| Index | Clause/Section | Page | Line | Comment | Suggestion | Must be Satisfied | Balloter | Ballot | Category | Resolution |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| 1 | 4 | 4 |  | In the Risk Assessment discussion section a paragraph on adding on-line monitoring equipment for continuous evalutaion of a liquid immersed transformer to add in evaluating its condition would be useful. The reader could be referred to C57.143-2012 here. | Add a paragraph as follows: The Transformer can be evaluated through the use of on-line monitoring. Each system can be monitored to determine if it is functioning properly The IEEE Guide for Application for Monitoring Equipment to Liquid-Immersed Transformers and Components, C57.143-2012. This guide should also be referred to when instrumenting a reconditioned liquid immersed power transformer as well. | Yes | Bench |  | General | Resolved Comment added |
| 2 |  | 3 |  | PC57.143 is no longer a draft but approved Guide | C57.143-2012 | Yes | Sparling |  | Editorial | Resolved Removed “P” |
| 3 | 5.1 | 17 |  | PC57.143 is no longer a draft but approved Guide | IEEE C57.143-2012 guide for the Application of Monitoring Equipment to Liquid-Immersed Transformers and Components | Yes | Sparling |  | Editorial | Resolved |
| 4 | 5.1 | 24 | 7 | DGA using mineral oil has | DGA for mineral oil filled transformers has | No | Crouse |  | Editorial | Resolved |
| 5 | 5.1 | 24 | 7 | DGA using mineral oil has | Should Natural Ester filled transformers be included? | No | Crouse |  | Technical | Resolved Included references to other fluids |
| 6 | 2 | 3 |  | C57.19.100 has been revised | Change date to 2012 or remove date | No | Spitzer |  | Editorial | Resolved |
| 7 | 1.1 | 1 |  | This is not the approved scope statement from the PAR approved on 3/31/11. | Change verbatim to the approved PAR scope language. | Yes | Thaden |  | Technical | Resolved |
| 8 | 1.2 | 1 |  | This is not the approved purpose statement from the PAR approved on 3/31/11. | Change verbatim to the approved PAR purpose language. | Yes | Thaden |  | Technical | Resolved |
| 9 | 3.1.1 | 4 |  | Definition is incorrect. DP is not a test, it is a value. | Define degree of polymerization. | Yes | Thaden |  | Technical | Resolved |
| 10 | 4 | 4 |  | While this clause has a lot of good information, it is not about how to recondition a transformer and is in my opinion beyond the scope of the approved project. The reader has to wade through all this material to get to clause 6, where he finally gets what the title and scope promise. Suggest that this material be placed in an appendix. | Move material not directly dealing with reconditioning transformers to appendices. | Yes | Thaden |  | Technical | Unresolved The guide title is evaluation and reconditioning of a transformer so a risk analysis is a necessary part of the evaluation.  Contact Balloter |
| 11 | 4.1 | 5 |  | Another factor is the criticality of the load served by the transformer (hospitals, interconnections, major oad centers, etc.) | Add additional consideration. | No | Thaden |  | Technical | Resolved |
| 12 | 4.2 | 6 |  | Why is insulation defects (third paragraph) a vintage issue? | Delete third paragraph from vintage clause or explain how it is a vintage issue.. | Yes | Thaden |  | Technical | Resolved moved to section 4.4 |
| 13 | 4.4.2 | 7 |  | This is a vintage issue and should be moved to 4.2. | Move 4.2.2 to 4.2 | Yes | Thaden |  | Technical | resolved; it could be incorporated into vintage but it is also part of a general discussion on cellulose. Moved 4.2.2 to 4.2 |
| 14 | 4.7 | 8 |  | This material is covered in other standards and technical papers. Why do all these words need to be in this standard. Just mention the types of construction. | Simplify the wording of this subclause. | No | Thaden |  | Editorial | Unresolved; include references for a more detailed guides. PEB There is no Section 4.7 |
| 15 | 5 | 16 |  | This material is covered in other standards and technical papers. Why do all these words need to be in this standard. Just mention the types of construction. | Rewrite clause or move some material to an appendix. | Yes | Thaden |  | Technical | Unresolved Vote at Working Group Meeting to replace most of Section 5 with reference to C57-152 with specific comments on reconditioning transformers |
| 16 | 5.1 | 16 |  | At he end of the third paragraph IEEE Std. was changed to IEEE Guide, which is not correct. A guide is a type of standard. Guide is used in the title, not in the refrence to the IEEE standard number. | Correct references | Yes | Thaden |  | Technical | Resolved |
| 17 | 5.1 | 17 |  | At the end of the third to the last paragraph PC57.143 is mentioned, but the title is not provided and I suspect that much of the information in this subclause is covered in PC57.143. If it is, it should not be repeated, but simplify provide a reference to PC57.143 with its title for information. | Do not duplicate information in PC57.143. Simply refer to the document. | No | Thaden |  | Editorial | Unresolved dependent on item 15 |
| 18 | 5.2 | 17 |  | The third paragraph is redundant to the first paragraph. | Delete the third paragraph. |  | Thaden |  | Technical | Removed in Draft 5A. dependent on item 15 |
| 19 | 5.2 | 18 |  | The last sentence of the first paragraph reads: "This combination of moisture, heat, and oxygen is the key factor that affects …" Suggest rewording to "Moisture, heat, and oxygen are the key factors that effect the rate …" | Suggest rewording. It does not take a combination of factors to effect. Any one of them can do it. | Yes | Thaden |  | Editorial | Resolved in Draft 5A |
| 20 | 5.4 | 18 |  | The second paragraph is redundant to 5.3.2, which should be 5.4.1, if this is not 5.4. | Delete paragraph and renumber subclauses correctly. | Yes | Thaden |  | Editorial | Could not identify referenced sections |
