NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Agenda
Standards Oversight and Technology Committee

November 2, 2011 | 9:00-10:30 a.m. Eastern
Westin Buckhead Atlanta
3391 Peachtree Road, NE
Atlanta, GA 30326
404-365-0065

Introductions and Chair's Remarks

NERC Antitrust Compliance Guidelines and Public Announcement

Agenda

1. **Minutes* — Approve**
   a. August 3, 2011 meeting
2. **Standards Presentation and Policy Issues for Discussion and Guidance***
   a. Update on proposals to revise Violation Risk Factor (VRF)/Violation Severity Level (VSL) criteria
   b. Balanced assessment of NERC Reliability Standards
   c. ANSI – Forward looking obligations
   d. Five-Year Assessment and Rule of Procedure 317 [note correction]
   e. Industry request to change our position on CIP v4 - Discussion
   f. Policy Discussion on Reliability Standards Development Plan (RSDP) long-term adjustments
3. **Standards Written Report***
   a. Status report looking ahead (interpretations and standards)
   b. Regional report and work plan
   c. Update on identifying a list of all outstanding directives
4. **Standards Committee Report***
5. **NASPI Update and Presentations* – Mark Lauby, Russell Robertson, Alison Silverstein**
6. **ERO Enterprise Solutions Roadmap***
7. **IT 90-Day Plan and Roadmap Update***

*Background materials included.

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Antitrust Compliance Guidelines

I. General

It is NERC's policy and practice to obey the antitrust laws and to avoid all conduct that unreasonably restrains competition. This policy requires the avoidance of any conduct that violates, or that might appear to violate, the antitrust laws. Among other things, the antitrust laws forbid any agreement between or among competitors regarding prices, availability of service, product design, terms of sale, division of markets, allocation of customers or any other activity that unreasonably restrains competition.

It is the responsibility of every NERC participant and employee who may in any way affect NERC's compliance with the antitrust laws to carry out this commitment.

Antitrust laws are complex and subject to court interpretation that can vary over time and from one court to another. The purpose of these guidelines is to alert NERC participants and employees to potential antitrust problems and to set forth policies to be followed with respect to activities that may involve antitrust considerations. In some instances, the NERC policy contained in these guidelines is stricter than the applicable antitrust laws. Any NERC participant or employee who is uncertain about the legal ramifications of a particular course of conduct or who has doubts or concerns about whether NERC's antitrust compliance policy is implicated in any situation should consult NERC's General Counsel immediately.

II. Prohibited Activities

Participants in NERC activities (including those of its committees and subgroups) should refrain from the following when acting in their capacity as participants in NERC activities (e.g., at NERC meetings, conference calls and in informal discussions):

- Discussions involving pricing information, especially margin (profit) and internal cost information and participants' expectations as to their future prices or internal costs.
- Discussions of a participant's marketing strategies.
- Discussions regarding how customers and geographical areas are to be divided among competitors.
- Discussions concerning the exclusion of competitors from markets.
- Discussions concerning boycotting or group refusals to deal with competitors, vendors or suppliers.

- Any other matters that do not clearly fall within these guidelines should be reviewed with NERC's General Counsel before being discussed.

III. Activities That Are Permitted

From time to time decisions or actions of NERC (including those of its committees and subgroups) may have a negative impact on particular entities and thus in that sense adversely impact competition. Decisions and actions by NERC (including its committees and subgroups) should only be undertaken for the purpose of promoting and maintaining the reliability and adequacy of the bulk power system. If you do not have a legitimate purpose consistent with this objective for discussing a matter, please refrain from discussing the matter during NERC meetings and in other NERC-related communications.

You should also ensure that NERC procedures, including those set forth in NERC's Certificate of Incorporation, Bylaws, and Rules of Procedure are followed in conducting NERC business.

In addition, all discussions in NERC meetings and other NERC-related communications should be within the scope of the mandate for or assignment to the particular NERC committee or subgroup, as well as within the scope of the published agenda for the meeting.

No decisions should be made nor any actions taken in NERC activities for the purpose of giving an industry participant or group of participants a competitive advantage over other participants. In particular, decisions with respect to setting, revising, or assessing compliance with NERC reliability standards should not be influenced by anti-competitive motivations.

Subject to the foregoing restrictions, participants in NERC activities may discuss:

- Reliability matters relating to the bulk power system, including operation and planning matters such as establishing or revising reliability standards, special operating procedures, operating transfer capabilities, and plans for new facilities.
- Matters relating to the impact of reliability standards for the bulk power system on electricity markets, and the impact of electricity market operations on the reliability of the bulk power system.
- Proposed filings or other communications with state or federal regulatory authorities or other governmental entities.

Matters relating to the internal governance, management and operation of NERC, such as nominations for vacant committee positions, budgeting and assessments, and employment matters; and procedural matters such as planning and scheduling meetings.

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

Draft Minutes
Standards Oversight and Technology Committee

August 3, 2011 | 9:15-10:15 a.m. PT
Vancouver Marriott Pinnacle
1128 West Hastings Street
Vancouver, BC VE 4R5 Canada

Chair Ken Peterson convened a duly noticed open meeting of the Standards Oversight and Technology Committee of the North American Electric Reliability Corporation on August 3, 2011 at 9:15 a.m. local time, and a quorum was declared present. The agenda is attached as **Exhibit A**.

NERC Antitrust Compliance Guidelines

Chair Peterson directed the participants' attention to the NERC Antitrust Compliance Guidelines.

Minutes

The committee approved the May 10, 2011 meeting minutes (**Exhibit B**).

Standards Status Report

Herb Schrayshuen, vice president and director of standards, provided a presentation (**Exhibit C**) where he reviewed the status of high priority deliverables, rapid development project and ANSI accreditation, as well as Project 2007-17 Protection System Maintenance and Testing. Further, Mr. Schrayshuen reviewed the Regional Standards priorities which led to an extensive discussion with industry stakeholders. The conclusion of the discussion relative to the integration of the regional standards development programs into the overall standards development process was that NERC management would work with Regional Executives to resolve any conflicting priorities.

Standards Committee Report

Herb Schrayshuen and Allen Mosher, Standards Committee Chair, provided an in-depth report of Standards Committee activities (**Exhibit D**).

ERO IT Strategy Development

Lynn Costantini, vice president and chief information officer, reported on the status of the ERO IT strategy development and business automation initiative. The project, which launched earlier this year, will result in new tools and technologies to meet evolving business requirements across the ERO enterprise (**Exhibit E**).

NERC Tools Update
Lynn Costantini, vice president and chief information officer, provided a status update three main topics the reliability tools transition; SAFNR, and NASPI. Her presentation is attached as **Exhibit F**.

Future Meetings
Chair Peterson reviewed future meetings of the committee.

There being no further business, Chair Peterson adjourned the meeting at 10:20 a.m.

Submitted by,

Herb Schrayshuen

Agenda Item 2
SOTC Meeting
November 2, 2011

Standards Presentation and Policy Issues for Discussion and Guidance

a. Update on proposals to revise Violation Risk Factor (VRF)/Violation Severity Level (VSL) criteria

b. Balanced assessment of NERC Reliability Standards

c. ANSI – Forward looking obligations

d. Five-Year Assessment and Rule of Procedure 317 [note correction]

e. Industry request to change our position on CIP v4 - Discussion

f. Policy Discussion on Reliability Standards Development Plan (RSDP) long-term adjustments

a. Update on Proposals to Revise Violation Risk Factor (VRF) / Violation Severity Level (VSL) Criteria

VRFs

The goal of this effort is to standardize a method to determine VRF assignments for individual requirements. As a part of this effort, the team is proposing to create definitions for five VRFs, rather than the current three VRFs.

Definitions and a tool to help assist in determining the VRF were presented to stakeholders for comment in mid-2010. Comments were favorable.

An updated set of definitions, as well as an updated tool for use in analyzing VRFs, is being prepared for a second round of industry comment.

Next steps are to vet the proposal through NERC staff and Regional Entities, and to update the Standards Committee (SC) and Compliance and Certification Committee (CCC) at the December 2011 meeting on staff's position and regional input.

VSLs

The goal of this effort is to develop a generalized approach for creating VSLs to be used in lieu of the current approach of performing an exhaustive analysis of possible violations for inclusion in the VSLs. The team is updating the proposal for informal review and feedback prior to posting for industry comment.

Next steps are to vet the proposal through NERC staff and Regional Entities and to update the SC and CCC at the December SC meeting regarding staff's position and regional input.

b. Balanced Assessment of NERC Reliability Standards

Background

The NERC Reliability Standards are a portfolio of performance, risk, and competency-based mandatory requirements that collectively provide a defense-in-depth structure for reliably planning, operating, and protecting the North American bulk power system. NERC's standards hold all users, owners, and operators of the bulk power system accountable for meeting specific reliability-related performance.

NERC staff works with the SC, electric power industry experts, and applicable regulatory and governmental authorities in the United States and Canada in identifying, prioritizing, and implementing the standards development projects identified in the *Reliability Standards Development Plan,* following the processes outlined in the *Standard Processes Manual.*

Process

In compliance with the *Standard Processes Manual,* the SC makes key decisions regarding the reliability standards development process for North American standards with the process and administrative input of NERC staff.

Once a proposed Reliability Standard is developed following the *Standard Processes Manual,* which is part of the NERC Rules of Procedure, and is presented to the NERC Board of Trustees (Board) for adoption prior to being filed with applicable regulatory authorities for approval.

Board Adoption

NERC Standards staff is responsible for preparing the package of material presented to the Board when a Reliability Standard is presented to the Board for adoption. When organizing and preparing the material for Board action, the drafting team responsible for the proposed standard submits an extensive set of documentation related to the standard's development. Included in the documentation is evidence of consensus, the reliability-related benefits of the proposal, and a listing of significant unresolved minority issues.

From the material provided by the standard drafting team, NERC staff prepares a summary document for Board action. The Board also has access to the public project page. The goal is to provide the Board with sufficient information to make an informed decision as to whether to either adopt the standard, direct the SC to make additional modifications to the standard, or provide the SC other direction with respect to the proposed standard.

It is the responsibility of the Board to adopt Reliability Standards that ensure the reliability of the North American bulk power system taking into consideration the reliability benefit of the standard.[1] In the course of development of a Reliability Standard, much debate occurs

[1] NERC Bylaws, Article IX, Section 1

relative to the reliability benefit of the standard. Rarely is 100 percent consensus achieved, and at the conclusion of the standards development process, there usually exists some level of disagreement amongst the parties involved in the standard's development. The drafting team responsible for the proposed standard is required to make its best effort at addressing all issues brought to its attention.

The Board is informed of the significant unresolved minority issues remaining at the conclusion of the standards development process.

From time to time there are significantly divergent views on issues involving a standard, definition, or interpretation. When the standard is taken to ballot it is likely to achieve sufficient affirmative votes to gain approval, but may not result in an obvious improvement to reliability or leave open the question of whether the reliability objective has been met.

When considering adoption of a Reliability Standard, the Board must consider not only the reliability impact of the standard (i.e., is the current level of reliability at least maintained, if not improved, by adopting the standard), but the Board must also consider the minority opinions highlighted in the material provided to the Board in the summary package.[2] If the Board is not satisfied with the drafting team's resolution of a minority opinion, the Board has the option to direct the SC to revise the standard or take some other action relative to the standard before the standard is resubmitted to the Board for adoption at a future date. The engagement that the Board can provide the SC is not limited and needs to take into consideration the specific known issues at the time the standard is presented to the Board for action.

Issue

The following is a list of considerations for process change going forward.

- An early alert to the Board or Standards Oversight and Technology Committee (SOTC) that a given standard may require more detailed attention prior to voting.
- A process for engaging, perhaps a subset of the Board or SOTC when this occurs.
- Does the Board want NERC staff to adhere to its prior recommendation of engaging directly in the process as any other commenter, or to have an additional role in preparing the answers to any questions the Board may have about the reliability benefit of a given industry proposal?
- How will the Board or SOTC weigh various factors?
- How can the new standard maintain or improve reliability?
- How does learning since the previous standard adoption support a modified standard?

