**Consortium for Electricity Reliability Technology Solutions**

Real Time Dynamics Monitoring (RTDM)

# Overview and Demonstration of CERTS Real Time Dynamics Monitoring for EIPP – Real Time Applications Task Team

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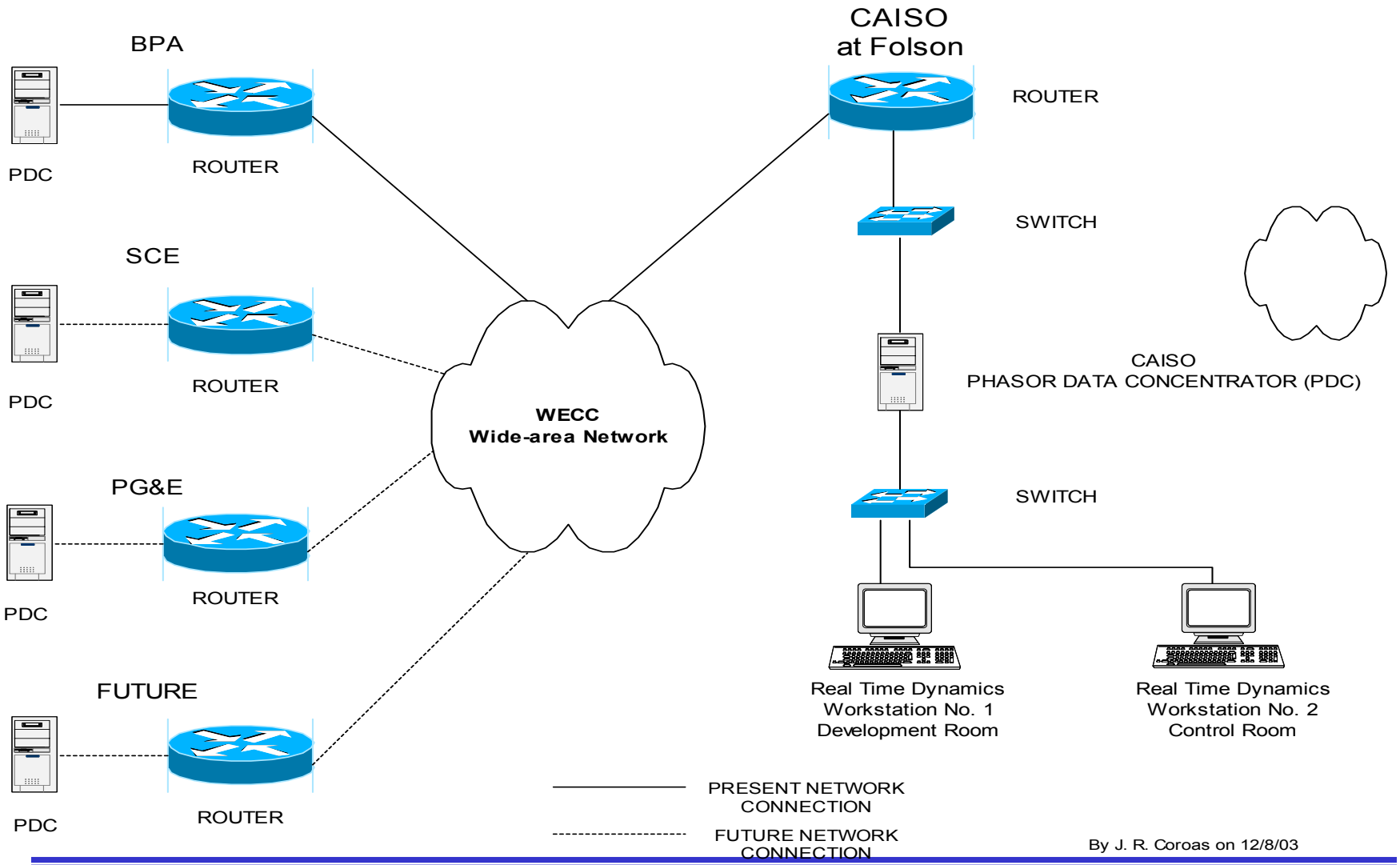
**Washington D.C., January 21, 2003**

