

# PSCC Meeting 9-12 January 2006

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WG /SC	TITLE	CHAIR	Att.	Capac.	A/V	ROOM
	<b>MONDAY</b>					
8:00-6:00	PSCC - Wire Line Committee	Pool	20	25		Cabildo
8:00-5:00	PSCC – BPL	Burns	40	50		LaNouvelle East
8:00-5:00	PSCC – PLC	Ray	20	50		LaNouvelle West
8:00 – 10:45	Substations - PC37.1 Work Session	Tengdin	20	25	CP	Iberville
12:30-3:15	Substations - P1615 Work Session	Thesing	20	25	CP	Iberville
3:30 – 4:30	PSRC Officer / SC Chair Coordination Meeting	Winston	15	#Cls		Iberville
<b>Conference Registration 4:30PM – 5:45 PM plus Tuesday all day and Wednesday morning</b>						
ALL	<b>Welcome Reception (6:30 – 8:30), Dinner (7:00- 8:30)</b>	Rounds of 8-10	140			
	<b>TUESDAY/WEDNESDAY 8:00-9:30 AM</b>					
Spouses	CONTINENTAL B'FAST (TUES,WED),	Spouses	25			Pontalba

<b>TUESDAY 8:00 – 9:15 AM (all mtg. rooms arranged hollow square)</b>			<b>A/V</b>	<b>Att.</b>	<b>Cap</b>	<b>Room</b>
B8	PSRC Long Range Planning WG (Starts at 7:00 AM)	Taylor/McDonald	#Cls		50	LaNouvelle East
SC&WG	Standard's Coordination: all WG & SC Chairs with a PAR Required to Attend	Gilbert	CP	40	50	LaNouvelle West
I7	Application of Rogowski Coils used for relaying purposes	Kojovic	CP	20	40	Iberville
B2	Fellows Awards	Thorp	#Cls	15	30	Bienville
SC-8	Security Risk Assessment Subcommittee	Cleveland			25	Beauregard
B5	Bibliography & Publicity - <b>Starts at 8:30</b>	Sidhu		10	25	Cabildo
B3	NEWCOMER'S ORIENTATION	Henville/ Swanson		20	25	Cathedral
Subs.	C3 Working Group	Tendgin			25	Gallier
SC-6	Wire Line Subcommittee	Pool			25	Ursurlines
<b>TUESDAY 9:30-10:45 AM</b>						
D4	Zone 3 Application Considerations	Patterson	CP	40	50	LaNouvelle East
C1	Cyber Security Issues for Relaying and automation	Ward	CP	35	50	LaNouvelle West
H14	Telecommunication Terms Used by Protection Engineers	Ray	CP	30	40	Iberville
I15	Revision of C37.110, Guide for CT Applications	Moskos		20	30	Bienville
SC-8	Security Risk Assessment Subcommittee	Cleveland			25	Beauregard
K5-1	Application of Aux P&C Functions in Multiple Relays	Chano	CP	25	25	Cabildo
J5	Generator Protection Setting Criteria	Mozina		25	25	Cathedral
Subs.	C3 Working Group	Tendgin			25	Gallier
SC-6	Wire Line Subcommittee	Pool			25	Ursurlines
<b>TUESDAY 11:00 AM –12:15 PM</b>						
K6	Sudden Pressure	Crellin	CP	50	50	LaNouvelle East
C3	Processes, Issues, Trends and Quality Control of Relay Settings	Kunsmann	CP	40	50	LaNouvelle West
Subs.	Working Group C1	Sciacca			40	Iberville
H11	Revision IEEE 1344 Synchrophasor Standard [PC37.118]	Martin	CP	25	30	Bienville
SC-8	Security Risk Assessment Subcommittee	Cleveland			25	Beauregard
K5-2	Application of Aux P&C Functions in Multiple Relays	Chano	CP	25	25	Cabildo
I8	Application of Optical Sensor Systems	Gilleland	CP	30	25	Cathedral
I1	Understanding Microprocessor-Based Technology Applied to Relaying	Sachdev	CP	20	25	Gallier
SC-6	Wire Line Subcommittee	Pool			25	Ursurlines
<b>TUESDAY 12:15 – 1:30 PM</b>						
Lunch (on your own)						
<b>TUESDAY 1:30 - 2:45 PM</b>						
H6	Substation Ethernet	Burger	CP	40	50	LaNouvelle East
K1	Protection of Transformers Against Faults and Abnormal Conditions	Sachdev	CP	40	50	LaNouvelle West
J4	Revision of the AC Generator Protection Guide	Yalla			40	Iberville
I2	Terminology Review	Swanson	OH	30	30	Bienville
D9	Revision of C37.113 Guide for Protective Relaying Ap. To Transmission Lines	Sachdev	CP	20	25	Beauregard
I9	Revise C37.105 Std. For Qualifying Class 1E Relays	Usman	CP	15	25	Cabildo
H8	File Name Convention	Makki	FC	20	25	Cathedral
C12-1	Performance of Relaying During Stressed System Conditions	Novosel	CP	10	25	Gallier
SC-6	Wire Line Subcommittee	Pool			25	Ursurlines
<b>TUESDAY 3:00 – 4:15 PM</b>						
JTF2	Protection Considerations for Combustion Gas Turbine Static Starting	Reichard	CP	30	50	LaNouvelle East
D7	Consideration for loss of AC voltage	Price	CP	25	50	LaNouvelle West
C11	Power System Protection Testing	Madani	CP	20	40	Iberville
HTF1	Teleprotection Review	Benou		20	30	Bienville
K10	SCC21 Distributed Resources Standard Coordination	Johnson	CP		25	Beauregard
I9	Revise C37.105 Std. For Qualifying Class 1E Relays	Usman	CP	15	25	Cabildo
I3	Relay Firmware Quality Assurance	Beresh	CP	15	25	Cathedral
C12-2	Performance of Relaying During Stressed System Conditions	Novosel	CP	10	25	Gallier
SC-6	Wire Line Subcommittee	Pool			25	Ursurlines
<b>TUESDAY 4:15 – 5:45 PM</b>						
K9	Arc Flash Task Force	Zimmerman	CP	70	50	LaNouvelle East
C4	Industry Experience with System Integrity Protection Schemes	Madani	CP	40	50	LaNouvelle West
H4	Rev. of C37.111 - COMTRADE Standard	Das	CP	30	40	Iberville
J7	C37.101 - Revision of Guide for Generator Ground Protection.	Uchiyama	CP	30	30	Bienville
H7	Comparison of IEEE/IEC Teleprotection Standards	Simon			25	Beauregard
I12	Revision of C57.13.1 Guide for Field Testing of Relaying Current XFMRs	Meisinger		15	25	Cabildo
K13	Guide for Relay Protection of Series Capacitors	Plumptre	CP	20	25	Cathedral
C5	Deployment and Use of Disturbance Recorders	Strang	CP	15	25	Gallier
SC-6	Wire Line Subcommittee	Pool			25	Ursurlines
<b>TUESDAY 6:00 – 7:30 PM</b>						
B	PSRC Advisory Committee	Winston	#Cls	20	25	Gallier
B1	Awards and Technical Paper Recognition	Plumptre	#Cls	15	25	Beauregard

WG /SC	TITLE	CHAIR	A/V	Att	Capac	ROOM
	<b>WEDNESDAY 8:00 – 9:15 AM</b>					
	OPEN				50	LaNouvelle East
H3	Amendment for C37.94	Dahlin	CP	40	50	LaNouvelle West
C9	Rev. C37.117 Appl of Prot. Relays used for Abnormal Freq Load Shed & Restoration	Apostolov	CP	30	40	Iberville
K3	Reducing outages in distribution substations.	Pickett	CP	30	30	Bienville
JTF1	Protection of motors connected to VSD/VFD systems	Gardell	CP		25	Beauregard
DTF11	Effect of Distribution Automation on Relaying	Friend	CP		25	Cabildo
H5-a	Common Format for IED Configuration Data	Weinbach	CP	10	25	Cathedral
I10-1	Revision of C37.98-Standard for Seismic Testing of Relays	Nemier		15	25	Gallier
	<b>WEDNESDAY 9:30-10:45 AM</b>					
C13-1	Undervoltage Load Shedding	Buanno	CP	50	50	LaNouvelle East
D1	Cold Load Pickup Issues and Protection	Napikoski	CP	30	50	LaNouvelle West
HTF2	Broadband Communications Over Power Line Carrier	Skendzic	CP	40	40	Iberville
Subs.	Working Group C2	Clark			30	Bienville
H5-b	Common Format for IED Event Data	Adamiak	CP	25	25	Beauregard
C6	Relay Engineering in Power Engineering Curricula	Venkata	CP	25	25	Cabildo
D8	Justifying Pilot Protection on Transmission Lines	Kobet	CP	30	25	Cathedral
I10-2	Revision of C37.98-Standard for Seismic Testing of Relays	Nemier		15	25	Gallier
	<b>WEDNESDAY 11:00 AM –12:15 PM</b>					
C13-2	Undervoltage Load Shedding	Buanno	CP	50	50	LaNouvelle East
H9	Understanding comm. technology for protection	Sachdev	CP	50	50	LaNouvelle West
	OPEN				40	Iberville
Subs.	C0 Subcommittee Meeting	Evans			30	Bienville
J3	Protection of Generators Interconnected to the Power System	Fennel			25	Beauregard
K14	Bus Protection	Kasztenny	CP	30	25	Cabildo
ITF2	Time Synchronizing of IEDs for Relaying	Ingleson	CP	25	25	Cathedral
H5-c	Common Format for IED Sampled Data	Vandiver	CP	20	25	Gallier
	<b>WEDNESDAY 12:15 – 1:30 PM</b>					
	(Lunch on your own)					
	<b>WEDNESDAY 1:30 – 2:45 PM</b>					
H	Relay Communications	Apostolov			50	LaNouvelle East
I	Relaying Practices	Ingleson	CP	40	50	LaNouvelle West
SC-5	SONET				40	Iberville
SC-7	New Concepts	Chaturvedi			30	Bienville
	<b>WEDNESDAY 3:00 – 4:15 PM</b>					
C	System Protection	Seegers			50	LaNouvelle East
K	Substation Protection	Sufana		40	50	LaNouvelle West
SC-5	SONET				40	Iberville
SC-7	New Concepts	Chaturvedi			30	Bienville
	<b>WEDNESDAY 4:30 PM- 5:45 PM</b>					
J	Rotating Machinery	Hartman			50	LaNouvelle East
D	Line Protection	Hedding			50	LaNouvelle West
SC-5	SONET				40	Iberville
	PSCC AdCom	Cleveland			30	Bienville
	<b>WEDNESDAY 5:45 PM – 7:00 PM</b>					
	Update On NERC SPCTF Activities	Cummings				LaNouvelle East/West

	<b>THURSDAY 8:00-12:00 NOON Classroom style set-up (Mic at Podium and 1 standing in each aisle)</b>					
	<b>PSRC Main Committee Mtg.</b> (raised platform for 4 + Podium)	Winston	125	125	CP	LaNouvelle East
	<b>THURSDAY Associated Meetings</b>					
	1:30 – 3:00					
	PSCC Main Committee Meeting	Cleveland	30			Beauregard

**PSCC Meeting 9-12 January 2006**

**PSCC MEETING  
At IEEE PES General Meeting  
Thursday, 12 January 2006  
8:00 AM -11:59 AM  
Hilton Franciscan D  
IEEE PES General Meeting, San Francisco**