[2] Standards Process page 20

- How can assessment tasks and performance measures engage the industry in thinking and working beyond the minimum level of performance?
- What assessment strategies are best suited to advancing Reliability Standards content and skills?

Recommendation

That the Standards Oversight and Technology Committee direct NERC staff to develop a specific plan of action based on the discussion at this meeting to identify the process steps necessary to address the case where a proposed standard requires more investigation than normal to ascertain the net benefit to reliability.

c. ANSI – Forward Looking Obligations

NERC received notice that effective September 9, 2011, NERC's standard development process has been re-approved as an ANSI-accredited standard development process. The following statement was included in the approval letter:

"NERC is expected to continue to make progress towards its stated goal of submitting documents to ANSI for consideration as proposed American National Standards (ANS)."

Options

- Reaccredit every five years as we have been
- Move to a continual accreditation process by submitting standards to ANSI for approval.

Proposal

In order to investigate the feasibility of the second option, NERC will initiate a dialogue with Canadian stakeholders to identify obstacles associated with submitting NERC standards to ANSI for approval. In the past the Canadian stakeholders have objected to a review by a United States accrediting organization. The benefits of seeking separate Canadian approval of NERC's standard development process must be weighed against the associated costs.

- Submitting standards to the Standards Council of Canada would require, among other things, that NERC first have its standards development process accredited by the Standards Council of Canada.
- Standards approved by the Standards Council of Canada must be published in both English and French, and would increase NERC's costs associated with developing standards.

If a determination is made that it is not necessary to obtain parallel approval of NERC's standard development process from the Standards Council of Canada, amend Rule of Procedure (ROP) 316 accordingly.

Currently ROP 316 states:

> 316. Accreditation
> NERC shall seek continuing accreditation of the NERC reliability standards development process by the American National Standards Institute and the Standards Council of Canada.

d. Five-Year Assessment and Rule of Procedure 317

The purpose of this agenda item is to engage in a discussion of the high level options below so that more direction on development of a plan (i.e., which option is preferred) can be provided.

Under Rule of Procedure 317, NERC is required to review each standard within five years of its effective date.

> 317. Five-Year Review of Standards
> NERC shall complete a review of each NERC reliability standard at least once every five years from the effective date of the standard or the latest revision to the standard, whichever is later. The review process shall be conducted in accordance with the NERC Standard Processes Manual. The standards process manager shall be responsible for administration of the five-year review of reliability standards. As a result of this review, the NERC reliability standard shall be reaffirmed, revised, or withdrawn. If the review indicates a need to revise or withdraw the standard, a request for revision or withdrawal shall be prepared, submitted and addressed in accordance with the NERC Standard Processes Manual.

The five-year review obligation is incorporated in the prioritization process; however, because of projects with higher reliability impact outweighing those with less, NERC will not achieve this goal based on current assumptions.

Status

NERC has 23 Reliability Standards that are expected to miss their five-year obligation by more than six months. Of those, 13 are forecast to miss by two years or more. Of those, six are forecast to miss by four years or more. The five-year review was included in the Rules of Procedure to comply with an ANSI accreditation requirement. The ANSI accreditation requirement is associated with ANSI-approved standards, and at this point, NERC does not have any ANSI-approved standards. NERC's regional standards are not developed in accordance with an ANSI accredited standard development process.

With over 100 enforceable standards, compliance with the five-year review requires review and revision of at least 20 standards each year, a number that would overwhelm the industry's resources at this time. All of the standards that are coming up for their five-year review are "Version 0" standards and are likely to require significant industry debate to make necessary improvements.

At a future time, when all of the "Version 0" standards have undergone a major revision such that the need for additional significant revisions is minimized, the five-year review of then stable standards should be achievable.

Solutions (high level)

1. Seek board approval of an extension to the due date and provide timely notice to FERC and other governmental authorities;
2. Reassign resources to focus on five-year review; and
3. With the next revision to the Standard Processes Manual, separate the maintenance requirements for standards that are and are not approved as ANSI process standards; and add the option of maintaining some approved standards under ANSI's more flexible "continuous maintenance" and "stabilized maintenance" methods.

e. Industry Request to Change Our Position on CIP v4

Certain stakeholder groups are advocating that NERC consider withdrawing CIP-002 v4 and that the industry await the development and delivery of CIP v5.

Background

Version 4 of the CIP standards was limited in scope and meant to be an interim step for addressing more immediate concerns raised in FERC Order No. 706, paragraph 236. The key changes to Version 4 from Version 3 include replacing the "risk-based" assessment methodology with "bright line" criteria, and an attempt to move toward more uniform application by eliminating subjectivity regarding what is "critical."

The Industry approved Version 4 on December 30, 2010. NERC submitted a petition for approval of CIP Version 4 to FERC on February 10, 2011, requesting approval of the standards. FERC issued a NOPR proposing to approve CIP Version 4 on September 15, 2011.

Version 5 addresses the remaining FERC Order No. 706 directives. NERC anticipates moving the proposed standards to initial ballot in December 2011. The Version 5 standards accomplish several key goals:

- The proposed standards will address the remaining FERC directives, approved interpretations, and existing Compliance Application Notices (CANs);
- They transition the concepts of "Critical Asset" and "Critical Cyber Asset" to a high, medium, and low impact classification system for requirement applicability;
- They provide guidance and context for each requirement, and leverage current stakeholder investment used for complying with existing standards; and
- They develop requirements that foster a "culture of security" to improve reliability.

The policy question for consideration is what the process should be when approved actions have been over taken by other events.

f. Policy Discussion on Reliability Standards Development Plan (RSDP) Long-term Adjustments

This year, the process for developing the RSDP considered areas not explicitly accounted for in the past. The SC considered the NERC President's Top Priority Issues for Bulk Power System Reliability and used them to help prioritize work, which the SC used to allocate resources to work on projects related to reliability, time-sensitivity, and practicality. However, the plan does not sufficiently consider the most current changes to the long-term strategic direction of the ERO. For example, although there are efforts underway to examine specific topics related to High-Impact/Low Frequency events, the plan does not include any significant note of this effort. Similarly, the plan does not include a project to address the cold weather issues related to the Texas event, although analysis of that need is ongoing.

Accordingly, there is likely to be a need to make adjustments in the 2012-2014 RSDP to address these shortcomings. The SC may need to defer some of the projects slated for initiation in 2012 to address these strategic priority areas.

Regarding longer-term solutions to this disconnect between planning efforts and being able to react to changing needs, there will need to be some more specific actions taken, such as:

- More coordination will be needed during the development of the RSDP with the strategic leadership of the Board and the ERO;
- Beginning the planning process earlier, to ensure all aspects are considered in the planning cycle;
- Building the plan to recognize the dynamic nature of our priorities and ensuring the plan can easily accommodate change, and that the plan treats such change as an expectation, rather than an exception; and
- Integrate the emerging issues process from the Reliability Assessment and Performance Analysis activities under the Planning Committee with the Standards development process.

If Trustees have questions or need additional information, they may contact Herb Schrayshuen at herb.schrayshuen@nerc.net.

Agenda Item 3
SOTC Meeting
November 3, 2011

Standards Written Report

a. Status report looking ahead (interpretations and standards)
b. Regional report and work plan
c. Update on identifying a list of all outstanding directives

a. Status Report Looking Ahead (Interpretations and Standards)

i. Standards

Project forecast to require special Board of Trustees meeting for action in January 2012

- 2010-17 Definition of BES (partial; remainder Q2 2013)

Project forecast for action at the February 2012 Board of Trustees meeting

- 2007-03 Real-time Operations

Projects forecast for action at the May 2012 Board of Trustees meeting

- 2009-01 Disturbance and Sabotage Reporting
- 2006-06 Reliability Coordination (remainder)
- 2007-12 Frequency Response

Projects forecast for action at the August 2012 Board of Trustees meeting

- 2007-09 Generator Verification (partial; remainder February 2013)
- 2007-17 Protection System Maintenance and Testing
- 2008-06 Cyber Security Order 706

Projects forecast for action at the November 2012 Board of Trustees meeting

- 2010-14.1 Phase 1 of Balancing Authority Reliability-Based Controls: Reserves
- 2010-07 Generator Requirements at the Transmission Interface (possibly partial)
- 2010-05.1 Phase 1 of Protection Systems: Misoperations

ii. Interpretations

Two interpretations are expected to require action at the February 2012 Board of Trustees meeting, including one CIP interpretation. In addition, a pilot effort to address a request for interpretation through a rapid revision of the standard may be ready for Board action in February.

b. Regional Report and Work Plan

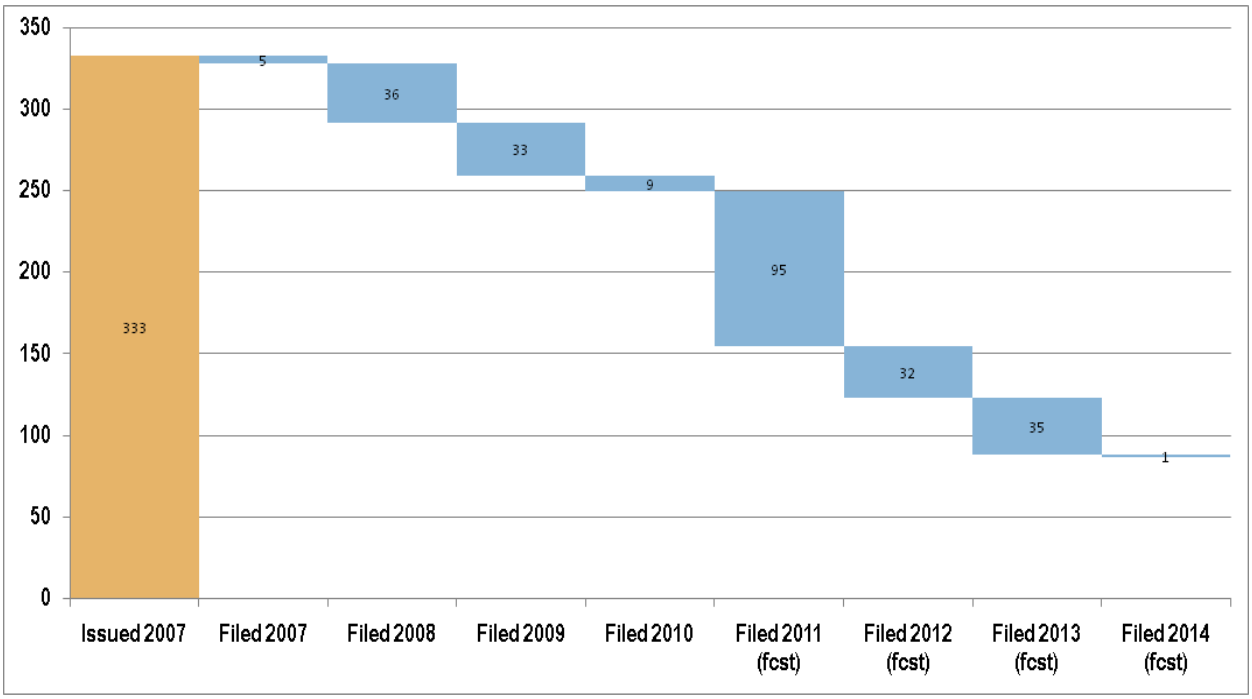
Please see the attachment.