# *Presentation-Demo Agenda*

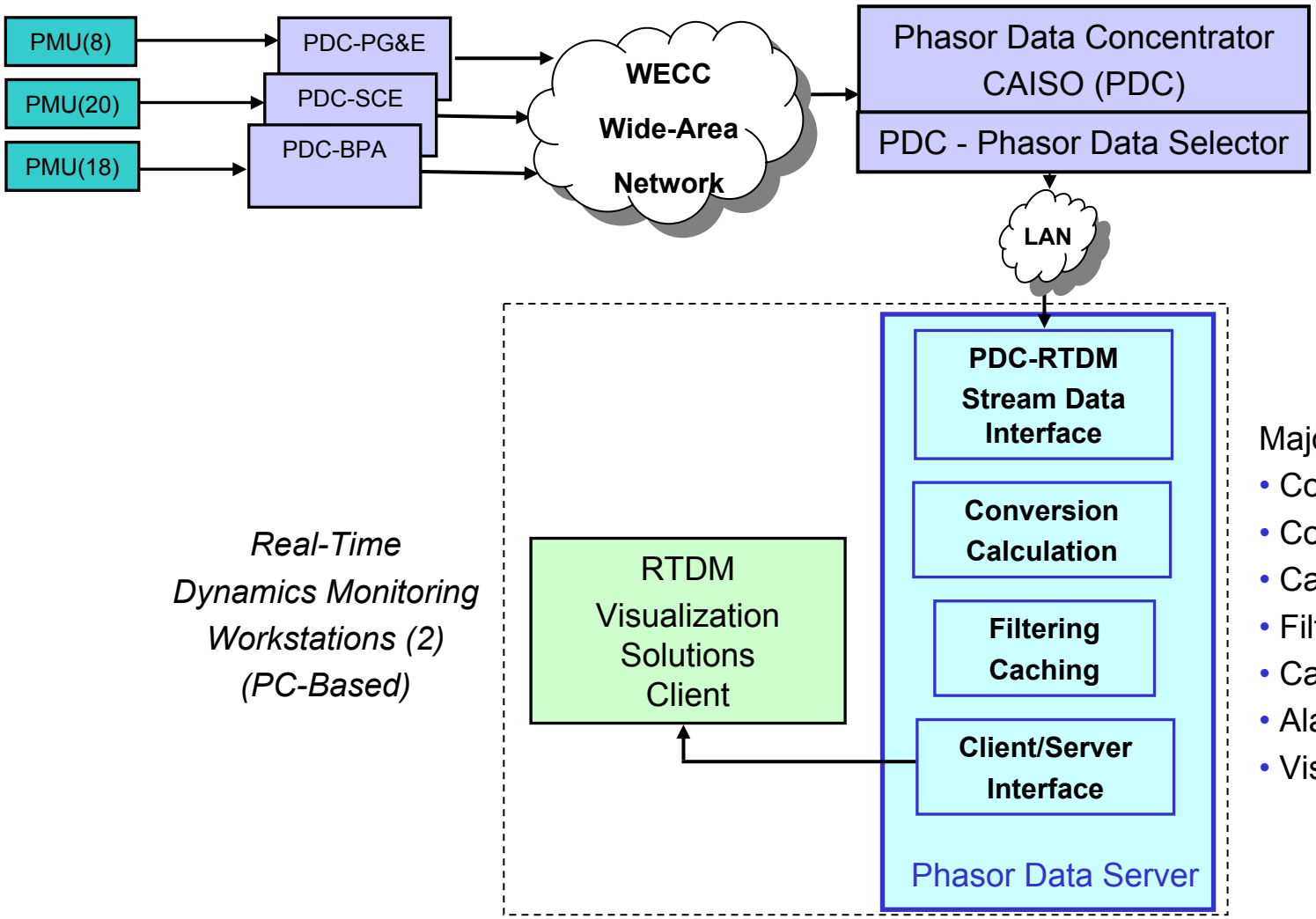
- Wide-Area Phasor Data Network
- RTDM Workstation Components
- RTDM – Visualization Solutions Overview
  - Frequency Monitoring and Response
  - Absolute Angle Difference of Key Paths
  - Relative Angle Differences Between Sources and Sinks
  - MW and MVAR Transfer Limits Monitoring for Key Paths
- RTDM – Phase 1-2 Deployment Process and Timeframes
- Next Steps