| 21 | 5.4 | 18 |  | Suggest deleting this subclause and putting related information in what was subclause 5.3.2. | Delete this subclause and add related info to what was 5.3.2. | Yes | Thaden |  | Editorial | There has been no Section 5.3.2 since beore the 2006 verision |
| 22 | 5.4 | 19 |  | Figure 2 is redundant to 5.3.2 (new 5.4.1) | Delete information | Yes | Thaden |  | Technical | There has been no Section 5.3.2 since beore the 2006 verision |
| 23 | 5.4 | 19 |  | The bullets would be more appropriate in 5.9. Only one bullet refers to Furan. In the paragraph there is a reference to section (subclause) 5.8, which should be 5.9. | Move information as appropriate to 5.9 and fix reference to 5.8. | Yes | Thaden |  | Technical | Resolved |
| 24 | 5.3.2 | 20 |  | IEC Standard 61198 is referenced but is not in reference clause 2. | Add reference to clause 2 | Yes | Thaden |  | Technical | Resolved |
| 25 | 5.3.3 | 21 |  | Figures numbers jump from 2 to 5. | Fix figure numbers | Yes | Thaden |  | Editorial | Resolved |
| 26 | 5.3.3 | 21 |  | What does [xvii] refer to? Roman numerals appear elsewhere in this subclause. | Fix as appropriate | Yes | Thaden |  | Editorial | Resolved |
| 27 | 5.4.1 | 23 |  | Cigre TB445 referenced but not listed in clause 2. | Add to clause 2. | Yes | Thaden |  | Technical | TB 445 not referenced in Guide |
| 28 | 5.4.1 | 24 |  | IEC 60422 referenced but not listed in clause 2 | Add to clause 2. | Yes | Thaden |  | Technical | Resolved |
| 29 | 5.4.1 | 24 |  | Fix table 5 table number | Fix table numbers | Yes | Thaden |  | Technical | Resolved |
| 30 | 5.4.1 | 24 |  | Delete paragraph following item 4 as it is duplicated on page 22. | delete paragraph | Yes | Thaden |  | Techincal | Resolved |
| 31 | 5.4.1 | 24 |  | Last paragraph fix figure number | Fix figure numbers | Yes | Thaden |  | Technical | Resolved |
| 32 | 5.4.1 | 25 |  | fix figure number for Tan Delta figure. Add table munber to table. Reword line above tabel to red "Indicative dissipation/power factor limits for new…" Correct spelling of "Frequency". | Fix items as noted | Yes | Thaden |  | Editorial | Resolved |
| 33 | 5.6 | 26 |  | Delete material and simply reference PC57.149 for informaton on the subject, since it appears to still be an active project. It just adds pages to the document and creates opportunity for disagreement between standards over time. | Modify as appropriate. | No | Thaden |  | Technical | Resolved |
| 34 | 5.9 | 34 |  | Fix figure number. | Fix figure number. | Yes | Thaden |  | Editorial | Resolved |
| 35 | 5.10 | 34 |  | The first sentence provides no specific information and should be deleted as it adds nothing to the paragraph. | delete the first sentence. | Yes | Thaden |  | Technical | Resolved |
| 36 | 6.1.4.2 | 42-48 |  | Fix figure numbers | Fix figure numbers | Yes | Thaden |  | Editorial | Resolved |
| 37 | 6.2.1.1 | 51 |  | Reword caution second sentence to read "… may result in failure of the transfomer and possible injury to the operator." The "or" implied an either or condition. | Reword sentence. | Yes | Thaden |  | Editorial | Resolved |
| 38 | 6.3.3. | 56 |  | delete also in last sentence. Reads better. | Reword | No | Thaden |  | Editorial | Resolved |
| 39 | 6.4.6 | 60 |  | Suggest adding info about temperature ratings of the materials | add temperature information | No | Thaden |  | Technical | Unable to find specific temperature rating information |
| 40 | 6.7.2 | 67 |  | Delete the word "caution". It is not an appropriate application and may trigger a legal review. | delete the word caution. | No | Thaden |  | Technical | resolved |
| 41 | 2 | 3 |  | IEEE Std C57.104 is active | delete (withdrawn) | Yes | Jin Sim |  | General | Resolved |
| 42 | 2 | 3 |  | IEEE Std 62 will be replaced with C57.152 soon | Replace it with C57.152. Also see clause 5.2 that already utilizes C57.152 | Yes | Jin Sim |  | General | Resolved |
| 43 | 3.2 | 4 |  | Acronym BIL is abbreviated | Change it to "basic lightning impulse insulation level" | Yes | Jin Sim |  | Technical | Resolved |
| 44 | 4.2 | 6 |  | Consider adding the "density of pressboard and loss of axial clamping pressure" in this section. | See clause 4.4.2 for technical wording | No | Jin Sim |  | Technical | Resolved; wording added |
| 45 | 4.2 | 6 |  | Fourth paragraph describing FRA and leakage reactance tests needs to be softened. | Add "FRA and leakage reactance tests may not show significant changes until these defects progress to electrical shorts." | Yes | Jin Sim |  | Technical | Resolved |
| 46 | 4.6 | 8 |  | Industry standards for short-circuit duty were revised in the late 1960s. | Please verify this. I think it was late 1970s. | No | Jin Sim |  | General | unresolved |
| 47 | 4.9 | 9 |  | What's the purpose of this clause in this guide? |  | No | Jin Sim |  | General | Resolved; Not part of transformer reconditioning question, remove section. |
| 48 | 5.4 | 19 |  | "Insuldur" is a trade name for one type of insulation | Replace "Insuldur" with "thermally upgraded kraft" everywhere | Yes | Jin Sim |  | General | Resolved |
| 49 | 5.4 | 19 |  | The caption for Figure 2 needs improvement | Change back to "Furanic compound family" | Yes | Jin Sim |  | Editorial | Resolved |
| 50 | 5.3.2 | 20 |  | Subclause numbers | Change 5.3.2 to 5.4.1 and 5.3.3 to 5.4.2 | Yes | Jin Sim |  | Editorial | Resolved |
| 51 |  | 22 |  | The last sentence before 5.5 does not seem to be correct | Delete the last part, starting with "when the CO2/CO ratio …" | Yes | Jin Sim |  | Technical | Resolved |
| 52 | 5.5 | 22 |  | Consider adding temperature sensitiveness of PF in this section |  | No | Jin Sim |  | General | Rejected |
| 53 | 5.4.1 | 23 |  | Subclause numbers | Change 5.4.1 to 5.5.1 | Yes | Jin Sim |  | Editorial | Resolved |