c. Update on Identifying a List of All Outstanding Directives

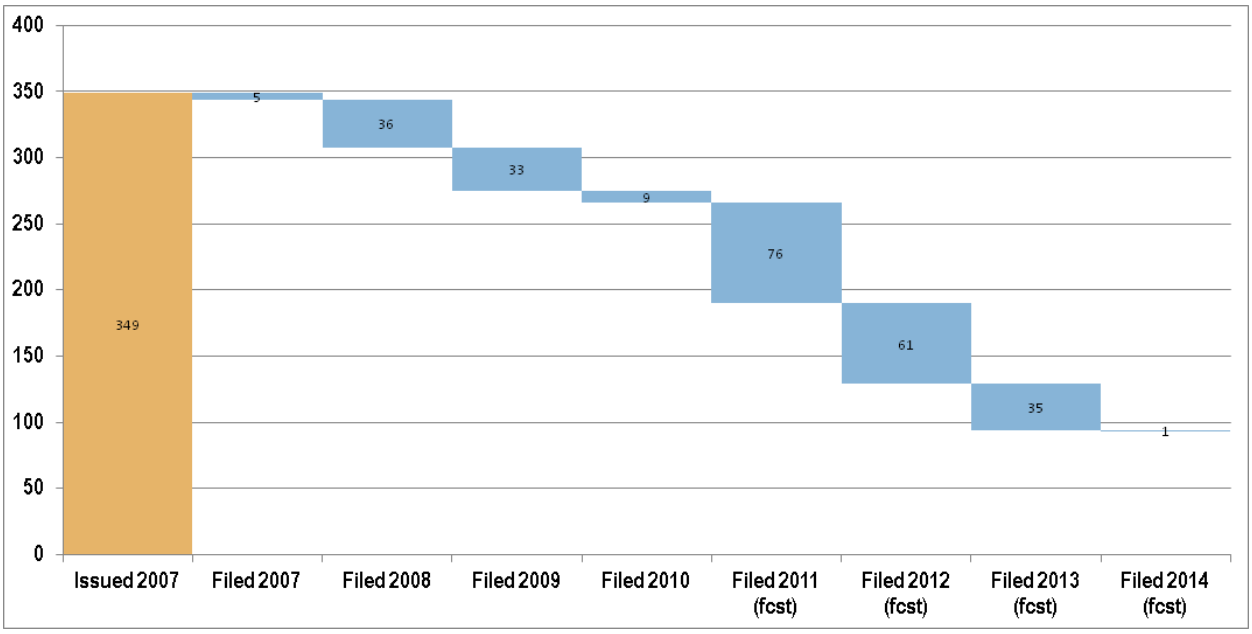
The Standards staff continues to coordinate with FERC staff on identification of FERC regulatory directives focused on standards development. On July 26, 2011 NERC submitted a report to FERC summarizing the progress made, and plans for addressing the standards-related directives received from applicable ERO governmental authorities.

The following charts summarize the progress on standards-related directives since the last report to the Standards Oversight and Technology Committee.

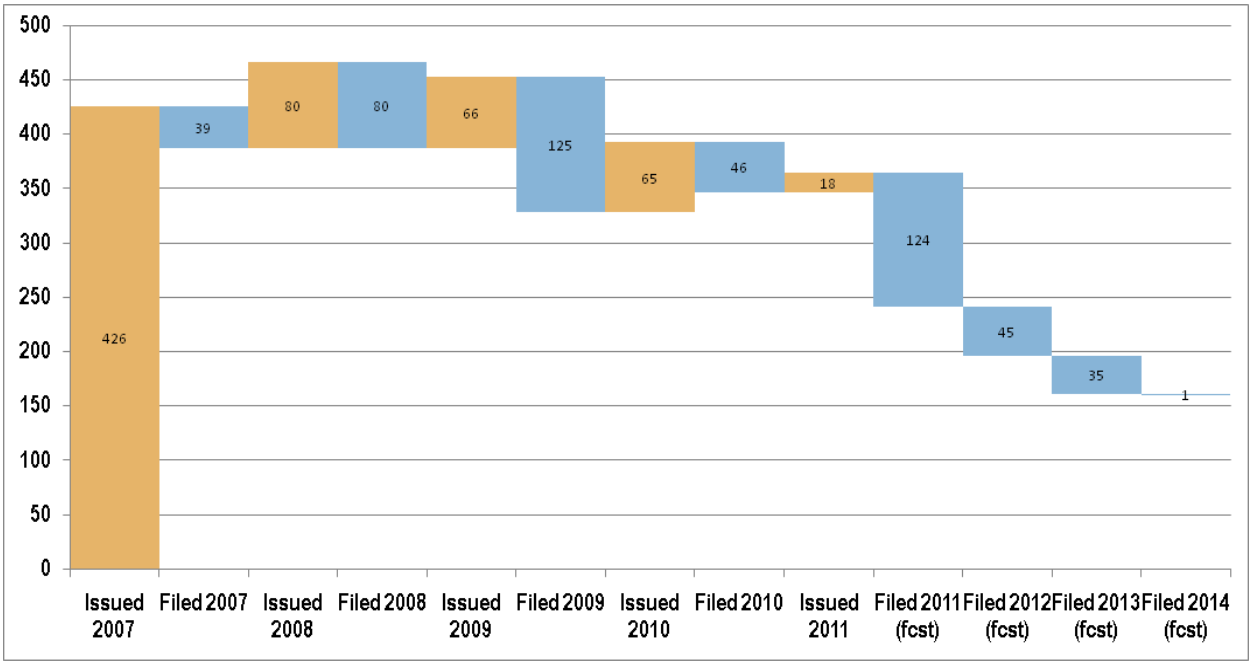
Previous 693 Directives Analysis
(as of July 7, 2011)



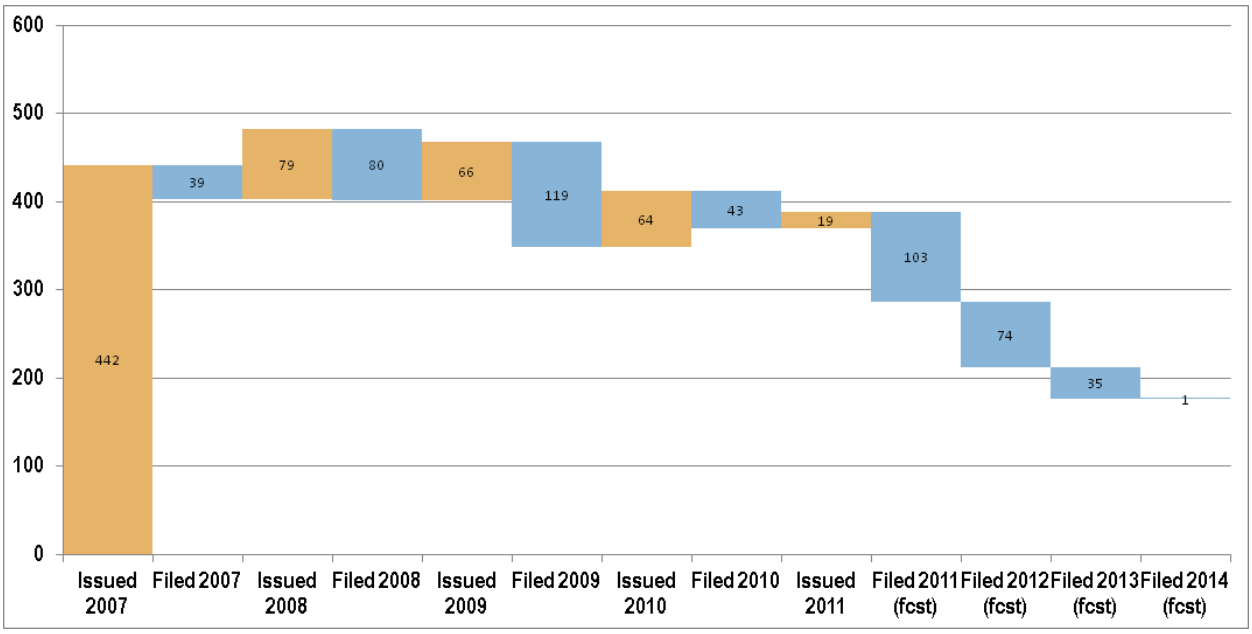
Current 693 Directives Analysis
(as of October 3, 2011)



Previous "All Directives" Analysis
(as of July 7, 2011)



Current "All Directives" Analysis
(as of October 3, 2011)



Comparison of Directives Analysis

693 Directives	Iss. '07	Filed '07	Filed '08	Filed '09	Filed'10	Filed '11 (fcst)	Filed '12 (fcst)	Filed '13 (fcst)	Total Remain
Previous Estimate	333	5	36	33	9	95	32	35	88
Current Estimate	349	5	36	33	9	76	61	35	94
Difference	16	0	0	0	0	-19	29	0	6

All Directives	Iss. '07	Filed '07	Iss. '08	Filed '08	Iss. '09	Filed '09	Iss '10	Filed'10	Iss '11	Filed '11 (fcst)	Filed '12 (fcst)	Filed '13 (fcst)	Total Remain
Previous Estimate	426	39	80	80	66	125	65	46	18	124	45	35	249
Current Estimate	442	39	79	80	66	119	64	43	19	103	74	35	242
Difference	16	0	-1	0	0	-6	-1	-3	1	-21	29	0	-7

The changes between the two time periods are due primarily to the coordination effort between NERC and FERC staffs focusing on the accuracy of the data and the change in the delivery date for Project 2007-03 Real-time Transmission Operations from 2011 to 2012.

Additional changes to the “directive counts” are expected to continue based on the coordination effort between FERC and NERC staffs until the directives report is prepared the in the first quarter of 2012.

November 2011
Regional Standards Group Report to the SOTC

This report highlights the key activities of NERC and the Regions in support of the RSG charter obligations in the period since January 1, 2011.

The Regional Standards Group (RSG) meets on a monthly basis and has held 10 meetings this year in-person or by phone.

The regions have worked to perform quality reviews, post regional standards to the NERC website, and file regional standards and variances with FERC. As a result of these efforts we report the following:

Regional Standards YTD:

- Regional Standards and Variances filed by NERC with FERC:
  - PRC-002-NPCC-01
  - CIP-001-2a (TRE regional variance to CIP-001 – Sabotage Reporting)
- Regional Standards and Variances approved by Regional Entity Board (not included above) – YTD:
  - MOD-25-RFC-01
  - IRO-006-TRE-01
  - PRC-006-SERC-01

Regional Standards Development Activities and Accomplishments – YTD:

- Seven of the eight regional standards development projects provided milestones for coordination of processing purposes to NERC.
- NERC Regional Standards staff has:
  - prepared a unified schedule for all regional projects in development
  - processed 5 regional postings for comment on behalf of the regions
  - performed 10 Quality Reviews on Regional Standards and Variances
  - attended 12 regional Standards Development team meetings (in-person or by phone) for coordination purposes
  - attended 4 Regional Standard Committee meetings on-site for coordination purposes

- updated the NERC Regional Reliability Standards Under Development webpage
- prepared a white paper on a comparison of regional standards, regional variances, and regional procedures

Other Activities

- NPCC solicited comments on their Cost Effectiveness Analysis Procedure (CEAP)
- SERC has a proposed update of the SERC Regional Standards Development Procedure – to be presented at the February 2012 Board of Trustees meeting
- RFC proposed revised standard development procedures which were approved for filing with FERC by the BOT. Subsequent to BOT approval, RFC requested the filing with FERC be held pending additional changes requested by RFC stakeholders.

Agenda Item 4
SOTC Meeting
November 2, 2011

Standards Committee Report

Since the last Board of Trustees meeting, the Standards Committee (SC) has met by conference call on August 11 and September 8 and met in person on October 12-13, 2011. SC meeting agendas and minutes are posted at: http://www.nerc.com/filez/scmin.html

This report outlines major ongoing activities and policy issues under consideration by the SC and its subcommittees that may be of interest to the Standards Oversight and Technology Committee.