# CAISO – Wide-Area Phasor Data Network




By J. R. Coroas on 12/8/03

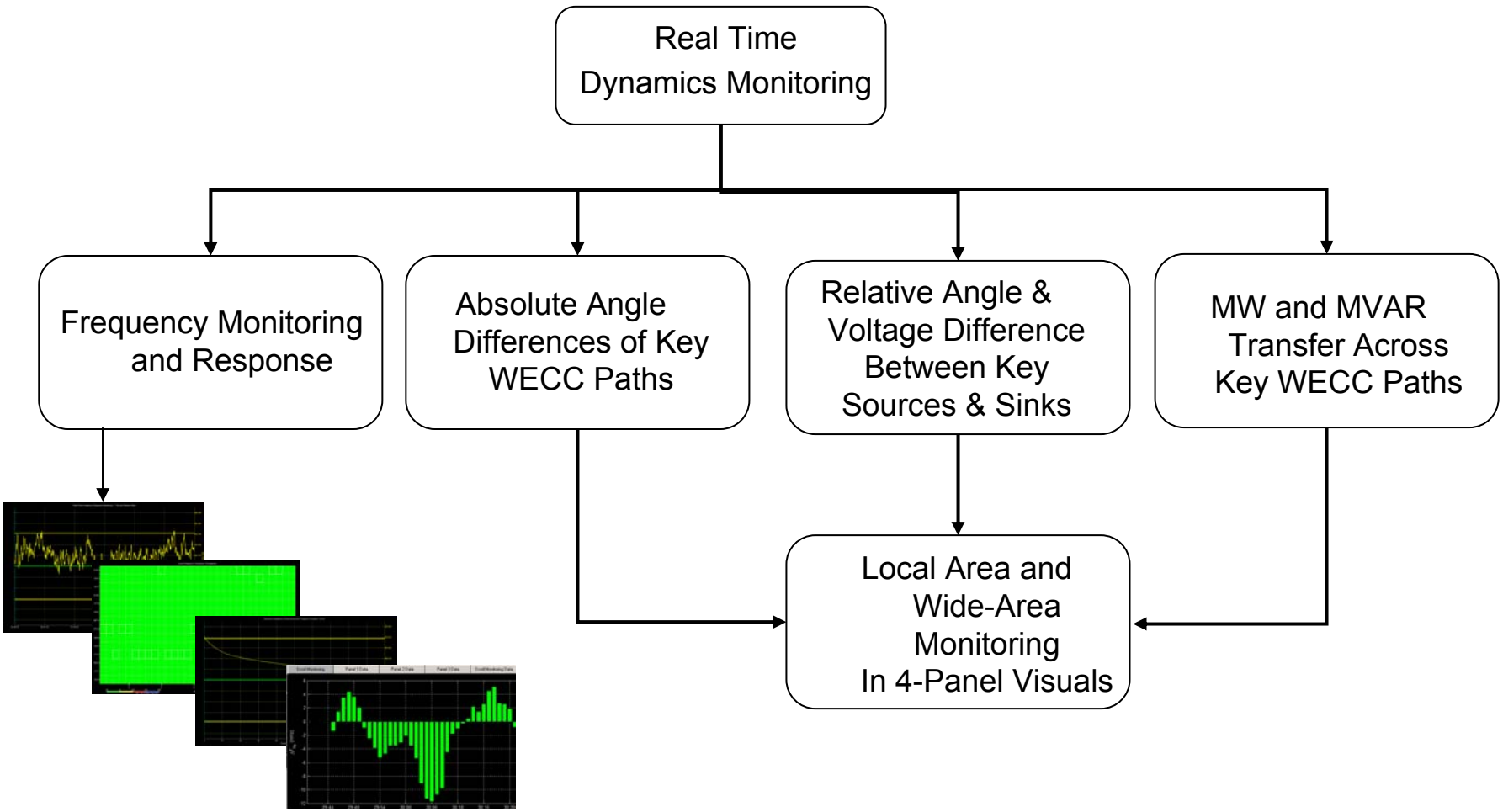
# *Real Time Dynamics Monitoring (RTDM) Workstation Components*



