.
C57.19.03 PC57.19.03	IEEE Standard Requirements, Terminology, and Test Code for Bushings for DC Applications	Elliott F. E. (360) 418-2269 felliott@ieee.org	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 Modification submitted Dec 2009 -on Nescom March-10 Agenda Std merging with IEC - will be called P65700-19-03
C57.19.03-1996/	Standard Requirements, Terminology, and Test Code for Bushing for DC Applications - Corrigendum 1	Elliott F. E. (360) 418-2269 felliott@ieee.org	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** ***Wagenaar L. B.***	(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 Draft submitted to Revcom -wil be on June 2010 Agenda
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** *Shull S.*	(417) 625-6110 sshull@empiredistrict.com			
PC57.12.30		Olen O. (262) 835-3362 rolen@cooperpower.com			New Project PAR sumittal underway
PC57.12.33	Guide for Distribution Transformer Loss Evaluation	Pekarek T. J. (330) 761-7800 tjpekarek@firstenergycorp.com		06/25/1998 12/31/2004	PAR Withdrawn - Inactive WG Decision made at Las Vegas Meeting to discontinue this activity. PAR administratively withdrawn on 12/7/04 NesCom Meeting
C57.12.20 PC57.12.20	Standard for Overhead Type Distribution Transformers, 500 kVA and Smaller, High-Voltage 34 500 Volts and Below; Low-Voltage, 7970/13 800 Y Volts and Below	Traut A. 706-548-3121 atraut@ieee.org	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 - New PAR Active 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 12/31/2007		Approved Published 3/7/2003. Reaffirmation in progress. May need extension.
C57.12.34	Requirements for Pad-Mounted, Compartmental-Type, Self-Cooled, Three-Phase DistributionTransformers, 2500 kVA and Smaller: High-Voltage, 34 500GrdY/19 920 Volts and Below; Low Voltage, 480 Volts and Below	Shull S. (417) 625-6110 sshull@empiredistrict.com	12/31/2014		Approved Originally Std. 1447, Combined C57.22-1980 & C57.12.26-1992 PC57.12.34/D11 approved by RevCom 9/22/2004 for publication. Published 3/8/05. New PAR for revision approved 3/19/2005. Standard approved Dec09
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 Formally P1265. C57.12.35-1996 reaffirmation approved by RevCom 6/23/2004. D7 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 - final edits PAR extended to 12/31/2008. D11 approved by SA Board on 9/27/2007

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** ***Shull S.***	(417) 625-6110 sshull@empiredistrict.com			
C57.12.37	IEEE Standard for the Electronic Reporting of Transformer Test Data	Hollingsworth R. (601) 422-1105 rhollin@howard-ind.com	2006 12/31/2011		Approved Formally C57.132, IEEE Std 1388-2000 D11d approved by SA Board on 3/30/2006. Published 7/21/2006
C57.12.38 PC57.12.38	Standard for Pad-Mounted, Compartmental-Type, Self-Cooled, Single-Phase Distribution Transformers with Separable Insulated High-Voltage Connectors; High Voltage, 34500 GrdY/19920 Volts and Below, Low Voltage, 240/120 Volts; 167 kVA and SmallerRequirements	Ghafourian A. A. (731) 285-9121 aghafourian@ermco-eci.com	2009 12/31/2009		Approved - This std replaces C57.12.21 & C57.12.25 Std published Nov 30 2009 PAR for Revision submitted Jan 2010 -on Nescom Mar-10 agenda
C57.15 PC57.15	IEEE Standard Requirements, Terminology, and Test Code for Step-Voltage Regulators	Colopy C. A. (262) 896-2342 ccolopy@cooperpower.com	1999 12/31/2009	06/09/2005 12/31/2009	Approved - Active PAR for Revision A new PAR was approved 6/9/05 due to scope changes. Original PAR 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			
PC57.12.51	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		09/15/2006 12/31/2010	New Project - PAR Requested 6/23/2006 Previously NEMA document C57.12.51, original publication by NEMA in 1981, Reaffirmed in 1998. This document was transferred to IEEE in Dec., 2002. New IEEE PAR requested and approved to 12/31/2010.
C57.12.01 PC57.12.01	IEEE Standard General Requirements for Dry-Type Distribution and Power Transformers Including Those with Solid Cast and/or Resin Encapsulated Windings	Sullivan J. C. (813) 884-5424 jcsullivan@ieee.org	2005 12/31/2010	12/09/2009 12/31/2013	Approved Previous 1998 version was successfully revised and approved in 2005. Published 5/19/2006 PAR for Revision approved Dec 09
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
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 12/31/2007	Approved Being revised by PC57.12.60 (PAR approved Dec, 2003) Need to decide if to withdraw C57.12.56
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 12/31/2007		Approved - Active Need reaffirmation. Need to request extension for reaffirmation or submit PAR for revision before 10/15/2007.
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 12/31/2007	Approved - Active PAR for Revision of Std PAR to Revise IEEE Std C57.12.56-1986 and IEEE Std C57.12.60-1998 Need to request PAR extension.
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
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 12/31/2007		Approved Need to initiate reaffirmation and requet extension. Reaffirmed Dec09
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 approve by RevCom 3/30/2006

