

T&D General Systems Subcommittee
Practical Aspects of Ferroresonance WG
Sheraton Centre, Toronto, Conference Room H
Tues July 15, 2003

Meeting Minutes

Panel is organized and ready (given the next day, attendance ~50, very successful). Most of main contributors to WG are identified, a few others are stepping forward as we progress.

Working Group Officers:

Bruce Mork, Michigan Tech Univ, is the chair of the WG. David Jacobson is co-chair and secretary. Reigh Walling is also possible backup person, schedule permitting.

Discussion:

Going around the table, there were many useful suggestions made as to the scope of the topics, level to present them at, etc. Summarizing:

- ◆ David Jacobson gave update on Literature Search. Classified into 7 circuits. 130 references, will circulate draft at next meeting.
- ◆ Discussion on how to structure practical scenarios. Should it be by topology, by voltage level, by HV system equipment vs. instrument transformers. Decided to gather up scenarios first and then decide how to structure their presentation in document.
- ◆ Practical issues about amorphous core transformers discussed. They tend to behave differently than conventional steel cores, since L_m is steeper and C is larger.
- ◆ Should guidance on transformer specifications be given? Mfrs and customers would be more willing to comply with common sense precautions related to application of transformer being purchased if it was documented in special publication (or in a future standard/common practice)?
- ◆ A new Panel on FR scenarios should be considered for Denver or San Francisco.

- ◆ Reminder that we also need to focus on things that ARE NOT ferroresonance.
- ◆ Mort may be able to address benefit/cost issues related to robust designs (or mitigations) that reduce likelihood of FR. Single-pole vs. gang-operated, etc.
- ◆ Parameters for FR modeling should be addressed. Walling/Mork/Martinez willing to to more work on this. (Refer to TP-133-0, papers from Martinez' TF).
- ◆ Should group FR scenarios into a series of papers (according to categories that we decide on for special publication).
- ◆ Track deadlines for upcoming panels and tutorials. What are lead times? Which conferences/meetings should we target?

- ◆ The following structure was agreed upon for documenting the practical scenarios:

Structure for documenting Practical Scenarios

- ◆ Clear description of the involved portion(s) of the system with one-line diagram. Include sequence of events or of normal operation that occurred. Event records, waveforms, if available, can be very useful.
- ◆ Detailed explanation of how and why it occurred, including perhaps a detailed three-line diagram describing “where the action is.” Equivalent circuit of transformer(s) and other involved system components should be provided. If a simulation was done, then maybe the simulation waveforms could help to explain what happened and why, in lieu of event records/waveforms.
- ◆ Finally, assuming some solution or mitigation was applied, an explanation of this and some closing comments, general advice, and lessons learned.

June 2004 meeting objectives:

- Revise Reference List, perhaps reduce down to fewer (most practical) papers?
- Continue with informal presentation of scenarios for FR. Possible presenters:
 - Francisco de la Rosa (DCSI)
 - Mort (benefit cost issues?)
 - Others?
- Discuss panel/tutorial for near future.
- Discuss papers, special publication

Toronto:

ER WG - July 14, 2003

<u>Name</u>	<u>Univ/Company</u>	<u>Status*</u>	<u>e-mail</u>
John Ainscough	Xcel Energy	3	john.ainscough@xcelenergy.com
Mort Khodair	PNM	2	mKhodair@Pnm.com
MANUEL GONZALEZ	CENTERPOINT ENERGY	2	MANUEL.GONZALEZ@ CENTERPOINTENERGY.COM
Moël JANSSENS	ELIA / UCL		moel.janssens@elia.be
DAN SULLIVAN	MITSUBISHI Electric	2	dan.sullivan@meppi.com
Donald Shoop	Mitsubishi Electric	2	dan.shoop@meppi.com

* 1 = Key contributor
2 = Review/small contribution
3 = integral observer