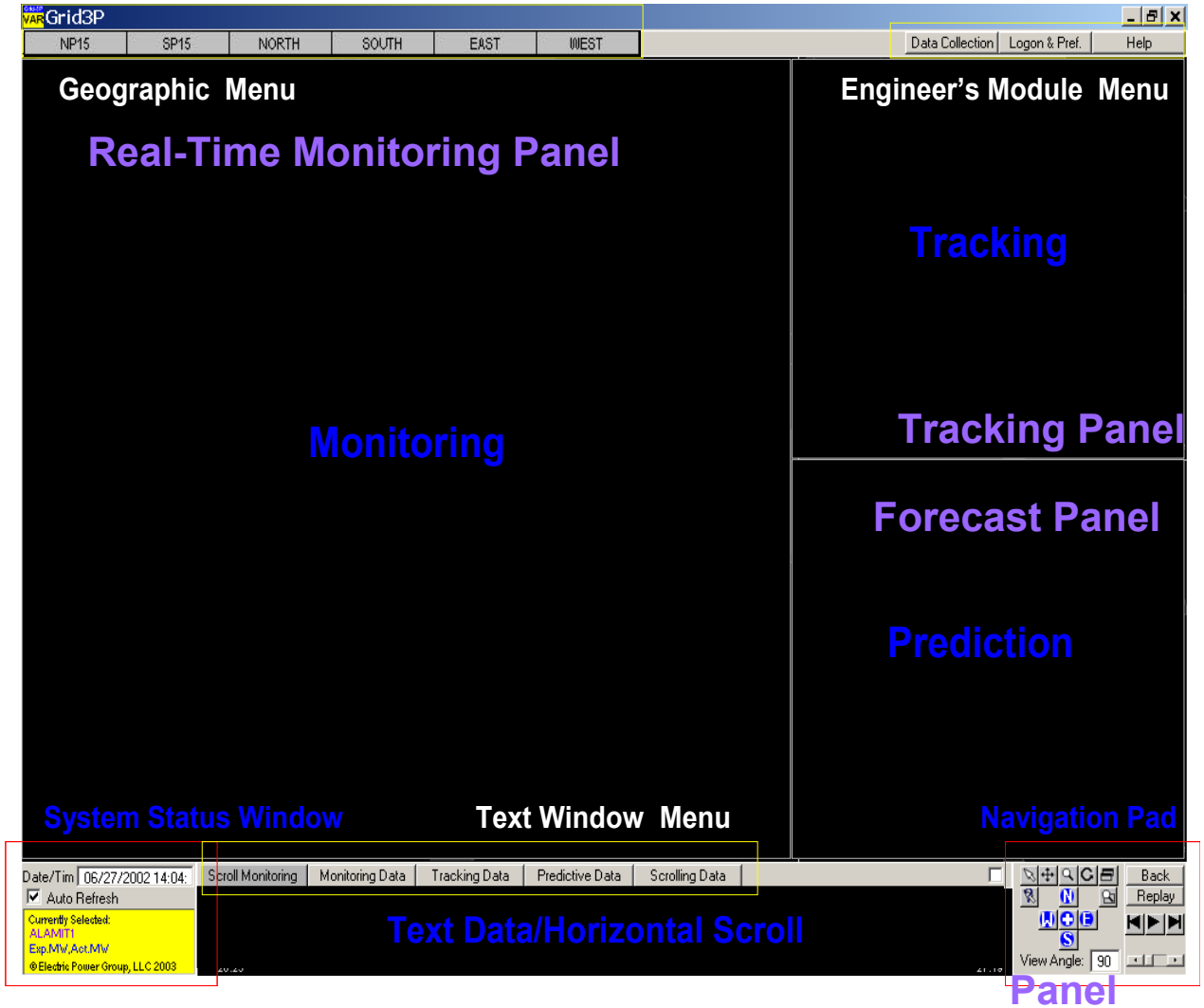

Major RTDM Functions:

- Collection
- Conversion
- Calculation
- Filtering
- Caching
- Alarming
- Visualization Solution

