

Minutes January 2006

C: SYSTEM PROTECTION SUBCOMMITTEE

Chair: T. Seegers

Vice Chair: R. Hunt

The System Protection Subcommittee met on January 11th, 2006 in New Orleans, LA. 37 people attended the meeting, including 13 members.

9 WGs met at this meeting. WG C2 Protective Relaying and Power Quality presented their report at the January 2006 main committee meeting. C2 was thanked for their hard work and contributions

WG C9 Guide for underfrequency and Load Shedding has formed a balloting body. The balloting body is balanced and valid. The balloting process will begin in the next few weeks, and will be set at 40 days. Ballots will be discussed at the May meeting.

The C Subcommittee is urging all Working Groups to restate the Working Group assignment at the start of each meeting, and to place the assignment on the Working Group meeting agenda. In addition, the C Subcommittee plans to place the Working Group assignment, Working Group Chair and Vice-Chair information, and the status of the Working Group, on the PSRC website.

WG Reports:

C1: Cyber Security Issues for Relaying

Chair: Solveig Ward

Vice Chair: Jim O'Brien

Output: Paper

Established: 2004

Expected Completion Date:

The C1 working group met on January 10, 2006 with 10 members and 23 guests in attendance. Three (3) guests indicated they would like to be members.

Sam Sciacca, Working Group Chair of Substation C1, gave a presentation of the approved project they had. They are to write a standard (P-1686) for Substation IED Cyber Security. It is to discuss IED cyber security features and functions. It is to apply to RTUs, PLCs, meters, electronic transducers, data concentrators and monitoring systems. It is not to address relays which are the responsibility of the PSRC or encryption devices. They have an aggressive schedule and plan to have the standard to ballot by December 2006.

The product of this working group was discussed in light of the Substation C1 project. It was decided to continue and complete the report this year which will be an input document into the new IED Cyber Security standard.

Draft 1.9 of the paper was discussed and a writing assignment was added for Alex Apostolov. The Chair and Vice Chair will divide the paper and send a section of draft 1.10 to each working group member for editing prior to the May PSRC meeting.

C2: Power Quality Issues in Protective Devices

Chair: T. W. Cease

Vice Chair: Steve Kunsman

Output: Report

Established: 2000

Expected Completion Date: 2006

The C2 Working Group will present their report at the January 2006 Main Committee meeting. The Working Group has completed its work, and will disband.

C3: Processes, Issues, Trends and Quality Control of Relay Settings

Chair: Steve Kunsman

Vice Chair: Gary Kobet

Output: Report

Established: 2003

Expected Completion Date: 2006

Working Group C3 met Tuesday, January 10, 2005 in New Orleans, LA in a single session with 7 members and 5 guests participating. One guest asked to become a member of the WG.

The report is now at Draft 5.1 after the working group session. Reviewed the report and identified sections needing additional content and assigned section editors. Our new goal is to complete the section writing and editorials for April 15th distribution of the report to the WG and C sub-committee for ballot. Next meeting will concentrate on negative ballot resolution.

Due 31-January-2006 *New section content/expansion assignments:*

Gary Kobet 2.0 add definitions

Ken Birt 4.2.2 reword for time varying impedance.

Rick Cornelison 4.7 & 4.8 expand content

Art Buanno 5.3 expand content

Ken Birt 5.8 expand content

Due 15-February-2006 *Section Editorial assignments:*

1.0 Art Buanno

2.0 Gary Kobet

3.0 Steve Kunsman

4.0 Kevin Donahoe

5.0 Rick Corenelison

6.0 George Gresko

7.0 Rick Corenelison

8.0 Art Buanno

9.0 Oscar Bolado

10.0 Bill Strang

References: Gary Kobet

Note to Editors:

1. Make references stand-alone to a document and not just a working group (see comment in Reference section and use Reference #1 as an example)
2. Identify Definitions that are in your section that are missing from section 2.0. Forward these to Gary for inclusion in this section.

