



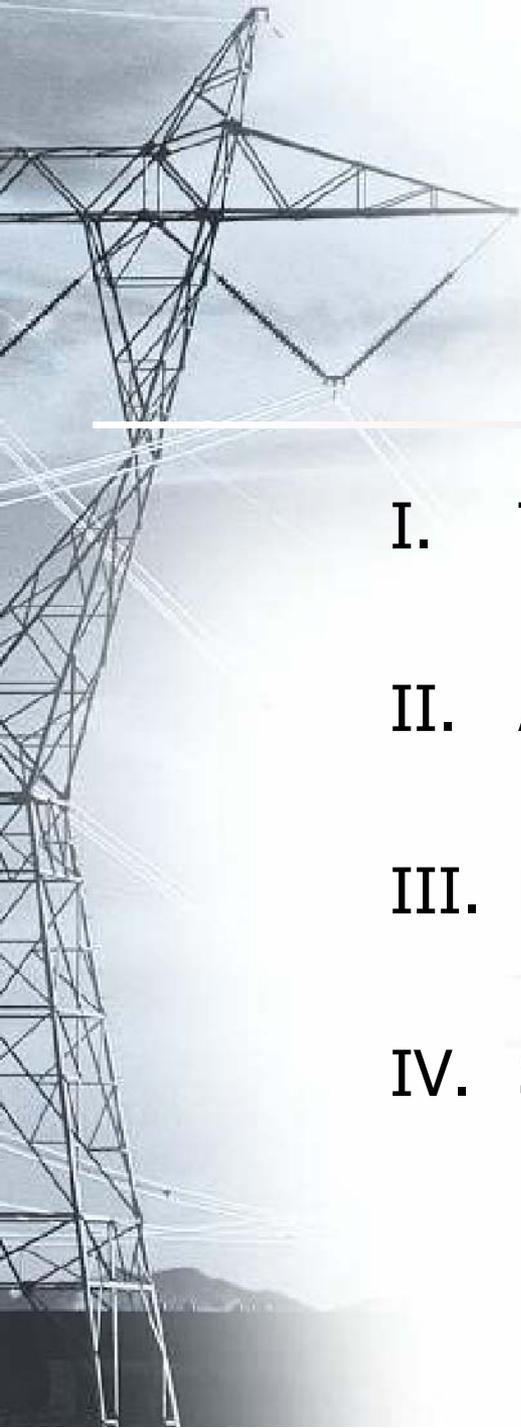
REPORT ON OFF-LINE APPLICATIONS TASK TEAM (OLATT)

By

Navin Bhatt

American Electric Power (AEP)

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OUTLINE

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- II. ACTIVITIES COMPLETED TO DATE
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- IV. SUMMARY