1. INTRODUCTION OF MEMBERS and GUESTS
2. APPROVAL OF MINUTES OF 2004 General Meeting
3. TOPICS TO BE ADDED UNDER 8. "OTHER BUSINESS":
4. CHAIRMAN'S COMMENTS F. Cleveland
5. TECHNICAL SESSION REPORTS
6. SUBCOMMITTEE REPORTS
  - A. Bibliography, Education & Recognition G.L. Nissen
  - B. Power Line Carrier R.E. Ray
  - C. Radio D.J. Marihart
  - D. Fiber Optics R. Bratton
  - E. Wire Line P.E. Pool
  - F. New Concepts M. Chaturvedi
  - G. Communications Standards M. Sanders
  - H. Security Risk Assessment F. Cleveland
  - I. Broadband Power-line Carrier T. Burns
7. LIAISON REPORTS
  - A. Technical Sessions Committee T.M. Burns
  - B. PES Awards Committee D.J. Marihart
  - C. Power Engineering Education Committee J. E. Newbury
  - D. Power System Relaying Committee R.E. Ray
  - E. Standards Coordinating Committee M. Sanders
  - F. PSEC Demand Side Management Subcommittee D.E. Nordell
  - G. EPRI Joe Hughes
  - H. UTC D.J. Marihart
  - I. ANSI C93 G. Morgan
  - J. CIGRE Göran Ericsson
  - K. IEC TC 57 (Power System Control/Comm)
  - L. IEC TC 77 (EMC & EMI)
  - M. IEEE/USA Communications & Information Policy S.A. Klein
  - N. SCC36 and UCA User's Group D.E. Nordell
  - O. CENELEC J. E. Newbury
8. Other Business :
9. Future Meetings
  - A. T&D Exhibition and Conference May 21-24, 2006, Dallas, Texas
  - B. PES General Meeting 18-22 June 2006, Montréal, Québec
  - C. 2007 Joint PSRC / PSCC Meeting January 2007, TBD
  - C. 2007 General meeting – 24 - 28 Jun., 2007, Tampa, Florida, USA

**PSCC MEETING**  
**At IEEE PES General Meeting**  
**Thursday, 16<sup>th</sup> June 2005**  
**8:00 AM -11:59 AM**  
**Hilton Franciscan D**  
**IEEE PES General Meeting, San Francisco**

1. INTRODUCTION OF MEMBERS and GUESTS
2. APPROVAL OF MINUTES OF 2004 General Meeting
3. TOPICS TO BE ADDED UNDER 8. "OTHER BUSINESS":
5. CHAIRMAN'S COMMENTS J.E. Newbury
5. TECHNICAL SESSION REPORTS
6. SUBCOMMITTEE REPORTS
  - A. Bibliography, Education & Recognition G.L. Nissen
  - B. Power Line Carrier R.E. Ray
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  - E. Wire Line P.E. Pool
  - F. New Concepts M. Chaturvedi
  - G. Communications Standards M. Sanders
  - H. Security Risk Assessment F. Cleveland
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7. LIAISON REPORTS
  - A. Technical Sessions Committee T.M. Burns
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  - G. EPRI Joe Hughes
  - H. UTC D.J. Marihart
  - I. ANSI C93 G. Morgan
  - J. CIGRE Göran Ericsson
  - K. IEC TC 57 (Power System Control/Comm)
  - L. IEC TC 77 (EMC & EMI)
  - M. IEEE/USA Communications & Information Policy S.A. Klein
  - N. SCC36 and UCA User's Group D.E. Nordell
  - O. CENELEC J. E. Newbury
8. Other Business :
9. Future Meetings
  - A. T&D Exhibition and conference October 2005, New Orleans
  - B. 2006 January 9-13 PSRC and PSCC, New Orleans
  - C. 2007 General meeting – Tampa

**1) Members and guests in attendance:**

John Newbury	Open University	<a href="mailto:j.e.newbury@open.ac.uk">j.e.newbury@open.ac.uk</a>
Terry Burns	Arizona Public Service	<a href="mailto:Terrence.Burns@APS.com">Terrence.Burns@APS.com</a>
Frances Cleveland	UCI 9/25/2005: Xanthus Consulting International	<a href="mailto:fcleve@ix.netcom.com">fcleve@ix.netcom.com</a>
Robert Bratton	TVA	<a href="mailto:REBRATTON@TVA.GOV">REBRATTON@TVA.GOV</a>
John Tengdin	Opus Publishing	<a href="mailto:JTTengdin@aol.com">JTTengdin@aol.com</a>
Manish Chaturvedi	Entergy	<a href="mailto:MCHATUR@entergy.com">MCHATUR@entergy.com</a>
Percy Pool	Verizon	<a href="mailto:percy.pool@verizon.com">percy.pool@verizon.com</a>
Harold Held		
Jodi ?????		
Miriam Sanders	Pulsar Technology	<a href="mailto:miriam.sanders@pulsartech.com">miriam.sanders@pulsartech.com</a>
Roger Ray	Pulsar Technology	<a href="mailto:roger.ray@pulsartech.com">roger.ray@pulsartech.com</a>
Dan Nordell	Xcel Energy	<a href="mailto:d.nordell@ieee.org">d.nordell@ieee.org</a>

**2) Previous meeting minutes approved as presented.**

**3) Additional items for agenda: none**

**4) Chairman's Comments (below)**

**5) Technical Session Reports:**

**Power System Communications Committee  
Meetings at the IEEE PES 2005 General Meeting  
12–16 June 2005  
San Francisco, California USA**

PSCC Object Registration WG	M 4:00P 5:00P	Hilton Union Square 6
PSCC Wireline Subcommittee SC6	Tu 8:30A 5:00P	St. Francis Cambridge
PSCC BPL Standards Subcommittee	Tu 9:00A 12:00P	Hilton Union Square 19
PSCC SONET and ATM WG	Tu 2:00P 5:00P	Hilton Union Square 11
PSCC Wireline Subcommittee SC6	W 8:30A 5:00P	Hilton Union Square 12
PSCC Fiber Optic Subcommittee	W 9:00A 12:00P	Hilton Green
PSCC Power Line Carrier Subcommittee	W 9:00A 12:00P	Hilton Union Square 6
PSCC Security Subcommittee	W 9:00A 12:00P	Hilton Union Square 15
PSCC New Concepts Subcommittee (combination, see below)	W 1:00P 5:00P	Hilton Union Square 1&2
PSCC AdCom	W 4:30P 6:00P	Hilton Union Square 8
PSCC Main Committee Meeting	Th 8:00A 12:00P	Hilton Franciscan D

# PSCC Meeting Draft Minutes 16 June 2005

## **PSCC New Concepts Subcommittee Combo Session (combination)**

*Wednesday, 15 June, 1:00 PM–5:00 PM Hilton/Union Square 1&2*

*Sponsored by: Power System Communications Committee*

1:00 pm–2:00 pm Committee Meeting: PSCC New Concepts Subcommittee

*Chair: M. Chaturvedi, Entergy*

2:00 pm–4:00 pm Panel Session

*Chair: D. Nordell, Xcel Energy*

The New Concepts Subcommittee of the Power System Communications Committee reviews

communications technologies which impact operation of the power system.

### *PRESENTATIONS AND PANELISTS:*

- Advanced Security Model for Power System Computer Networks  
C. LI, *Ryerson University*  
C. YANG, *Ryerson University*  
T. MANDER, *Ryerson University*  
R. CHEUNG, *Ryerson University*
- A Channel and Inventory System for Power System Telecommunications at Swedish National Grid [TPWRD-00101-2004]  
G. ERICSSON, *Swedish National Grid*  
M. JACOBSON, *Swedish National Grid*

4:00 pm–5:00 pm Committee Meeting: PSCC New Concepts Subcommittee

*Chair: M. Chaturvedi, Entergy*

## **Advanced Security Model for Power System Computer Networks**

Celia Li, Cungang Yang, Todd Mander, Richard Cheung

*Abstract*—Increase of automation in power systems, combined with introduction of open-access competition, has resulted in greater reliance by utilities on computer networks for their power system operations. This paper presents an effective security method to address uprising serious concerns about access controls of utility computer networks, particularly under open access environment. A new role-based access control model and an advanced security management architecture for utility computer networks are proposed. The significance of the model is to extend network access controls from a single domain to multiple domains interconnected with the Internet. This paper presents a method for managing security policies using XML. This method simplifies security policy administration for utility networks. Unlike most existing implementations, the authorization is independently defined, and separated from policy representation and implementation mechanisms. An XML-based security policy and a digital credential are introduced to establish trust and role assignment for users in different network domains.

## **A Channel and Inventory System for Power System Telecommunications at Swedish National Grid**

Göran Ericsson, *Member, IEEE*, and Marcus Jacobson

*Abstract*—This paper describes the development of a Channel and Inventory System (CIS) for Power System Telecommunications. The system is novel, since no other similar systems have been found. The system is based on a software shell, originally aimed for the process industry, but here developed for the telecommunication purposes. The system is in fully operation at Swedish National Grid and it has been accepted on a wide scale. The paper highlights the approach for using a supplier, based on rapid prototyping. The solution relies on an object-oriented structure, where a worldwide web interface generates adequate user information, which is invaluable for fault location, fault handling, and telecommunication planning. The CIS possesses several flexible properties, which can be expanded and further developed.

## **6) Bibliography, Education & Recognition - Gary Nissen: No report**

## **7) Powerline Carrier: Roger Ray**

After long effort, 643 has been published.

Resolution: Thanks to Roger and his subcommittee for their work on this standard.

**8) Don Marihart – Radio**

Had Radio subcommittee along w/SONET and ATM. Not active. Technology is moving primarily to fiber. Everything that needs to be said about radio has been said.

Assignment: Consider whether wireless IP should be added to scope.

**9) Robert Bratton: Fiber Optics (SONET/ATM Report Attachment 1)**

Met yesterday. Really poor attendance.

SONET/ATM WG (Terry Burns) – has been in existence since mid '90's. Original plan was to write guides on SONET and ATM. Had lack of interest and participation. Did get a paper written on SONET. Resolved: We will post it on our website.

Recommendation: Drop ATM part due to obsolescence.

Remaining issue: IP. Need to determine needs of utilities and make an attempt to fill that need.

Fiber Optic Standards WG – working on several standards. 1137 OPGW; P1222 – now an approved and published standard. First dual-logo standard to be submitted w/IEC.

**10) Wireline Subcommittee - Percy Pool (Report: Attachment 2)**

Attendance: Tuesday - 10 members; Wednesday – 7 members. No power company individuals.

3 issues – IEEE 1590-2003 – Optical protection of facilities. E-mails Jan-early June w/several requests for “appeal” or “recall”. Have successfully resolved the issue. Solution is to open 1590 for revision ahead of schedule. Will be done at the conclusion of the current project. Will start Jan or June of next year.

Resolved: Thank Percy and group for their resilience.

Project 820 – resolved ballot comments.

3<sup>rd</sup> project 487 – Recommended practice for protection of wireline facilities. PAR approved last July. Had 7 contributions for this meeting – reviewed six of them. Expect some more contributions for next meeting.

Expect to meet in New Orleans in January – request two consecutive days.

**11) New Concepts – Manish Chaturvedi (Attachment 3: New Concepts)  
(Attachment 4: Object Registration WG)**

Met yesterday as a combo session. Format has been working well in attracting new guests. Had 12 members and guests. Agenda was to cover introduction to PSCC (publicity), updates from BPL Standards Subcommittee and Security Subcommittee.

Topics of interest: Application of common-carrier digital services. Expected to become more prevalent. Example, DV2010 potential application as well as advanced DA. Disaster recovery plans for critical communication infrastructure. Update of what is happening w/UCA. UCA certification process.

Panel session (chaired by Dan Nordell): 2 papers presented

Guest (Brian) from EPRI discussed substation application of wireless technologies.

Object Registration WG: WG established quite a few years ago when 61850 was just starting. Were focused on IEEE doing object registration.

Comment (John Tengdin) – When we did 1613 we were building on PSRC documents (Will send report)

**12) Standards – Miriam Sanders**

P1222 – PAR approved Nov 2004.

P1675 – BPL safety standard, approved June 2004

Will send report (none received).