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** ***Johnson, Jr. C. W.***	(276) 688-1512 charles.w.johnson@us.abb.com			
C57.16 PC57.16	IEEE Standard Requirements, Terminology, and Test Code for Dry-Type Air- Core Series-Connected Reactors	Dudley R. F. (416) 298-8108 richardd@ca.trenchgroup.com	1996 12/31/2010	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 by the SA Board on 12/6/2006
C57.96 PC57.96	IEEE Guide for Loading Dry Type Distribution and Power Transformers	Marek R. P. (804) 383-2376 Richard.P.Marek@usa.dupont.com	1999 12/31/2013	12/09/2009 12/31/2013	Approved - Active RevCom approved reaffirmation on 9/22/2004 Previous revision in 1994. PAR for Revision approved Dec 2009 Ext expiration until PAR exp 2013
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 12/31/2010		Approved 9/22/04 - RevCom approved reaffirmation Ballot complete - Std on REVCOM March 2010 agenda
SubCommittee Chair	**HV CONVERTER TR & REACTORS** ***Dudley R. F.***	(416) 298-8108 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	2007 12/31/2012		Approved - D10 approved - in final edit Trial use std published 6/6/2000; upgraded to full use 3/2002 PAR for revision of C57.129-1999 approved on 6/24/2004 D10 approved by SA Board 9/27/2007
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 12/31/2010	Approved. Active PAR for revision Active PAR for revision. Ballot complete - Std on REVCOM March 2010 agenda PAR Extension granted Dec 09 until 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	**INSTRUMENT TRANSFORMERS** ***Smith J. E.***	(601) 346-9104 jes1@ieee.org			
C57.13 PC57.13	IEEE Standard Requirements for Instrument Transformers	Smith J. E. (601) 346-9104 jes1@ieee.org	2008 12/31/2013		Approved - Active PAR to revise std. PAR to Revise IEEE Std C57.13-2008 submitted to NESCOM On NESCOM Mar-10 agenda
C57.13.2	Conformance Test Procedure for Instrument Transformers	Khalin V. M. (859) 879-2797 vladimir@kuhlman.com	2005 12/31/2010		Approved PAR to Revise Std C57.13.2-1991; harmonize with C57.13-1993 D4 approved by RevCom on 6/8/2005 Published 9/29/2005.
C57.13.5 PC57.13.5	Standard of Performance and Test Requirements for Instrument Transformers of a Nominal System Voltage of 115 kV and Above	Riffon P. (514) 840-3000 x3424 riffon.pierre@hydro.qc.ca	2006 12/31/2009	12/07/2005 12/31/2009	Approved - Active PAR for Revision Reference Std. 1400 Previously C57.13.5 was a trial use Upgraded to Full Use 3/30/2006
C57.13.6	Standard for High Accuracy Instrument Transformers	Ten Haagen C. W. (603) 749-8433 chris.tenhaagen@indsys.ge.com	12/31/2010		Approved Document published in 12/9/2005