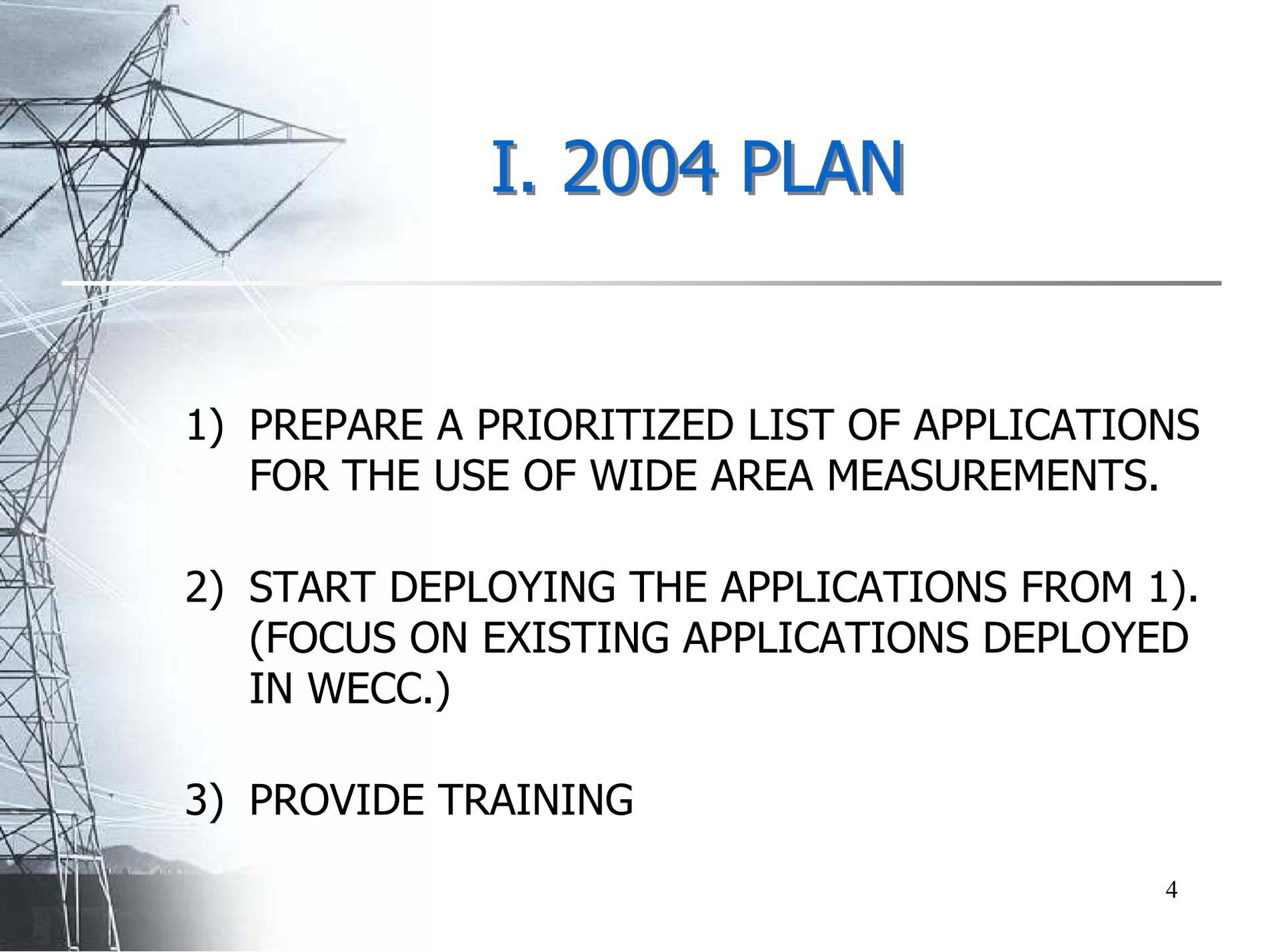


I. SCOPE

- DEVELOPMENT AND DEPLOYMENT OF APPLICATIONS AND TOOLS
- RELATED TRAINING

IN ORDER TO:

- ENABLE GRID PLANNERS, ANALYSTS AND OPERATORS TO SUPPORT THE ASSESSMENT OF POWER SYSTEM PERFORMANCE AND MODEL VALIDATION
- ENHANCE DECISION-MAKING RELATED TO BULK GRID RELIABILITY.



I. 2004 PLAN

- 1) PREPARE A PRIORITIZED LIST OF APPLICATIONS FOR THE USE OF WIDE AREA MEASUREMENTS.
- 2) START DEPLOYING THE APPLICATIONS FROM 1). (FOCUS ON EXISTING APPLICATIONS DEPLOYED IN WECC.)
- 3) PROVIDE TRAINING



II. ACTIVITIES COMPLETED TO DATE

✓ Completed the team survey.

- Survey provided an inventory of dynamics recording devices installed on team members' systems.
- Survey provided a list of off-line applications that the team members are interested in.
- Survey results are available at <http://phasors.pnl.gov>.

Periodic surveys will be conducted to update the information.



