

Meeting Minutes, Part 2

WG 824: Series Capacitor Working Group

of the Capacitor Subcommittee of the Transmission and Distribution Committee

Date: January 30, 2003, 08:00 – 12:00.

Place: Riviera Hotel, Royale Skybox 203, Las Vegas, Nevada, U.S.A.

1. Introduction

The meeting was called to order by Jan Samuelsson, who served as Acting Chair of the meeting in the absence of the official Chair Gerald Lee, who unfortunately could not attend the meeting.

The following people were in attendance:

Name	Company	Member/Guest
Bharat Bhargava	So. California Edison Co.	M
Bill Chai	General Electric	M
Stuart Edmondson	Duke Power Company	M
Clay Fellers	Cooper Power Systems	M
John Joyce	Siemens HVS	M
Mark McVey	Dominion Power	M
Jan Samuelsson	ABB	M (Acting Chair)
Todd Campbell	General Electric	G
Keith Harbison	Cooper Power Systems	G
Sharma Kolluri	Entergy	G
Carlet Langford	Nevada Power Co.	G
Tom Grebe	Electrotec	G

2. Previous Meeting Minutes

The minutes from the July 23, 2002 Chicago meeting were approved as submitted.

3. Additional Agenda Items

No additional agenda items were brought up

4. Review of the K13 Document

See "Meeting minutes, part 1".

5. Review of Draft 1.1 of IEEE Guide for the (Functional ?) Specification of Fixed Transmission (Line) Series Capacitor Banks.

Besides Draft 1.1, the following documents were distributed to the participants of the meeting:

- “Comments to the document “IEEE Guide for the (Functional?) Specification of Fixed Transmission Series Capacitor Banks” by Jan Samuelsson (attached to these minutes)
- Text on Thyristor Valve Bypass including a definition and a single line diagram, by John Joyce (attached to these minutes)

General discussion of the structure of the document.

Several of the participants of the meeting were not satisfied with the present structure (outline, format) of the document. The substation engineer was identified as the main target person of the document. To serve this purpose, a structure (format) of the document similar to that of **IEEE Std. 1031-2000 “IEEE Guide for the Functional Specification of Transmission Static Var Compensators”** was agreed upon. The meeting **assigned the work to reorganize the document to Gerald Lee.**

Mark McVey agreed to resubmit IEEE Std. 1031 to the delegates of SC WG 824.

Note. In the Guide-document, the word “**should**” shall be used in place of the word “**shall**”.

Section 1 Overview.

Section 1 of the document is missing. John Joyce volunteered to write section 1. The following should be observed:

- (i) There should be consistency in the formatting of paragraphs and subparagraphs.
- (ii) An Annex should be included showing the structure of a FSC-specification similar to that included in IEEE 1031.

Section ??? References.

Expand on references. References cited in the text of the document should be included in section ???. Other useful references (e.g. K13-document) should be included in an Annex “Bibliography” at the end of the document. Repeat the references included in P824.

Section ??? Definitions, acronyms and abbreviations.

Repeat definitions included in P824/D7.1. Acronyms as in IEEE Std. 1031.

Section 2. Scope of the project.

- (i) In the 2nd subsection, change “**deviations**” to “**exceptions**”.
- (ii) Add different types of project structures (scopes) as:
 - Complete supply
 - Turn-key
 - Not Turn-key
 - Civil works

John Joyce volunteered to rewrite section 2.

Section 3 Service conditions

Rewrite section 3 according to P824. Mark McVey volunteered to rewrite section 3.

Add a new section 4: “Insulation coordination of a FSC”.

- IEEE Std. 1313.1, 1996 and IEEE Std. 1313.2, 1999 and IEC 60071-1 and IEC 60071-2 shall be the base document for section 4.

Jan Samuelsson volunteered to write the new section 4.

Note. Ask Gerald to resubmit the **corrected copy** of IEEE P824 of the Chicago meeting.

Section 5: Change title to: “Planning and system configurations. “

Section 5.1 Capacitive reactance per line.

- In the list on page 9:

- Specify in more detail: “System stability requirements” (first item in the list)
- Add “Power transfer targets”

- Change **the first part** of **sub-section 3** to read: “Higher levels of series compensation can improve system performance, e.g. increase power flows on long lines, improve system stability and voltage profile but increase the likelihood of SSR.”

- Change text of **sub-section 4** to read: “For parallel paths of transmission lines, the level of series compensation should be selected so as to avoid unequal power flows. The level of series compensation may however be used to optimise power flows on selected parallel lines with unequal current ratings, to push/pull more power on a stronger line/path.

- Add typical graph(s) of line voltage profile(s).

Section 5.2 “Number of SC banks in a transmission line.

Bharat volunteered to review subsection 2 regarding “base for the actual per unit calculations.

Section 5.4 Future requirements for series capacitors

Higher short circuit duty in the power system should also be considered as a future requirement.

Bharat volunteered to review and make corrections to all subsections of section 5.

Section 6 “Bank topology and connection orientation”.

- Move section 6 and incorporate it in section 8.

- A single line diagram showing the different connections would be helpful

Pierre Bilodeau was assigned to do the work on section 6.

Section 7 Current ratings for the bank inserted mode

- Move sub-sections 7.1 and 7.2 to section 5. Note: Use “should” instead of “shall”.

- Change title of sub-section 7.3 to “Major Equipment Considerations

- Sub-section 7.3 and section 8 should be reorganized and moved to section 5.

Todd Campbell volunteered to reorganize section 7 and 8 and move it to section 5. A Figure like Figure 1 of P824 should be included.

Discussion of “Fault Current” :

The following definitions need to be added to the document

- Definition of “fault current” and “through fault current”.

- Definition of symmetrical fault current, asymmetrical fault current and peak fault current.

- A separate Annex dealing with “Fault current” is required.

- John Joyce volunteered to write the new definitions

- Jan Samuelsson volunteered to write the new Annex (including a figure) dealing with fault currents.

Section 9 Capacitor fusing and unit arrangement.

- Insert figure from IEC 60143-1, Draft 7. (Jan Samuelsson to provide)

Section 10.3 Thyristor bypass

Provided by John Joyce at the meeting.

Discussion on P824, Draft 7.1

The following comments were made on the P824 document.

- There are a few issues still to be resolved. **Can these issues be resolved at a conference call?**
Gerald Lee to investigate and report to the WG-members.

- The WG-paper PE-009PRD (09-2000) “Considerations for the application of Series Capacitors to Radial Power Distribution Circuits” should be included in the Bibliography under Annex C.

- A factor 1.2 is missing in section 7.1.2.1. The text within (...) should read (This equates to $4.3 (1.2 \cdot \sqrt{2}) = 2.53 \text{ pu}$)

Next meeting.

July, 2003, Vancouver, Canada.

Closure of the meeting

The meeting was closed at 12:15 by the acting chair Jan Samuelsson. The chairman thanked the delegates for their active participation in the meeting. The chairman also directed a “thank you” to Gerald Lee for his work to provide all the documents needed for the Las Vegas meeting.

Respectfully submitted
Jan Samuelsson, Acting Chair
June, 20, 2003

J.S.