NASPI Interoperability Panel (1)

Driving Applications Forward
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Making Electric Power Safer, More Reliable, and More Economical®
“What Components Are You Offering?”

Integrated PMUs
- SEL-421
- SEL-451
- SEL-487E
- SEL-487V

Data Concentration
- SEL-3373

Distributed Control
- SEL-3378
- SEL-3530

Secure Communications
- SEL-3620

Visualization
- SEL-3025

Radios and Optical Networks
- SEL-700G
- SEL-751A
- SEL-787

Distributed Control Console
- SEL-2401

Satellite Clocks
- SEL-2407

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“Do you have stand-alone PMUs?”

- 24 Channels of IEEE C37.118 Synchrophasors
- Includes Synchrophasor RTC
- SEL-351A Feeder PMU
Relays/PMUs Send And Receive Synchrophasors
“Filtering requirements & usage”

Planned compliance with new C37.118 standard
**SEL-5073 SYNCHROWAVE PDC Functional Block Diagram**

- **PMU or PDC Inputs**
  - >200 PMU or PDC inputs
  - Variable input message rate from 1 to 240 messages per second
  - Ethernet and/or serial inputs

- **Time Alignment**

- **Data Concentration**
  - Power Calculations (1P, 3P, P and Q)
  - Archive
    - Continuous
    - Triggered
    - Logs
    - Access/Diagnostic

- **Independent Outputs**
  - Fully configurable output message streams
  - Send data to internal and external clients or entities
  - Variable message rates from 1 to 240 messages per second
“PDC Functionality And Performance”

Phasor Data Concentration
Integrated Protection and Control
Built-in Functions like Modal Analysis, etc

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“PDC Functionality” – Easy to Use

- Simple configuration
- Flexible data access
- Real-time status
- Event logs
- Upgradeable
“PDC Functionality” – Wide Area Control

[Graph showing time series data with various markers indicating different damping ratios.]
“PDC Functionality” - Reliability

- Conforms to
  - IEEE 1613
  - IEEE C37.90
  - IEC 60255

- Built-in diagnostics

- No moving parts – all solid state

- Same design, testing, and manufacturing practices as SEL’s proven protective relays
“PMU / PDC Testing Approach”

- PMU / PDC testing
  - SEL
  - other vendors
- Thorough testing
  - IEEE C37.118
  - Other industry stds
  - SEL standards
“Timing source approach”
“How consistent are user requirements?”

- Conform to standards where applicable.
- Working on many distributed control solutions.
- Protection / control algorithms have system specific features.
“How do you comply to overall user’s requirements?”

1. Conform to standards.
2. Discuss end-users needs.
3. Inputs from SEL’s large team of field-application engineers.
4. Track all customer requests and commitment dates.
5. R&D team in Pullman, WA implementing new enhancements.
“Are you willing to participate in accelerated implementations to help end users?”

Yes! We have a team dedicated to synchrophasor R&D