**13) Security – Frances (Attachment 5: Security Subcommittee Report)**

Security Risk Assessment subcommittee met yesterday morning. Have preliminary outline of a “recommended practice” document. Have some volunteers and reviewers lined up. Will cover basic concepts of security risk assessment and not get into potential solutions. Looking for domain experts. Probably a good time to have a panel session. Looking to do that.

**14) Terry Burns – BPL (Attachment 6: BPL Subcommittee)**

First comment – both “Security Risk Assessment” and “BPL” are new subcommittees.

Under Broadband – P1675 and P1775 are two new efforts. 1775 will work on EMC issues. 1675 divided into two different parts – Hardware and Installation. Have drafts for both parts. Draft for hardware is only half started – have only done inductive coupling so far. IEEE is not in the lead. The industry is VERY active and difficult to keep up with.

Next meeting in Dallas Sept 11-14 w/UPLC, a sub-entity under UTC.

**15) Liaison Reports Received**

- |  |                |
|--|----------------|
| A) Technical Sessions Committee<br>See Attachment 7                  | D.E. Nordell   |
| B) PES Substations Committee<br>See Attachment 8                     | J. Tengdin     |
| C) CIGRE<br>See Attachment 9   | Göran Ericsson |
| D) IEEE/USA Communications & Information Policy<br>See Attachment 10 | S.A. Klein     |

**16) John Newbury – Chairman’s Comments**

Attendance at this meeting 1537. Included people attending for single day.

Issue: The only time we’ve had very high attendance has been when the meeting is in July. June time conflicts w/exams at universities. Request for Keith Gray (Chairman to Technical Council) to raise the question with governing council.

Another serious thing – problem of attracting younger members to PES and IEEE. Reflects fact that students are not studying engineering and science in University. There is a shortage of engineers. Terry Burns suggestion to get officers of PES to send letter out to utility executives requesting participation in committees. IEEE does not do a good job of “advertising”.

Upcoming meetings:

- 9-13 January 2006, New Orleans
- Montreal 19 June 2006 (one week later than this year)
- Summer 2007 – possibly in Tampa, FL
- January 2007 - Scottsdale

Need a scope for BPL subcommittee – Terry will provide.  
Also need for Security subcommittee (Frances)

John Newbury is editor of Power Delivery Transactions. We are doing well. In six issues we published 2100 pages. At one time it was only 6 pages per paper. Now set at eight pages.

TW Cease is Editor-in-chief. Discussion w/Newbury – Security and BPL are upcoming issues. In future issue, half will be dedicated to security and BPL topics. We can invite papers to this publication. Propose to do at the very beginning of next year.

Mel Olken – Power and Energy magazine editor – would like articles from committees. Request for one- or two-paragraph contributions from subcommittee chairs highlighting what we will be doing in Montreal.

New electronic balloting system for IEEE. Significant advance. “My ballot” puts the balloting experience in the hands of the sponsor.

New area – windpower –

General meeting – Montreal – list of preferred subjects will be posted. Suggestion to have Monday afternoon and Wednesday afternoon. May need to coordinate w/other groups on Security topic. Frances to connect with them. Suggestion: Security on Monday afternoon and BPL on Wednesday afternoon.

Technical Council – paper on environmental policy.

PSCC Officer changes effective in January 2006:

John Newbury – Past Chair

Frances Cleveland – Chair

Dan Nordell – Vice Chair and TCPC

Stan Klein - Secretary

## **Attachment 1: SONET/ATM Working Group Meeting**

SONET/ATM Working Group Meeting  
June 14, 2005  
San Francisco Hilton Hotel 2 -5 PM

The following were in Attendance:

Terry Burns – APS (Chair)

Tom Dalhin – RFL

Roger Ray – Pulsar Technologies

Don Marihart – KEMA

John Miller – Georgia Power

Bob Bratton – TVA

A discussion took place on the disposition of the existing SONET paper. It was decided to publish it on our PES website, as publishing it elsewhere within IEEE would be difficult.

As ATM is a dying technology, it was decided to forgo any intended work on this topic.

The future of much of a utility's communications needs appears to be taking the direction of IP. Therefore, research the Working Group should determine where the needs are in this technology as it relates to utilities and make an attempt to fill them. As a minimum, a tutorial or similar should be looked into.

## Attachment 2: SC6 – Wireline Subcommittee (WLS) Report

### SC6 - WIRELINE SUBCOMMITTEE (WLS) REPORT

June 16, 2005

The Wireline Subcommittee (SC6) met on Tuesday June 14 at the St Francis Hotel with 10 members and guests in attendance and on Wednesday June 15 at the Hilton Hotel in San Francisco, CA. There were 7 members in attendance.

The current WLS activity is as follows:

- **IEEE 1590-2003** IEEE Recommended Practice for the Electrical Protection of Optical Fiber Communication Facilities Serving, or Connected to, Electrical Supply Locations

Several e-mails have been circulated, after the January meeting, by a couple of members seeking a recall of this document. The issue was added to the SC agenda for this week's meeting and was successfully resolved. The SC unanimously approved to open the document for revision upon completion of the final draft for the review of P487, currently underway. The petitioner agreed with the proposed solution. The information for the new PAR was developed during the meeting and approved by all present.

- **IEEE 820-1984 (R1999)** *IEEE Standard Telephone Loop Performance Characteristics*

The ballot for the revision of this Standard closed on May 26 2005. There were 19 affirmative votes, 1 negative and 2 abstentions. There were 40 comments received with the ballot.

The SC reviewed and resolved all comments received. The SC recommended a recirculation ballot due to the negative vote. The recirculation will be requested once the draft has been revised to reflect the changes agreed during the comment resolution.

- **IEEE 487-2000** *IEEE Recommended Practice for the Protection of Wire-Line Communication Facilities Serving Electric Supply Locations*

The 5-year review for this RP is due in 2005. A PAR for the revision of this RP was submitted on July 20, 2004. IEEE-SA NesCom approved the PAR on August 12, 2004.

Seven (7) contributions with proposed changes were received. Six were reviewed in their entirety at this meeting. The approved portions of these contributions will be added to the working draft of P487. Further review will continue at the next meeting.

## **Attachment 2: SC6 – Wireline Subcommittee (WLS) Report**

The Wireline Subcommittee (SC6) will meet at the 2006 PSCC - PSRC Meeting in New Orleans, LA during the week of January 9, 2006. The SC requests a conference room for 2 consecutive days.

### Future PSCC Meetings

2006 PSCC - PSRC Joint Meeting – New Orleans, LA January 9-12, 2006

2006 PES General Meeting – 18-22 June 2006 – Montreal, Quebec.

2007 PSCC - PSRC Joint Meeting – TBD

2007 PES General Meeting – 24-28 June 2007 – Tampa, FL

Respectfully submitted,

Percy E. Pool, SC-6 Chair

### Attachment 3: New Concepts

## Report on New Concepts / Protocols Subcommittee Meeting on June 15, 2005 at San Francisco

The New Concepts/Protocols Subcommittee met on June 15<sup>th</sup>, 2005 between 1 pm and 4:30pm as a Combo (Panel) Session. 12 members and guests were present for the meeting:

	<u>Name</u>	<u>Affiliation</u>
1.	Marcus Jacobsen	Svenska Kraftnat
2.	Stan Klein	Stan Klein Associates
3.	Dan Nordell	Xcel
4.	Frances Cleveland	UCI
5.	Brian Cramer	EPRI
6.	Cungang Yang	Ryerson Univ.
7.	Emile Struyk	BC Hydro
8.	Jason Stamp	Sandia National Labs
9.	Lars Nordstrom	KTH
10.	Nelson Segoshi	CTEEP
11.	John Newbury	Open Univ.
12.	One guest did not sign in	

The Agenda of the meeting included the following items:

1. Introduction to PSCC, New Concepts/Protocols
2. Update on BPL Standards Subcommittee
3. Update on Security Subcommittee
4. Status Update: Object registration WG
5. Panel Session
6. General Discussion: New Concepts/Protocols

Since more guests were expected at 2pm, the chair decided to postpone the introduction to PSCC after the Panel Session. The meeting began with introduction of and brief discussions on the following topics of interest:

- The application of Common Carrier Digital Services to utility communications – security and reliability aspects. An example is DV2010 – consortium of utilities formed to develop and commercialize Distribution Automation technologies. Applications include high speed fault isolation of network feeders.

### Attachment 3: New Concepts

- Disaster recovery plans for critical communication infrastructure of electric utilities. Natural Disasters like Hurricanes can wreak havoc with Utility SCADA networks. The presence of backup communication infrastructure like radios can greatly simplify post-storm restoration efforts.
- UCA Update: Developments in commercial applications, testing and certifying facilities (Dolan labs), **Technical Issues** resolution mechanism

This was followed by the Panel session chaired by Dan Nordell in which the following papers were presented:

1. "Advanced Security Model for Power System Computer Networks" presented by Cungang Yang
2. "A Channel and Inventory System for Power System Telecommunications at Swedish National Grid" presented by Marcus Jacobson

After the Panel Session, Manish Chaturvedi made a brief presentation on the background, scope, structure, and officers of the PSCC for the benefit of the guests present. John Newbury talked about basic principles of BPL, background, and update on the BPL Standards Subcommittee. Frances Cleveland presented the on-going work of the Security subcommittee and a preliminary outline of its primary work product - the technical report. The Security Committee is planning a panel or combo session at the 2006 General Meeting at Montreal.

Stan Klein presented the status of Object Registration for 61850 and Related Standards. The subcommittee requested the Object Registration Working Group to prepare a report and present it as a part of the combo session at the 2006 General Meeting.

Brian Cramer talked about substation applications of Wireless technologies. At present, many generating stations use wireless for data acquisition. Issues related to wireless applications to the substation environment will be collected. Brian will provide some information to the subcommittee. Manish expressed concern with using off the shelf products in a severe substation environment (heat and humidity).

The meeting closed with an announcement of the next meeting with PSRC at New Orleans in January, 2006 to be followed by a meeting of the subcommittee at the PES general Meeting at Montreal in June, 2006.

## Attachment 4: Object Registration WG

### Status of Object Registration for 61850 and Related Standards

There are four ways in which an object can be registered:

1. Registration in the standard that originally defines the type of object.
2. Registration in a standard that references the standard originally defining the object type.
3. Registration by an international registration authority.
4. Registration by some other organization.

We have been focused on IEEE picking up the role of registering the objects under method (4) after IEC “runs out the string” on method (1) due to limitations on amendment. When we started, IEEE did not understand object registration beyond assignment of 802-related numbers. The need arose to register objects for Intelligent Transportation Systems, and SCC 32 sponsored setup of an IEEE system for registering those objects. As part of the setup, IEEE became a method (4) registration authority. However, the SCC 32 system is characterized by involvement of multiple societies, a governance organization specifically for the object registration system, and funding by government agencies that are the primary purchasers of systems using the objects.

In the case of 61850, the following have occurred:

1. When new objects were needed for hydro and wind power, new standards were started referencing 61850 and registering the relevant objects.
2. At least one or two amendments remain allowable for 61850 itself.
3. The wind power objects are being expressed in XML. Object registration in XML is much simpler than for ISO and IEC standards. The objects are part of a namespace. A namespace is defined by a URI, which in turn is governed by a domain name. Thus, in XML, registering a domain name effectively makes the domain owner an XML object registration authority. The URI need not be actually accessible on the Internet, but if it is, the objects can be described there. To the extent future power system objects are expressed in XML, their registration is extremely simple.
4. In one case where an MMS-related object was needed, it was planned to be registered under a branch of the ISO ASN.1 tree that was issued to the MMS sub-group of the (now defunct) OSI Implementers' Workshop. That Workshop met at NIST in the early 1990's to work out issues in implementing ISO Open System Interconnection, such as maximum limits on buffer sizes (where the standard allowed infinite extensions but an implementer needed to impose a limit for practicality).