II. ACTIVITIES COMPLETED TO DATE

✓ **Selected an application.**

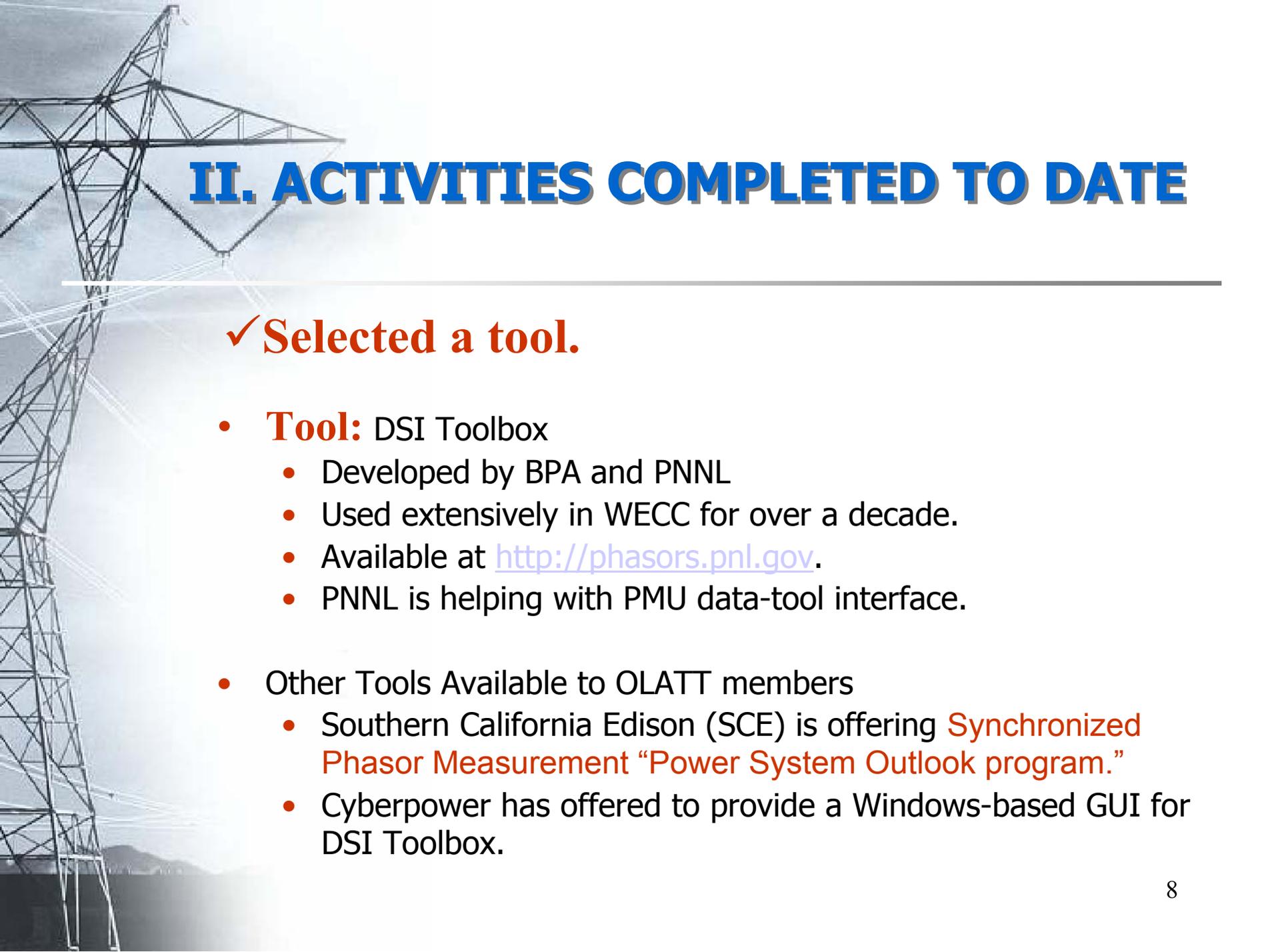
- **Application:** A combination of system trend analysis and post disturbance analysis.
 - Objective: Broaden our understanding of EI power system dynamics by coordinating analysis and interpreting results across all parts of EI.
 - Activity: Analysis of major system events such as generator trip-outs, wide area outages, etc.