| 54 | 5.5.1 | 23-25 |  | Parts of this subclause does not belong | Delete the bottom half (below Table 5) of page 24 | Yes | Jin Sim |  | Editorial | Resolved |
| 55 | 5.7.1 | 29 |  | Utilizing power frequency for this test may saturate the core at excitation higher than the rated voltage. | Add appropriate caution. | Yes | Jin Sim |  | Technical | Resolved |
| 56 | 5.7.1 | 29 |  | Recommended limits for RIV and PD are reasonable for 100% test voltage. However, these are too high for 75-85% level and completely unacceptable at rated voltage. | Develop lower values for lower test voltages, or add appropriate wording so that the guide does not mislead the user. | Yes | Jin Sim |  | Technical | Partially resolved with statement changed to reference 100% test voltage |
| 57 | 5.7.2 | 30 |  | The statement ",,, it is not susceptible to interference…" needs to be softened. | Change the word "not" to "less" | Yes | Jin Sim |  | Technical | Resolved |
| 58 | 6.1.1 | 36 |  | Second paragraph, last part | Change the word "forces" to "clamping pressure" to make this technically correct. | Yes | Jin Sim |  | Editorial | Resolved |
| 59 | 6.1.3 | 37 |  | Fourth paragraph should be improved to provide general guide for users. | Finish the paragraph with the addition "which generally should be greater than the pressure expected from axial forces produced by windings during the fault." | Yes | Jin Sim |  | General | Resolved |
| 60 | 6.2.2.1 | 53 |  | The last part needs to be changed to reflect the fact that C57.139 has been published. | Change the last sentence to include "IEEE guide C57.139 should be utilized for DGA in LTC" | Yes | Jin Sim |  | General | Resolved |
| 61 | 6.3 | 54 |  | Subclause title | Should include "and arresters", see 6.3.5 | Yes | Jin Sim |  | Editorial | Resolved |
| 62 | 6.3.5 | 56 |  | Last part calls for IEC 60099-5 unnecessarily | Replace it with IEEE C62.82.1 and C62.22 | Yes | Jin Sim |  | General | Resolved |
| 63 | 6.5.4 | 64 |  | Two paragraphs does not belong here. | The ones starting with "The pointer…" and "The float mechanism…" seems to be from LLG and should be removed. | Yes | Jin Sim |  | Editorial | Resolved |
| 64 | 7 | 70-end |  | Most of this clause is from IEEE C57.93 and should be removed. | Consider removing the content by referencing C57.93 | No | Jin Sim |  | General | Referenced the guide |
| 65 | 5.4.1? | 23 | 43 | Does this follow clause 5.5 or is it part of clause 5.5? | Give new clause number (and on so on through document). |  | Darwin |  | Editorial | Resolved |
| 66 | 5.4.1? | 25 | 8 | There is already a figure 5 on page 21 | Give new figure number (and on so on through document). |  | Darwin |  | Editorial | Resolved |
| 67 | 5.4.1? | 25 | 17 | In table (which is not given a number) the word "fraquency" is used | Use correct word "frequency" |  | Darwin |  | Editorial | Resolved |
| 68 | 5.10.1 | 35 | 20 | Sentence "broken or loose leads etc., needs some commas. | Change to "Broken or loose leads, supports, or tank….." |  | Darwin |  | Editorial | Resolved |
| 69 | 6.1.2 | 36 | 48 | "a ~~pressboard~~ oil box" is incorrect. | Use "an oil box" |  | Darwin |  | Editorial | Resolved |
| 70 | 6.4.6 | 60 | 52 | Last sentence "..should be made following…" is incorrect. | Use "…should be inspected following…" |  | Darwin |  | Editorial | Resolved |
| 71 | 6.6.4 | 66 | 1 | Last sentence "..controls are found to…" is incorrect. | Use "…controls be found to…" |  | Darwin |  | Editorial | Resolved |
| 72 | 6.7.1 | 66 | 42 | Sentence "…should not exceed 12 month frequency…" is not correct | Use "…should not use a 12 month frequency…" |  | Darwin |  | Editorial | Resolved |
| 73 | 6.7.3.2 | 68 | 4 | Sentence "…journal bearing surfaces b the use…" is incorrect | Use "…journal bearing surfaces by the use…" |  | Darwin |  | Editorial | Resolved |
| 74 | 6.7.3.3 | 68 | 18 | Sentence "…constructed of using fluorocarbon…" is not correct | Use "…constructed using fluorocarbon…" |  | Darwin |  | Editorial | Resolved |
| 75 | 6.8.1 | 69 | 21 | Sentence "…should not exceed 12 month frequency…" is not correct | Use "…should not use a 12 month frequency…" |  | Darwin |  | Editorial | Resolved |
| 76 | 7.1 | 70 | 43 | Sentence "…from the active parts, is it becomes…" is incorrect | Use "…from the active parts, it becomes…" |  | Darwin |  | Editorial | Resolved |
| 77 | 7.2 | 74 | 19 | clauses 7.2.1 through 7.2.4 don't exist | Delete the phrase "The criteria in…..etc". |  | Darwin |  | Editorial | Resolved |
| 78 | Ex 7.3 | 78 | 32 | Why get rid of clause concerning "Refrigeration Method" | Include this clause |  | Darwin |  | Technical | Unresolved |
| 79 |  | v |  |  | Update list of participants | No | R\_Asano |  | General | unresolved |
| 80 | 4 | 4 | §3 in the page | Add "production disruption" to the list of potential costs. | "The cost of a failure can vary greatly. Any analysis of potential costs of a failure should consider the possible repair or replacement costs of the transformer or failed component, environmental impact and clean-up costs, damage to adjacent equipment, production disruption, lost revenues and litigation costs, as well as any other site-specific potential costs. " | No | R\_Asano |  | General | Added wording |
| 81 | 4.1 | 4 | §1 | Additional to system requirements, regulations may have changed and the considerations to update the transformer or installation also need to be taken into account. | "To conduct a risk assessment of all the transformers in a user’s system, one of the severity factors that should be addressed is the particular transformer’s current and future value in its service position. System operating requirements or regulations (e.g.: PCB, fire or environmental protection) may have changed since each particular transformer was originally installed. Consideration should be given to the functionality of each individual transformer with respect to the strategic impact of the system. Some questions that should be addressed include the following:  - Will the transformer or installation need to be adapted to meet current fire safety standards or environmental regulations?" | No | R\_Asano |  | General | Added wording |
