

**C57.104 – IEEE Guide for the Interpretation of Gases Generated in Oil – Immersed Transformers**  
**Tuesday, March 18, 2008**  
**Charlotte, North Carolina**

The meeting was called to order by Rick Ladroga at 1:50 pm on Tuesday, March 18, 2008. Vice Chair and Secretary Susan McNelly was also in attendance. There were 43 members, 51 guests, and 13 guests requesting membership.

Guests requesting membership were:

Don Angell  
Rick Cantrell  
Beth Dumas  
Shawn Galbraith  
Rodolfo Garcia  
David Harris  
Josh Herz  
Wayne Johnson  
John Lackey  
Shawn Luo  
Joe Nims  
Arturo Nunez  
Craig Stiegemeier

Introductions of attendees 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 2007 meeting in Minneapolis, Minnesota was requested. The minutes were approved as written.

**Update on status of recent ballot on C57.104:**

- Ballot issued last fall, comments received (97 % Positive, 3% Negative, 115 Affirmative Votes, 3 Negative, 170 Total Comments- Mostly editorial, minimal amount of technical)
- Ballot Resolution Committee consisting of Tom Prevost, Sue McNelly, Claude Beauchemin, Brian Sparling, and Rich Ladroga met several times during the interim period (Telcon) and also met for 5 hours last evening to resolve comments. Approximately 170 comments were satisfactorily addressed by the Resolution Committee.
- Will go out for a recirculation ballot shortly after this meeting.

**C57.104 – NEW GUIDE:**

Goal of the new Guide is to take a different approach. This will be more tutorial in nature and will be more comprehensive. The reality is that many people are misapplying the guide. Rick indicated that he would like the focus to be more informative and tutorial in nature.

## Task Force Presentations

- Jim Dukarm – Framework Structure TF

Jim presented an initial framework for the new Guide with Overview, Scope, Limitations, References, and Definitions sections. The following is the initial framework outline developed by the Framework TF.

1. Overview
  - 1.1 Scope
  - 1.2 Limitations
2. References
3. Definitions
4. The Nature, Purpose, and Application of Dissolved-Gas Analysis
  - 4.1 The nature of Dissolved-Gas Analysis
  - 4.2 The Purpose of DGA
  - 4.3 The Application of DGA
    - 4.3.1 Detection and diagnosis of abnormalities
    - 4.3.2 Risk assessment
    - 4.3.3 Risk classification by DGA
      - 4.3.3.1 Risk management strategies
    - 4.3.4 Measurement verification and quality assurance
  - 4.4 DGA contexts
5. DGA Norms
  - 5.1 Variables and norms for fault detection and risk classification
    - 5.1.1 Minimum interpretation limits for gas concentrations
    - 5.1.2 Baselines for increments
    - 5.1.3 Time windows and baselines for rates of change
    - 5.1.4 Limits for combustible gas increments
    - 5.1.5 Limits for combustible gas rates of increase
    - 5.1.6 CO<sub>2</sub>/CO
    - 5.1.7 Acetylene/Hydrogen
    - 5.1.8 Oxygen/Nitrogen
  - 5.2 Derivation, use, and maintenance of DGA norms
6. DGA Data Interpretation
  - 6.1 Data Quality Review
    - 6.1.1 Transcription and Typographical errors
    - 6.1.2 Missing or duplicated data
    - 6.1.3 Mis-identified or swapped sample
    - 6.1.4 Sample mis-handling
      - 6.1.4.1 Air exposure
      - 6.1.4.2 Air contamination
      - 6.1.4.3 Cross contamination
    - 6.1.5 Wildly inconsistent values
    - 6.1.6 Chronically absent or low hydrogen
    - 6.1.7 Inconsistent O<sub>2</sub>/N<sub>2</sub> ratio
  - 6.2 Interpretation of DGA Data
    - 6.2.1 Initial Sample
    - 6.2.2 Periodic Screening
    - 6.2.3 Surveillance
    - 6.2.4 Monitoring
    - 6.2.5 Quality assurance and verification

- Tom Prevost – Data TF

Norman Field Volunteered to take over as chair of the Data TF. No presentation from this TF was done at this meeting.

- Tom Lundquist - DGA in Arc Furnace Transformers TF

Presented a summary of information gathered from three laboratories.

Fredi Jacob asked if Jim Dukarm could do a statistical analysis rather than set values.

- Brian Sparling – Case Studies (Q – Existing – SDM, ABB, DOBLE, WEIDMANN, etc) TF

The draft of the framework will be sent out shortly for review and comment.

The meeting was adjourned at 3:07 pm.

Rick Ladroga  
WG Chair

Susan McNelly  
WG Vice Chair and Secretary