The issue of duplicate or near-duplicate objects under different names remains, but in the draft procedure for IEEE object registration the resolution of such situations is voluntary only. Object registrations can not be rejected for lack of technical merit unless they are registered in a standard. Registration by methods (3) and (4) is purely administrative, and registrations can be rejected only for administrative reasons.

## Attachment 5: Security Subcommittee Report

# PSCC Security Meeting

June 15, 2005

### *Present*

Name	Company	Email
Dan Nordell	Xcel Energy	<a href="mailto:D.Nordell@ieee.org">D.Nordell@ieee.org</a>
Bill Dickerson	Arbiter Systems	<a href="mailto:billdickerson@shaw.ca">billdickerson@shaw.ca</a>
Jason Stamp	Sandia Nat'l Labs	<a href="mailto:jestamp@sandia.gov">jestamp@sandia.gov</a>
Stan Klein	Open Secure Energy Control Systems, LLC	<a href="mailto:sklein@cpcug.org">sklein@cpcug.org</a>
Brian Cramer	EPRI	<a href="mailto:bcramer@epri.com">bcramer@epri.com</a>
Manish Chaturvedi	Entergy	<a href="mailto:mchatur@entergy.com">mchatur@entergy.com</a>
Frances Cleveland	UCI	<a href="mailto:fcleve@ix.netcom.com">fcleve@ix.netcom.com</a>
Dan Ruiz	Kema	<a href="mailto:Daniel.Ruiz@kema.com">Daniel.Ruiz@kema.com</a>

### *Discussion on Deliverable for PAR*

The purpose of the Security Risk Assessment PAR was stated as follows:

*Information security has become increasingly important in power system operations. Although security measures have been developed in the broader communications industry and standardization work is currently underway for security in power system communications protocols, very little effort has been undertaken on how to assess security risks in power system operations, and therefore what security measures need to be implemented. Therefore, the purpose of this Working Group will be to develop methods by which the information security risks can be assessed by utilities. These efforts will be closely coordinated with the on-going work on security standards for power system communications in the IEC TC57 WG15, the on-going work on recommended practices for security solutions in IEEE SCC36, the IEEE PES SCC TF on Electronic Security in IEEE PES Standards, and other security industry efforts.*

The discussion on the steps needed to fulfill this PAR started with a brief presentation by Frances (see attached pdf presentation):

- Frances presented a preliminary outline of a Recommended Practices document, open for discussion
- This outline covers the basic concepts, terminology, and methodology of security risk assessment as a “tutorial” introduction, then addresses “domain-specific” security risk assessments, using consequence screening, for a number of power system operations functions.
- The following is the preliminary outline, along with currently identified contributors; others will review documents
  - Section 1: Introduction – Scope and Background – Frances
  - Section 2: Common Security Threats and Attacks – Frances
  - Section 3: Common Security Measures - Jason
  
  - Section 4: Security Standards, Services, and Best Practices – Jason
  - Section 5: Security Risk Assessment Methodology
  - Section 6: Security Vulnerability Analysis for Power System Operations Functions (covering Market, Transmission, Distribution, Generation, Distributed Generation, Customer Services)
  - Sections 7-x: Domain Expert Security Assessments

## Attachment 5: Security Subcommittee Report

### *Panel Session*

- Planning for a panel session, probably in the next summer meeting in Montreal 2006.
- This panel session would be called: *Information Security Risk Assessment for Power System Operations*
  - Introduction: Background, Terminology, and Purpose
  - Government Perspective on Security Risk Assessment
  - Security Risk Assessment Methodology
  - Examples of Applying the Security Risk Assessment Methodology:
    - Substation: Protective Relaying
    - Distribution Automation
    - Customer Services
    - Market Operations
    - Distributed Energy Resources
- Speakers will be approached later
- Abstract and more detailed information will be due in December, 2005



# Information Security Risk Assessment Subcommittee –

## Issues and Proposed Approach

Frances Cleveland

Chairperson of IEEE PES PSCC  
Security Risk Assessment Subcommittee

# Purpose of Security Risk Assessment PAR

- Information security has become increasingly important in power system operations. Although security measures have been developed in the broader communications industry and standardization work is currently underway for security in power system communications protocols, very little effort has been undertaken on how to assess security risks in power system operations, and therefore what security measures need to be implemented. Therefore, the purpose of this Working Group will be to develop methods by which the information security risks can be assessed by utilities. These efforts will be closely coordinated with the on-going work on security standards for power system communications in the IEC TC57 WG15, the on-going work on recommended practices for security solutions in IEEE SCC36, the IEEE PES SCC TF on Electronic Security in IEEE PES Standards, and other security industry efforts.*

# Recommended Practices for Information Security Risk Assessment for Power System Operations: Preliminary Outline

- Section 1: Introduction – Scope and Background – Frances
- Section 2: Common Security Threats and Attacks – Frances
- Section 3: Common Security Measures - Jason
- Section 4: Security Standards, Services, and Best Practices – Jason
- Section 5: Security Risk Assessment Methodology
- Section 6: Security Vulnerability Analysis for Power System Operations Functions (*covering Market, Transmission, Distribution, Generation, Distributed Generation, Customer Services*)
- Sections 7-x: Domain Expert Security Assessments

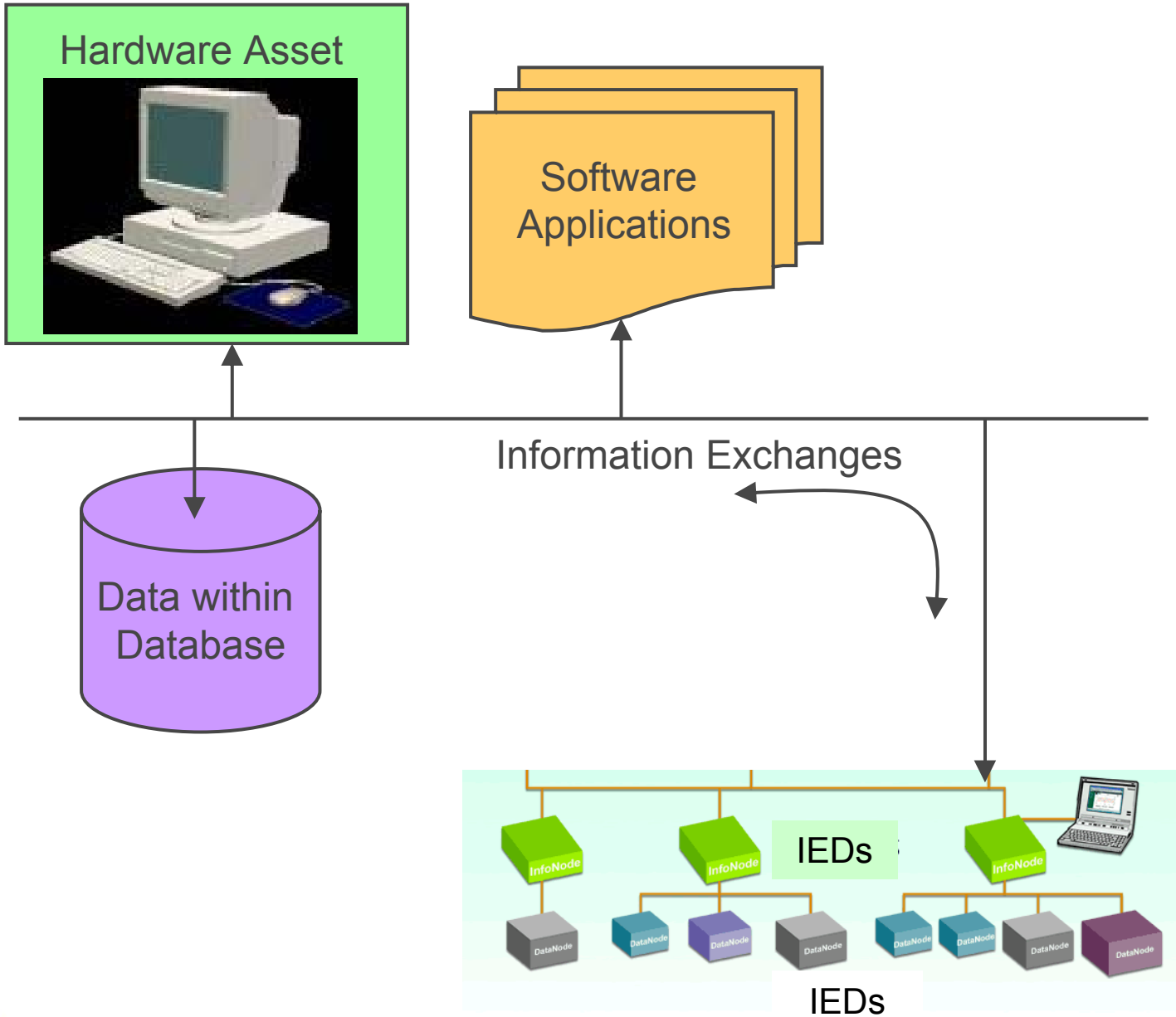


## Issues to cover in the introductory sections

# North American Electric Reliability Council (NERC) Security Document 1300

- NERC's 1300 document contains (among others) three key statements related to security for power system operations:
  - “Critical business and operational functions performed by cyber assets affecting the bulk electric system necessitate having security management controls.”
  - “This standard [NERC's 1300 document] requires that entities identify and protect critical cyber assets related to the reliable operation of the bulk electric system.”
  - “In order to protect these assets, it is necessary to identify the electronic perimeter(s) within which these assets reside. When electronic perimeters are defined, different security levels may be assigned to these perimeters depending on the assets within these perimeter(s).”

# Types of Assets Requiring Security Risk Assessment



# Security Risk Assessment – Key Issues

- Cyber security involves **NOT just passive encryption** of information exchanges (a common misperception), but **active management controls**. Management of security measures must be an on-going process.
- The most effective way to handle security is to identify the **cyber assets** and protect them. In this context, “assets” are:
  - physical computer-based hardware
  - software applications
  - databases containing information
  - data exchange messages.
- Since assets are often strongly interconnected with one another, it would be very difficult to handle each one completely separately. However, assets with similar security requirements are often within well-defined boundaries (e.g. within a substation, within a control center, at all customer sites), which can be used as “**electronic perimeters**” or (as often termed) identified as “**security domains**”.
- The **same security countermeasures can then be applied to all assets within a security domain**, based on the security requirements of the most sensitive asset. This minimizes the effort required within a security domain, and allows more attention to be paid to the complex security issues for exchanging information between different security domains.
- These **security domains can match up with the IntelliGrid Environments** (possibly with Sub-Environments for a closer fit).

# Security Requirements to Counter Threats

## Confidentiality

Unauthorized  
Access to  
Information

## Integrity

Unauthorized  
Modification or Theft  
of Information

## Availability

Denial of Service or  
Prevention of  
Authorized Access

## Non-Repudiation

Denial of Action that took  
place, or Claim of Action  
that did not take place

There are 4 Basic Security Requirements that Counter 4 Basic Threats:

- **Confidentiality** – preventing the unauthorized access to information
- **Integrity** – preventing the unauthorized modification or theft of information
- **Availability** – preventing the denial of service and ensuring authorized access to information
- **Non-Repudiation** – preventing the denial of an action that took place or the claim of an action that did not take place.