# *Real Time Dynamics Monitoring (RTDM) Visualization Solutions Overview*



# CERTS Generic Multiple-View Visualization Solutions Architecture



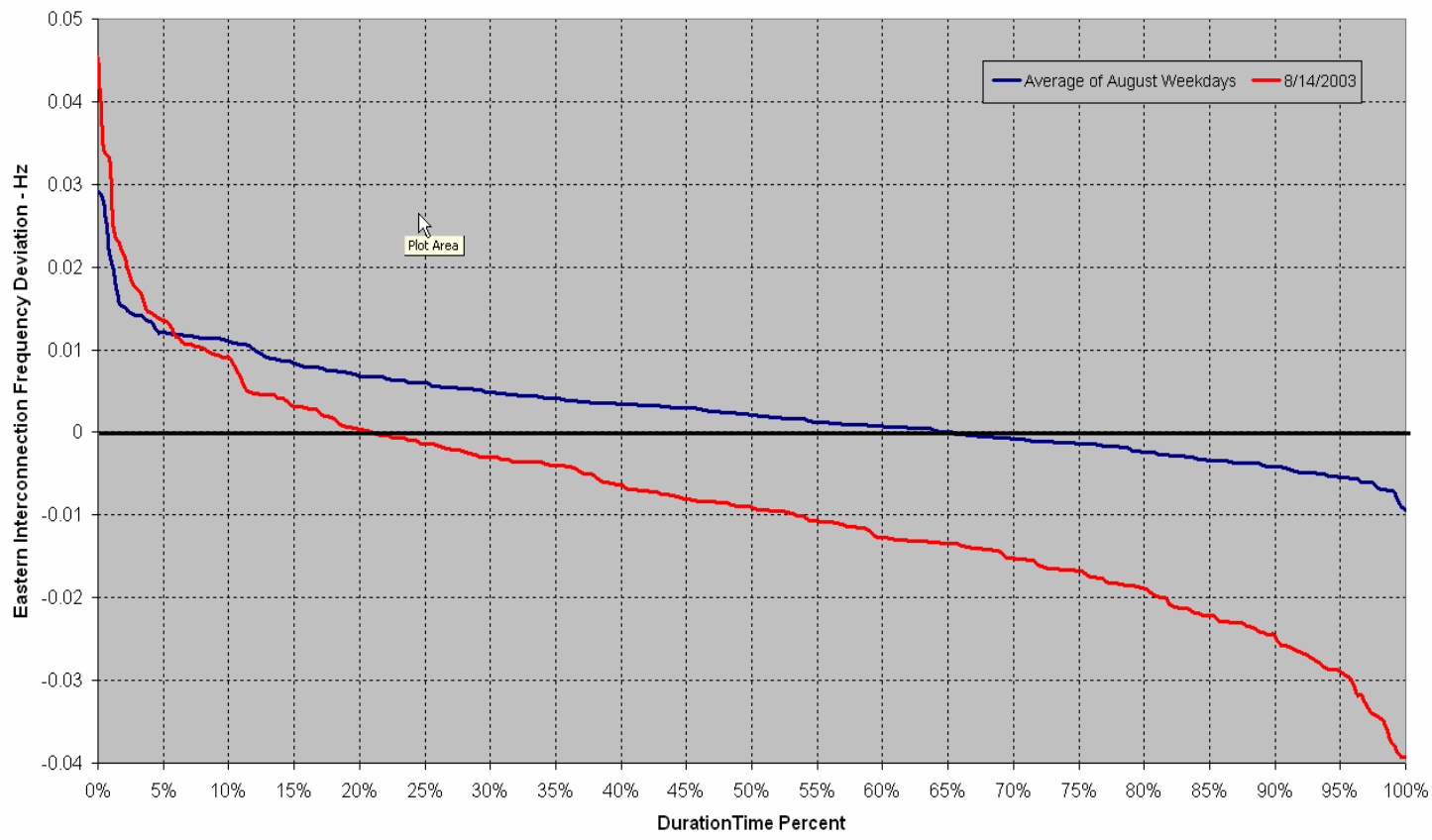
# *Frequency Monitoring and Response*

1-Panel Visual

3-Panel Visual

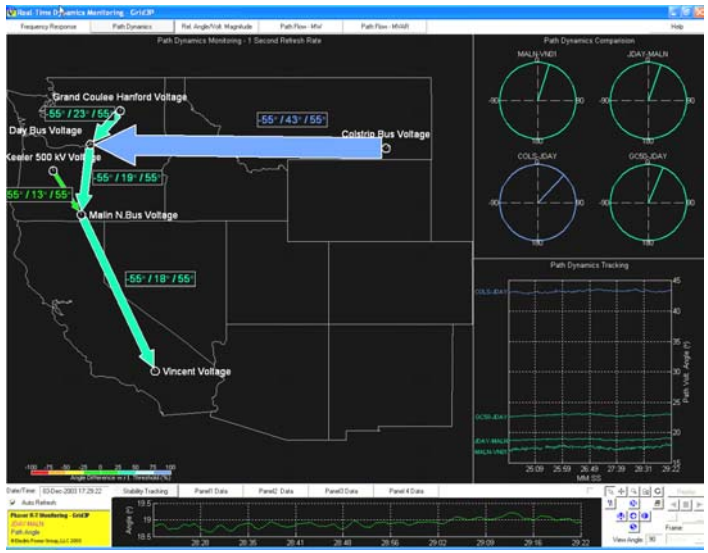
# *NERC Policy-9 For Frequency Monitoring For Reliability Coordinators*

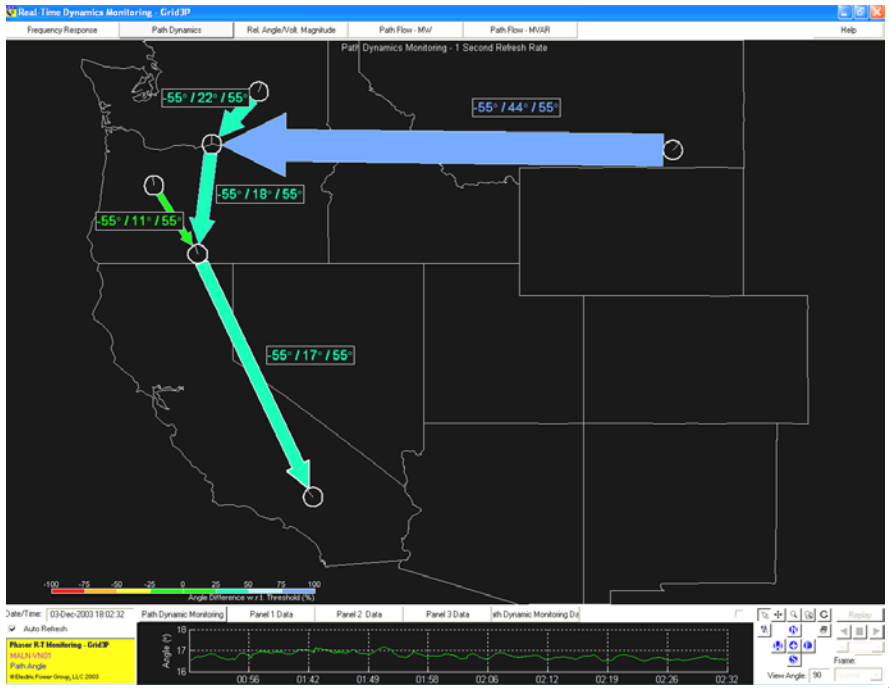
**NERC Policy-9 Frequency Monitoring Criteria**
**For Reliability Coordinators**
**"..Take Action When Interconnection Frequency Error**
**Is In Excess of 0.030 Hz For More Than 20 Minutes.."**