II. ACTIVITIES COMPLETED TO DATE

✓ Selected an application. (continued)

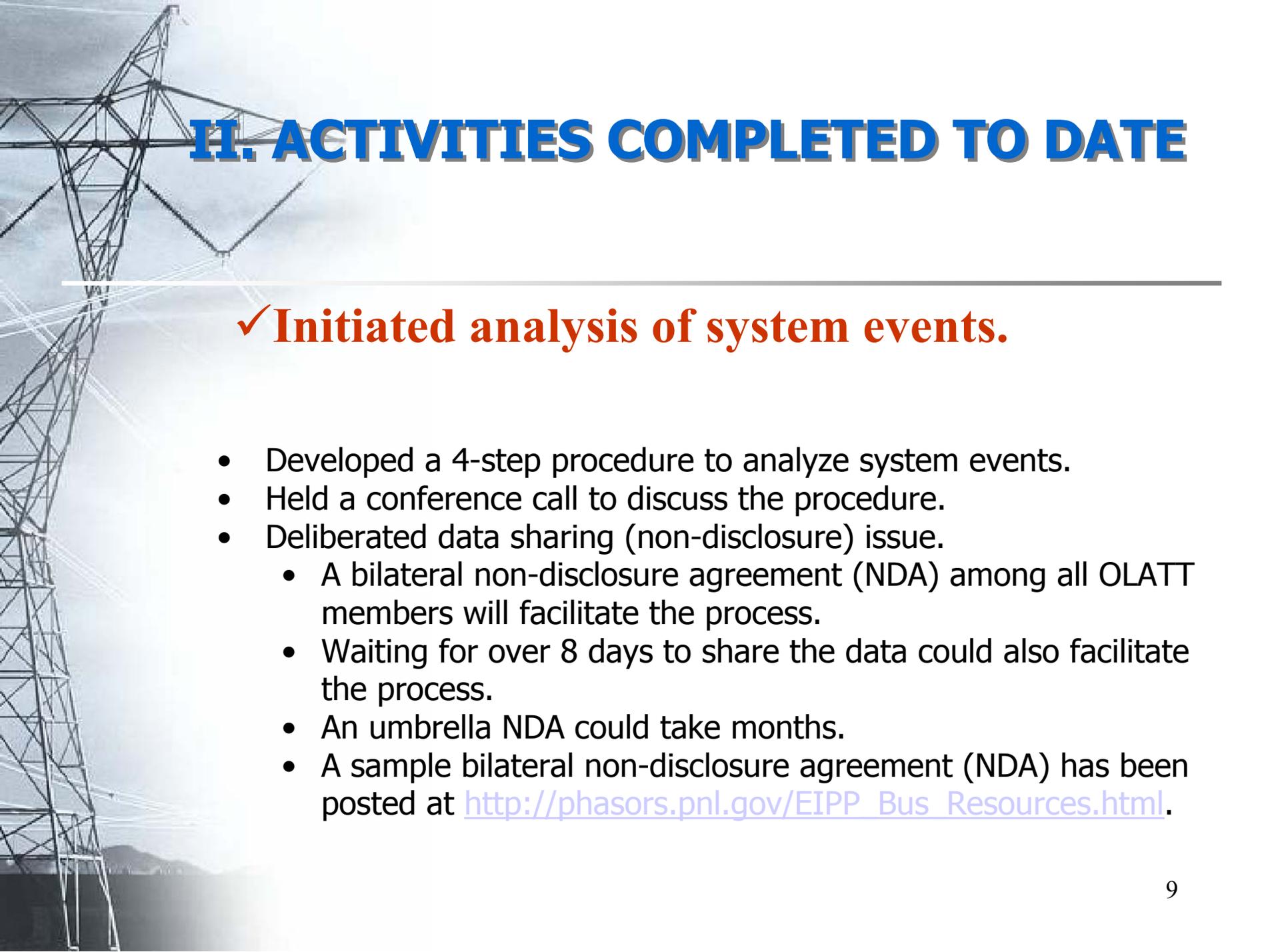
- Focus on:
 - calculation of frequency response characteristics (MW/0.1 HZ) for a generator trip
 - calculation of oscillatory modes and associated damping
 - identification and analysis of interesting voltage swings
- Development of a database of analyzed events
- Trending analysis and correlation with time of day, season, peak load, major line outages, etc.