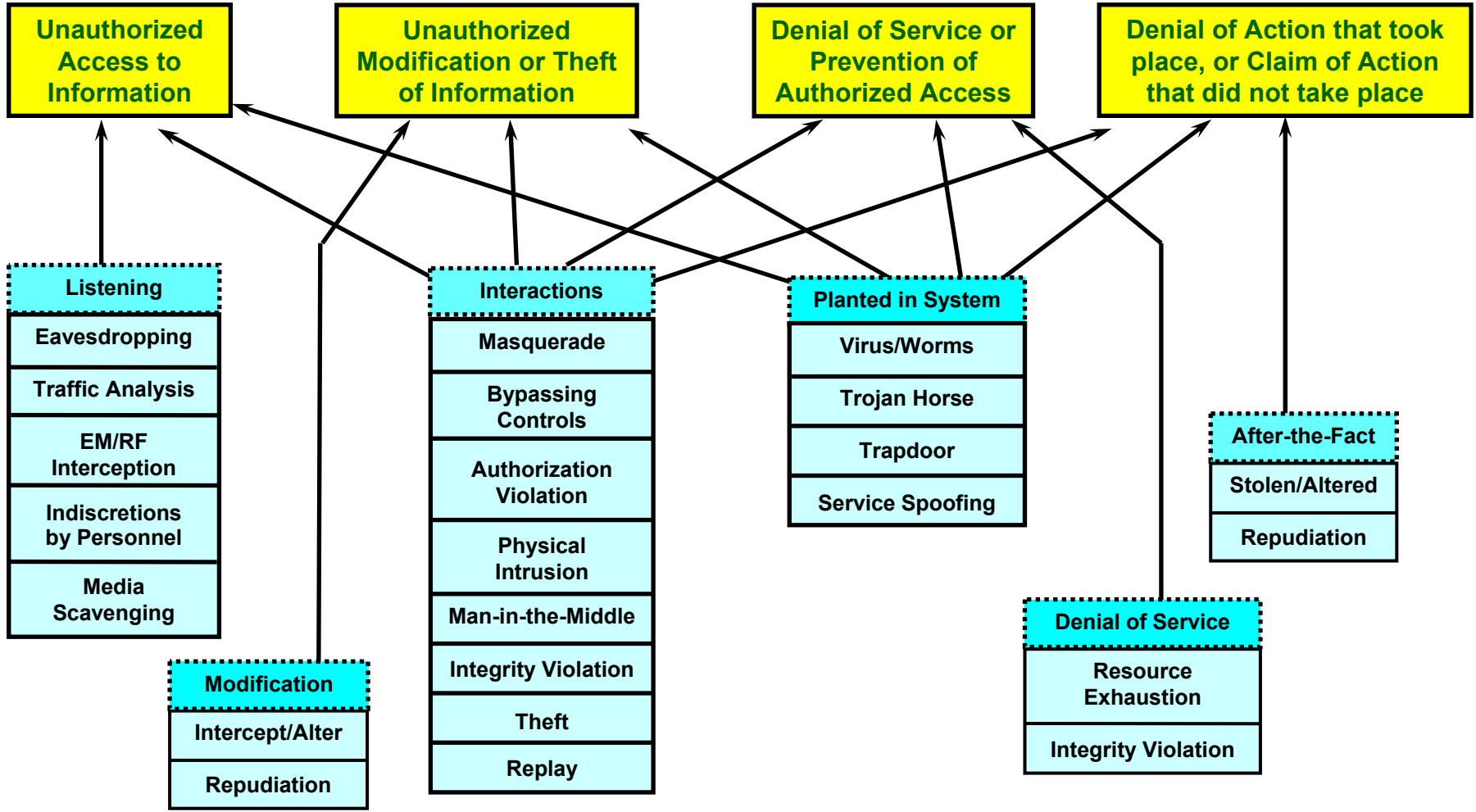
# Security Requirements, Threats, and Attacks

## Confidentiality

## Integrity

## Availability

## Non-Repudiation



# Security Requirements, Threats, Countermeasures, and Management

## Confidentiality

## Integrity

## Availability

## Non-Repudiation

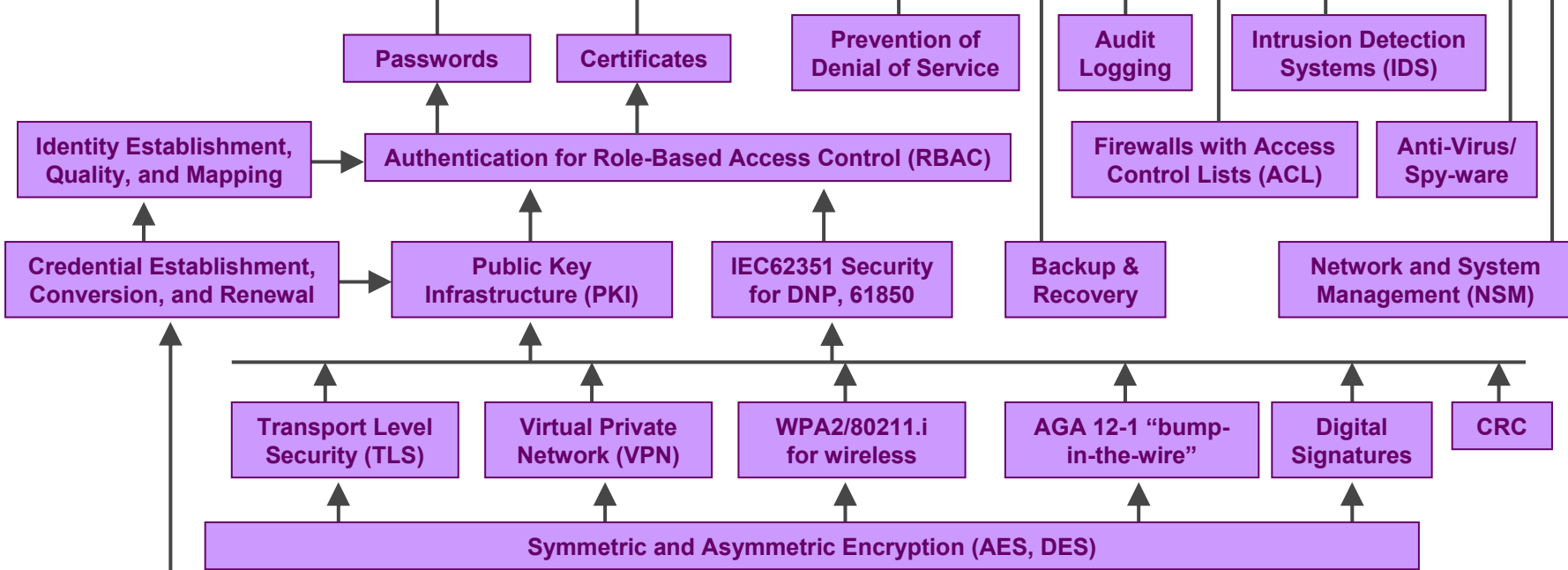
Unauthorized Access to Information

Unauthorized Modification or Theft of Information

Denial of Service or Prevention of Authorized Access

Denial of Action that took place, or Claim of Action that did not take place

Key Security Services and Technologies



Security Management



Corporate Security Policy and Management



NERC 1200/1300

Utility  
Cons  
Intern

# Security Risk Assessment and Mitigation Process

## Domain Experts

1

### Describe the Function

as a narrative and basic steps, along with drawings to help identify the locations of data and the flows of information.

2

### Identify the Information Assets

that must be secured, specifically databases, data exchanges, applications, and hardware.

3

### Determine Configuration and Performance Constraints

of these information assets by using the Configuration and Performance Questions.

4

### Consequence Screening: Assess Security Requirements

Of Confidentiality, Integrity, Availability, and Non-Repudiation by using the Security Questions for each of the key information assets.

## Communications Experts

5

### Identify the Security Domains

that most closely match the Configuration and Performance Constraints.

6

### Determine Generic Solutions to Security Requirements

This determination may not be exact, but can provide support to ascertaining what security services are needed.

7

### Identify Security Technologies and Techniques

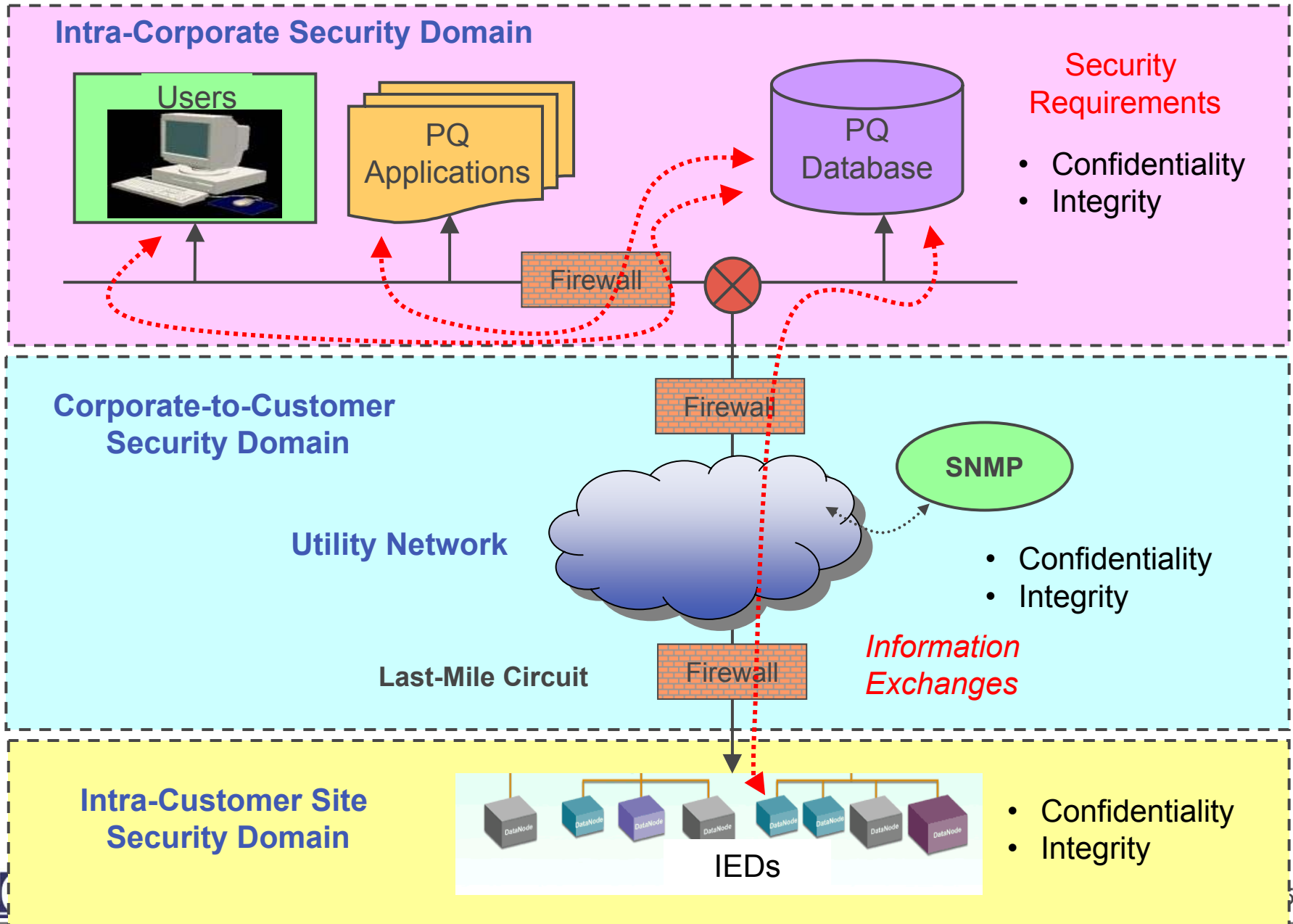
based on Generic Solutions within Security Domain recommendations and modified by the Security Questions