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SubCommittee Chair	**INSULATING FLUIDS** ***McNelly S.J.***	(612) 330-6904 sjmcnelly@ieee.org			
PC57.130	IEEE Trial-Use Guide for the Use of Dissolved Gas Analysis During Factory Temeprature Rise Tests for the Evaluation of Oil-Immersed Transformers and Reactors	Gryszkiewicz F. J. (617) 393-3161 frankjg@ieee.org		01/30/2000 12/31/2007	New Project - Std under development New Project - Std under development - currently under ballot resolution. PAR extension requested and approved to 12/31/2007.
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 - Std under development PAR to expire 12/31/2006. Deferred PAR withdrawal to 3/2007. PAR extended to 2009 PAR extension granted Dec 09 until 12/31/2010
PC57.147	Guide for Acceptance and Maintenance of Natural Ester Fluids in Transformers	McShane C. P. (262) 524-4591 cpmcshane@cooperpower.com		12/10/2003 12/31/2007	New Project - Active PAR Std under development Document submitted for MEC. 1st Ballot closed - 98% approval rating. Need recirculation.
PC57.155	DGA Guide for Esters filled Transformers	Boman P.E. (785)256-7161 paul_boman@hsb.com			PAR submitted to NESCOM - on March-10 agenda
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 12/31/2005	01/09/2010 12/31/2014	Withdrawn - Active New PAR for Revision PAR to Revise IEEE Std C57.104-1991 Original PAR and document withdrawn in Dec. 2005. New PAR approved in June, 2006. New PAR approved Jan 2010
C57.106	IEEE Guide for Acceptance and Maintenance of Insulating Oil in Equipment	Thompson J. A. (605) 534-3571 writejt@trservice.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	Gryszkiewicz F. J. (617) 393-3161 frankjg@ieee.org	1983 12/31/2008		Approved
C57.121	IEEE Guide for Acceptance and Maintenance of Less-Flammable Hydrocarbon Fluid in Transformers	Sundin 9035267577 sales@dsifluids.com	1998 12/31/2007		Approved Was to be administratively withdrawn in Dec., 2004 Reaffirmation ballot pool invitation initiated in October, 2005. Exp. Date extended to 12/31/2007 - Reaffirmed Dec 09
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

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SubCommittee Chair	**INSULATING FLUIDS** ***McNelly S.J.***	(612) 330-6904 sjmcnelly@ieee.org			
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 successful. Approval by RevCom on 3/19/05. New WG formed to revise document on a continuous basis based on TF recommendation. PAR number assigned PC57.152
IEEE 637 PC57.637	IEEE Guide for the Reclamation of Insulating Oil and Criteria for Its Use	Thompson J. A. (605) 534-3571 writejt@trservice.com	1985 12/31/2012	12/10/2008 12/31/2012	Approved - Reaffirmed Reaffirmation approved by SA Board 9/27/2007 PAR for Revision approved Dec 2008

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** *Forsyth B. I.*	405-622-8816 bruce.forsyth@ieee.org			
PC57.145	Guide for the Definition of Thermal Duplicate Liquid-Immersed Distribution, Power, and Regulating Transformers	Beaster B. L. (601) 422-1302 blbeaster@ieee.org	0	06/25/1998 12/31/2004	New Project - Active PAR Std under development Previously P1524 Modified PAR to expire in 2004 PAR administratively withdrawn in December, 2004
PC57.154	Design, Testing and App of Liquid-Immersed Transformers with High-Temp Insulation	Marek R. P. (804) 383-2376 Richard.P.Marek@usa.dupont.com		03/19/2009 12/31/2013	PAR for new standard approved March 2009
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 12/31/2008	Approved - Active PAR for Revision Requested PAR for revision on 10/18/2004. PAR approved 12/8/2004
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 12/31/2006		Approved Previously IEEE 838. Published 3/12/2002. Exp. Date extended to 12/31/2007 Need recirculation on reaffirmation ballot
C57.91 PC57.91	IEEE Guide for Loading Mineral-Oil-Immersed Transformers	Duckett D. A. (407) 942-9401 don.duckett@pgnmail.com	1995 12/31/2010	12/09/2009 12/31/2010	Approved - Active PAR for revision Combined from C57.91-1981 & C57.92-1981 & C57.115-1991 Reaffirmation approved by RevCom 6/23/2004 New PAR for revision approved 5/2/2005. PAR Extension Request approved Dec09 until 12/31/2010
C57.91-1995/Cor	IEEE Guide for Loading Mineral-Oil-Immersed Transformers--Corrigendum 1	Pierce L. W. (706) 235-1805 piercelw@aol.com	2002 12/31/2007		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.