II. ACTIVITIES COMPLETED TO DATE

✓ Selected a tool.

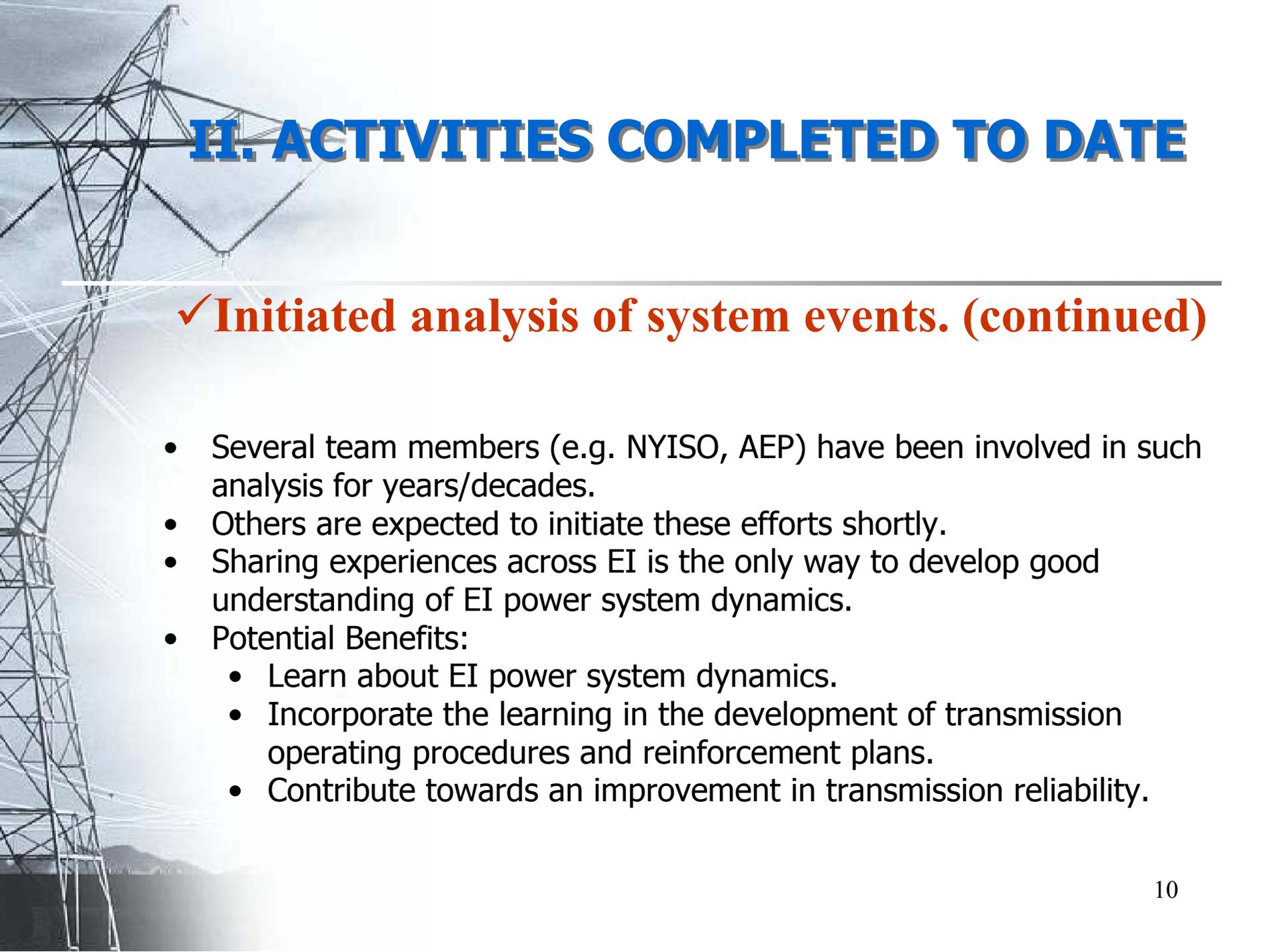
- **Tool:** DSI Toolbox
 - Developed by BPA and PNNL
 - Used extensively in WECC for over a decade.
 - Available at <http://phasors.pnl.gov>.
 - PNNL is helping with PMU data-tool interface.
- Other Tools Available to OLATT members
 - Southern California Edison (SCE) is offering **Synchronized Phasor Measurement** “Power System Outlook program.”
 - Cyberpower has offered to provide a Windows-based GUI for DSI Toolbox.