8

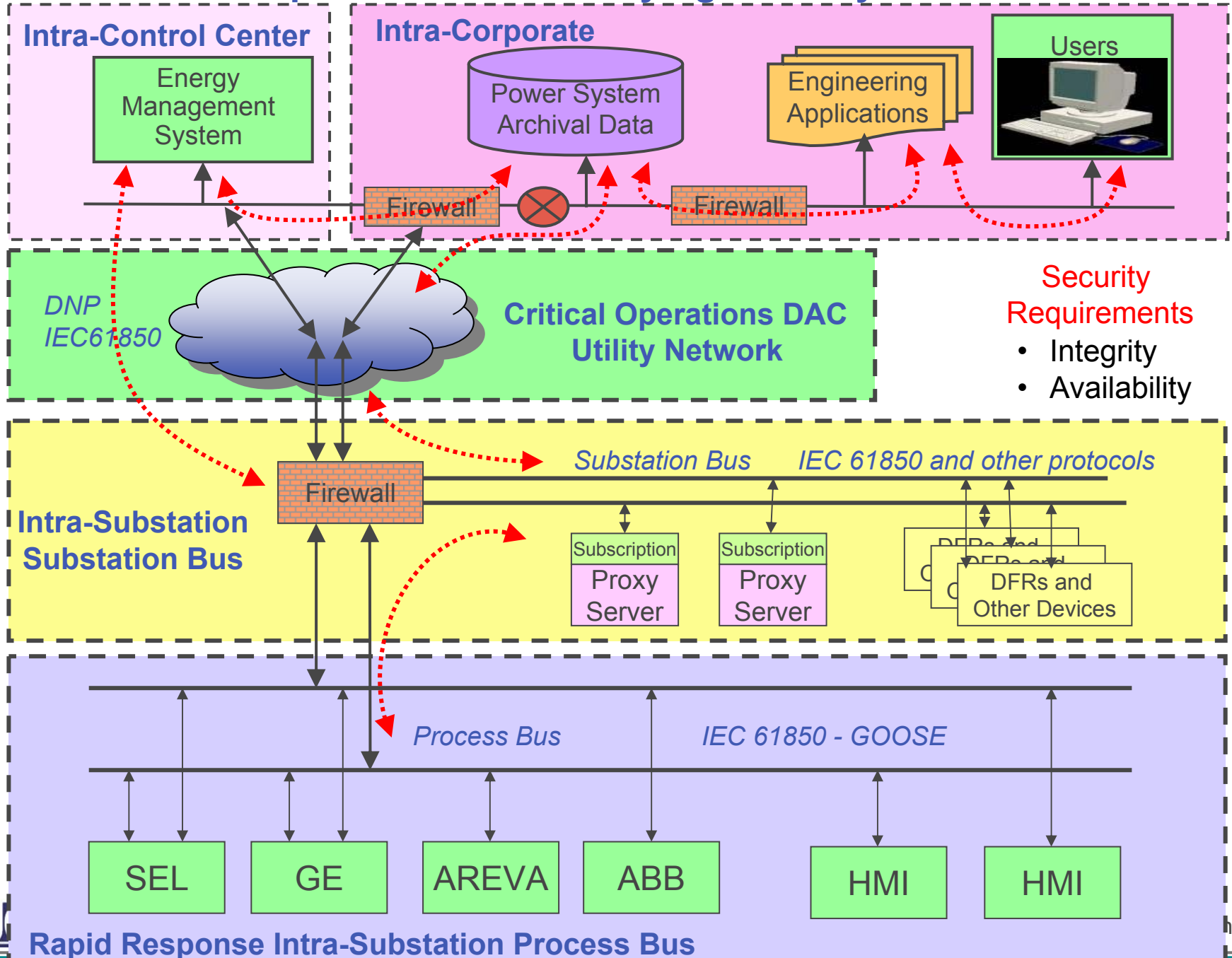
### Select Actual Security Products and Procedures.

Company security policies and existing security products should be used to determine what actual security products and procedures should be implemented.

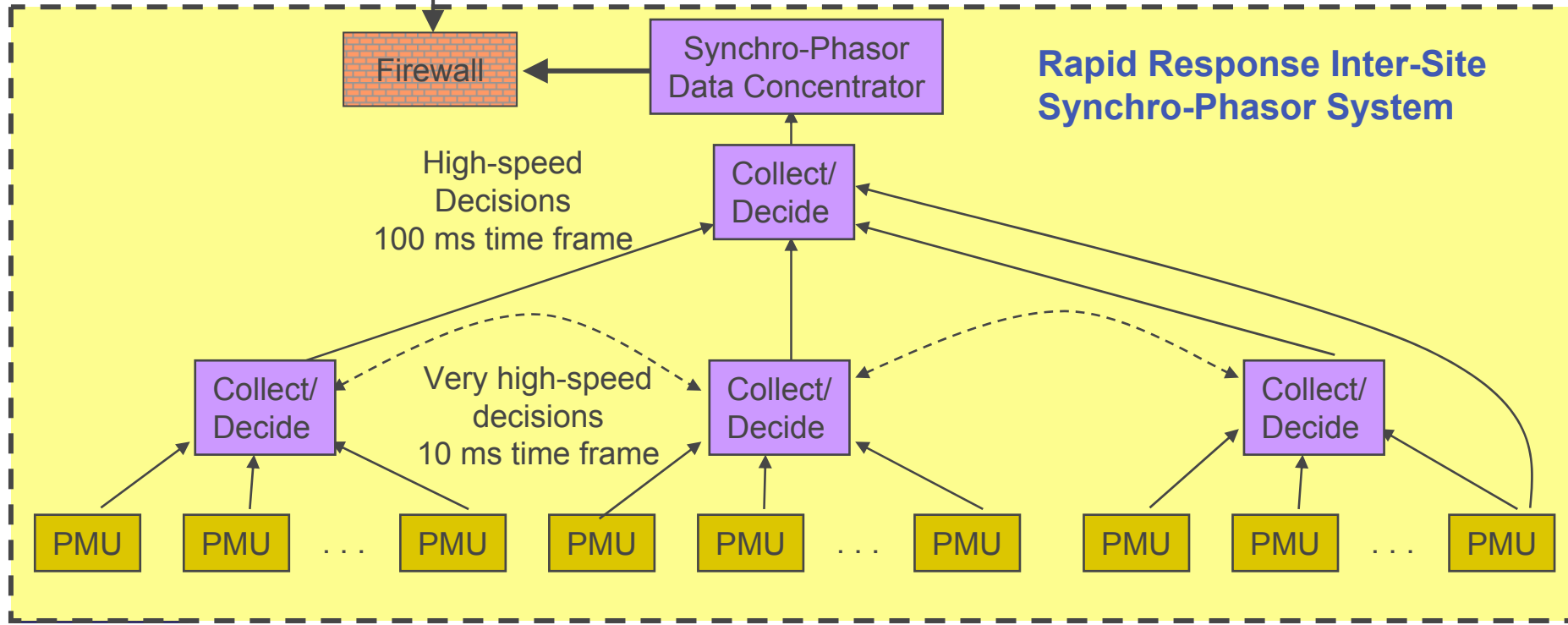
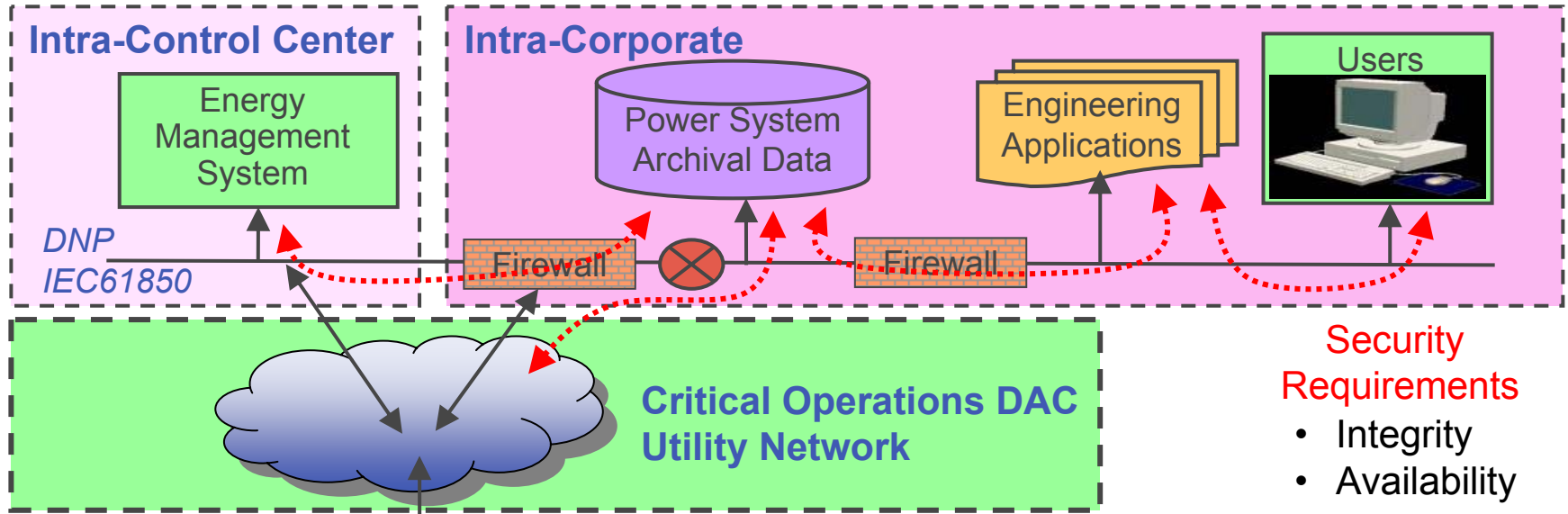
# Example: Power Quality Data Retrieval Security Domains



# Example: Protective Relaying Security Domains



# Example: Synchro-Phasor Function Security Domains



# Panel Session Planned for Montreal, Summer 2006

- Information Security Risk Assessment for Power System Operations
  - Introduction: Background, Terminology, and Purpose
  - Government Perspective on Security Risk Assessment
  - Security Risk Assessment Methodology
  - Examples of Applying the Security Risk Assessment Methodology:
    - Substation: Protective Relaying
    - Distribution Automation
    - Customer Services
    - Market Operations
    - Distributed Energy Resources

## **Attachment 6: Broadband Power-Line Carrier Subcommittee**

### **Broadband Power-Line Carrier Subcommittee**

Scope: Evaluate and report on the characteristics and performance of Broadband over Power Line (BPL) systems as they are applied and affect the electric power systems. Recommend design criteria and operating and test procedures to assure reliability of and compatibility with utility distribution systems and the general public. Report on new equipment designs applicable to electric utility use. Develop and maintain related standards.

IEEE P 1675™/D-Installation-6.3.05

June 3, 2005

# **Draft Standard for Broadband over Power Line Hardware**

Sponsored by the  
Power Systems Communications Committee  
of the  
IEEE Power Engineering Society

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(This introduction is not part of IEEE P<XXX>, <Title>.)

See 9.3 of the *IEEE Standards 2000 Style Manual* for information on the Introduction. Use the **heading 1** style for the Introduction and the **paragraph** style for succeeding paragraphs of text. (See Clauses 1-3 in this template for information about styles.)

A working group list is included in the Introduction, with names listed in alphabetical order, first name followed by last name. Working group names should always be in the **member** style. In the example below, a lengthy list was broken into three columns. To create columns, use the Section command to break a continuous list into three columns; do **not** use tabs. Tabs will cause the order of names to change when the text is converted.

NOTE—The list may use one to four columns.