Reliability Standards Development Plan 2012-2014
The SC worked with NERC staff to develop and solicit industry support for the Reliability Standards Development Plan 2012-14 (RSDP) that is scheduled for Board of Trustees approval at the November 2011 Board of Trustees meeting. The following are several elements of the RSDP that are worthy of note:

- The SC used a new standards prioritization tool that provides for scoring of projects based on reliability benefits (*e.g.*, the project addresses NERC strategic priorities, fills a reliability gap or improves upon existing standards), cost considerations, time sensitivity (regulatory deadlines or ANSI review) and practical considerations (addresses compliance issues or stakeholder concerns).
- The SC has for the first time introduced consideration of the cost of implementation and administration into the prioritization process. These metrics may require significant future work to ensure that the metrics give costs appropriate consideration. Projects have been grouped into three development branches, based on reliability benefits, time sensitivity, and practicality, to ensure a balanced NERC standards development program.
- A number of projects targeted for development beginning in late 2012 and throughout 2013 will require research and industry outreach to ensure that the technical foundation for standard development has been completed before active standard development is initiated. The SC will work closely with the NERC Operating and Planning Committees on this issue.
- Regulatory orders, such as the orders issued and rulemakings initiated at the September 15 FERC Open Meeting, may have a significant impact on the priority and sequencing of projects within the RSDP. Similarly, new technical reports and insights may lead to mid-course corrections. However, the SC does not expect to put ongoing projects on hold in 2012.

Interpretations and Compliance Application Notices
The SC has expressed concerns about conflicting outcomes and duplication of effort between the formal standard interpretations developed under the *NERC Standard Processes Manual* and Section 300 of the NERC Rules of Procedure, compared to the Compliance Application Notice (CAN) process administered by the NERC Compliance Operations department. The NERC SC Chair has requested and the Standards Committee has agreed to await NERC staff consideration of stakeholder comments on the revised CAN process document as well as a number of CANs that have been posted for industry comment before raising these concerns again. Nonetheless, a number of SC members have significant concerns that may not be alleviated by revisions to the CAN process and the issuance of revised CANs. The SC Chair continues to believe a single NERC portal for industry requests for formal interpretations, informal interpretations and a range of compliance and enforcement guidance is needed.

Rapid Revision of Standards in Lieu of Interpretations
The SC is field-testing a process whereby a simple request for an interpretation could be addressed through a permanent revision to the standard. As envisioned, the process is consistent with the approved *NERC Standard Processes Manual*. If an interpretation drafting team identifies simple, straightforward modifications to a standard that can more effectively address an interpretation request than an interpretation, the drafting team may elect to develop the proposed changes to the standard and submit them with an associated SAR. Following SC review, the changes may move directly to comment and ballot. If minor changes are needed, the drafting team will make those changes and attempt to move the change through the standards process. However, if major changes are needed to reach consensus, the SC may decide to move the project out of Rapid Revision into the normal standard development process. A field test using a request for an interpretation of MOD-028-1 – Area Interchange Methodology is underway. The results of this field test will be used to analyze the use of the Rapid Revision process as an alternative to some requests for interpretation.

Process and Quality Innovations: Learning from Experience
The SC held an informal SDT Leadership Workshop prior to the SC's October 2011 meeting in Atlanta, to provide drafting team leaders with an opportunity to meet with members of the SC and have a candid exchange of thoughts and ideas about how to improve upon the NERC standards program, now and in the future. The following is a list of some the issues discussed:

- Clarification on the drafting team's obligations to address comments submitted by NERC staff, the Board of Trustees, or the Member Representatives Committee either during formal comment periods or informally.
- Experience with Rapid Development "field test."
- Opportunities to use technical writers and attorneys earlier in the standard development process than during formal quality reviews.
- Opportunities to review and improve the quality review process.
- Need for administrative support for inactive (future) projects, e.g., setting up meetings, helping with informal postings, etc.

- Dealing with stakeholder concerns about how a standard will affect compliance rather than focusing on the reliability implications.
- Need for periodic updates/communication to drafting teams to provide status so teams are aware of when their projects will move forward in the standard development process.
- Maintenance of drafting team membership through the life cycle of a project.
- Need for improved processes for collecting and assembling comments submitted on proposed standards.

Modification to the Standards Process to Allow Waiver of Process Steps for Good Cause Shown

From time to time, the SC faces an issue unanticipated in the processes established in the Standard Processes Manual. For example, such a dilemma occurred when the drafting team that developed PRC-005 – Protection System Maintenance asked the SC to allow the team to repeat the recirculation ballot. The Standard Processes Manual does not address this situation, and SC members felt obligated to uphold the processes as outlined in the manual, which require that when a ballot of a standard fails, if the drafting team wants to continue with the project, it must return to the initial stage of the standards process. The SC may explore options to modify the standard process to provide more flexibility so that the SC has authority to approve a wider range of variations to the process, provided the variations approved still support ANSI principles that the standards process is open, transparent, builds consensus, provides for a fair balance of interests, ensures due process, and is timely.

Agenda Item 5
SOTC Meeting
November 2, 2011

North American SynchroPhasor Initiative and Technology Development

Action
None

Background
In 2008, NERC's Board of Trustees approved a $6.5M, five-year project to support the North American SynchronPhasor Initiative (NASPI) and technology development through the Grid Protection Alliance (GPA). The NERC NASPI project was created, in part, for NERC to take on funding of TVA's funding of the Eastern Interconnection (EI) phasor data hub. Both activities represent a collaborative effort between the U.S. Department of Energy, NERC, and North American electric utilities, vendors, consultants, federal and private researchers and academics. The project, as initially envisioned, would expedite the development and deployment of synchrophasor technology to enhance grid security and reliability. The original project objectives were to:

- Develop advanced applications for phasor data;
- Support the TVA SuperPDC and the use of phasor data for wide-area situational awareness across the Eastern Interconnection; and
- Identify, document, and share information on the business case value of synchrophasor systems for reliability coordinators, balancing authorities, and transmission operators.

NERC has provided direction and funding by support to two specific ongoing efforts:

- NERC's project management and meeting funding supports three meetings per year of industry experts to share and advance the deployment of synchrophasor technology and expedite phasor data applications to maintain bulk electric system reliability. The mission of the North American SynchroPhasor Initiative is to improve power system reliability and visibility through wide area measurement and control, which NASPI achieves through issue identification, information sharing, and coordination of expert resources and efforts.
- Given federal Smart Grid Investment Grants (SGIG) funding for phasor measurement units (PMU) and communications system deployment and phasor data applications development, NERC's funding with GPA, leveraged with the U.S. Department of Energy, has been focused on building software tools to facilitate data exchange between PMUs and phasor data concentrators (PDCs) with enhanced security and performance. GPA's mission is to improve the reliability and resiliency of the electric grid.

NERC's 2011 budget allocated $1M for GPA activities and $150k for NASPI project management, with additional costs for meetings. GPA leverages NERC's funds with DOE investments, while NASPI offsets all of its meeting costs for 2011 with over $100,000 in attendee meeting registration fees and over $30,000 in vendor sponsorships for NASPI meetings.

The goal of the discussions at the Standards Oversight and Technology Committee meeting will be to provide a status report of both NASPI and GPA activities and preview upcoming deliverables in 2012:

- Alison Silverstein, NASPI project manager, will review NASPI's recent accomplishments, outline plans for 2012, and outline the NERC-DOE plan to mainstream NASPI community activities over the next three years.
- Russell Robertson, GPA director, will review GPA's recent deliverables and accomplishments and outline GPA's plans and major work products for the coming year.

Synchrophasor Project Update

Grid Protection Alliance

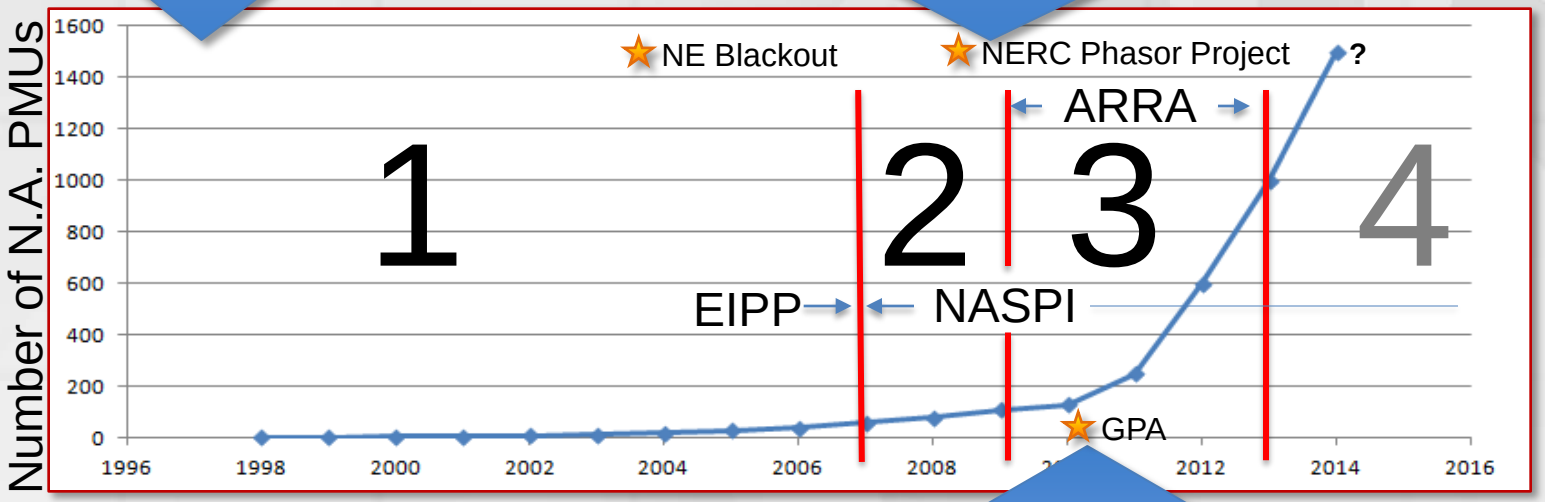
November 2, 2011

GRID PROTECTION ALLIANCE

Synchrophasor Epochs

- Academic leadership
- Small group of innovators (BPA, TVA)

- Slow phasor measurement unit (PMU) growth
- R&D driven innovation
- North American Synchro Phasor Initiative (NASPI) seeks consensus solutions
- NASPInet is the hot topic



PMU Numbers Representative

- Smart Grid Investment Grant (SGIG) -- $300M phasor investment
- Individual project driven solutions
- More capable vendor support

GRID PROTECTION ALLIANCE

Grid Protection Alliance

GPA is a not-for-profit company that builds collaborative efforts among government, regulators, vendors, grid owners and grid operators.

- **Mission** – to improve the reliability and resiliency of the electric grid

- **Purpose** – to advance the technology of the electric grid by providing services and systems that create lasting value for electric energy producers, transmission & distribution companies, and consumers.