| 82 | 4.9 | 8 |  | Some transformers are manufactured with more than one grounding pad, however, grounding in multiple points may be the cause of circulating current. | "In order to enforce a ground potential to the transformer tank, the tank is usually connected to a grounding point. Although some transformers are equipped with multiple grounding pads, grounding in multiple points may be the cause of circulating currents and overheating." | Yes | R\_Asano |  | Technical | Resolved, Removed Section |
| 83 | 4.13 | 10 | Equation  (1) | The probability is time dependant and it is important to clarify what is the meaning of the calculated pobability of failure. i.e. the probability of failure of the transformer over unlimited time is 100%. | "Failure statistics are executed over a period of time, typically one year. Therefore the result of this calculation is the probability of a failure occurs during the next period of time. " | Yes | R\_Asano |  | Technical | Incorrect statement, not used. This sound more like a statement about rate of failure not probability which is an event driven device. |
| 84 | 5.1 | 15 | §1 | It is important to explain that DGA is a topic of contiunous development and that the user of this technique must be alert and learn from those research instead of limit the scope to some specific papers. | "Significant information regarding the condition of the insulation system of a transformer can be obtained from oil testing and correct interpretation of the oil analysis. It is beyond the scope of this guide to provide detailed technical information on all oil analysis and testing; however, it is recommended that the reader refer to the guides and bibliography for references on oil testing and analysis. Oil analysis, tests and interpretation are topics of continuous improvements and therefore, it is important for the user to frequently search for information about recent developments, usually published in technical papers." | Yes | R\_Asano |  | Technical | IEEE Guides for various fluids are referenced in this Guide. |
| 85 | 5.1 | 15 | §2 | Delete "using mineral oil" | "DGA has proven to be a valuable and reliable diagnostic technique for the detection of incipient fault conditions within liquid-immersed transformers by detecting certain key gases. DGA has been widely used throughout the industry as the primary diagnostic tool for transformer maintenance, and it is of major importance in a transformer owner’s loss prevention program. " | No | R\_Asano |  | Editorial | Resolved |
| 86 | 5.1 | 15 | §3 | Add reference to the CIGRE Brochure 443 - "DGA in Non-Mineral Oils and Load Tap Changers and Improved DGA Diagnosis Criteria" Working Group D1.32, 2010 | "Data have been acquired from the analysis of samples from electrical equipment in the factory, laboratory, and field installations over the years. A large body of information relating certain fault conditions to the various gases that can be detected and easily quantified by gas chromatography has been developed. The gases that are generally measured and their significance are shown in Table 2, based on IEEE Guide C57.104. Methods for interpreting fault conditions associated with various gas concentration levels and combinations of these gases are also provided in IEEE Guide C57.104, IEC Guide 60599 and CIGRE Brochure 443." | Yes | R\_Asano |  | Technical | IEEE Guide reference added for C57-155 |
| 87 | 5.1 | 16 | §1 in the page | Correct "samply" by "sampling" | "...The application of on-line dissolved gas monitoring may considerably reduce the risk of missing detection or of prolonged delay in detecting fault initialization due to a typical on-site sampling interval (see IEEE PC57.143)." | No | R\_Asano |  | Editorial |  |
| 88 | 5.4 | 17 | all | General re-formulation necessary. Keep informative information and difficulties of sampling conducting to Furanics just in the next chapter | "Aging or deterioration of the solid insulation is a time function of temperature, moisture content, and oxygen content. With modern oil preservation systems, the moisture and oxygen contributions to insulation deterioration can be minimized, leaving insulation temperature as the controlling parameter. Since, in most apparatus, the temperature distribution is not uniform, the part that is operating at the highest temperature will ordinarily undergo the greatest deterioration. Therefore, in aging studies it is usual to consider the aging effects produced by the highest (hottest-spot) temperature. Degree of polymerization (DP) is used as a precise measure of the degradation of the paper insulation used in transformers. Cellulose (i.e., the main constituent of paper and wood) is a large linear polymeric molecule constituted of several hundreds of glucose units. DP is the average number of glucose molecules making the cellulose chains. The difficulty, however, is that in order to get a sample of paper, the transformer must be opened. Moreover, the areas of greatest deterioration of cellulose material in a transformer (the hottest spot), is usually not easily accessible for obtaining paper samples. Section 5.9 provides more details on the DP Test procedure. For this reason, other methods such as the furanic analysis discussed in the next section, are used to estimate the DP of the transformer insulation." | Yes | R\_Asano |  | Technical | Referenced to IEEE Technical Paper on Furan analysis added. |
| 89 | 5.3.3 | 20 | §1 in the page | Remove reference to the section | "The latest research on this topic suggests that the ageing of thermally upgraded Insuldur paper does not produce as much furans as Kraft paper. ..." | No | R\_Asano |  | Editorial | Resolved |