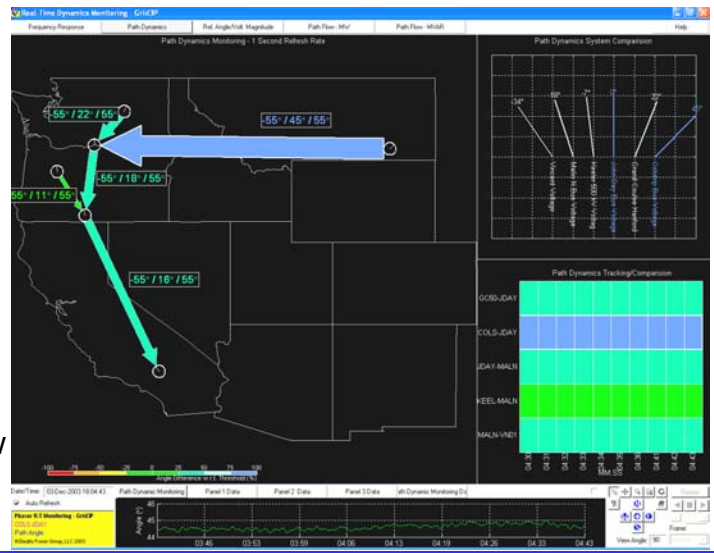
# *Absolute Voltage Angle Differences Across Key WECC Paths*

Local View



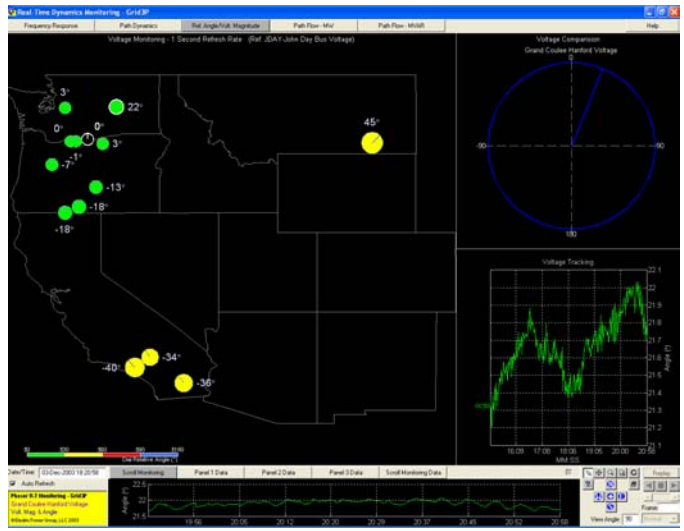



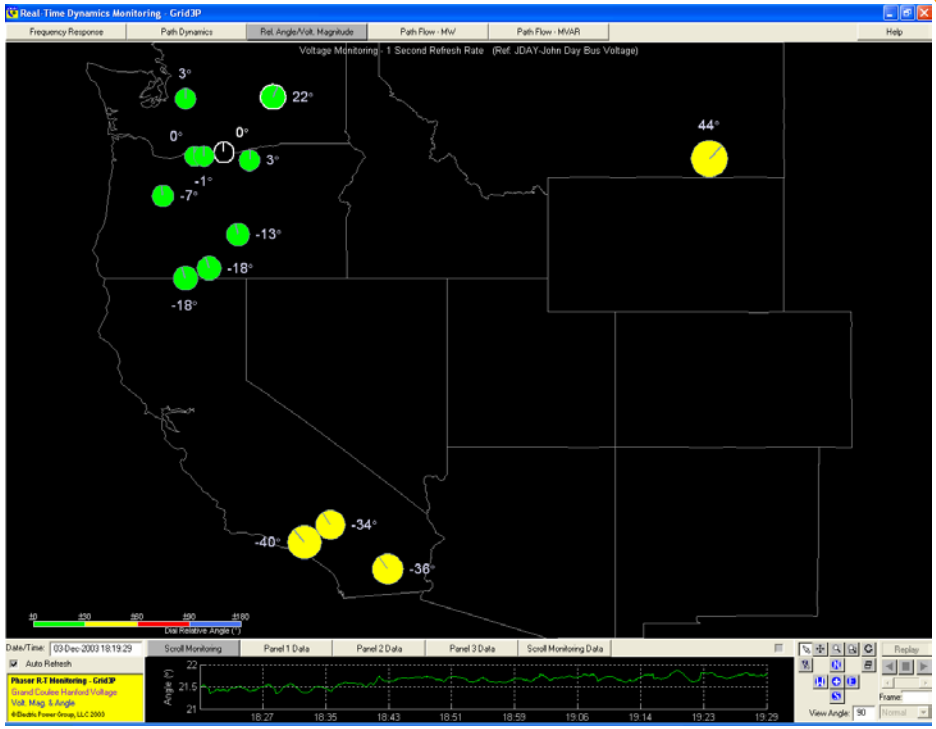

Wide-Area View



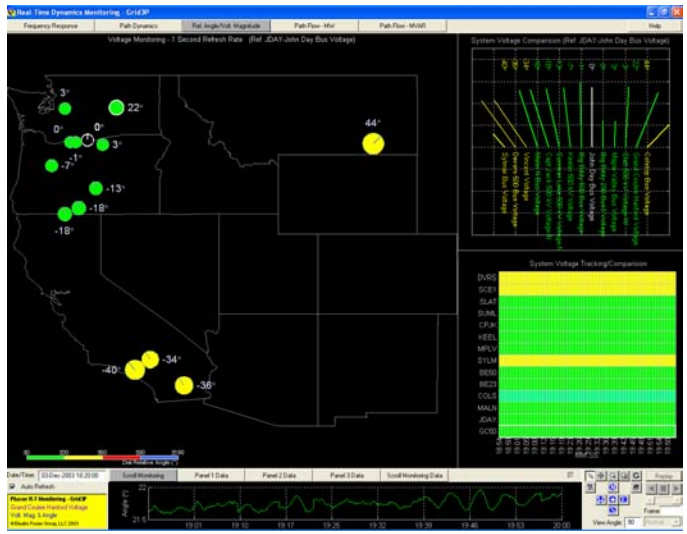
# *Relative Angle Differences Between Key WECC Sources & Sinks*