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** ***Antosz S.***	(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.
PC57.142	A Guide To Describe The Occurrence And Mitigation Of Switching Transients Induced By Transformer-Breaker Interaction	Degeneff R. C. (518) 276-6367 degenr@rpi.edu		05/07/2007 12/31/2011	New Project - Active PAR Std under development PAR extension granted 9/23/2004 - new expiration @2006 New PAR approved - for join sponsorship between Transformers Committee and Switchgear Committee.
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 12/31/2008	New Project - Active PAR PAR approved by NesCom 6/23/2004 Std under development
C57.105	IEEE Guide for Application of Transformer Connections in Three-Phase Distribution Systems	Reitter G. J. (650) 508-2850 greitter@deltastar.com	1978 12/31/2007		Approved Was to be administratively withdrawn in Dec., 2004. Request extension to 2006. Reaffirmation ballot pool invitation initiated in October, 2005. Extension approved to Dec. 2007
C57.109	IEEE Guide for Liquid-Immersed Transformers Through-Fault-Current Duration	Patel B. K. (205) 987-8012 bkpatel8012@charter.net	1993 12/31/2007		Approved Reaffirmation ballot pool invitation initiated in October, 2005. Extension approved to 12/31/2007
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 12/31/2008	11/18/2004 12/31/2008	Approved - Active PAR for Revision PAR approved 11/18/2004. Ballot closed on 9/27/2007- need recirculation
C57.120 PC57.120	IEEE Loss Evaluation Guide for Power Transformers and Reactors	Traut A. 706-548-3121 atraut@ieee.org	1991 12/31/2011		Approved Reaffirmation approved by RevCom 6/8/2006. PAR for Revision submitted 1/21/2010 to merge C57.120 & C57.12.33 On NESCOM Mar-10 Agenda
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 WG Chair record from IEEE shows R. Girgis Revision ballot pool invitation started.
C57.18.10 C57.18.10a	IEEE Standard Practices and Requirements for Semiconductor Power Rectifier Transformers	Kennedy S. P. (716) 896-6500 skennedy@niagaratransformer.com	1998 12/31/2008	03/04/2005 12/31/2009	Approved - Active PAR for Amendment Replaced the C57.18-1964 for pool cathode mercury-arc rectifiers. New PAR for Amendment 1: Technical and Editorial Corrections was approved 2/22/05

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** ***Antosz S.***	(412) 498-3916 santosz@ieee.org			
C57.21 PC57.21	IEEE Standard Requirements, Terminology, and Test Code for Shunt Reactors Rated Over 500 kVA	Dudley R. F. (416) 298-8108 richardd@ca.trenchgroup.com	1990 12/31/2007	09/11/2003 12/31/2007	Approved - Active PAR for Revision PAR to Revise IEEE Std C57.21-1990 Reaffirmation approved on 6/23/2004. Current revision in ballot comment resolution (5 negative received) PAR extension needed if document not ready for RevCom
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 12/31/2011	Approved - Active PAR to revise std PAR to Revise IEEE Std 32-1972 Dec. 2002 - Sponsor changed from PES/SPD to PES/TR Being revised under PC57.32 PAR extension request approved - expiration date extended to 12/31/2009 PAR Modified and extended to Dec 2011