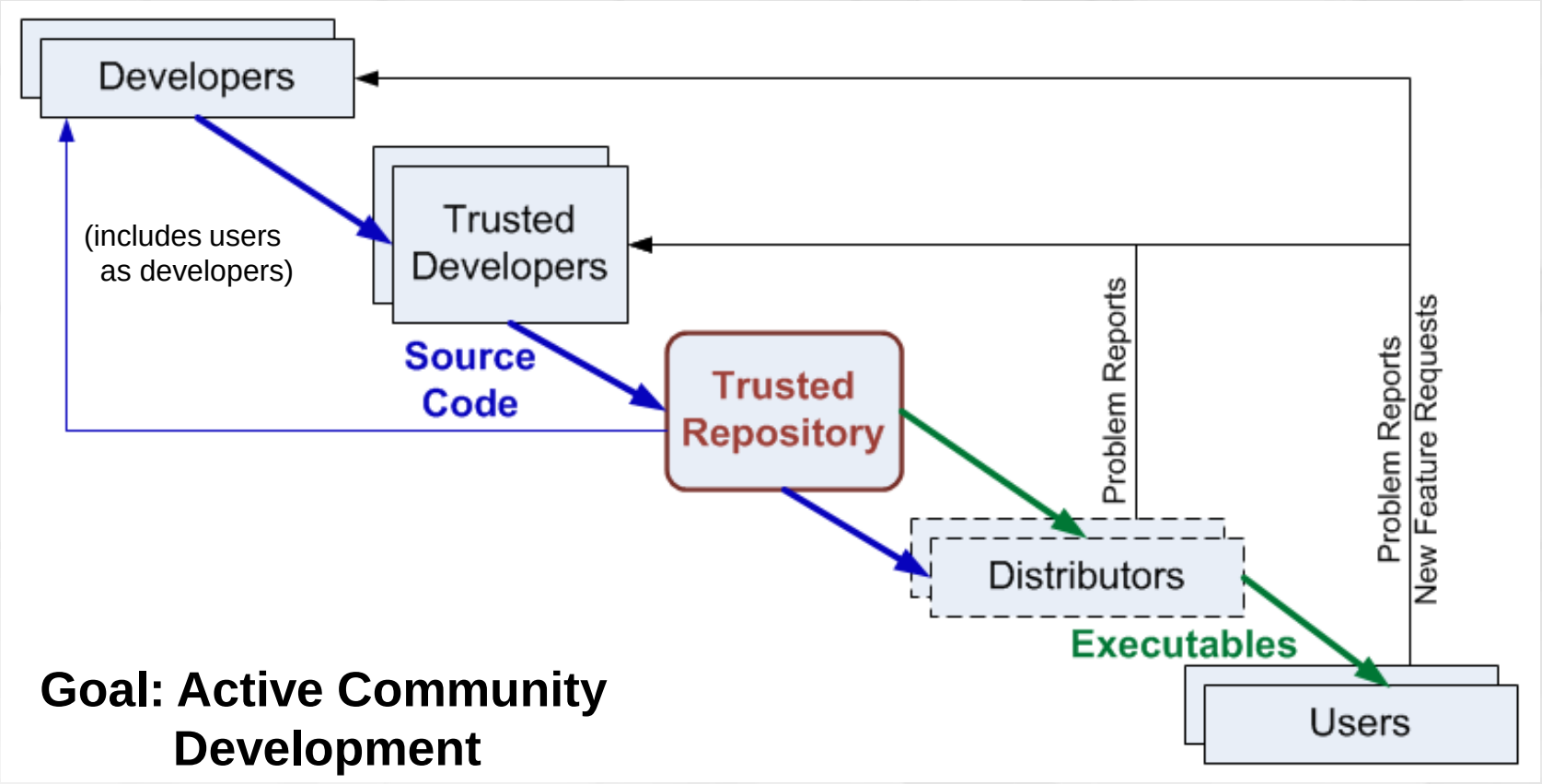
GRID PROTECTION ALLIANCE

Why open source …

- Best way to accelerate innovation in phasor measurement systems
- Increases quality and puts “many eyes” to work to improve security
- Provides assurance that client investments are not encumbered with “vendor lock in”
- Provides a direct path to commercialization

GRID PROTECTION ALLIANCE

Open Source Software (OSS) Development Model

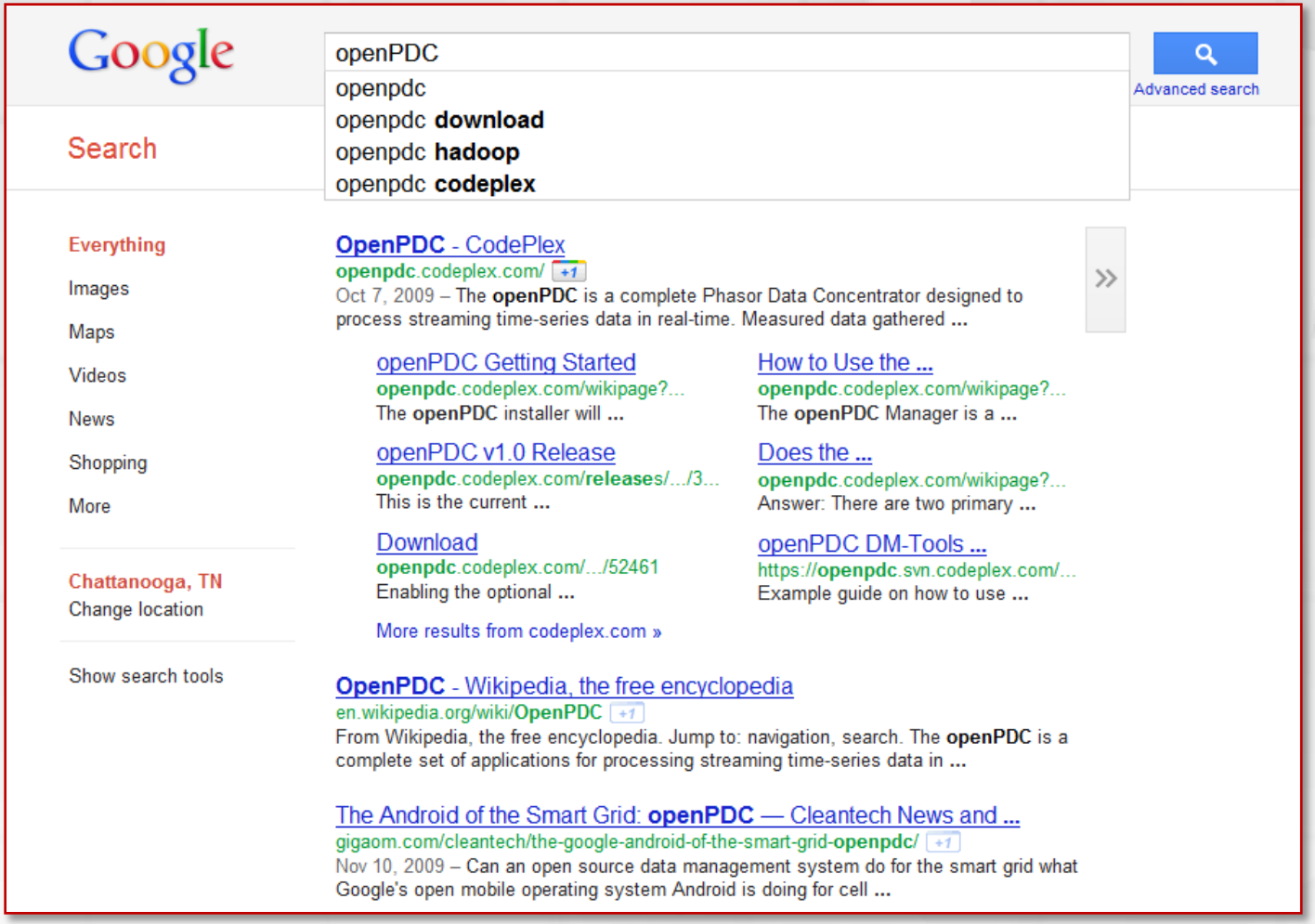


From David A. Wheeler Presentation, 11/4/2009

GRID PROTECTION ALLIANCE

openPDC

Open Source Phasor Data Concentrator



GRID PROTECTION ALLIANCE

openPDC

Open Source Phasor Data Concentrator

openPDC GRID PROTECTION ALLIANCE

Register | Sign In | CodePlex Home

CodePlex Open Source Community

Search all CodePlex projects [Search]

Home | Downloads | Documentation | Discussions | Issue Tracker | Source Code | People | License | RSS

View All Comments | Print View | Page Info | Change History (all pages)

Search Wiki & Documentation

Home

Quick Links

News -- About the openPDC -- Commercial Extensions -- Community Involvement -- Code Blog -- Nightly Builds -- Attributions

The openPDC is a complete Phasor Data Concentrator software system designed to process streaming time-series data in real-time. Measured data gathered with GPS-time from many hundreds of input sources is time-sorted and provided to user defined actions as well as to custom outputs for archival.

News

July 18, 2011 Please join us for the Inaugural Grid Protection Alliance User's Forum for the Time Series Framework and openPDC to be held in the Georgia Power Building in Atlanta, GA on September 7, 2011. If you can come out a day early, on September 6 we will hold a Time-

40 people are following this project (follow)

Download

CURRENT	openPDC v1.4 SP1 Release
DATE	Mon May 2 2011 at 7:00 AM
STATUS	Stable
RATING	No Ratings
	1116 downloads
MORE	View all downloads

Join Us

Project is open to developers looking to contribute n-unit tests, bug fixes, power system calculators and new adapters for systems integration.

Sign in to join this project.

Activity 7 30 All days

Page Views	1646

GRID PROTECTION ALLIANCE

openPDC

Open Source Phasor Data Concentrator

GRID PROTECTION ALLIANCE

Among the openPDC users are …

- MISO
- Entergy
- Southern Company
- TVA
- OG&E
- Duke Energy
- FP&L
- BPA

- WECC
- PG&E
- ISO-NE
  - Central Maine Power
  - Bangor Hydro
  - Northeast Utilities
  - NSTAR
  - VELCO
  - United Illuminating

- <u>Under Consideration</u>
  - Dominion
  - PacifiCorp
  - Idaho Power
  - BC Hydro
  - Manitoba Hydro

GRID PROTECTION ALLIANCE

openPG

Open Source Phasor Gateway

Business Case for the Open Phasor Gateway

openPG GRID PROTECTION ALLIANCE

The openPG provides required security isolation as it reduces operational costs

Application Profile
The openPG is a back office system that is used to securely send and receive high sample rate synchrophasor data with owners of other openPGs.

Hardware
The openPG executes on standard server hardware. As a massively threaded application, it effectively utilizes all CPU resources presented to it. A production openPG is not intended for implementation in a virtualized environment.

Required OS and Services
The openPG is a Microsoft .net application and is intended for deployment using Windows Server 2005 or 2008. However, the openPG will run under other Windows operating systems.

Business Needs

Recent growth in the amount of phasor information and the need to share it among grid operators is a call for an appliance that:

- Creates a hardened security buffer between critical internal and external systems.
- Provides high-quality encryption to protect the confidentiality of reliability and market sensitive BES data.
- Facilitates and reduces the cost of phasor data exchange.

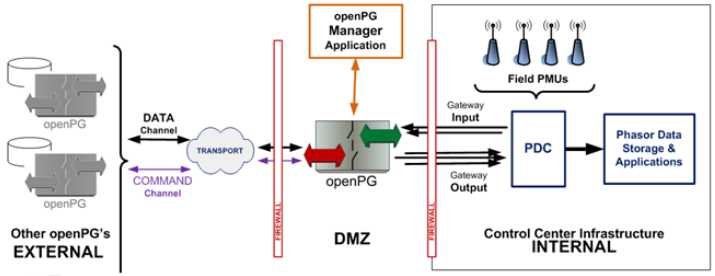
This need was anticipated by DOE in 2008 as they funded the development of the NASPInet technical specification. This specification called for an appliance named the phasor data gateway. The openPG is an implementation of this gateway for real-time phasor data exchange.

openPG Overview

The Phasor Gateway provides an easy-to-configure interface to other phasor information systems. Development of the openPG has been funded by NERC.

The openPG:

- Only exchanges data with other openPGs where a trusted union has been established.
- Automatically discovers the phasor measurements that have been made available by other openPGs and allows the selective subscription to these measurement points.
- Provides tools for administrators to limit the phasor data that is available for subscription by a specific openPG.
- Supports strong encryption of the data exchanged between gateways.



GRID PROTECTION ALLIANCE

Business Case for the openPG

openPG GRID PROTECTION ALLIANCE

Benefits

Using the openPG rather than standard protocols, such as IEEE C37.118, has the advantage of:

- Improving security and reducing bandwidth by only exchanging the measurement points that are needed.
- Simplified configuration management through automated metadata exchange and ability to easily rename imported data points.
- Reduced latency for most phasor data since the concentration step of a PDC is not required.
- Scalability and extensibility.