II. ACTIVITIES COMPLETED TO DATE

✓ Initiated analysis of system events.

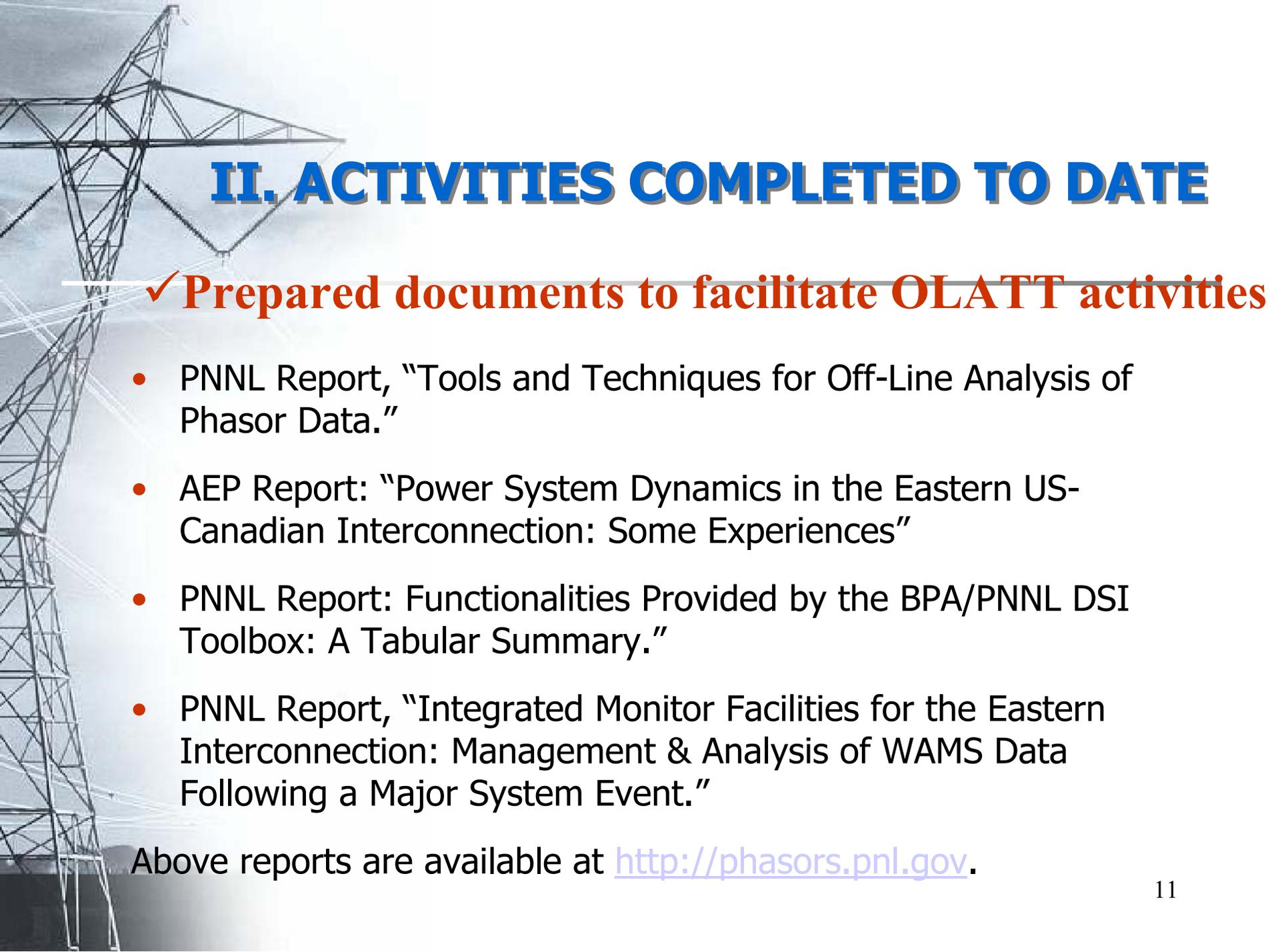
- Developed a 4-step procedure to analyze system events.
- Held a conference call to discuss the procedure.
- Deliberated data sharing (non-disclosure) issue.
 - A bilateral non-disclosure agreement (NDA) among all OLATT members will facilitate the process.
 - Waiting for over 8 days to share the data could also facilitate the process.
 - An umbrella NDA could take months.
 - A sample bilateral non-disclosure agreement (NDA) has been posted at http://phasors.pnl.gov/EIPP_Bus_Resources.html.



