

JOHN W. HARLEY

March 17, 2009

Via e-mail

F. Jakob, Chair
IEEE Transformers Committee
WG C57.139 Guide for Dissolved Gas Analysis of Load Tap Changers

Subject: Proposed safety warning

Dear Fredi:

Claude Beauchemin and I propose that a safety warning of possible hazardous conditions be added to the C57.139 Guide in order to alert personnel (1) flushing prior to taking samples from load tap changers or (2) servicing load tap changers if this service is based on DGA results.

Background:

- The Purpose given in Section 1.2 of the C57.139 Guide is "to assist a maintenance or test technician in evaluating the mechanical condition of a load tap changer (LTC) without the need to deenergize the transformer in question or remove the LTC oil and open the inspection hatch. Additionally, repairs to the LTC can be made in a timely fashion based on accurate gas analysis ..."
- The C57.139 Guide Section 2 lists ASTM D3613 as a normative reference, which means it is indispensable for the application of the Guide. This is noted, but the recommendation for a safety warning is not contingent on this.
- ASTM D3613 Standard Practice for Sampling Insulating Liquids for Gas Analysis and Determination of Water Content: Section 1.2 states "It is the responsibility of the user of this standard to establish appropriate safety and health practices ... prior to use."

Rationale for a warning statement:

The C57.139 Guide proposes the reason for sampling the oil in an LTC as stated above.

- ASTM D3613 Standard Practice recommends flushing of drain valves with preferred quantity of four liters for proper sampling.
- The results of the C57.139 Guide analysis of samples may cause servicing operations of the LTC.

There is currently no warning in the Guide that gas evolving from the oil mixture in flushing or servicing of the LTC may be in the flammable range.

ASTM D3613 Standard Practices for Sampling Electrical Insulating Liquids, the normative reference, is specific that it is the responsibility of the users of the standard to establish appropriate safety practices. The users of ASTM D3613 are the users of the C57.139 Guide.

There is a possibility of a flammable hazard associated with the flushing prior to taking samples and during the handling of fluids required for servicing of the LTC when combustible gases are high. These activities result from the desire to analyze samples or the analysis of samples as proposed in the C57.139 Guide.

A safety warning should be added to the Guide.

Proposed safety warning:

X.X Safety warning

The safety warning in this subclause applies only to work done on transformer LTC installed in the field, not to factory testing. Refer to factory test codes for safety warnings for these situations.

WARNING

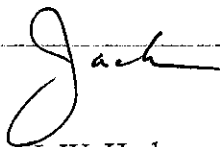
Oil from load tap changers (LTC) taken while flushing prior to sampling or during and after removal for LTC servicing may create a flammable gas mixture when exposed to air. Handling of this oil should only be attempted by those maintenance or test technicians and engineers trained in working on and knowledgeable of the risks associated with it.

Oil with gas levels exceeding 1500 ppm dissolved hydrogen or exceeding 10,000 ppm total dissolved combustible gases could create a flammable gas mixture when exposed to air.

Side note about the normative reference D3613:

- ASTM D3613 was withdrawn in 2007. This standard has been incorporated into ASTM D923-2007 Standard Practices for Sampling Electrical Insulating Liquids.
- ASTM D3613 and ASTM D923 have identical wording that it is the responsibility of the users of the standard to establish appropriate safety practices.

Sincerely,



J. W. Harley