Compliance Assurance. As a security device, the openPG is intended to be installed at the edge of a security perimeter, and its functionality is purposely limited to secure communication with other openPGs. The openPG provides:

- **NERC Data Sharing** — The openPG promotes BES reliability improvement by providing an easy and secure way to exchange phasor data with others — as an ICCP node does today. Phasor data exchange can only occur between pairs of gateways that have established trusted unions.
- **Change Testing** — The openPG improves change resiliency and provides the tools for operation staff to quickly validate phasor information system changes.
- **Change Logging** — To meet CIP requirements all configuration changes to the openPG are logged.
- **Operations Logging** — The openPG includes an operational log historian that records a collection of key gateway operating statistics every 10 seconds.
- **Access Control** — Administrator access credentials can be maintained in external systems, such as MS Active Directory, or can be stored locally in encrypted configuration files.
- **System Currency** — The openPG is easy to test, update and patch as new versions are released.

Data Confidentiality. The openPG utilizes best practice encryption with frequent key change to provide the highest levels of data confidentiality.

Configuration Flexibility and Efficiency. The openPG reduces costs by making phasor data exchange easy to manage.

- **Exchange of Gateway Meta Data** — The openPG sends its configuration information to other trusted openPG's on request. Measurements are assigned a Globally Unique Identifier (GUID) so that the common name to reference the point can be changed as needed by each gateway user. This feature allows the gateway to assign or update names to points sent or received without impacting gateway operator or downstream applications.
- **Quick Additions of New Points** — Each sending gateway provides a list of available points to other openPGs. Selecting a new point for subscription just requires a few mouse clicks..
- **Configuration Alignment** — The ability to dynamically update configuration information results in faster, lower cost openPG operation. As an openPG owner makes changes to measurement metadata, these changes are made known to all other connected gateways.
- **Data Transfer Efficiency** — Data is transferred among gateways on a point-by-point basis with each point transferred requiring only 9 bytes through use of GPA's Gateway Exchange Protocol.
- **Open Source Reduces Total Cost** — Redistribution and modifications of the openPG are allowed without royalties or licensing costs. Thorough community review lowers risk and improves quality. The openPG is released under the Eclipse Public License.

Low Latency. The openPG can receive multiple input data streams and forward this phasor data to the specified gateways without the need for data concentration delays.

High Availability. The openPG is designed to be deployed as a service within a clustered server environment.

High Quality Solution. The openPG is an object oriented system that is open source with many eyes on code quality.

System Integration. The openPG is designed to leverage the full suite of input and output adapters developed for the openPDC. As support for new protocols are developed for the openPDC, these improvements will dynamically be available to the openPG as well.

Future Proofing. As an open source product, there is no vendor lock-in with the openPG. Any open source community improvements to GPA's time series library are seamlessly incorporated into new openPG releases.

The openPG is available for download at: http://openPG.codeplex.com

- **An edge device for the security perimeter**
- **Lowers the cost of configuration management**

DOE Project -- SIEGate

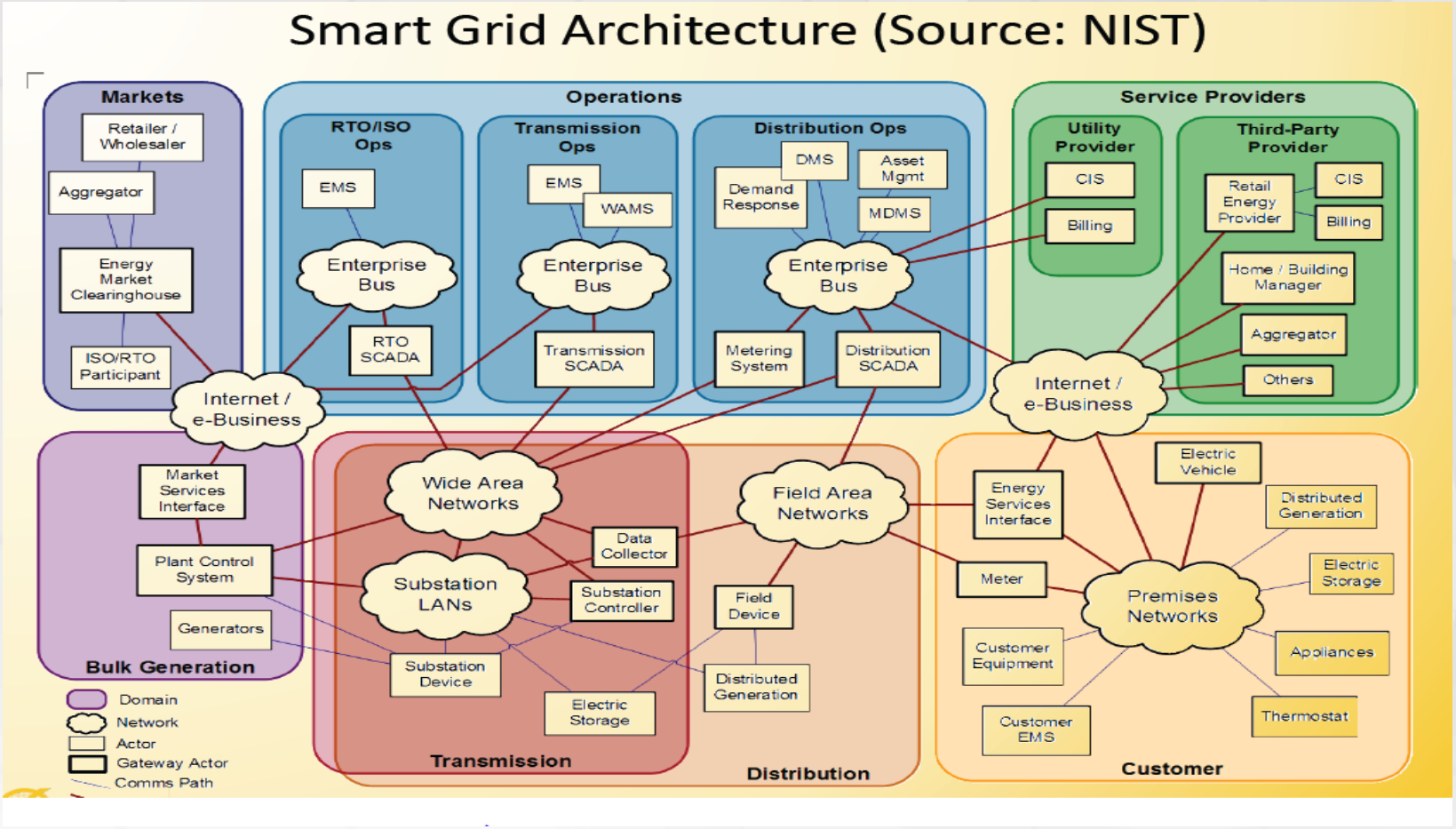
Secure Information Exchange for Grid Operations

A generalized, security hardened appliance for the exchange of real-time grid operating information.

- Open source
- Productized by Alstom
- Security tested by PNNL
- Demonstrated by PJM
- NERC provides cost share via NASPI project

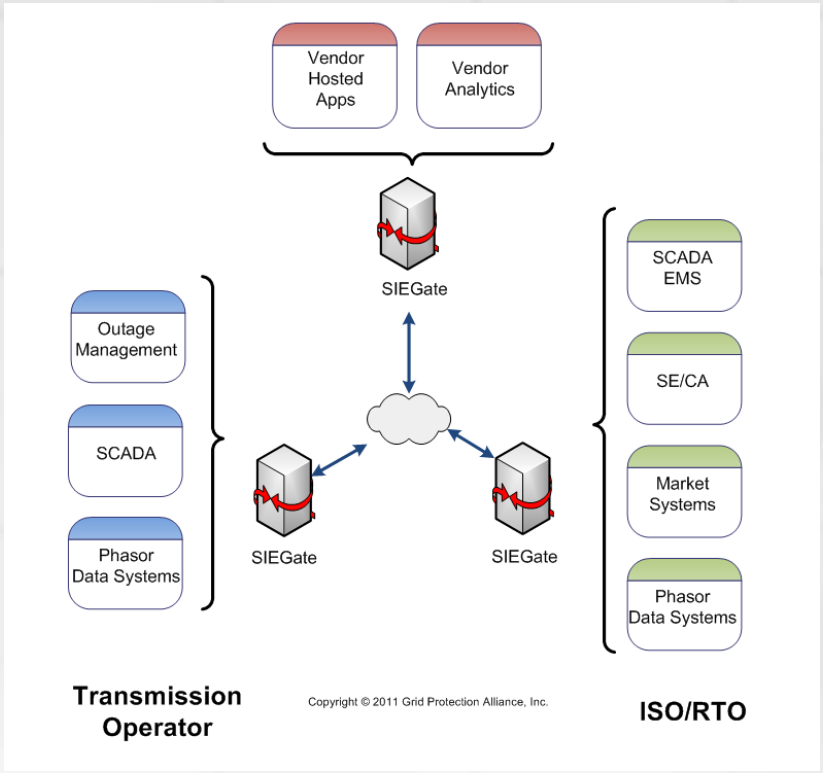
GRID PROTECTION ALLIANCE

Current State of BES Data Exchange is Complex



GRID PROTECTION ALLIANCE

SIEGate Secures and Simplifies



- Support for Multiple Data Types
  - Periodic Real-Time (e.g., SCADA & Phasor)
  - Alarms
  - Files (e.g., SDX & Disturbance Data)
- Focus on ease of configuration and use
- Full software stack security

GRID PROTECTION ALLIANCE

TVA Support

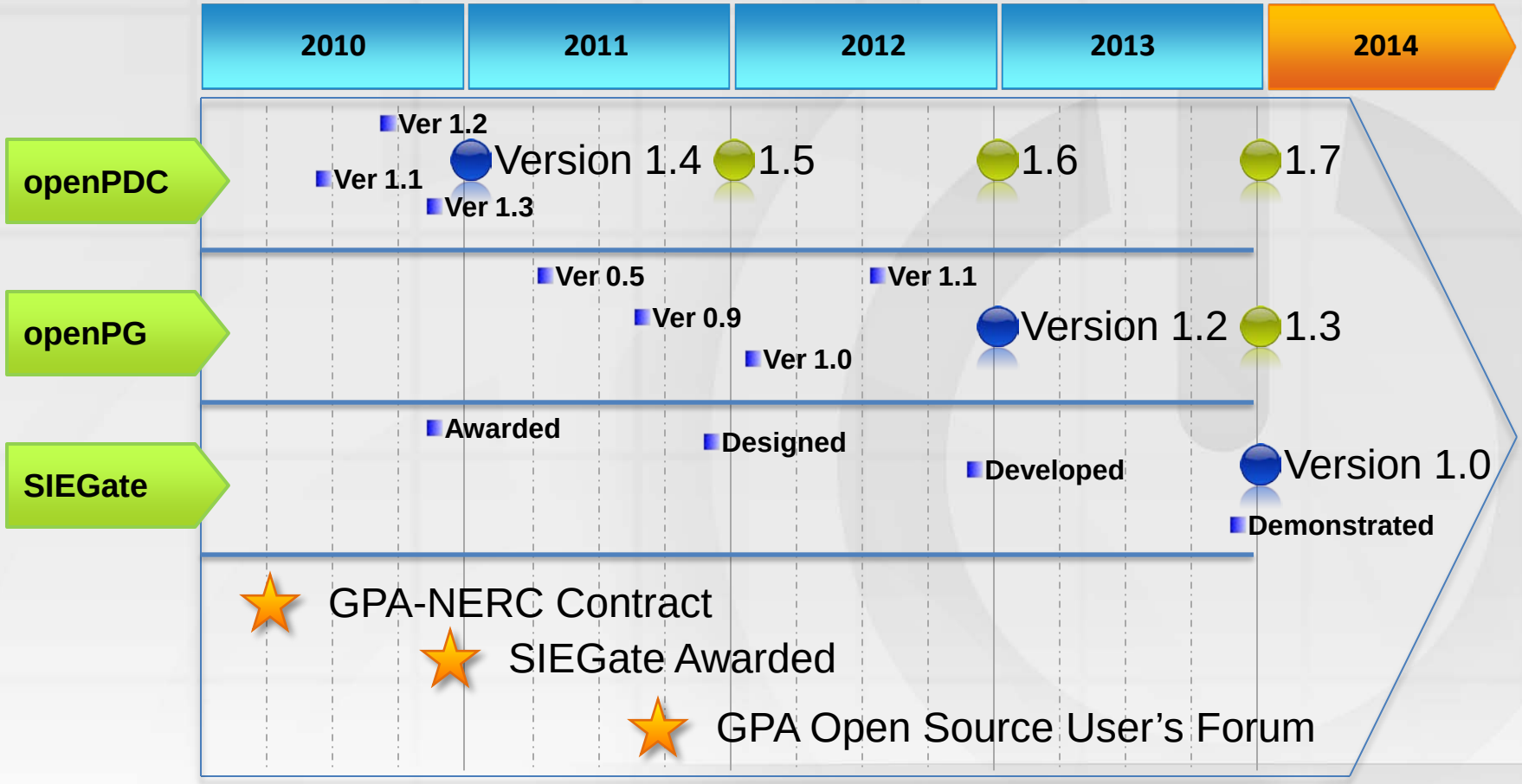
- TVA providing EI-wide phasor data storage until other phasor data hubs are operational
- 120 PMUs connected but data availability is volatile.
  - From day-to-day the number of PMUs transferring data to the concentrator can range from 30% to 70%
- Over 30 TB of saved phasor data
- Real-time data exported to Entergy, MISO and WECC (for testing)