| 90 | 5.3.3 | 20 | §1 in the page | Typo in Palavanpour | "...Since the Pahlavanpour and DePablo curves were derived from European transformers, it is highly likely to be for predominantly Kraft insulated transformers and the recent research discussion bears this out...." | No | R\_Asano |  | Editorial | Typo corrected |
| 91 | 5.8.1 | 28 | Before equation (4) | Forced radiation? | "For forced oil cooling " | Yes | R\_Asano |  | Technical | Resolved |
| 92 | 5.8.2.2 | 29 | §1 in the page | It is important to check the temperature of the air side connector. Oxidation or bad connection may cause excessive heat and damage the bushing | "Determine the normal operating temperature including air side terminal and connector, and document any temperature rise greater than or equal to 10 °C." | Yes | R\_Asano |  | Technical | Resolved |
| 93 | 6.1.3 | 36 | Last pargraph | It should be recommended that the OEM or a service provider familiar with the design and field operations execute such a critical job because of the necessary skill set. Motivate the user to execute this operation following the procedure in the guide may result risky. | "The original equipment manufacturer or designers that are familiar with the design of the transformer should be consulted for performing reblocking to ensure that components should not be damaged." | Yes | R\_Asano |  | Technical | Resolved |
| 94 | 6.1.3.1, 6.1.4.1, 6.1.4.2, 6.1.4.3, 6.1.4.4, | 36 | all | It should be recommended that the OEM or a service provider familiar with the design and field operations execute such a critical job because of the necessary skill set. Motivate the user to execute this operation following the procedure in the guide may result risky. | Delete the itens or re-purpose with informative recommendations only to highlight critical points and controls. | Yes | R\_Asano |  | Technical | Comment placed in 6.1.1 |
| 95 | A1 | 75 | footnotes | References in footnote | Add references in the body of the annex and remove footnotes. | No | R\_Asano |  | Editorial | Rejected Footnotes allowed by style manual |
| 96 | 6.2.2.1 | 52 |  | “CAUTION” | Move CAUTION box right  below title DETC external inspections. | No | Saurabh Ghosh |  | Editorial | Resolved |
| 97 | 6.2.1.3 | 53 | 3 | If degradation is observed, the contacts… | If degradation occurs and or contacts are worn out, it is recommended that existing DETC may be replaced with a new one. | No | Saurabh Ghosh |  | Technical | Resolved |
| 98 | 6.3.5 | 57 | 9 | ..properly rated metal oxide varistor arresters.. | …properly rated metal oxide arresters. | Yes | Saurabh Ghosh |  | Technical | Rejected Varistor allowed |
| 99 | 6.4/6.4.1 | 58 | 1 | An LTC compartment … | A LTC compartment… | Yes | Saurabh Ghosh |  | Grammatical | Resolved |
| 100 | 4/4.1 | 5 | Last line | Will the transformer meet future load projections? | Add below the following:  Is the transformer suitable to run in parallel with other transformers in the system. | No | Saurabh Ghosh |  | Technical | Wording added |
| 101 | 4/4.1 | 6 | 1 | Does transformer design quality impact system reliability? | Does the transformer design and manufacturing quality based on performance metrics impact system reliability? | Yes | Saurabh Ghosh |  | Technical | Wording added |
| 102 | 6.1.3 | 39 | 2 | …are possibilities of insulation damage or conductor tilting due to previous faults, the clamping pressure…. | …are possibilities of insulation damage or conductor tilting due to previous faults, replace the damaged insulation with new one and reclamping with a pressure….. | No | Saurabh Ghosh |  | Technical |  |
| 103 | 5.4? | 18 | 1 | Figure 2: On my screen the picture looks low resolution |  | No | Ewald Schweiger |  | Editorial |  |
| 104 | 5.4? | 19 |  | Figure is called Figure 2 again | rename | Yes | Ewald Schweiger |  | Editorial | Resolved |
| 105 | 5.4 | 17 |  | The following clauses (page 18 and 19) are stated 5.3.x | check | Yes | Ewald Schweiger |  | Editorial | Resolved |
| 106 | 5.4? | 18 |  | Bookmark at Lundgaard is not defined |  | Yes | Ewald Schweiger |  | Editorial | Resolved |
| 107 |  | 20 |  | Figure 5 can be found on page 20 and 23 | please check the numbering of the figures | Yes | Ewald Schweiger |  | Editorial | Resolved |
| 108 |  | 44 |  | Figure 7: Plan view: "Hose coupler" and "s" in next line |  | Yes | Ewald Schweiger |  | Editorial | Resolved |
| 109 | 2 | 2 |  | The three standards added (C57.19 series) are the only ones with publication dates | If the publication dates are removed, C57.116 can remain state-of-art longer. |  | Paulette Payne |  | Editorial | Resolved |
| 110 | 5.3.2 | 20 |  | Subclause should relate to 5.4 | Correct the numeration of the subclause |  | Paulette Payne |  | Editorial | Resolved |
| 111 | 5.3.3 | 20 |  | Subclause should relate to 5.4 | Correct the numeration of the subclause |  | Paulette Payne |  | Editorial | Resolved |
| 112 | 5.4.1 | 23-24 |  | Subclause is misplaced (comes after 5.5) | Subclause should be placed in 5.4 |  | Paulette Payne |  | Editorial | Resolved |
| 113 | 6.1.3 | 38 |  | Concur with Editor's comment to remove last paragraph of subclause. |  |  | Paulette Payne |  | Technical | Unresolved |
| 114 | Figure 4 | 42 |  | Elevation view - one of the captions is partially truncated | Enlarge text box |  | Paulette Payne |  | Editorial | Resolved |
| 115 | Figure 5 | 43 |  | Plan view - one of the captions is partially truncated | Enlarge text box |  | Paulette Payne |  | Editorial | Resolved |
| 116 | Figure 6 | 45 |  | Elevation view - one of the captions is partially truncated | Enlarge text box |  | Paulette Payne |  | Editorial | Resolved |
| 117 | Figure 7 | 46 |  | Plan view - enlarge text box for two of the captions |  |  | Paulette Payne |  | Editorial | Resolved |