---

*Example:*

At the time this standard was completed, the working group had the following membership:

Raghu Singh, *Chair*

Dennis Adam	Arnold Ginsberg	James Monroe
Sam Baker	Lorraine Gray	Martin Morman
Lucy Bankeroff	Jasper Hao	David Nowinski
John Barrett	Chris Hefner	Helen L. Olson
Cy Beverly	Kristin Heller	Shane Paquin
Brian Boehm	Carla Hoover	Andy Polack
Tom Bolland	Mark Hopkins	Kevin Ptack
Stuart Brown	Darwin Hummel	Peter Randall
Phil Calvert	Stanley Jaworski	Steven Reindor
Quylen Cao	Darlene Kerr	Walter Ryland
Bill Capehart	Carole Ketchie	Bill Schmidt
Chris Cenham	Larry Koch	Alex Scott
Myra Choi	Richard Kreke	Keith Shewbridge
Jim Cooper	Jill Kudock	Thomas Snyder
Pamela Croll	Jerome Lane	Ryan Sorensen
Tor Coyle	Chuck Laughlin	Bryan Sova
Darren d'Angelo	Linda Lavin	Jeff Stolzenthaler
Brett de Weese	Jonathan Lies	Nester A. Stopyra
Harold Ditmanson	John Lovelace	Ernest F. Storch
Kelly Dobbins	Sidney Lubofsky	Robert Tausworthe
Susan Dorfman	David Lubabee	Bill Thomas
Lyle Dorsey	Rune Martynowkcz	Paula Tilsworth
Bernadette Downell	John McClellen	Mary Turner
Bob Elston	Sarah McCloskey	Warren Verne
Richard Evers	Shari McGill	Lucas Waxman
Francis Gechman	Mike Mintz	Marta Wilson
Jon Gess	Alana Moore	Greer Wright

The following members of the balloting committee voted on this standard. Balloters may have voted for approval, disapproval, or abstention. (To be provided by IEEE editor at time of publication.)

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## #. Installation and Maintenance considerations

### **#.1 General considerations**

Installations of couplers and associated devices shall be performed using approved work methods. The installation shall be performed by personnel authorized and qualified to work in the supply space. It is recommended that surge suppression devices be installed in conjunction with couplers to maintain the BIL of the distribution system.

#### **#.1.1 Affect on medium and low voltage conductors**

The design and material of the couplers shall have no adverse effect on the distribution conductors or any material covering the distribution conductors. Both the physical and electrical characteristics of the coupler, conductor and conductor covering shall be compatible. The coupler shall be installed to limit the likelihood of movement which can damage the distribution conductor or covering.

#### **#.1.2 Grounding / Bonding considerations**

Coupler ground connections shall be properly bonded to an effectively grounded pole ground. If a pole ground does not exist on the pole, an effectively grounded pole ground shall be installed. Grounding methods as described in IEEE C2, other applicable codes or those established by the administrative authority shall be used. The ground resistance requirements are specified in IEEE C2, other applicable codes or established by the administrative authority. The resistance to ground shall be low enough to allow prompt operation of circuit protective devices on the distribution system.

The service (120/240 volt) neutral (Grounded Conductor) shall be tied to a neutral bus installed in the node enclosure. An "Equipment Grounding" bus shall be installed in the node enclosure. A "Main Bonding Jumper" shall connect the neutral bus and the Equipment Grounding bus. If the service neutral ground point (that is, the grounding electrode used to ground the service transformer neutral) is greater than 20 feet from the node enclosure, a grounding electrode shall be installed, and a "Grounding Electrode Conductor" shall bond the neutral bus to the "Grounding Electrode". A driven pole ground can be used as the Grounding Electrode. In no case shall an additional Grounding Electrode (ground rod) be installed within 6 feet of an existing Grounding Electrode. That is, if a pole has a pole ground running down the side into the ground, any additional ground rods must be a minimum of 6 feet away from the pole ground.

All non-current carrying metallic objects within the enclosure, shall be bonded with an Equipment Grounding Conductor to the Equipment Ground. If the enclosure is not completed dielectric, the current carrying parts shall be bonded to the effectively grounded pole ground.

### **#.2 Pole Mounted Locations**

#### **#.2.1 Installation considerations**

During installation and maintenance, all conductors and devices shall be maintained under positive control. The conductors from the coupler to the node shall be treated as supply conductors of 600 V or less. Clearance and protection requirements shall be those of vertical and lateral supply conductors, 600 V or less.

##### **#.2.1.1 Inductive devices**

The installation of inductive couplers shall be performed by an employee or contractor who is qualified and authorized to work in the supply space. During the installation process, minimum approach distances shall be maintained at all times or all energized parts within minimum approach distance shall be covered with insulating protective equipment.

Approved work methods shall be used during the following installation sequence:

- a) Attach coupler to the medium or low voltage conductor,
- b) Verify the ground terminal is not energized,
- c) Attach ground wire,
- d) Make signal cable available.

### **#.2.1.2 Capacitive devices**

The installation of capacitive couplers shall be performed by an employee or contractor who is qualified and authorized to work in the supply space. During the installation process, minimum approach distances shall be maintained at all times or all energized parts within minimum approach distance shall be covered with insulating protective equipment.

Approved work methods shall be used during the following installation sequence:

- a) Using a hotstick or similar tool, attach capacitive coupler to the medium or low voltage conductor,
- b) Verify the ground terminal is not energized,
- c) Attach ground wire,
- d) Make signal cable available.

### **#.2.2 Maintenance considerations**

*Where a coupler is installed on a pole, the pole ground will be the point of ground for the coax at the coupler. To provide for an adequate ground for the coax at the node enclosure, the pole ground shall be bonded to the service neutral. The coax shield at the enclosure end shall be bonded to the Equipment Ground. Should the shield of the coax between the coupler and the enclosure not have a permanent bond to ground through a bulkhead adaptor or similar device, then before the coax is removed from the node, or if the coax from the coupler is removed from the bulkhead adaptor, the coupler shall be disconnected from the medium voltage conductor, and the primary side of the coupling capacitor grounded. This is to prevent a rise in potential on the coax shield. (I am not sure we want this in the standards. This will place the pole ground at the medium voltage conductor. On underground this is not a problem since the cable is covered by a semi-conductive jacket.)*

The coax shield shall be grounded at the enclosure end by bonding it to the Equipment Ground. Before the coax is removed from the node, or if the coax from the coupler is removed, the coupler shall be disconnected from the medium voltage conductor, and the primary side of the coupling capacitor grounded. This is to prevent a rise in potential on the coax shield.

Upon the completion of maintenance on the coupler and node, the equipment shall be placed back into service using the appropriate installation procedure.

### **#.3 Pad Mounted Locations**

If the coupler is not installed over the effectively grounded concentric neutral or LC shield of the medium voltage conductor, it shall be treated as an insulator. The node shall be treated as communication equipment and shall meet required clearances. The installation shall not impede the normal operation,

including switching, of the pad mounted supply equipment and the supply conductors within the pad mounted supply equipment.

### **#.3.1 Installation considerations**

During installation and maintenance, all conductors and devices shall be maintained under positive control. The conductors from the coupler to the node shall be treated as supply conductors of 600 V or less. Clearance and protection requirements shall be those of vertical and lateral supply conductors, 600 V or less.

#### **#.3.1.1 Inductive devices**

The installation of inductive couplers shall be performed by an employee or contractor who is qualified and authorized to work in the supply space. During the installation process, minimum approach distances shall be maintained at all times or all energized parts within minimum approach distance shall be covered with insulating protective equipment.

Approved work methods shall be used during the following installation sequence:

- a) Attach coupler to the medium or low voltage conductor (Use of a hotstick or similar tool is recommended),
- b) Verify the ground terminal is not energized,
- c) Attach ground wire,
- d) Make signal cable available.

#### **#.3.1.2 Capacitive devices**

The installation of capacitive couplers shall be performed by an employee or contractor who is qualified and authorized to work in the supply space. During the installation process, minimum approach distances shall be maintained at all times or all energized parts within minimum approach distance shall be covered with insulating protective equipment.

Approved work methods shall be used during the following installation sequence:

- a) Using a hotstick or similar tool, attach capacitive coupler to the medium or low voltage conductor,
- b) Verify the ground terminal is not energized,
- c) Attach ground wire,
- d) Make signal cable available.

### **#.3.2 Maintenance considerations**

Where a coupler is installed in pad mounted equipment, the equipment ground will be the point of ground for the coax at the coupler. To provide for an adequate ground for the coax at the node enclosure, the pole ground shall be bonded to the service neutral. The coax shield at the enclosure end shall be bonded to the Equipment Ground. Should the shield of the coax between the coupler and the enclosure not have a permanent bond to ground through a bulkhead adaptor or similar device, then before the coax is removed from the node, or if the coax from the coupler is removed from the bulkhead adaptor, the coupler shall be

disconnected from the medium voltage conductor, and the primary side of the coupling capacitor grounded. This is to prevent a rise in potential on the coax shield.

Upon the completion of maintenance on the coupler and node, the equipment shall be placed back into service using the appropriate installation procedure.

## Attachment 7: Technical Sessions Committee

### Agenda & Minutes

#### Meeting of the PES Technical Council Technical Sessions Committee

Monday, June 13 – 1:00 to 5:00 p.m.  
San Francisco, CA

1. Introduction – Each Attendee introduced themselves and stated their affiliation.
2. Circulation of attendance book

#### Attendees:

Paula Traynor – Chairperson  
Hubert Bilodeau – TPC GM 2006  
Jim McDonnach – PDCC  
Cary Cook – TPC GM05  
Mirdslav Beporic – ETCC  
Rejean Arseneau – PSIM  
Om Malik – EDPGC  
Cheral Kostu-Madeau – PES Exe. Office  
Charlie Henvilla – PSRC  
Jeffrey Nelson – Switchgear  
Joseph Willson – PSOC  
Satish Ranade – T&D  
Samuel Norman – SB  
Donna Florec – PES Exe. Office  
Dan Nordell – PSCC  
Tom Grebe – T&D  
Don Fallon – Transformers  
Osama Mohammed – EMC  
"Izzy" Kerszenbaum – EMS  
Rick Taylor – Secretary TC  
Georges Mintillit – Switchgear – for Ted Bruce  
Juan J. Sanchez-Gasca – PSDP  
Lou Wozniak - TPC GM Denver  
Chen-Ching Liu = PSACE

3. Circulation of TCPC roster – An attendees List was circulated
4. Approval of Minutes – The members did not remember receiving the minutes. Paula will follow-up with Keith Grey.
5. Executive Office Staff Presentation – Donna Florec reviewed the conference paper and panel session review process and recorded requests for improvement.

## Attachment 7: Technical Sessions Committee

- TPCPs need a way to know that a message went out. They requested a email come up with a default cc to the sender including the ability to modify text.
  - TPCPs want the ability to segregate committee meeting request by subcommittee.
  - TPCPs have the right to make an initial quality check and either request modifications from the author or reject the conference paper.
  - TPCPs requested that the term conference paper be used instead of proceeding paper.
  - Change the conference paper submittal with a pointer to the author's kit.
  - When submitting a panel, the TCPC can set up and account for the session chairperson. The chairperson can supply this to the panelists.
  - A simple survey was requested of paper submitters asking for suggestions for improvement.
6. Suggested Technical Program Content Changes – Rick Taylor, Secretary of Technical Council suggested that we change the process for setting the technical program to improve the meeting content. He would like each committee to provide input on what they need to be effective and to provide the top issues that they are dealing with. He stated that the tracks are not working because they are set before the program topics are put together. He also suggested that formal paper sessions include the most interesting from a committee point of view. Other accepted papers would be put in the poster sessions.

Paula stated that the advertising will be increased significantly for the GM 2006 meeting.

There is significant interest in a second meeting in the January/February timeframe. A group will be put together to explore this need.

## Attachment 7: Technical Sessions Committee

Each committee provided their topics of interest. The list is attached.

**Action for TCPCs: After the meeting, a draft theme and call for papers for the 2006 GM was drafted using the topics of interest. Please review the attached document and provide comments. This will also be discussed at the TC meeting.**

7. New "Less Formal" Panel Presentation Format, update/experience - Brad Roberts, Emerging Technologies Coordinating Committee Chair – There was nothing new on this topic.
8. Panel Session Documentation Capture – Carey Cook – There are drop boxes for power point slides from sessions and they also can be emailed to Donna Florec. These will be posed on the website.

The TCPCs requested that the presentations be protected from copying.

