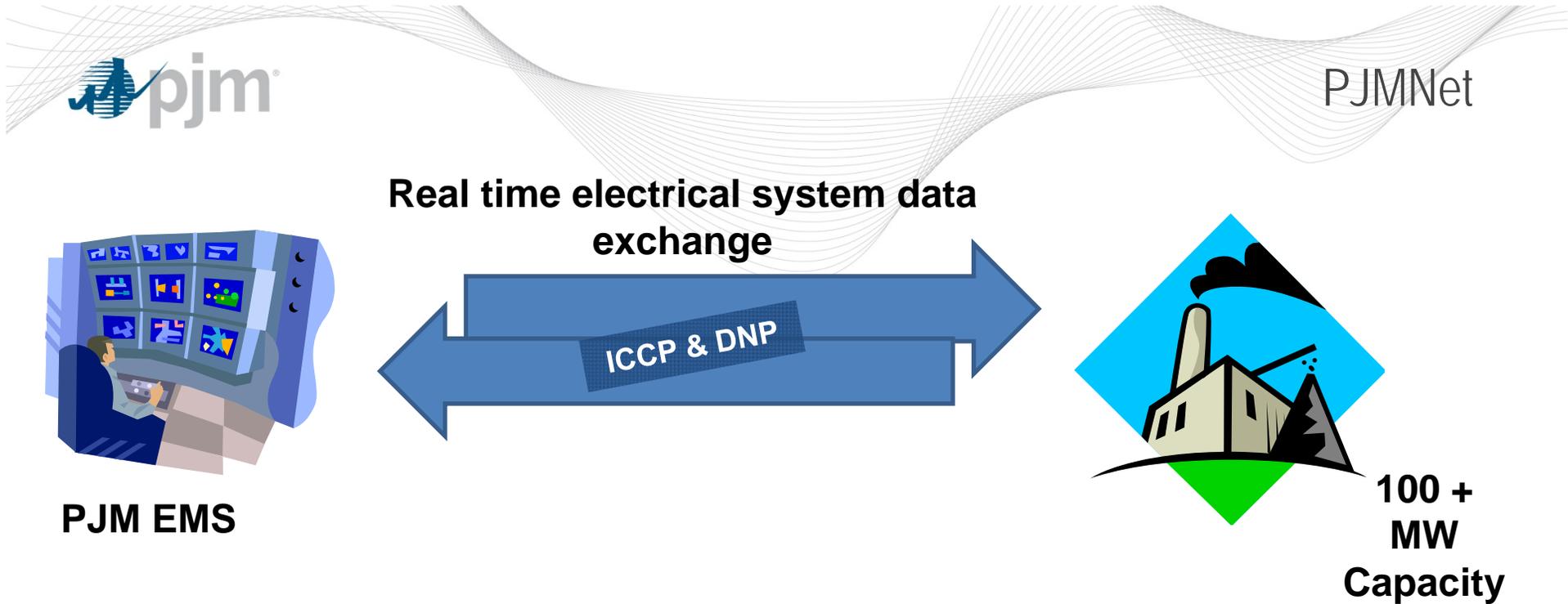




Member Communications Issue

Technical Update &
Solutions Matrix Overview

September 27, 2013



- Telecommunication circuits installed by PJM .
- Connection may or may not be redundant, and may also include an additional circuit to a member's disaster recovery/back up location.
- PJMNet Connection is not synonymous with a telecommunication circuit.

- ICCP
 - Redundant circuits required

- DNP3 / RTU
 - Redundant circuits evaluated on impact to PJM system
 - Connection may or may not be redundant
 - Single Telcom circuit
 - Redundant Telcom circuit

Transmission/Generation Owner PJMNet Eligibility

- **Transmission Companies:**
 - Required by PJM for System Reliability purposes
 - Received one PJMNet connection per transmission entity
 - PJM decides eligibility for connection

- **Generation Companies:**
 - Generation MWs must be greater than threshold in Manual 14-D
 - One PJM connection per Voting Member
 - Generator, Market Operation Center, Group of Generators
 - Additional connections provided by PJM if deemed required for reliability by PJM

- **All Other Members Requiring Connectivity:**
 - Connect to PJM via Internet SCADA



Package A

Single PJMNet connection available for Voting Members

- For Voting Member Companies that meet some or all of the following requirements:
 - Are not eligible due to generating capacity below current Threshold
- Cost Allocation
 - Status Quo Plus:
 - Voting member can purchase one PJMNet connection.