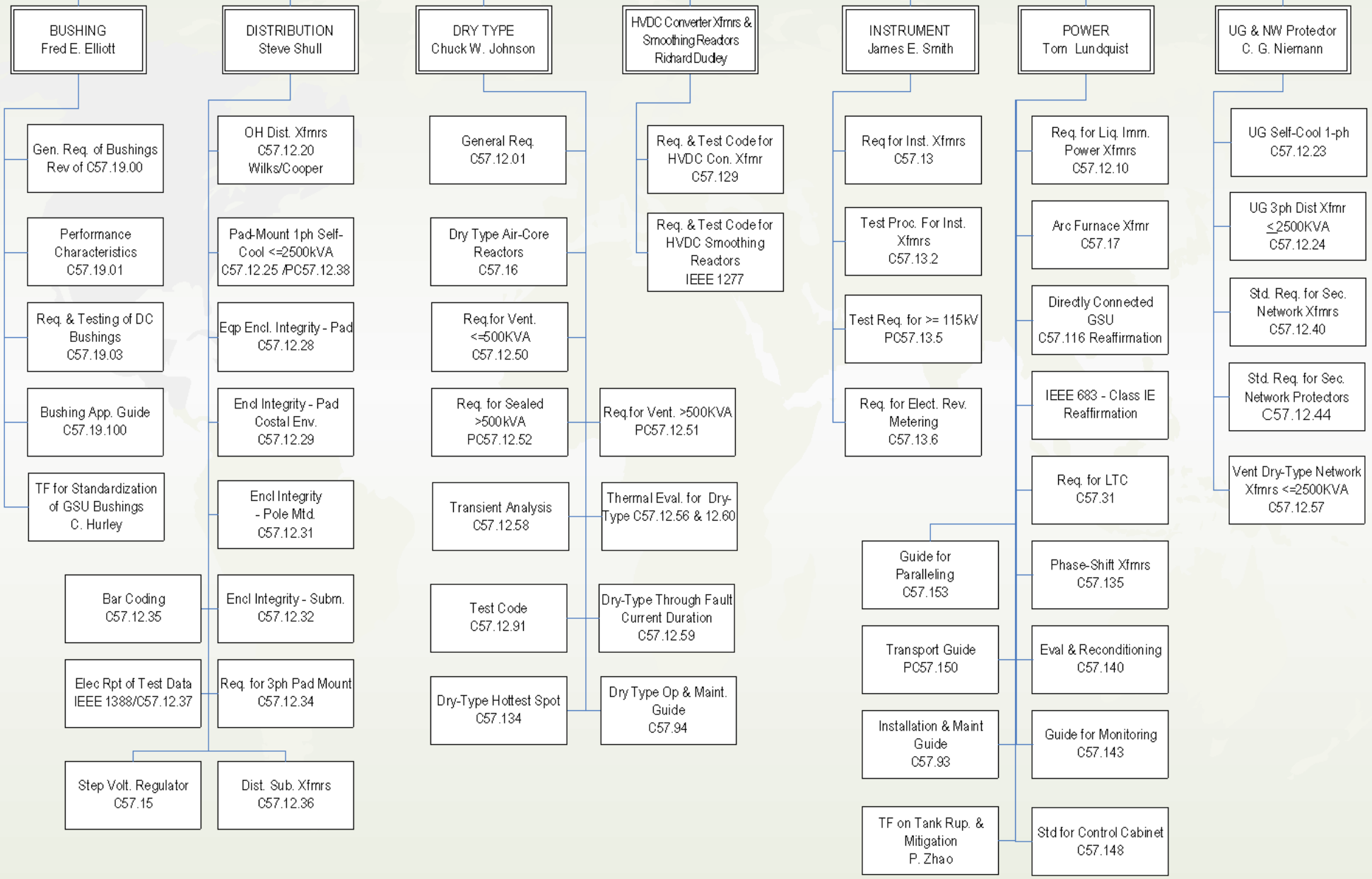
STANDARD / PROJECT	TITLE	Working Group Chair / Phone / Email	Pub Year / Rev Due Date	PAR Issue Date / PAR Expiration	Standard Status / Remark
SubCommittee Chair	**POWER TRANSFORMERS** *Lundquist T.*	(602) 236-8617 tom.lundquist@ieee.org			
PC57.12.10	Standard Requirements for Liquid-Immersed Power Transformers	Arteaga J. (601)422-1920 javier.arteaga@ieee.org	1997	06/13/2002 12/31/2008	New Project - Std under development Formally NEMA/ANSI document. PAR extension request granted by NesCom to 12/31/2008.
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.
PC57.148	Standard for Control Cabinets for Power Transformers	Watson J.D. (561) 691-2206 joe_watson@ieee.org		02/27/2004 12/31/2007	New Project - Active PAR Std under development
PC57.150	Guide for the Transportation of Large Power Transformers and Reactors	Anderson G. W. (402) 680-1111 gwanderson@ieee.org		11/18/2004 12/31/2008	New Project - PAR approved in Nov. 2004 PAR approved by NesCom in 11/18/2004
PC57.153	Guide for Paralleling Power Transformers	Jauch E.T. (727) 866-0632 jauch@ieee.org		03/27/2008 12/31/2012	PAR For new standard PAR approved Mar 2008
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 of PAR for revision of old ANSI Std. requested.
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
C57.125	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 12/31/2010	Approved - Active PAR for Revision PAR to Revise IEEE Std C57.131-1995 PAR Modified Dec 09 and extended to Dec 2010.
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 12/31/2011		Approved D18 approved by RevCom 11/16/2006