Due 28-February-2006 *Consolidation of assignments above and issuance of final draft 5.2*

Steve Kunsman

Due 1-April-2006 *Overall Editorial assignment (review paper for continuity, eliminate overlap and confirm recommendations)*

All Working Group Members

Due 15-April-2006 *Distribution of Final Document for Ballot to WG and C Subcommittee*

Steve Kunsman

The WG requests that the latest draft (version 5.1) be posted to the PSRC website. Next meeting request single-session, computer projector and room for 20 participants.

C4: Industry Experiences With Power System Protection Schemes (PSPS)

Chair: Vahid Madani
Vice Chair: Miroslav Begovic
Output: Survey
Established: 2004
Expected Completion Date: 2007

WG C-4 met on January 10, in single session with 19 attendees (7 M, 12 G). A brief background was provided for guest attendees. The web based survey will be developed with the help and assistance of EPRI.

The attendees reviewed the survey and discussed the content of questionnaire. Some clarifications were discussed and some WG members commented and made the necessary recommendations. Most of the discussion was concentrated on the portion of the questionnaire dealing with various issues of communications and testing of the SIPS schemes.

It was concluded that, given somewhat complicated structure of the questionnaire, it would be of high importance to present as soon as possible the final version of the document in HTML format to the members for final review and distribution.

Next step is to complete the editing and send the questionnaire and supporting Appendices to the "C" subcommittee and the PSRC and the CIGRE, officers for comments, and in parallel work on the web based development for the May 2006 meeting.

Updated Assignment

Conduct a survey of power systems professionals worldwide to accumulate experiences with the System Integrity Protection Schemes (SIPS). This survey will complement and expand on the previously published IEEE/CIGRE paper "Industry Experience with Special Protection Schemes" by P.M. Anderson and B.K. LeReverend (IEEE Transaction on Power Systems, Vol. II, No. 3, August 1996). The survey will be conducted via an internet-based questionnaire with the assistance of, and be available to, other interested parties; (e.g. IEEE, CIGRE, PES, EPRI, etc.). The survey will be concluded by September 2007 and will be presented in a report to the "C" Subcommittee and a Summary Transactions paper.

Received written contributions will be distributed electronically to the members before the May 2006 meeting.

Next Meeting – 1 Sessions, 30 People, Projector, Power strip

C5: Deployment and use of Disturbance Recorders

Chair: Bill Strang
Vice Chair: Jeff Pond
Output: Report
Established: 2001
Expected Completion Date: 2006

Our working group met Tuesday afternoon with 7 members and guests attending.

Only a few minor comments had been received from the e-mail circulation of recent drafts. It is believed that this report should be completed as soon as possible in light of the FERC's document progress in this area. However, those in attendance strongly indicated a need to redraft the report, significantly improve the material and its presentation, and recirculate that revised material as quickly as possible. A sequence of sending and receiving comments and suggested changes/needs, followed by a sequence of changes to

address and incorporate those changes, and further round of review, comments, suggestions and revisions was put forward and agreed to. The desired result of this effort is a complete revision of the existing and any new material and format of the report previously circulated. If all of the individual steps and time line objective are met as defined in the meeting, the result will be a new draft in time for review prior to the May meeting.

Room for 20, computer projector.

C6: Relay Engineering in Power Engineering Curricula

Chair: Mani Venkata
Vice Chair: Jaime DeLaRee
Output: Transactions Paper
Established: 2003
Expected Completion Date: 2006

We had a very productive WG meeting at New Orleans. Eight people were present. We have included the new members/guests in the e-mail list above. The attached post-New Orleans Version includes some of the changes discussed at the meeting.

In summary, the group decided that the primary objective should be on educating future protection engineers at the university level. As a result, the following actions were taken:

Keep the Sections I to IV of the paper as they are. They will need some minor editing and changes discussed at this meeting. The person(s) responsible are:

Section I: Mani Venkata and Arun Phadke
Section II: Peter McLaren
Section III: Horowitz and Novosel
Section IV: Sukumar Brahma, Jaime De Le Ree, and Mani Venkata

Move old Section VII on the design and philosophy of education modules to Section V. The material in this section is written well and it provides proper guidance for the rest of the paper to follow. It may need minor edits by Arun Phadke and Vahid Madani.