9. Comments from Technical Program Chair, SF – Carey Cook – There were 10 Tutorials, 87 technical sessions (38-40 non-tracked), 1 poster session with 155 papers.
10. Transmission and Distribution, PES Meeting Status – Satish Ranade - 400 papers (all in poster sessions), 40 sessions (each two hours and staggered to encourage participants to also tour the showroom floor), high interest sessions. He recommends using the IEEE alias, a few more days for paper review would be helpful, remove any mention of abstracts.
11. TPC and TCPC's for 2006 PSCE – Juan Sanchez-Gasca – The theme is "New Challenges, New Solutions. Everything is ready. They have learned from the NY meeting and made a number of changes to improve the conference. There will be increased advertising for the meeting.
12. TPC and TCPC's for 2006 General Meeting – Montreal, Canada – Hubert Bilodeau was introduced and participated in the discussion for item #6.
13. CIGRE/IEEE 2005 Joint Meeting – New Orleans, LA – Vijay Vittal – They will have 50 papers presented in the CIGRE format. The meeting is October 5-7 just before T&D. There is a common registration.

TCPCs asked how they could get the papers to prepare the CIGRE type discussion.

## **Attachment 7: Technical Sessions Committee**

14. Definition of commercialism in Technical Sessions – No new issues were presented. The TCPCs are to reject papers that are plainly commercial in nature. The session chairperson can review presentations and suggest changes if commercialism is extreme. IEEE guidelines state that the company logo should appear on the 1<sup>st</sup> slide only.
  
15. Report on scheduling process using the internet – Overall the process went well however a review of the scheduling to prevent overlap was not done. Rick Taylor and Paula Traynor will investigate methods of doing this.
  
16. Schedule of committee contributions to Power&Energy Magazine – Rick Taylor will produce a schedule. This will be handled in the TC. This is not the TCPC responsibility.

## Attachment 7: Technical Sessions Committee

### Technical Sessions Committee Committee Topics of Interest

Monday, June 13, 2005

San Francisco, CA

Panel /Paper Session Topics from EMC - O.A. Mohammed

- 1) Dynamic Simulation of Electric Machines and Drives
- 2) Issues in the design , application , operation and maintenance of Electric Machines for Wind Power Generation
- 3) Issues in the design , application , operation and maintenance of Electric Machines for Tidal Power Generation
- 4) Review of commercially existing super conducting machines
- 5) Using Synchronous generator flux probe for monitoring torsion and vibration

### Summary of Topics from FlipChart – Provided by all TPCPs attending the meeting

- 1) New Computing and Information Technologies (IT)
- 2) Distributed Generation
- 3) Standards
- 4) Presenting the work of the committee
- 5) Economic aspect of loss evaluation and equipment efficiency
- 6) Power Quality
- 7) Design for reliability
- 8) New design of circuit breakers
- 9) Substation Automation including Cyber Security
- 10)Developing Countries Issues !!
- 11) Conservation Efficiency
- 12)Demand Side response
- 13)Use of Synchro - Phasors in protection and energy control
- 14)Environment Policy
- 15)Broadband over Power lines
- 16)Restructuring and De-regulation of the industry
- 17)Use of Phasors Measurement
- 18) Reliability and Stability
- 19)Load Understanding

## **Attachment 7: Technical Sessions Committee**

- 20) Training of Younger Engineers and Development
- 21) Bringing in other disciplines
- 22) What we provide to our supervisors
- 23) Environmental aspect of equipment design and application
- 24) Transient modeling of Electrical Equipment
- 25) Aging Infrastructure – Equipment Structure – People – Life extension-replacement strategy
- 26) Wind Power
- 27) Scheduling of operations
- 28) Market Monitoring
- 29) Reliability issues
- 30) Blackouts
  - Prevention
  - Analysis

## Attachment 7: Technical Sessions Committee

### IEEE Power Engineering Society 2006 General Meeting

#### *Call for Papers*

**Submission Deadline for Full Papers (not Abstracts):** \_\_\_\_\_

The IEEE Power Engineering Society (PES) 2006 General Meeting will be held \_\_\_\_\_ at the \_\_\_\_\_ . This premier power engineering conference will bring together power engineering practicing engineers and academics from all over the world. The aim of the conference is to provide an international forum for these experts to promote, share, and discuss various issues and developments in the field of electrical power engineering.

**Theme and Preferential Topics:** The theme of the meeting is Power Engineers Working Together- Transcending Specialties . The preferential topics for the meeting are as follows.

- Design Aspects of Wind Farms
- Use of Phasor Measurements
- Aging Infrastructure Issues
- Integration of New Technology with Old Technology
- Issues with Increasing Fault Current Levels
- Dynamic Simulation of Power System Components
- VAR Issues
- Cyber Security Issues
- Broadband Carrier Communication Issues
- Demand Side Response and Load Understanding
- Design for Reliability
- Economic Aspect of Loss Evaluation and Equipment Efficiency

**Submission Requirements:**

**For more information:**

END

## Attachment 8: PES Substations Committee

Liaison Report to PSCC – June 17, 2005

There are three activities underway within the PES Substations Committee that should be of interest to the PSCC:

- A corrigenda revision to IEEE 1613-2003 “Standard Environmental and Testing Requirements for Communications Networking Devices in Electric Power Substations” to delete the provision for impulse tests in the field. The Invitation to Ballot will be issued shortly, and the ballot pools of PSCC, PSRC and Substations will be invited to ballot.
  
- Work is well along in Working Group C3 Task Force 1, chaired by Mike Thesing Advanced Control Systems (mike.thesing@acsatlanta.com) on P1615 “Recommended Practice For Network Communication in Electric Power Substations”. We had a productive work session in San Francisco, and draft 1 is nearing completion. Contact Mike if you want to become a working member of his task force. The next meeting will be at the T & D Expo in New Orleans in October. The tentative schedule is:  
2005  
Sept 1 All new sections submitted to chair for draft 1  
Sept 20 Completion of draft 1 - distribute to TF members  
Oct 10 Task force meeting in IEEE T&D to review draft 1  
Oct 24 All task force comments due for draft 2  
Nov 1 Submit draft 2 to IEEE-SA for editorial review  
Nov 21 Request formation of balloting body with IEEE-SA  
Dec 21 Begin balloting document
  
- Work is underway on the update of C37.1, the so-called “SCADA standard”, in Working Group C3. The new title is “Standard for SCADA and Automation Systems. Craig Pruess – Black and Veatch – (preusscm@bv.com) is the editor. Their next work session will also be at the T & D Expo. Newcomers are welcome if you are willing to work.

Submitted by John Tengdin – Substations Committee C3 June 17, 2005

## Attachment 9: Cigré Liaison Report

### Cigré JWG D2/B3/C2 – 01 Security for Information Systems and Intranets in Electric Power Systems

Summary by

Göran Ericsson *Swedish delegate of Study Committee D2 and member of JWG*

#### **General**

Cigré (Conseil International des Grands Réseaux Electriques, International Council on Large Electric Systems ([www.cigre.org](http://www.cigre.org))) is divided into 16 Study Committees (SCs), covering different aspects of power engineering. Within each SC there is a number of working groups (WGs) and task forces (TFs). For special purposes sometimes, joint working groups (JWGs) are formed to explore new ideas and extend the collaboration between the areas of two or more study committees.

#### **JWG D2/B3/C2 – 01**

Within Cigré, the JWG D2/B3/C2-01 Security for Information Systems and Intranets in Electric Power Systems has been formed. It is a joint work between the study committees of:

D2 – Information Systems and Telecommunication for Power Systems

B3 – Substations

C2 – Systems Operation and Control

There are thirteen (13) members, where four (4) are corresponding members, with representation from Norway, France, Ireland, The Netherlands, Spain, Sweden, and The USA.

The scope of the joint working group is to identify and define information security domains for the electric power industry, such as main domains for Utility Intranets and Information Systems, Telecontrol (control center and substations). Also, general IT security issues should be addressed, such as secure Internet connections and firewalls.

#### **Schedule, Deliveries**

The JWG was formed in 2002/2003, and it had its first meeting in July 2003. The JWG meets four times per year, and the members have e-mail exchange in between to progress work. The JWG is working on producing a Technical Brochure (TB) on the subject, and the work will be finished during the first part of 2006. As intermediate deliveries, approximately five papers are to be published in *Electra* (Journal of Cigré) during 2004 and 2005.

The papers address the following issues, partly relying on the standard ISO/IEC 17799.

- Why is IT security important for the Power Industry?
- Threats/Vulnerabilities
- Definitions
- Management of IT Security
- Selection of controls
- Security mechanisms
- On-going works in Europe and North America, including standards bodies and Web references.

So far, two papers have been published on behalf of the JWG:

G. Ericsson: “**Managing Information Security in an Electric Utility**”, *Electra* No 216 – October 2004

The paper provides general background on:

- Why information security is important for the electric power industry,
- Where the threats and vulnerabilities arise,

## **Attachment 9: Cigré Liaison Report**

- How the evolution of the architecture of IT systems has made modern systems more vulnerable, and
- General information on the work of various groups which have examined IT Security issues.

June, 2005 2(2)

P. Roche: “**Cyber security considerations in Power System Operations**”, Electra No 218 – February 2005

The main purposes of this paper is to:

- Describe the forces which have influenced the development of multiple, interconnected IT networks within the power industry,
- Examine the special features of operational systems which make them vulnerable to IT threats,
- Describe some reported cyber security incidents and experiences from case studies, and
- Suggest some immediate measures that can be taken to protect the integrity of key IT systems.

### ***Review of IEC work***

The JWG is reviewing work within IEC TC 57. The JWG will receive the IEC 62351 series of documents on “Data and Communication Security” for review and comments before the process of votes by the IEC National Committees. A first review was sent to IEC in the beginning of June 2005.

### ***Tutorial Mexico June 2005***

Three presenters from the JWG gave a half-day tutorial on Information Security during the Cigré D2 Colloquium, held in Cuernavaca, Morelos, Mexico, June 8-10, 2005. The tutorial was well attended with more than 200 participants. By the end of June 2005, the presentations will be available on the <http://www.cigre-d2.org/> together with the two papers 216 and 218 from Electra.

## Attachment 10: CCIP Liaison Report

CCIP Liaison Report  
June 16, 2005  
S. A. Klein, PES Representative to CCIP

CCIP 2005 issues (many being similar to those in 2004 but with some adjustments):

5. Spectrum policy, including BPL, cognitive radio, and other areas
6. Telecommunications reform, including layered architecture and advantages of ubiquitous gigabit and multi-gigabit capacity to all end users.
7. Critical infrastructure protection, including position statement on information security for electric power (due for reconfirmation in 2005).
8. Others, including spam, voting systems, privacy, identity theft, and more.

The position statement on BPL has been on hold pending a white paper from the SA project on BPL, for which the draft was due January 15. I have been recommending that any CCIP activity on BPL be sent to John Newbury, Terry Burns, Dan Nordell, and John Estey for review.

Note that under the CCIP position statement on Advanced Broadband (posted at <http://www.ieeeusa.org/policy/positions/broadband.asp>), systems with capacity in the megabit range, including cable modem, DSL, and now BPL, are regarded as legacy technologies to be superseded by gigabit technologies. There is now a CCIP white paper posted at <http://www.ieeeusa.org/volunteers/committees/ccip/docs/Gigabit-WP.pdf> and providing the rationale for “ubiquitous gigaband”

During the past year, I briefed the issues surrounding BPL to the IEEE-USA Energy Policy Committee and made the following points:

5. The view of CCIP that megabit technologies, including BPL, should be superseded by gigabit technologies as soon as possible.
6. The overriding role of the interference issue.
7. The fact that power engineers are unaccustomed to addressing wavelength-related issues (because of the great distance of a wavelength at 60 Hz) but the a typical wavelength at BPL relevant frequencies is well within the lengths of wires and spacings common in power systems. Also, the fact that corroded connections can easily become sources of intermodulation-based interference.
8. An analogy between megabit broadband (cable modem, DSL, and BPL) versus advanced gigabit broadband is that between power from animals versus power from engine technology. Innovators who only have animal power available would be unable to think of innovations that are relevant to engine power.