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** *Lundquist T.*	(602) 236-8617 tom.lundquist@ieee.org			
C57.93 PC57.93	IEEE Guide for Installation of Liquid-Immersed Power Transformers	Lau M. Y. (604) 528-3201 mike.lau@bchydro.bc.ca	1995 12/31/2007	06/13/2002 12/31/2007	Approved - Active PAR for Revision Rev of ASA C57.93-1958, IEEE Std C57.12.11-1980, & C57.12.12-1980 PAR to Revise IEEE Std C57.93-1995 Document submitted to RevCom - on RevCom agenda for 12/2007
IEEE 638 P638	IEEE Standard for Qualification of Class 1E Transformers for Nuclear Power Generating Stations	Swinderman C. (724) 778-5234 craig.swinderman@meppi.mea.com	1992 12/31/2011	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.
SubCommittee Chair	**STANDARDS** *Bartley W. H.*	(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	Snyder S. L. (731) 288-4282 slsnyder@ieee.org	2006 12/31/2011	06/07/2007 12/31/2011	Approved - New PAR Active D3 approved by SA Board in September, 2006. Published 2/28/2007. New PAR approved on 6/7/2007; active for 2008 revision Balloted 2008 Recirc1 - Dec 2009; Recirc2 - Feb 2010
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 PC57.12.80a	IEEE Standard Terminology for Power and Distribution Transformers	Raymond T. (518) 884-0297 tc.raymond@ieee.org	2002 12/31/2007	11/10/2005 12/31/2009	Approved - Active PAR for Amendment Amendment PAR approved to add thermally upgraded definition Need Reaffimation to C57.12.80
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 D3 approved by SA Board 9/15/2006 Published 2/15/2007 Previous version 1999.
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 Reaff Ballot successful - Std on REVCOM March 2010 agenda