The former Sections V, VI, VIII and IX will form new Sections VI to IX respectively. These latter sections will focus on the modules for an undergraduate course, a graduate course which could be also used as a training course by the industry, laboratory modules etc. Juan Gers, Mo Sachdev, Sukumar Brahma and Adly Girgis have agreed to collectively develop the second half of the paper.

Section X on References need re-numbering to conform to the chronological listing in the main body of the paper. In addition, they need to conform to the IEEE format. Mani Venkata and Jaime De Le Ree will be responsible for this section.

Appendix A on the university listing will need changes to align with the PEEC listing reported in the latest educational resources survey. Jim Thorp, Sukumar Brahma, Jaime De Le Ree, and Mani Venkata will review and revise this list limited to the North American universities.

Appendix B will form detailed outline for utility training modules. Tom Wieds will review this one.

Appendix C will contain detailed Bibliography. This should be checked against the recent listings of B5 WG chaired by Tarlochan Sidhu, who will review and recommend the final list.

C9: Under Frequency Load Shedding and Restoration

Chair: Alex Apostolov
Vice Chair: Ken Behrendt

Output: IEEE Guide
Established: 1999
Expected Completion Date: 2006

The working group met on Tuesday, January 10th, with 5 members and 3 guests present. Chairman Alex Apostolov reported that a valid ballot body has been formed, with balloting to be completed before the May meeting.

C11: Guide for Protection System Testing

Chair: Vahid Madani
Vice Chair: Hyder DoCarmo
Output: Paper
Established: 2005
Expected Completion Date: 2008

WG C-11 met on January 11 in single session with total 23 in attendance (7 M, 16 G). Two attendees joined as new members to WG C-11.

Draft 2 of the Guide was discussed. The WG members reviewed list of pending contributions, and several members volunteered to contribute with writing assignments for the following sections:

- Commissioning Tests
- Periodic Maintenance Tests
- Analysis of Test Results
- Benefits & Justification for Different Types of Tests
- Distribution Protection

Deadline for pending assignments is March 5, 2006.

New topics for extending descriptions on some sections were suggested.

Below is a copy of the Assignment, Scope, Purpose and reason for the Guide as approved by WG members for the PAR:

Assignment: The working group will develop a guide for system application test requirements, scope and level of tests, and benefits for overall protective schemes. This assignment includes SPSs, end-to-end testing, data collection requirements, and the test procedure definitions.

Scope, Purpose, and Reason:

This guide is intended for power system protection professionals. It will include a reference listing of type tests for protective devices as well as overall protection scheme performance tests for various types of protection schemes. The Guide will describe the methods, extent, and types of protection scheme tests. Interlocking and control functions inherent to the protective schemes are included. This assignment encompasses overall system testing procedures, data collection requirements, as well as the test procedure definitions.

Reason:

This document will aid academic, manufacturing, application engineers and industry protection professionals with the overall benefits for protection scheme performance testing. The document will discuss benefits and challenges associated with verification of overall protection performance and will include information such as: a) Listing of type / production tests, b) Product performance tests from user view, c) Commissioning test - d) Relay settings are properly selected and calibrated e) Verify connections and calibration of settings, f) Trip/no trip and troubleshooting test

Next Meeting – 30 People, 1 Session, Projector, Power strip

C12: Performance of Relaying During Stressed Conditions

Chair: Damir Novosel

Vice Chair: George Bartok

Output: Paper

Established: 2004

Expected Completion Date: 2007

The WG met on January 10, 2006 in a single session with 9 members and 16 guests present. This was the fourth meeting of the WG. The vice chairman, George Bartok, chaired the meeting in the absence of the WG chairman.

The status of Draft 3 of the WG Report was reviewed and changes from the previous draft were presented. A general discussion of overall content and format followed. Outstanding writing assignments were identified. It was agreed that all outstanding assignments will be submitted by April 1, 2006 so that Draft 4 can be compiled and distributed prior to the May 2006 meeting.

The current draft of the WG Report will be posted on the WG web site.

C13: Undervoltage Load Shed

Chair: Art Buanno

Vice Chair: Imai Sinichi

Output: Report

Established: 2005

Expected Completion Date: 2008

On Wednesday morning January 11, 2006, the UVLS Working Group met for the second time with 25 in attendance in two sessions. This included 13 members (including 1 new) and 12 guests.