GRID PROTECTION ALLIANCE

GPA 2012 Work Plan

- Security test and improve the openPG
- openPG demonstration:
  - Data Exchange Working Group (DEWG)
  - SGIG winners
- Develop SIEGate
- Support NASPI and NERC
- Support TVA Phasor Data Concentrator

GPA Product Timeline



= NERC Supported

GRID PROTECTION ALLIANCE

NASPI Project Budget and Costs

- Approved in July 2008 as a 5-Year ~$6.5M Project, about $4M for TVA, and later GPA

	NERC Budget Year					
Approved Budget	2009	2010	2011	2012	2013	Total
	$ 698,000	$ 1,075,000	$ 996,000	$ 863,000	$ 476,000	$ 4,108,000

	Actual	*Acutal*	*Planned*	*Budgeted*	*Estimated*	
Costs	2009	2010	2011	2012	2013	Total
GPA		$ 808,405	$ 780,000	$ 660,000	$ 400,000	$ 3,212,821
TVA	$ 368,282	$ 83,486	$ 72,648	$ 40,000	$ -	$ 564,416
Total	**$ 368,282**	**$ 891,891**	**$ 852,648**	**$ 700,000**	**$ 400,000**	**$ 3,777,237**

GRID PROTECTION ALLIANCE

NASPI Status Report Accomplishments and Plans

Alison Silverstein, Project Manager
North American SynchroPhasor Initiative

NERC Board of Trustees
Standards Oversight & Technology Committee

November 2, 2011

NASPI background

- Voluntary collaboration between NERC, electric industry and DOE to advance adoption and use of phasor technology for grid reliability and economics
- Collaborative community -- members include utility and RTO/ISO staff, vendors, consultants, national lab staff, academics, students
- Three Work Group meetings a year cover broad themes and updates (SGIG project updates, vendor offerings, international, research)
  - Recent meeting attendance ranges from 170 to 270 people
  - NERC charges registration fees of $200/person ($75/student)
  - Industry sponsorships are bringing in $10k to $25k/meeting
- Five Task Teams (Data & Network Management, Operations, Performance Standards, Planning Initiatives, Research) do most of the real work
- Project manager coordinates meetings, issue identification, articulates strategy, handles outreach to industry and media
- www.naspi.org

PMUs now and later

Early 2011

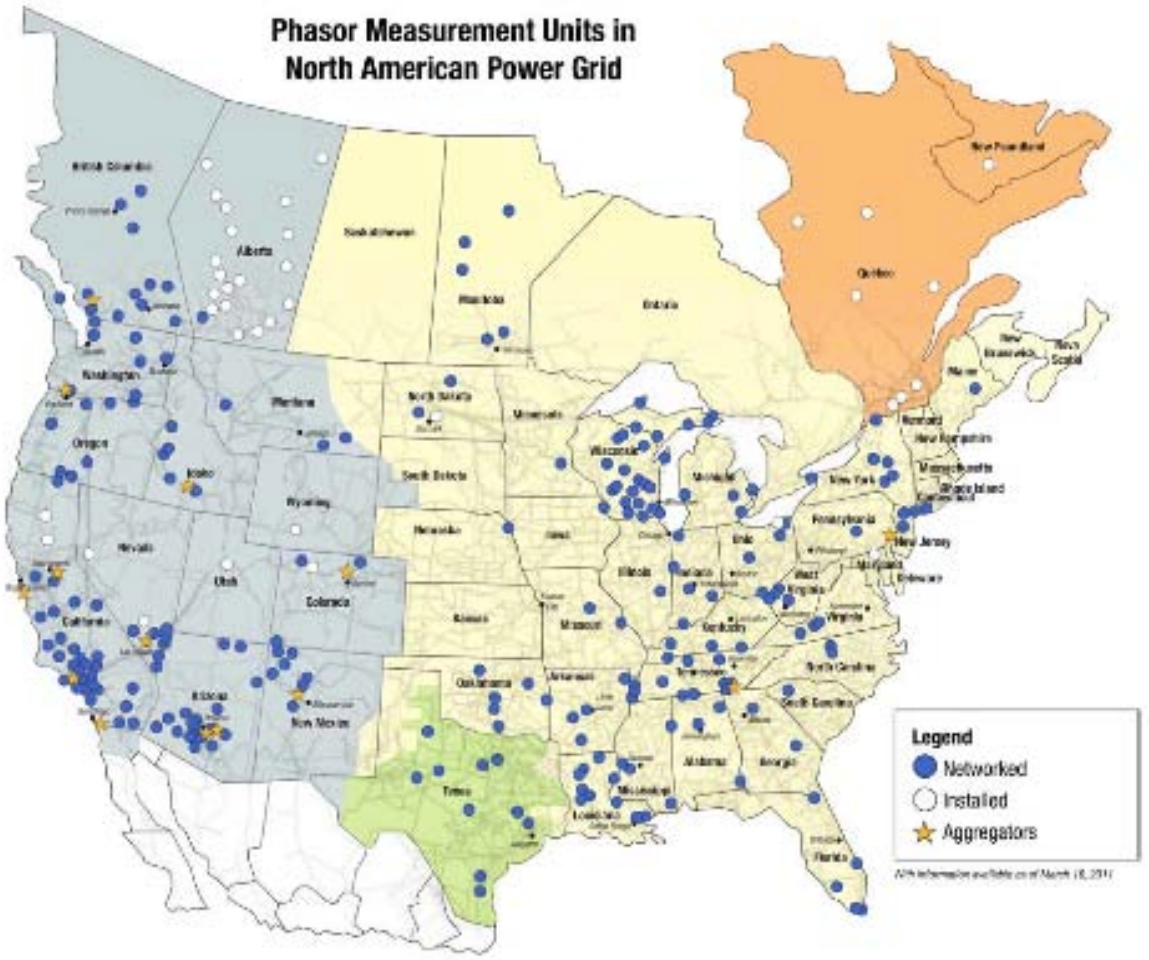
-- about 250 PMUs

End of 2013

-- over 1,000 high-grade PMUs thanks to 10 industry SGIG projects

2015

-- maybe 1,300, then growing again



NASPI

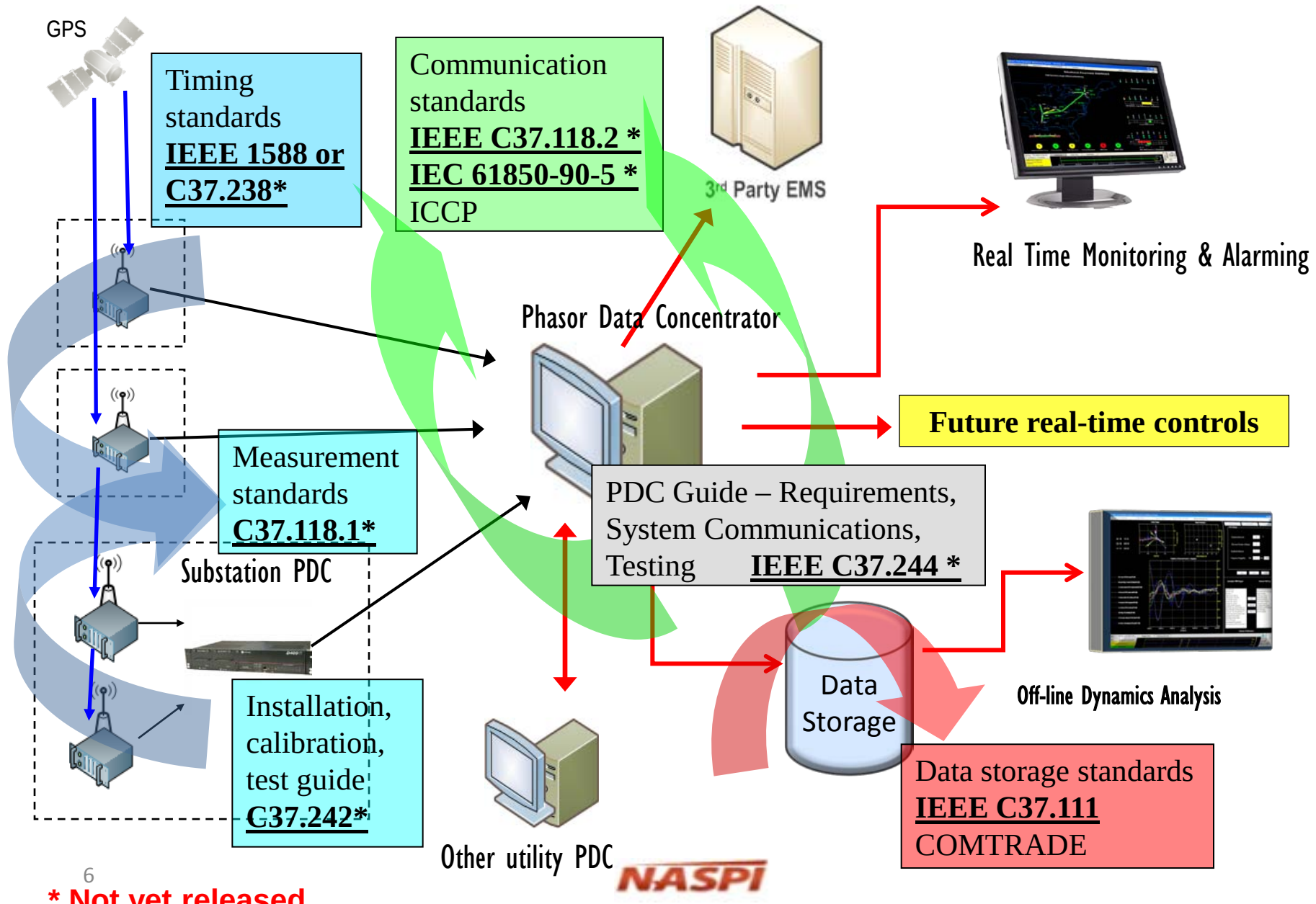
Major NASPI accomplishments

- Prepared NASPInet communications architecture framework for phasor data networks
- Existence of NASPI convinced DOE to dedicate SGIG funds for phasor technology, and NASPI work helped frame project priorities and research tasks
- Helping SGIG award recipients identify project solutions
- Helping vendors identify awardees' needs and drive PMU and PDC product maturity
- Prepared vision and reference documents
  - phasor technology roadmap and strategic plan
  - applications review
  - NASPInet
  - fact sheets
  - RAPIR report
  - presentations for outreach and boilerplate
- Articulating R&D needs (esp baselining and pattern recognition)
- Developed WECC data-sharing agreement

NASPI Accomplishments (2)