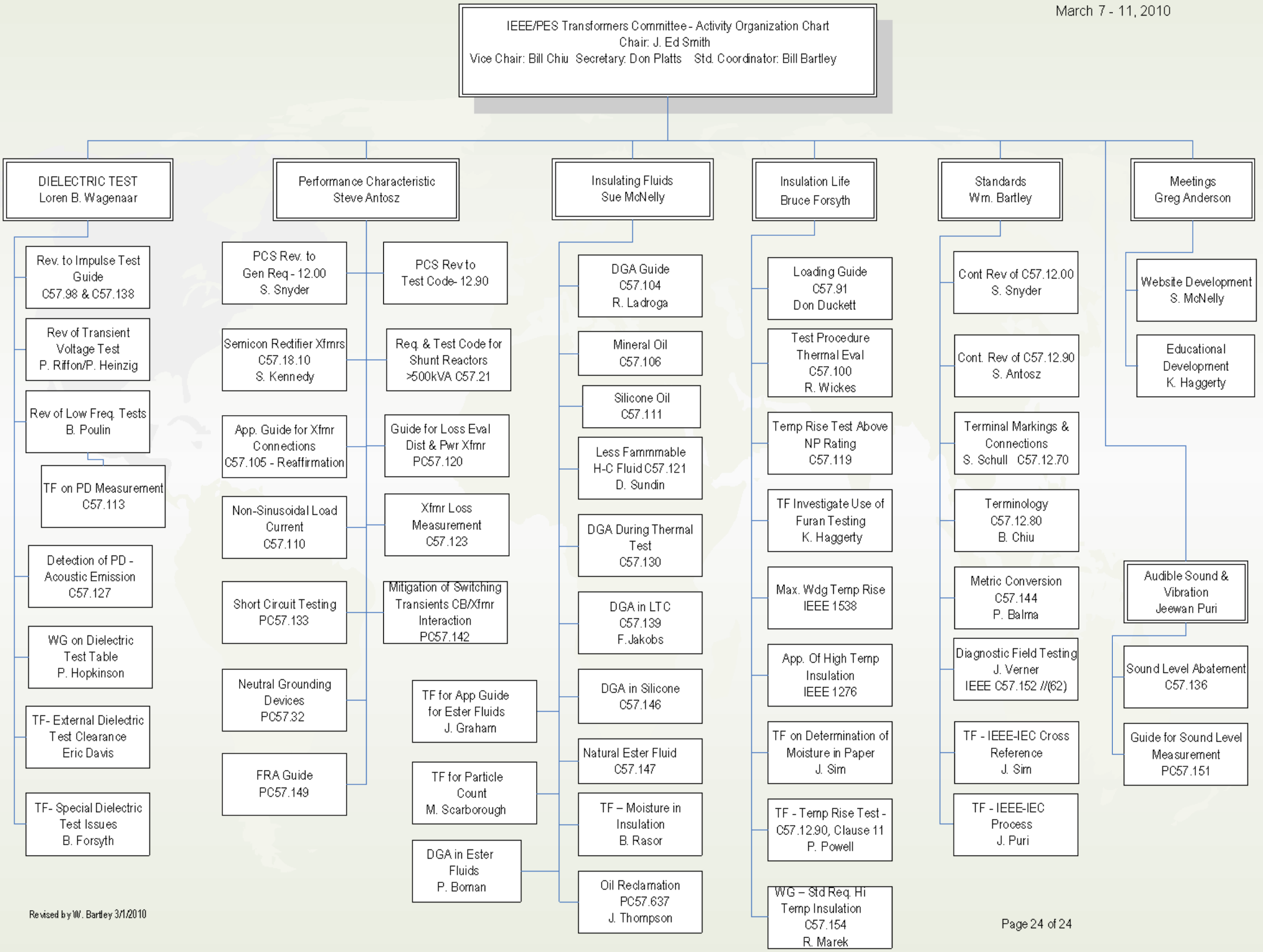
STANDARD / PROJECT	TITLE	Working Group Chair / Phone / Email	Pub Year / Rev Due Date	PAR Issue Date / PAR Expiration	Standard Status / Remark
SubCommittee Chair	**UNDERGROUND TR & NW PROTECT** *Niemann C. G.*	(847) 683-2145 carlpumco@sbcglobal.net			
C57.12.23 PC57.12.23	IEEE Standard for Underground Type, Self-Cooled, Single-Phase Distribution Transformers with Separable Insulated High-Voltage Connectors; High Voltage 25kV and Below; Low Voltage 600V and Below	Traut A. 706-548-3121 atraut@ieee.org	2009 12/31/2014		Approved Published 4/20/2009
C57.12.24 PC57.12.24	Requirements for Transformers - Underground-Type, Three Phase Distribution Transformers: High Voltage (34 500 GrdY/19 920 V and Below) and Low Voltage (480V and Below, 2500 kVA and Smaller	Termini G. (610) 941-1524 giuseppe.termini@peco-energy.com	2000 12/31/2011	02/20/2007 12/31/2011	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 an approved PAR from IEEE SA Board.
C57.12.40 PC57.12.40	Standard for Requirements for Secondary Network Transformers - Subway and Vault Types (Liquid Immersed)	Klaponski B. (204) 633-7220 brian.klaponski@carte.ca	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 Voltas and Below, Low Voltage 216Y/125 and 480Y/125 Volts	Robinson A. L. (361) 289-4001 alrobinson@aep.com	1992 12/31/2000		Standard withdrawn in 2001 Existing standard withdrawn by IEEE on 1/15/2001. No longer endorsed by IEEE. New working group formed to address revision. Need new PAR.

IEEE/PES Transformers Committee - Activity Organization Chart

Chair: J. Ed Smith
Vice Chair: Bill Chiu Secretary: Don Platts Std. Coordinator: Bill Bartley



Revised by W. Bartley 3/1/2010



Revised by W. Bartley 3/1/2010