| 118 | 6.3 | 54 |  | I don't understand why "arresters" was removed from the subclause title as it still remains a topic in this subclause. If the reader were to scan the Table of Contents for topics covered, one would surmise arresters is not covered at all. | Either keep title as originally, or make arresters a separate clause from bushings. |  | Paulette Payne |  | Editorial | Resolved |
| 119 | Title | i |  | Reconditioning of Liquid Immersed | Should be changed to Filled if allowed by IEEE SA, as that is the direction of all new standards and guides. | No | Patrick McShane |  | Editorial | Resolved |
| 120 | Abstract | ii | 1 | ….insulating oil …… | ….insulating liquid …… |  | Patrick McShane |  | Editorial | Wording change made |
| 121 | Abstract | ii | 2 | …oil reclamation ….. | ….insulating liquid reclamation …. |  | Patrick McShane |  | Editorial | Wording change made |
| 122 | Keywords | ii | 1 | evaluation, life extension, reconditioning, risk assessment | Power transformers, maintenance, condition evaluation, life extension, reconditioning, risk assessment |  | Patrick McShane |  | Editorial | Wording added |
| 123 | Introduction | iv | 1 & 2 | This introduction is not part of IEEE Std C57.140-2006, IEEE Guide for the Evaluation and Reconditioning of Liquid Immersed Power Transformers | This introduction is not part of IEEE Std C57.140-2006, IEEE Guide for the Evaluation and Reconditioning of Liquid Filled Power Transformers |  | Patrick McShane |  | Editorial | Resolved |
| 124 | Participants | v | 1 | … Reconditioning of Liquid Immersed Power | … Reconditioning of Liquid Filled Power |  | Patrick McShane |  | Editorial | Unable to change |
| 125 | 7/ 7.2 | viii | 1 | On-line oil dryout method | On-line insulating liquid dryout method |  | Patrick McShane |  | Editorial | Wording changed |
| 126 | Title | 1 | 2 | … Reconditioning of Liquid Immersed … | …Reconditioning of Liquid Filled …. |  | Patrick McShane |  | Editorial | Unresolved, Not certain if we can change the title |
| 127 | 1/ 1.1 | 1 | 2 | … insulating oil maintenance and diagnostics, oil reclamation… | … insulating liquid maintenance and diagnostics, liquid reclamation … |  | Patrick McShane |  | Editorial |  |
| 128 | Page Header | 2 | 2 | IEEE Guide for the Evaluation and Reconditioning of Liquid Immersed Power Transformers | The page headers on this and subsequent pages, the “filled” needs to be changed to Filled. I cant’t do it as it acts like a watermark. |  | Patrick McShane |  | Editorial |  |
| 129 | General | - | - | …oil… | Wherever oil is mentioned, it should be replaced with insulating liquid. |  | Patrick McShane |  | Editorial | Resolved with liquid |
| 130 | 4 | 3 |  | on or in the transformer | Perhaps worng infinitive used here. Suggest wording: “…event of the transformer and integrated (non-ancillary) accessories” OR same using the word “components” rather than “accessories”. |  | Patrick McShane |  | Editorial | Wording change |
| 131 |  |  |  | component | component or accessory |  | Patrick McShane |  | Editorial | Wording Change |
| 132 | 4 | 3 |  | large liquid-filled | “large” meaning medium and large power transformers? Needs to be more specific as the word “large” is very subjective. |  | Patrick McShane |  | Editorial | Wording change, removed “large” |
| 133 | 4 | 4 |  | instrumenting | Is this really a correct word? If not, consider: “…when applying monitoring instruments to ….” |  | Patrick McShane |  | Editorial | Wording change |
| 134 | 4 | 4 |  | costs | Does cost mean to imply potential causualties? Possible reword: (i.e. how severe the damages of the event could be.) |  | Patrick McShane |  | Editorial | Wording Change |
| 135 | 4.2 | 5 |  | …transformers that do not contain thermally upgraded cellulose insulation (based on a rated temperature rise of 55 °C) … | IEEE stds are used outside of North America as well, where the majority of new transformers are still manufactured with 55 C rise as standard. |  | Patrick McShane |  | Editorial | Wording change, removed “older” |
| 136 | 4.6 | 7 |  | ..windings… | Perhaps a good place to reference IEEE C57.91) |  | Patrick McShane |  | Editorial | Wording Change |
| 137 | 4.8 | 8 |  | ..small …. | Why is this clause needed? What difference is population is small or not? I would think data from larger population would have greater statistical significance. |  | Patrick McShane |  | Editorial | Wording change to clarify the meaning for smaller transformer populations may need additional information from external sources. |
| 138 | 4.13 | 9 |  | ..reliability… | Shouldn’t the word here be “condition”? |  | Patrick McShane |  | Editorial | Wording change |
| 139 | 5 | 16 |  | Diagnostic tests | Has anyone reviewed this section against the revised C57.152? They cover a lot of the same tests, and they should be compatible with each other. |  | Patrick McShane |  | Editorial | Unresolved same as item 15 |
| 140 | 5.1 | 16 |  | ..owner’s… | Again, better to avoid the apostrophe , e.g.” in the loss prevention program of the owner of the transformer.” |  | Patrick McShane |  | Editorial | Resolved |
| 141 | 5.1 | 16 |  | C57.104 | Include references for DGA of alternative insulating insulating liquid s as available, currently the one for silicone C57.146 and pending one for esters PC57.155 (esters) |  | Patrick McShane |  | Editorial | Resolved |
| 142 | 5.1 | 16 |  | Table 2 – Under fault conditions … | This is an incorrect statement, as nitrogen, oxygen, and CO2 are components in air and significant amounts are found in insulating liquid dielectric fluids in units that are not “under fault conditions”. **Excessive** CO2 levels indicate a potential fault condition.  A statement should be made that alternative fluids A statement that small amounts of combustible gases, called stray gasses, often are detected relatively soon after enerization. This phenomenon should be addressed. In particular, CO2 in silicone, and ethane in esters stray gas levels are significantly higher than stray gases typically found in mineral oil filled units. |  | Patrick McShane |  | Editorial | Resolved, removed under fault condition in caption |