Local View

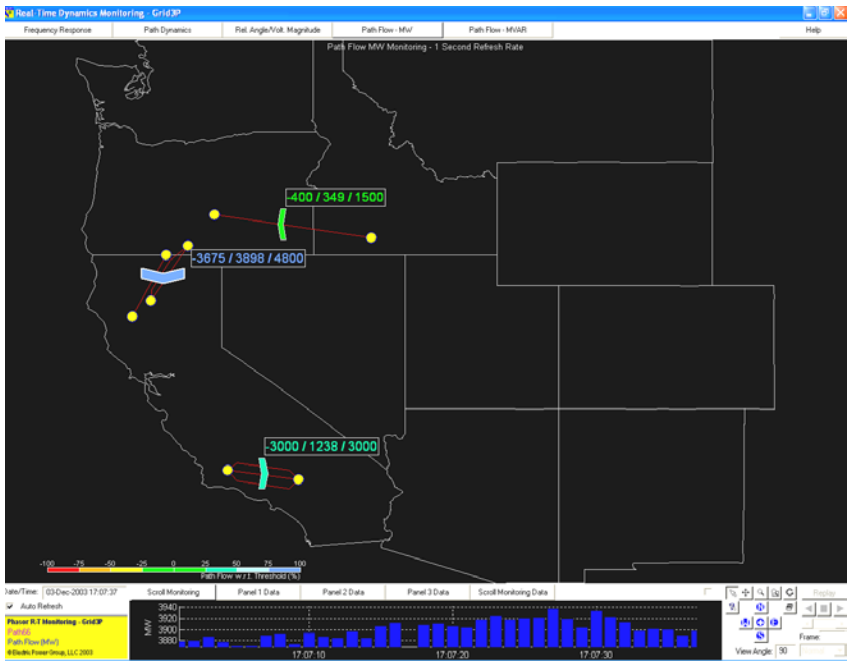




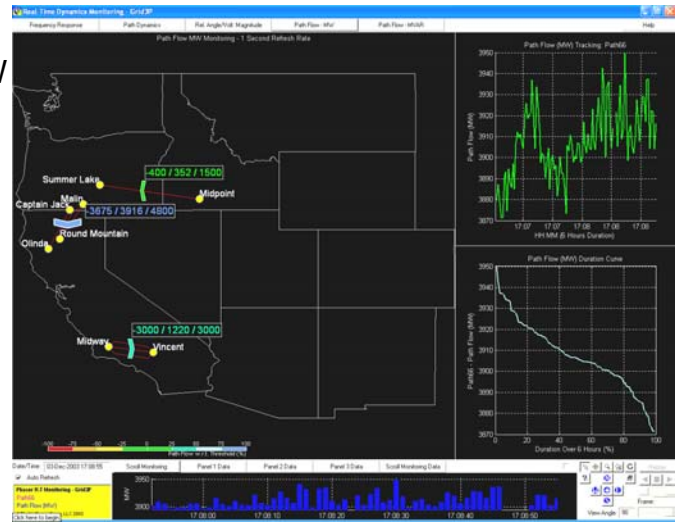

Wide-Area View

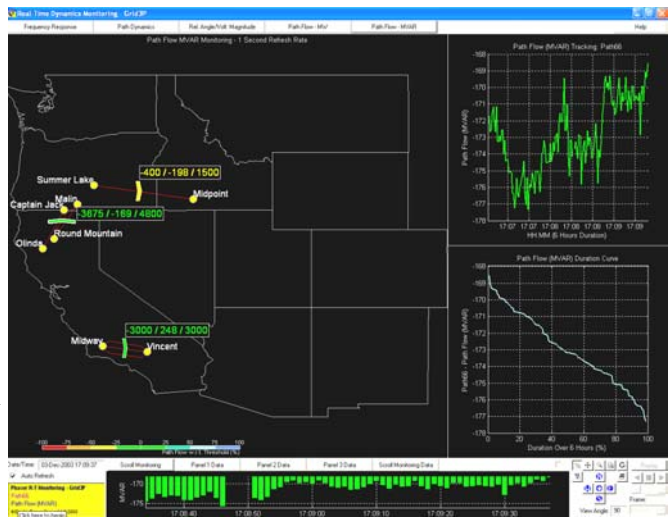


# *MW and MVAR Transfer Limit Monitoring For Key WECC Paths*




3-Panel View MW




3-Panel View MVAR

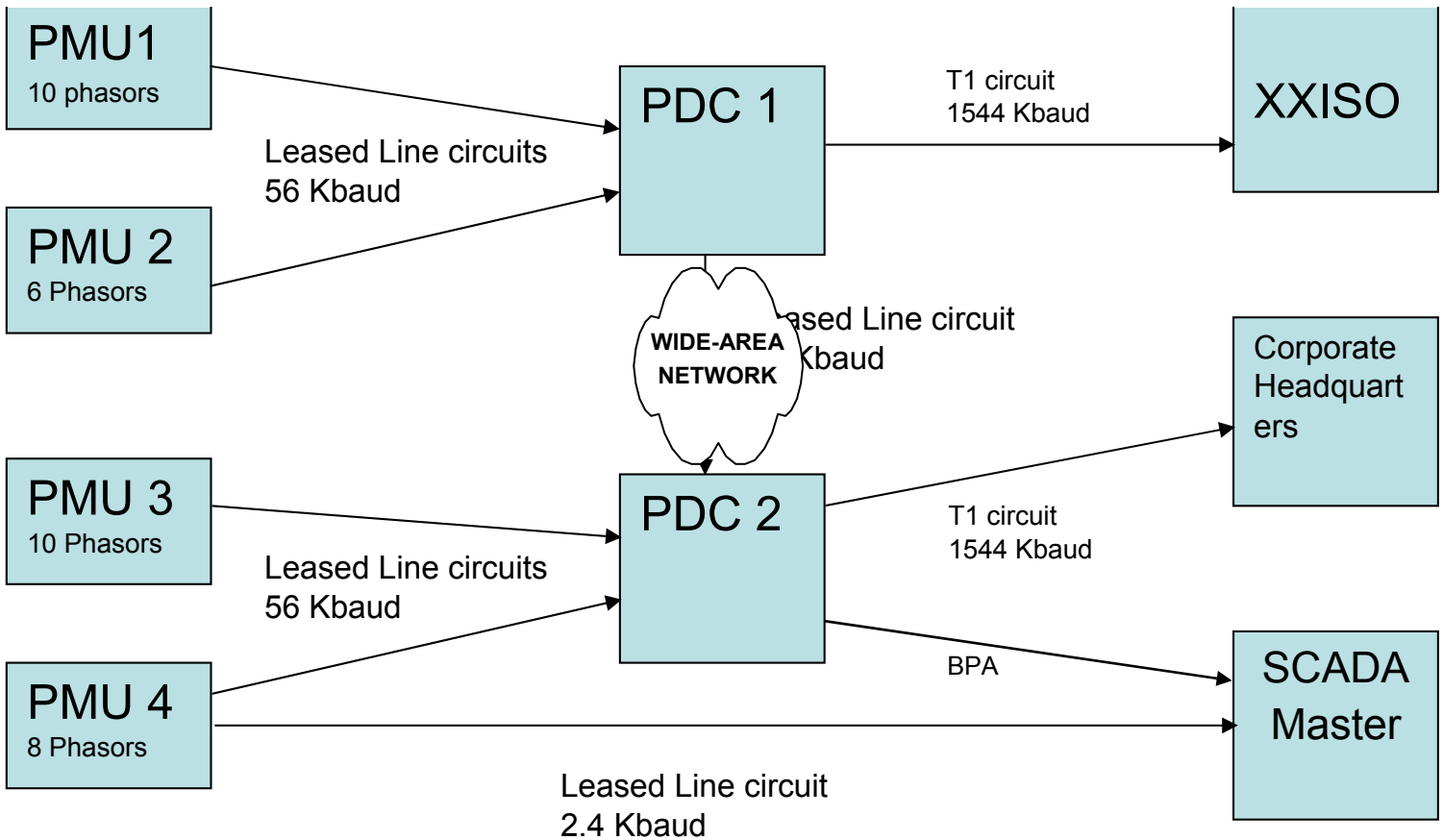
# Real Time Dynamics Monitoring Demonstration

# *Real Time Dynamics Monitoring Phases 1-2 Deployment Process and Estimated Times*

***Phase-1***

- Identification, definition of local dynamics operational issue(s) to address
- Inventory and location of available PMU(s) and PDC(s)
- Definition of data, algorithms and/or methodology required to address operational issue(s) – 1 Week
- Definition, design, deployment of PMU-PDC-CERTS Workstation local data communications -1st phase – 1-2 Months
- Tailoring and deployment of data selector and data filter software required – 1-2 Weeks
- Tailoring and deployment of CERTS data server and client – 1-2 Weeks
- Tailoring and deployment of CERTS visualization solutions – 1-2 Weeks
- Field tests, training and documentation – 1-Week

***Phase-2***

- Definition, design, deployment of PDC-PDC wide-area phasor data network to address wide-area dynamics issues - 2nd phase – 10-12 Months

# *Phasor Hardware Architecture Alternatives*