

CIGRE B2 Advisory Group A6

“MECHANICAL ASPECTS OF OVERHEAD CONDUCTORS AND FITTINGS” (Previously WG11)

- Convenor: **David Hearnshaw** (United Kingdom)
- Secretary: **Wolfgang Troppauer** (Austria)
- Latest Meetings
 - Salzburg, Austria, April 28-30, 2008
 - Paris, France, August 21-23, 2008
- Reports of Working Groups
 - WG 25 *Revision of existing IEC standards, and recommendation of new IEC standards relating to Overhead Lines.*
 - WG31 *Aeolian Vibrations of Single Conductors Strung at Relatively High Tensile Load*
 - WG32 *Assessment of the Performance of Aged Fittings*
 - WG33 *Guidelines for Cable Cart/Trolley (Cycling) Safety on Old Conductors*
- Liaison With Other Groups (CIGRÉ B2-03 & B2-12, IEEE, IEC)
- Paper Presentations
- Informal Exchanges
- Plans for Future Meetings
- Web Sites, (www.e-cigre.org, www.regiocom.ch/aeolus)

WG25: IEC PUBLICATIONS/TUTORIALS

Convenors **KONSTANTIN PAPAILIOU, LOUIS CLOUTIER, UMBERTO COSMAI**

- IEC Standards on Fittings, Spacers and Dampers
 - Liaison with IEC TC7 - Two groups established to develop new specs for:-
 - Testing of Self Damping Characteristics (TC7 PT3)
(Led by **Konstantin Papailiou**)
 - Conductor Fatigue Testing (TC7 PT4)
(Led by **Louis Cloutier**)
 - Liaison with IEC TC11 to upgrade IEC Standards
(Led by **Umberto Cosmai**)
 - 61284 – Conductor Fittings (IEC 61284) TF led by **H-J Krispin**
 - 61854 – Spacers (IEC 61854) TF led by **W. Troppauer**
 - 61897 – Vibration Dampers (IEC 61897) TF led by **D. Sunkle**

WG 25 Cont'd

- The first draft of the self-damping TF report led to considerable discussions took place on the following points:
 - Source of self-damping of conductors;
 - Tension to be used for pre-conditioning;
 - Control of conductor tension variation due to variation of temperature;
 - Preparation of samples, repeatability and test set-up.
- No report from IEC PT 4 (Fatigue testing) chaired by **Louis Cloutier**.
- For high temperature fittings, **Hans-Jorg Krispin** suggested that we consider preparing the document to differentiate between conductors with zirconium alloy wires and conductors with annealed wires because of their different fitting requirements.
- **Craig Pon** presented a summary of various requirements for spacer dampers from Utilities. The point of the presentation was to illustrate the large discrepancies between users.
- The work is on schedule for the completion of the various tasks but more work will have to be done between meetings.
- Next half-day meeting is scheduled for April 2009 in Bruges.

WG31: “VIBRATION PRINCIPLES”

- **CONVENOR: GIORGIO DIANA (ITALY)**
- **SECRETARY: HANS-JORG KRISPIN (GERMANY)**
- **Benchmark “Aeolian Vibration on Single Conductors Strung at Relatively High Tensile Load”**
 - Data from the “Old” Messina crossing is being collected for this benchmark
 - Four analytical methodologies are being compared by classifying the assumptions inherent in each
 - Report due end of 2008

WG31: Cont'd

■ Aeolian Vibration of Bundled Conductors

- Two analytical methodologies being compared
- Case studies possible include quad, triple and twin bundle lines
- Wind Turbulence data at the location of field measurements of vibration will be obtained.
- Test data from Hydro Quebec's field sites for different bundle arrangements will be located
- Presenting computational results into direct comparison with fatigue inducing intensity (bending amplitude) and some members are in favor of using $f_{y_{max}}$.

■ Next Meeting

- The next meeting will be held in Bruges, Belgium, on 28th of April, 2009.

WG32: “FITTINGS”

- **CONVENOR: DAVID SUNKLE (USA)**
- **SECRETARY: PETER DULHUNTY (AUSTRALIA)**
- The focus of this WG is testing of old fittings.
- Utility survey on testing of aged fittings:
 - The revised paper based on 37 responses from 22 countries, on the survey on aged fittings was accepted with minor adjustments, and would be uploaded to a website. This will become one section of a technical brochure on aged fittings. **(David Havard).**

WG32: “FITTINGS” cont’d

- A paper on testing of aged fittings is being drafted. Key changes included extending the table of test methods to all fittings, making the document more accessible to new engineers by adding several diagrams, and including an annex of relevant Standards. A new draft will be reviewed at the next meeting. (**David Sunkle** and **Wolfgang Troppauer**)
- Presentations
 - A film on testing of aged hardware conductors and towers at Ontario Hydro and presentation on estimation of remaining life of conductors (**David Havard**).
 - Results of testing of aged yoke plates, eye bolts, and turnbuckles were presented by **Wolfgang Troppauer**
- Next meeting will be in Bruges, April 2009

WG33: “GUIDELINES FOR CABLE CART SAFETY ON OLD CONDUCTORS”

- **CONVENOR: PETER CATCHPOLE**
- **SECRETARY: PETER DULHUNTY**
- Questionnaire distributed to possible cart users in selected countries
- Concern that the topic of worker safety would incur an unwanted risk within their organization
- Need for a “Confidentiality Statement” to protect the privacy of the respondents
- Factors considered to affect the safety of cart use on aged conductors include:
 - Weights of carts, equipment and persons
 - Tension and condition of the conductor/OHGW
 - Potential damage sources – Aeolian vibration fatigue, clamp damage...
 - Conductor type and relevant characteristics differences
 - Line features such as span lengths and design tensions
 - Lightning strike damage
 - Corrosion
- Development of guidelines by CIGRE
- Target – Technical Brochure by end 2009/early 2010.

Meeting of B2-AG-06

- **Tutorials: a CD of all tutorials produced in WG11 is being prepared**
- **Discussion Papers and verbal reports**
 - How do we Prevent Aircraft Warning Markers Falling off? – **D Havard**
 - Where Should we Place Stockbridge Dampers with Armor Rods? – **D Havard**
 - Storm in China 2008 – **D Hearnshaw**
 - Wake Effects of Wind Turbines on OHTLs – **B. Wareing**
 - Vibration Tests on Covered and Novel Conductors – **B Wareing**
 - Self Damping Analysis – Hawk ACSR – **B Wareing/J-L Lilien**
 - Videos of Conductor Galloping - **D Havard**
 - Vibration Behaviour of the ACSS/TW Conductors - **G.Diana**
 - Spacer and Spacer Damper Tutorial – **U Cosmai**
 - Engineering Guidelines Relating to Fatigue Endurance of Conductor/Clamp Systems – Technical Brochure – **A Leblond.**

Meeting of B2-AG-06 Cont'd

- Update of Guides – **D Havard/U Cosmai**
 - 1. Self Damping Measurements.
 - 2. Aeolian Vibration Dampers. (Priority 1)
 - 3. Endurance Tests of Conductors. (Priority 2)
 - 4. Bolted Clamps. (Priority 3)
 - 5. Interphase Spacers.
 - 6. Vibration Measurements.
 - 7. Optical Fibre Cable Fittings.
- Liaison with other groups
 - IEEE WG on Overhead Conductors – **C Pon**
 - EPRI Orange book completed – **D Havard**
- Future meetings
 - April 27-29, 2009, Bruges, Belgium
 - September 20-24 2009, Toronto Canada

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