| 143 | 5.1 | 17 |  | ..samply interval.. | Misspelling of sampling, and I suggest replacing “interval” with “ ....due to typical time duration between taking samples.” |  | Patrick McShane |  | Editorial | Resolved |
| 144 | 5.4 | 19 |  | Insuldur paper produces more acids than Kraft paper | I recommend eliminating trade names if there are acceptable generic terms. I think Kraft is essentially no longer a paper trade name, howeber Insuldur may still be. |  | Patrick McShane |  | Editorial | Resolved |
| 145 | 5.3.2 | 20 |  | Figure 2 | Should be Figure 3 |  | Patrick McShane |  | Editorial | Resolved |
| 146 | 5.3.3 | 21 |  | Figure 5 | Fig. 4? |  | Patrick McShane |  | Editorial | Resolved |
| 147 | 5.5 | 22 |  | Power factor | Consider incorporating the new language in the recent revision of C57.152 and at a minimum reference its **Section** **7.2.12 Capacitance, power factor, and dissipation factor** |  | Patrick McShane |  | Editorial | Resolved |
| 148 | 5.4.1 | 23 |  | **Frquency Domain** **Spectroscopy (FDS) Cigré TB445 Guide for Transformer Maintenance(XX2)** | Is this section based on mineral oil or is it suitable for alternative insulating insulating liquid s? If the former, it should be so stated. And all references of “oil” should be changed to “mineral oil”, including Figures 4 and 5. |  | Patrick McShane |  | Editorial | Unresolved |
| 149 | 5.6 | 25 |  | (FRA) | A repeated font error seems to be inherent in the document’s bullets. The first bullets often have a different font than the following bullets. Maybe just on my screen computer perhaps? |  | Patrick McShane |  | Editorial | Resolved |
| 150 | 5.6.1.5 | 27 |  | Analysis of Results | Recommend rewording this paragraph for better clarity and grammar form. |  |  |  |  | Resolved, |
| 151 | 5.6.1.5 | 27 |  | ..a FRA trace … | “any” rather than “a”? |  | Patrick McShane |  | Editorial | Resolved |
| 152 | 5.6.1.5 | 27 |  | ..preictability … | predictability. This is due to typical frequency core effects, main…. |  | Patrick McShane |  | Editorial | Resolved |
| 153 | 5.7 | 28 |  | ..a local breakdown… | ..a “localized breakdown”? |  | Patrick McShane |  | Editorial | Resolved |
| 154 | 5.8 | 29 |  | …converted to electrical signals. | I would end the sentence after the word “surface”. The “.. converted to electrical signals” is superfluous. |  | Patrick McShane |  | Editorial | Resolved |
| 155 | 5.8.2.1 | 30 |  | ..equal to 10 °C … | Is this (and other sections’) “10 ºC limit based on 65 ºC rise rated transformers? What about forced oil and/or forced air ratings? And is it a valid limit for the new IEEE C57.154 Standard for transformers with High Temp. Insulation Systems and operating at elevated temperature? |  | Patrick McShane |  | Editorial | Resolved, 10C is not based on the transformer rating |
| 156 | 5.8.2.3 | 30 |  | **Tap changer** | I assume this pertains to LTCs external to the main tank but not sure as most transformers also have DETC, often de-energized TCs when operating. Pls clarify if this section pertains to both or not. If pertains only to LTC, include “Load” in the title and in the paragraph. Should this section address both LTC and DETCs? |  | Patrick McShane |  | Editorial | Resolved |
| 157 | 5.8.3 | 31 |  | Table 3 – Suggested temperature rise recommendations | See coment 32 above. |  | Patrick McShane |  | Editorial | Resolved |
| 158 | 5.9 | 33 |  | Figure 3 is an example of the information that should be provided with the samples. Samples collected from different locations should be separated and clearly identified so that analysis of the results will be logical. Samples should be protected from the environment. The use of sealed plastic bags is a method of separating samples. | I would move this sentence to the paragraph above after the sentence “Wrap the sample in plastic or place in a sealable plastic.  Separating and clearly identifying samples is a good practice but the practice, by itself, does not guarantee the analysis results will be logical.  This info is redundant to previous paragraphs in this section. |  | Patrick McShane |  | Editorial | Resolved |
| 159 | 5.10 | 35 |  | …real and are … | I don’t understand the wording “more apparent than real” . Can this be make clearer? E.g. “…can be deceptive, thus difficult to locate and identify.” |  | Patrick McShane |  | Editorial | Resolved |
| 160 | 5.10.2 | 35 |  | Investigated further. | Changed because “fan guards” are not a type of noise. |  | Patrick McShane |  | Editorial | Resolved |
| 161 | 6 | 35 |  | …to restore many … | Restore seems out of place, perhaps the author meant” to attend to” |  | Patrick McShane |  | Editorial | Resolved |
| 162 | 6.1.1 | 36 |  | At the time this guide was published, the only recognized method for evaluating coil-clamping adequacy was.. | Is this statement still correct or has some new technologies available since this statement was first used in this standard? |  | Patrick McShane |  | Editorial | No, resolved |
| 163 | 6.1.1 | 36 |  | (It is not advisable because increased clamping pressure may exacerbate the condition that is causing the generation of a particular gas and could possibly cause the transformer to fail soon after energization.) | Are the parenthesis is need for the remainder of this paragraph? I would not use it. If the intent is not to make the wording part of the requirements of this standard, then the wording should be put into a Note. |  | Patrick McShane |  | Editorial | Resolved |