The working group assignment was reviewed with no changes as the following:

This working group produces a report on the implementation of undervoltage load shedding (UVLS) in electric power systems. It presents background information, guidance in implementing UVLS schemes and a bibliography. UVLS philosophy and methods, voltage collapse detection, existing practices, settings and coordination between UVLS and UFLS are discussed.

Four presentations were made and discussions followed each. They included those by the following:

1. Charles Henville – Real Consequences Follow Imaginary Power Deficiencies
2. Art Buanno (FirstEnergy) – Undervoltage Load Shedding at FirstEnergy
3. Shinichi Imai (Tokyo Elect. Power) – TEPCO's Practice of UVLS as Wide Area Protection
4. Ken Martin (Bonneville Power Administration) – Under Voltage Based Controls – WACS (Wide Area Control System)

The contents of the outline were then discussed. The initial writing assignments were made as follows.

1. Introduction (Mozina)
2. Background
 - 2.1. Voltage Stability (Begoric)
 - 2.2. Voltage & reactive power management and emergency actions to avoid load shedding (Begoric)
 - 2.2.1. Continuously Controlled Reactive Power Source
 - 2.2.2. Discontinuously Controlled Reactive Power Source
 - 2.2.3. Automatic Voltage Control
 - 2.2.4. Voltage reduction and LTC blocking
 - 2.3. Coordination between UVLS and UFLS
3. Undervoltage load shedding philosophy
 - 3.1. System Studies

- 3.2. Selection of method
4. Undervoltage load shedding methods (application types)
 - 4.1. Manual/SCADA load shedding (Mozina)
 - 4.2. Automatic load shedding (Buanno, Imai)
 - 4.3. Local (Buanno, Imai)
 - 4.3.1. Centralized (Substation/Bus)
 - 4.3.2. Distributed (Feeder)
 - 4.3.3. Adaptive (Begoric)
 - 4.4. Wide area undervoltage load shedding (Buanno, Imai)
5. Voltage collapse detection, measuring principles and characteristics
 - 5.1. U/V (Harley)
 - 5.2. Rate of change of voltage (Imai)
 - 5.3. Impedance locus detection (Begoric, Novosel to be asked)
 - 5.4. Others
6. Scheme design (Buanno, Henville to be asked)
 - 6.1. Dependability and security
 - 6.2. Redundancy
 - 6.3. Voltage measurement accuracy and security
 - 6.4. Other considerations
 - 6.4.1. Time delay
 - 6.4.2. Frequency variation effects
7. Existing UVLS practices (Young, Burger, Madani to be asked, Henville to be asked)
 - 7.1. SCADA Based
 - 7.2. Local (Buanno)
 - 7.3. Wide Area Protection (Imai)
8. Setting and performance criteria
 - 8.1. Performance criteria
 - 8.2. Setting guidelines for undervoltage load shedding
9. Maintenance, testing and reliability
10. Major power system disturbances related to voltage instability
 - 10.1. 1987 France
 - 10.2. 1987 Tokyo (Imai)
 - 10.3. 1989 Quebec
 - 10.4. 2001 Peru
 - 10.5. 2003 Northeastern North America
 - 10.6. 2003 Sweden
 - 10.7. 2003 Italy

The proposed schedule for the working group assignment was established as the following:

- April 17, 2006 – Initial contributions
- January 2007 – Completion of writing assignments
- June 2007 – Complete editing
- July-August 2007 – ballot paper
- September 2007 – complete assignment

Afterwards the meeting was adjourned.

At the C Subcommittee meeting, we requested a projector and a room for 40 people at the next meeting (in Albany, NY, May 15-18). At this time, we requested a time allotment for only a single session. However, we asked for the possibility to expand the meeting to two sessions after confirming in the next two weeks the number of presentations being prepared.

Power System Analysis, Computing & Economics Committee Liaison by Malcolm Swanson

No activities to report

NERC by Phil Winston

No activities to report

Liaison Report of the IEEE PES Power System Stability Controls SC to the PSRC by Gary Michel

No activities to report