II. ACTIVITIES COMPLETED TO DATE

✓ Initiated analysis of system events. (continued)

- Several team members (e.g. NYISO, AEP) have been involved in such analysis for years/decades.
- Others are expected to initiate these efforts shortly.
- Sharing experiences across EI is the only way to develop good understanding of EI power system dynamics.
- Potential Benefits:
 - Learn about EI power system dynamics.
 - Incorporate the learning in the development of transmission operating procedures and reinforcement plans.
 - Contribute towards an improvement in transmission reliability.



II. ACTIVITIES COMPLETED TO DATE

✓ Prepared documents to facilitate OLATT activities

- PNNL Report, "Tools and Techniques for Off-Line Analysis of Phasor Data."
- AEP Report: "Power System Dynamics in the Eastern US-Canadian Interconnection: Some Experiences"
- PNNL Report: Functionalities Provided by the BPA/PNNL DSI Toolbox: A Tabular Summary."
- PNNL Report, "Integrated Monitor Facilities for the Eastern Interconnection: Management & Analysis of WAMS Data Following a Major System Event."

Above reports are available at <http://phasors.pnl.gov>.



III. PLAN FOR FUTURE ACTIVITIES

REMAINDER OF 2004

- Facilitate the involvement of all OLATT members in the analysis of system events.
- Address the NDA issue.
- Either develop a MATLAB-based GUI for the DSI Toolbox OR acquire the Cyberpower GUI, as appropriate.
- Provide training on “analysis of system events using DSI Toolbox.”



III. PLAN FOR FUTURE ACTIVITIES

REMAINDER OF 2004 (continued)

- Actively reach out to engineers from other parts of EI to expand OLATT membership.
 - Sharing experiences across EI is the only way to develop good understanding of EI power system dynamics.
 - Approach those who have been involved in the analysis of EI power system dynamics through wide area measurements and simulation studies.
 - Potential candidates include NERC Interconnection Dynamics Working Group (IDWG) members, NPCC SS-38, members of MAPP Region, etc.
- Explore the use of the SCE tool.



III. PLAN FOR FUTURE ACTIVITIES

LONG TERM OBJECTIVES

- 1) Create and sustain a technical/administrative process for the analysis of EI system events using phasor data.
- 2) Continue to deploy the existing applications.
- 3) Develop and deploy new applications.
- 4) Provide training.
- 5) Identify benefits derived from deploying the applications.
- 6) Integrate the applications as part of commonly-used grid reliability tools.



IV. SUMMARY

- Team activities are proceeding per plan.
- DOE's facilitation has helped the team.
 - DOE resources are providing leverage to industry efforts.
 - This is a tremendous opportunity for industry players to get involved.
- Training on event analysis tools & procedures is a high priority activity in 2004.
- GUI for DSI Toolbox is also a high priority item in 2004.
 - Either develop a MATLAB-based GUI through DOE funds;
OR
 - Acquire the Cyberpower Windows-based GUI.
- It is essential to expand the team membership to include all regions/sub-regions of EI.