- Major role in identifying needs and accelerating development of phasor technology interoperability standards, now working through IEEE and IEC adoption process (see next page)
  - Phasor measurement
  - PMU capabilities and communications, calibration and testing
  - Timing standards
  - PDC guidelines
  - Phasor data storage needs
- Early identification of issues and solution needs
  - Data-sharing for operations and research
  - PMU functionality for SGIG purchase specs
  - PDC performance and data archiving
  - PMU placement guidelines
  - End-to-end interoperability for data and devices
  - Cyber-security for synchrophasor systems
  - PMU or synchrophasor Registry and nomenclature standardization
  - Real-time data quality and availability (problems and causes)
  - GPS availability and trustworthiness
  - Operator training

Phasor Measurement System & Standards



* Not yet released

Current NASPI activities and priorities

- Three meetings each year (10/12-13/11 on SGIG projects; 2/29-3/1/12 on research and training; 6/13-14/12 vendor show and success stories; 10/17-18/12 on SGIG projects) with 170 to 270 attendees per meeting
- Develop new technology roadmap to update RAPIR report (see https://www.naspi.org/site/StaticPDF/resource/rapir_final_20101017.pdf), with summary SGIG project info in NASPI Annual Report to support DOE
- With PMU and PDC functionality settling out, looking at how to ensure high-quality, production-grade performance of the entire synchrophasor system, with high-quality data worth feeding into applications
- Recognize and document applications that offer highest value to industry (requires continued baselining research and data-sharing)
- Identify effective operator and user training methods
- Continue outreach and education on phasor technology to support mainstreaming strategy

Likely synchrophasor applications maturity and adoption sequence

- Forensic uses ready and accepted now
- Planning uses ready next
  - Model validation uses routine today within WECC
  - Planning and other uses require several more years of data collection, baselining analysis, research and tool development
- Real-time operator uses will take longer
  - Wide-area visualization tools are commercially available today but require some time to gain operator familiarity
  - Need better communications systems for fast, high-quality data delivery
  - Need more time for data collection and analysis to inform operator support tools
  - Automated equipment action will come last (e.g., RAS schemes)

What's the future path?

Several questions about institutionalization:

1. how does synchrophasor technology get mainstreamed?
2. how does synchrophasor community get mainstreamed -- what happens to NASPI task teams and functions?
3. in the meantime, what happens to several existing projects?

We have an initial plan for all this so integration is smooth and successful. But the plan will require more industry leadership and evolving NERC support, and the transition cannot be expected to move much faster than the technology's value to the industry.

NASPI Transition Plan -- summary

- Migrate work of Planning and Operations Task Teams into NERC PC and OC
- Migrate work of Data & Network Management Task Team back into industry and to NERC DEWG and CIPC
- Migrate work of Performance Standards Task Team to IEEE, IEC, and PSRC.
- Dial back NERC funding of GPA for infrastructure after 2013 with pick-up by industry and vendors
- Keep NASPI conference and project management function going through 2013 and evaluate continuing need then; maybe migrate role to NATF or ISO-RTO Council?
- Migrate NERC and DOE funding of TVA SuperPDC operation to Eastern Interconnection RCs
- DOE to continue funding some phasor technology R&D; applications development and technology improvements move to industry lead (SGIG awardees and vendors)
- Details in background slides….

NASPI Transition Plan Background

Evolution of NASPI as an organization

- NERC is funding NASPI meetings and project manager now, and expects to do so through at least 2013.
  - NASPI charges attendee registration fees and takes vendor sponsorships for some meeting meals, so meeting costs are break-even
- DOE funds synchrophasor research projects, interoperability standards development, and National Lab staff technical and admin support for NASPI task teams, leadership, and website.
- NASPI is mostly a voluntary community with no formal governance or authority, so members are frustrated when their proposals don't get adopted or enforced.
- All NASPI functions (see later pages) are useful now, but not all need to be continued.
- Industry members would like to see NASPI continue in its current role beyond 2013.

Task Team transition

1. **Planning Implementation Task Team**
   - Coordinating work on modeling, baselining, oscillatory patterns, integrating phasor data into system planning, PMU placement
   - Baselining research supported by DOE through PNNL and EPG
   - Proposed transition path – increase NERC PC focus on synchrophasors, transition PITT functions into appropriate subcommittees of the PC (incl. Stds) with selected research funding from DOE
2. **Operations Implementation Task Team**
   - Working on how to use phasor data in operations (RTDMS and other visualization tools, state estimation, renewables integration, operator training)
   - SuperPDC/RTDMS provision for Eastern Intercon supported by NERC and DOE funds
   - Proposed transition path – increase NERC OC focus on synchrophasors, transition OITT functions into appropriate subcommittees of the OC (incl. Stds), but esp. RCWG, with selected research funding from DOE. However, end NERC and DOE funding for TVA SuperPDC/RTDMS provision (see below)

Task Team transition

3. **Performance Standards Task Team**
   - Developing technical interoperability standards and protocols
   - DOE funding for technical support by EPG and PNNL staff
   - Proposed transition path – DOE funding ends when current IEEE 37.118 and IEC 61850 are adopted. When current wave of standards development is ended, PSTT role moves over to IEC and PSRC.
4. **Data & Network Management Task Team**
   - Working on issues like network architecture, data classes, naming conventions, Registry
   - Limited DOE funding since NASPInet study includes Phasor Gateway testing; NERC funds GPA work on phasor system infrastructure tools (Open PDC, Phasor Gateway)
   - Proposed transition path – some issues move to NERC DEWG, others move to individual industry decisions
5. **Research Initiatives Task Team**
   - Focus is on sharing findings, not research formulation or management
   - Limited DOE funding for meeting support and website
   - Proposed transition path – none needed. DOE will independently continue to fund specific research projects.

NERC- and DOE-funded projects

1. TVA-hosted SuperPDC and RTDMS, supported by GPA (NERC-funded) and EPG (DOE-funded) is the largest budget item.
   - Eastern entities won't need this as the SGIG projects go into operation. TVA-hosted SuperPDC/RTDMS will mostly fill data gaps, but soon it will no longer be needed.
   - Proposed transition milestone – execution of data-sharing agreements among MISO, PJM, NYISO and ISO-NE; maybe also Southern and Entergy. NERC and DOE should support TVA installation no longer than one year past this date, or no later than 2015.
2. Other projects discussed above
3. NASPI Leadership and technical support
   - As NASPI Task Teams evolve (as discussed above), formal support for NASPI (as an organization) by DOE and NERC will wind down -- likely, no later than 2015, when the DOE SGIG project work is completed and results shared with industry.

NASPI functions

FUNCTION	POTENTIAL DESTINATIONS
Convening and conferences • Work Group and Task Team meetings • Networking • Cross-pollination of ideas • Facilitate cooperation (e.g., vendor show, multi-vendor data network demo, SGIG awardee info sharing)	• Absorb TTs into NERC and IEEE ctts (PITT into PC, OITT into OC, DNMTT into DEWG, PSTT into PSRC) • Create another NERC ctt focusing on phasor technology? • Vendor community user groups • Professional society conferences • Private subscription-model trade assn?
Information sharing • Research results • How-to guidance	• PSRC and/or university • Regional planning or operating authorities
Technology advancement • Technical standards and protocol development • Product and concept development (e.g, NASPInet, Registry) • Expedite revelation of buyer needs and vendor capabilities to speed product maturity	• Industry technical groups and standards bodies • Vendors, vendor user groups, consultants
Strategy development • Technology roadmap • Policy issues and positions (data-sharing, cyber-security)	• DOE, CERTS • NERC committees • FERC and state regulators

NASPI functions (2)

FUNCTIONS	POTENTIAL DESTINATIONS
Analysis • Identify timely issues and focus attention on their resolution (e.g., NASPInet, Registry, PMU placement, phasor data quality, PMU capabilities) • Perform research and analysis (e.g., phasor-based reliability tools, GPS vulnerability) • Help DOE identify and document impacts of SGIGs	• DOE and industry members and consultants?
Outreach and communications to key publics • Single point of contact for phasor interests (media inquiries, industry briefings, NARUC) • Prepare resource materials (RAPIR report, fact sheets, powerpoints, upcoming technology roadmap and status report)	• Industry, NERC, DOE
Coordinate activities, policy, effort • Research needs • Consensus view on key ideas and work products • Support DOE and NERC ctts with reports, contacts • Provide leads, contacts, suggestions	• DOE, CERTS • NATF, NERC ctts, ISO-RTO Council

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

ERO Enterprise Solutions Roadmap

Catherine Sills
Manager of ERO Enterprise Projects

November 2, 2011

RELIABILITY | ACCOUNTABILITY




ERO Enterprise Solutions Roadmap

- Regional Entities and NERC agree to adopt the ERO IT Strategy.
- Adoption will drive consistency, efficiency, and performance measurement that should result in higher productivity.
- Considers the areas of governance, process, technology and resources, and comprises approximately 30 guiding principles and recommendations for implementation.

ERO Enterprise Solutions Roadmap

- Governance
  - Collaborative model
  - NERC and Regional EMG – decision authority
  - Establish ERO Project Management Office (PMO) – process, methodology, structure
  - ITSG – advisory role
- Process
  - Define set of common processes
  - Redesign for consistency and standardization
  - Data definition

ERO Enterprise Solutions Roadmap

- Technology
  - Standard security policy
  - Standard data management policy
  - Standard technology footprint
- Resources
  - Develop funding and resource model
  - Dedicated NERC resources

ERO Enterprise Solutions Roadmap

- Next Steps
  - Launch dedicated staff
  - Implement collaborative model
  - Develop 2012/2013 resource and project plan
  - Business process mapping
  - Develop policies

NERC
NORTH AMERICAN ELECTRIC RELIABILITY CORPORATION

IT 90-Day Plan and Roadmap Update

Marvin Santerfeit
Director of Information Technology and Services

November 2, 2011

RELIABILITY | ACCOUNTABILITY




Executive Summary

Landscape

- Multiple Applications
- Inconsistent Process & Controls
- Inexperienced technology staff
- Enterprise responsibility w/o Enterprise authority
- Unknown or undocumented business process
- Limited Analytics or Decision Analysis tools
- Conflicting Responsibilities (Internal / ERO)

IT Strategy

- Inventory / Process / Workflow Mapping
- Stabilization (Network)
- ITIL / ISO Framework
- Organizational Resource Alignment
- Plan, Design, Implement, Operate (PDIO)
- Transparency / Metrics
- Technology Alignment (SharePoint / Data Warehouse)

Result

- Documented Processes
- Stable, Redundant, Secure Network
- Consistent, Repeatable, Documented Processes
- Roles & Responsibilities Match Skills
- Standardized and Accepted Business Practice
- Solid Foundation for Decision Making Process
- Consistent View, Analytics, Data Availability

90-Day Plan

- 90-Day Plan
  - Stabilize Network Infrastructure
    - Complete Princeton Data Center to Atlanta Data Center move by end of year
    - Complete Washington DC (new office) build-out and move in by Dec. 16
    - Review 2012 resource requirements and organizational alignment
    - Implement technology reporting and metrics
    - Complete application review and establish ownership
    - Improve customer satisfaction (response/follow-up/documentation)
    - Launch re-designed (SharePoint) NERC Intranet site
    - Review/update policies and procedures
    - Build methodology and resource model for ERO Project Management Office (PMO)
    - Refine NERC support methodology – single point of ownership

Next Steps

- IT Roadmap
  - Realign IT Organization – Support, Infrastructure, Development, PMO, Security
  - Application discovery and functional analysis
  - Implement methodology – plan, design, implement, operational
  - SharePoint 2010 Design and Implementation Model
  - IT Service Desk implementation (ITIL Framework) – best practice model
  - Draft IT Disaster Recovery/Business Continuity plan
  - Vendor assessment and consolidation
  - Identify and leverage outsource opportunities ex., firewall management
  - Create and implement virtualization strategy
  - Create Information Security Management System (plan, do, check, act)
  - Create Development Model (development, QA, Pre-Pro, production)
  - Assess “cloud” computing opportunities
  - ERO application re-design or enhancement priorities
  - Hardware, software, network and database design