AUDIBLE NOISE AND VIBRATION SUBCOMMITTEE

Meeting Minutes
San Diego, California
March 10, 2004
Acting Chairman: Bill Darovny

1. Audible noise & vibrations S.C. met on March 10, 2004 at 8:00 AM with 12 members and 7 guests present.

2. The minutes of the Pittsburgh PA meeting were reviewed and approved.

3. **WG Report:**

   3.1. Bill Darovny acting Chairman of the TF for writing "Sound Level Measurement Guide" reported that the guide is at Draft 2 and that 8 new editorial comments were received at the meeting. Clauses to be added to the guide are 'narrow band measurements' and 'practical aspects of making sound level measurements'. These will be based on IEC 60076-10 with changes made to suit the North American environment.

   3.2. Bill Darovny gave a presentation on narrow band measurements as documented in IEC 60076-10-1 clause 5.4. Comments for improvements to the narrow band section were:

      3.2.1. In the 3rd paragraph, reference to 1/12 octave is incorrect and should be 1/10 octave.

      3.2.2. Narrow band measurements should be on the C scale rather than A scale.

      3.2.3. Add typical narrow band A scale and C scale spectrum graphs for a 60 Hz transformer (IEC has a 50 Hz A scale spectrum). The intent of showing both scales is for user reference. Mr. Girgis will provide this information.

      3.2.4. Mr. Kennedy offered to provide an example of narrow band measurements taken at site where the user was interested in segregating the transformer noise from that of other equipment.

      3.2.5. Table x – 'Values Of A Weighting As A Function Of Frequency' should be specific to the transformer frequencies (ie 120, 240, 360 ….Hz) rather that of the ranges shown. Mr. Girgis will provide this information.

      3.2.6. It was commented that EPRI did some work on narrow band measurements some years ago and information may be available.

4. Standard Sound Level Tables:

   4.1. The major topic discussed was Jeewan Puri's proposal to create new sound level tables that could eventually used in C57.12.00 and C57.12.01. These are based on NEMA TR1 tables and a progression analysis based on equations developed by Jeewan. Copies of the theory and proposed tables had been sent to all SC members for comments.

   4.2. In summary, the proposal extends the tables for kVA ranges currently not covered and also alters some of the existing TR1 values. For dry type transformers, some of the dB levels would rise 1 to 5 dB and for liquid filled transformers some would decrease by 1 dB.

4.3. Six written comments were reviewed at the SC meeting. The responses ranged from ‘make no changes to the TR1 tables’ to ‘extend the tables but do not change the existing values’. There were no comments accepting the proposal.

4.4. Verbal concerns to Jeewans proposal were:

4.4.1. There is no need to create a new equation to extend the tables, as the origin of the NEMA TR1 table is known. This equation is available in the public domain; see Standard Handbook for Electrical Engineers, 12th edition, McGraw-Hill, section 10, "Transformers" by W.J.McNutt, paragraph 94, equation 10-58.

4.4.2. One manufacturer has published values for kVA ranges currently not covered. These should be compared to the Puri and McNutt values.

4.4.3. In extending the tables, eliminate the values proposed for impractical transformer ratings.

4.4.4. Keep the existing TR1 values because changing them would confuse the user. The TR1 reference has been in use for many decades and is a stable baseline.

4.4.5. Keep the existing TR1 values because some users specify Sound Level in terms of the NEMA TR1 value minus X dB. Changing the baseline would create confusion.

4.4.6. The TR1 values represent a baseline for users and they are always able to specify lower values when required for their application.

4.4.7. In Europe, there are several different SL tables based local and National requirements. The TR1 table is considered the North American baseline.

4.4.8. Why are the proposed values different in the dry type and oil filled tables?

4.4.9. There is a need of a paragraph on how to interpret the tables.

4.4.10. It was suggested that the table heading should say ‘typical’ so as not to confuse the user.

4.4.11. Load noise is not addressed. Load noise is more commonly specified in Europe and we should consider adding it to the document.

4.4.12. Need to correct the terminology for the forced cooled ratings.

4.4.13. We were informed that NEMA committee plans to review ST-20 and ST-1 and the status of the TR1 sound level table will be discussed.

5. The SC meeting adjourned at 9:15 AM.

Bill Darovny, March 13, 2004