| 164 | 6.1.3.1 c) | 39 | last | Caution. | Words used for alerts in documents should avoid standard terms “Caution” and “Warning” unless their use is required |  | Patrick McShane |  | Editorial | Resolved |
| 165 | 6.1.4.2 | 41 | Title and first line | …maple … | Is” maple” the right adjective, must it always be maple? Maybe “hard” would be better. Since there are many types of maple wood, I assume if it must be maple, it must be “rock maple” or equivalent.6  If imust be “maple” then it belongs before the word “wood” in this sentence and in Figures 4,8, and 9. However, Figures 5, 6, and 7 use the term “maple”. Whatever decided, there should be consistency. See highlighted wording below. |  | Patrick McShane |  | Editorial | Maple is the industry standard. Resolved |
| 166 | 6.1.4.4 | 49 | last | should be tightened to 610 N·m (450 ft·lb) of torque. | This last sentence seems very “precise”. Are we sure this is still accurate? Should this exact range be a part of this standard guide? Do all the manufacturers agree? |  | Patrick McShane |  | Editorial | The section speaks to a typical size of bolt which would have a specifc torque value. Resolved |
| 167 | 6.1.4.5 | 49 | Middle  para | …will … | Why introduce future tense into this standard? Replace “will” with “is” or “is typically” |  | Patrick McShane |  | Editorial | Resolved |
| 168 | 6.1.5 | 49 |  | ..often be … | Standards should avoid absolute statements unless absolutely required. It can lead to unnecessary litigation exposure. |  | Patrick McShane |  | Editorial | Resolved |
| 169 | 6.3.1 | 54 |  | Make sure the test set-up is correct | The use of punctuation is not consistent in this section so I changed them to be consistent and correct. |  | Patrick McShane |  | Editorial | Resolved |
| 170 | 6.4.1 | 57 |  | … without oil backing … | I am not sure what is “oil backing “. And stating “no risk” is perhaps an avoidable absolute. Does it mean that on the other side of the tank there is a volume of oil in contact with the metal where the weld is taking place |  | Patrick McShane |  | Editorial | Unresolved, maybe define oil backing. |
| 171 | 6.4.4 | 60 |  | … typically used for smaller transformers .. | Define smaller, add an appropriate range. |  | Patrick McShane |  |  | Resolved |
| 172 | 6.4.6 | 60 |  | The nitrile (Buna-N) or fluorocarbon (Viton .. | Typically it is improper to include product trade names into the standards, especially when well known generic terms exist. |  | Patrick McShane |  |  | Resolved |
| 173 | 6.5.2 | 62 |  | There should be no noncontacts, commonly referred to as dead spots, or simultaneously normally open and normally closed contacts | Recommend making this statement clearer. |  | Patrick McShane |  |  | Resolved |
| 174 | 6.6.2 | 65 |  | Electronic Temperature Monitor (ETM) for LTI .. | Consider the ETM acronym to Section 3.2 |  | Patrick McShane |  |  | Rejected , ETM is only used within a two consecutive sentence place. |
| 175 | 7.1 | 70 |  | Off Line De-Energized  Processing methods | Please contact Paul Boman to determine if he has alternative instructions for alternative fluids, and if so, please add to this section. |  | Patrick McShane |  |  | Rejected, no alternative instructions available, just fluid handling methods. |
| 176 | 7.1 | 71 |  |  | The format for the bullet sequence is out of whack. Recommend using numerics 1-4 here. |  | Patrick McShane |  |  | Resolved |
| 177 | Below 7.2 | 74 |  |  | Add a section here on dry-out by retrofilling with natural esters, which naturally reduce the moisture in the insulating paper and in the fluid itself via chemical processes? |  | Patrick McShane |  |  | Unresolved |
| 178 | 1/ 1.1 | 1 |  | Recommended guidelines for the following transformer attributes are contained in this document. Those are, insulating oil maintenance and diagnostics, oil reclamation; testing methods for the determination of remaining insulation (paper) life, coil reclamping. Also included are upgrades of auxiliary equipment such as bushings, gauges, deenergized tap changers (DETCs) and load tap changers (LTCs) (where applicable). The goal of this guide is to assist the user in extending the useful life of a power transformer. | The entire scope should be rewritten as thus:  Recommended guidelines for the following transformer attributes are contained in this document. These are, overall condition assessment, insulating oil maintenance and diagnostics, oil reclamation; testing methods for the determination of remaining insulation (paper) life, and coil reclamping. Also included are upgrades of auxiliary equipment such as bushings, gauges, deenergized tap changers (DETCs) and load tap changers (LTCs) (where applicable). The goal of this guide is to assist the user in extending the useful life of a power transformer. | Y | Bipin Patel |  |  | Unresolved |
| 179 | 1/1.2 | 1 |  | The purpose of this guide is to develop a comprehensive document that will aid users in selecting the proper direction for their unique needs | Purpose should be rewritten as thus:  The purpose of this guide is to develop a comprehensive document that will aid users in evaluating and reconditioning transformers to enhance performance and extending useful service life. | Yes | Bipin Patel |  |  | Unresolved |
| 180 | 4/4.1 | 5 |  | Economic considerations may include cost of transformer losses, maintenance, and undelivered energy when the loss of the transformer results in a loss of ability to supply load on the system and costs associated with failure including customer incentives. | Should be rewritten as thus:  Economic considerations or  justifications such as  reconditioning cost and its  usefulness v/s purchasing a  new transformer with better  performance and longer  service life, reconditioning a  transformer as a system spare,  etc. | Yes | Bipin Patel |  |  | Current wording conveys the meaning without pushing for the purchase of new equipment. |