Package B

PJMNet connections available for Voting Members

- For Voting Member Companies that meet some or all of the following requirements:
 - Are not eligible due to generating capacity below current Threshold
 - Already have an valid existing PJMNet connection under their voting membership and desire additional connections
- Cost Allocation
 - Status Quo Plus:
 - Voting member companies can purchase up to 5 additional connections

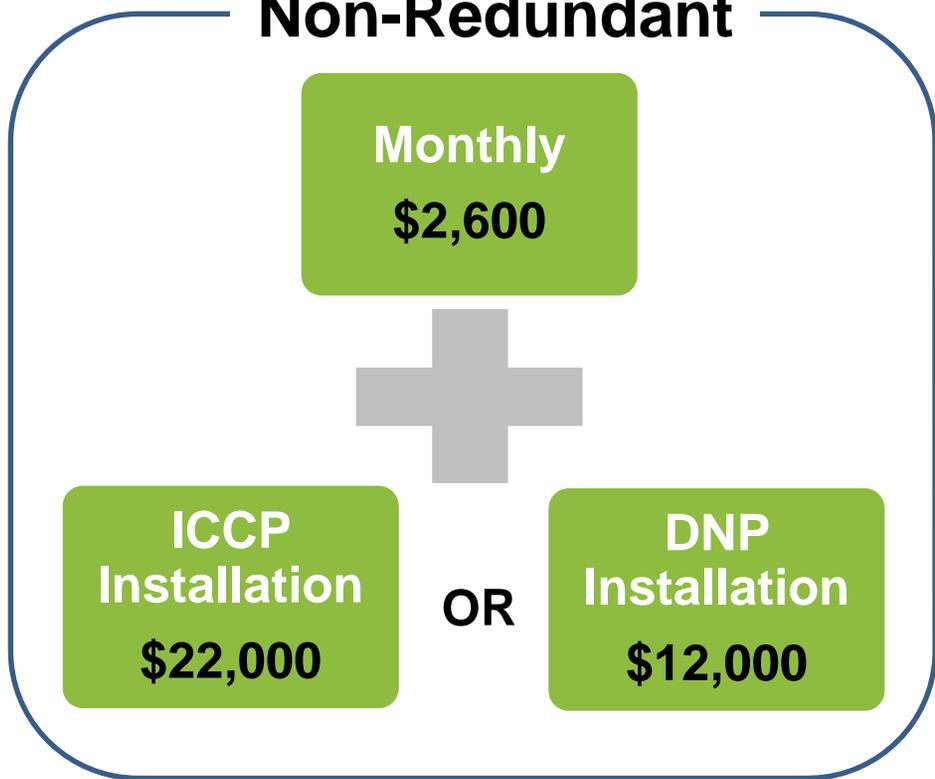


Package C

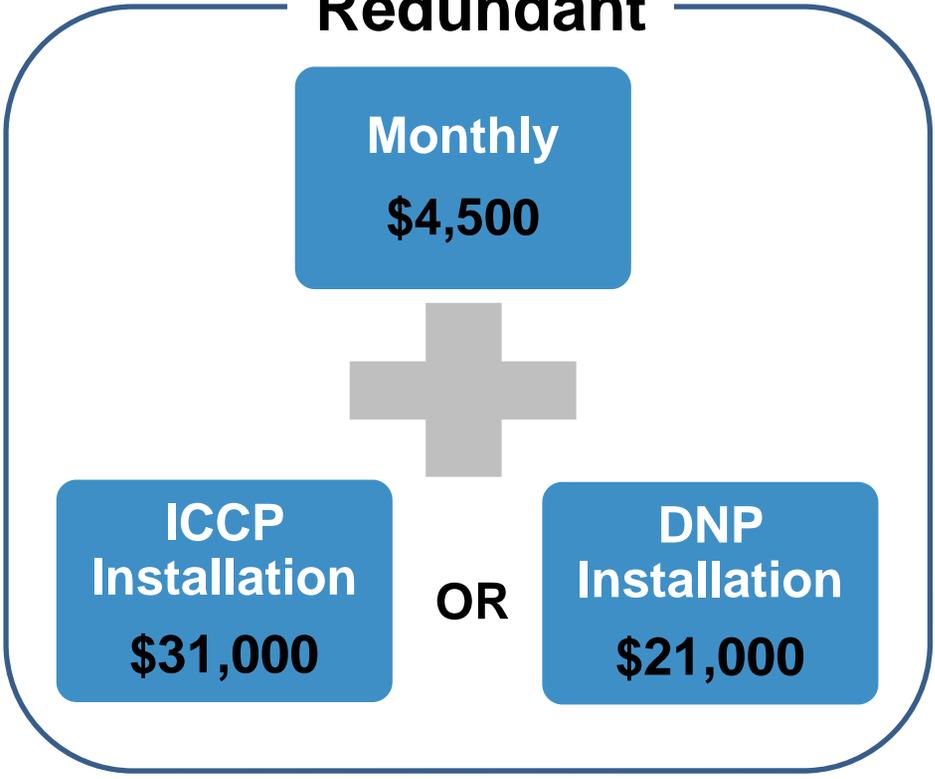
PJMNet connections available for Voting Members

- For Voting Member Companies that meet some or all of the following requirements:
 - Are not eligible due to generating capacity below current Threshold
 - Already has a valid existing PJMNet connection under their voting membership and desire additional connections
- Cost Allocation
 - Status quo is no longer valid.
 - All voting member companies required to purchase first connection
 - PJM will pay for any additional connection they deem necessary for reliability purposes
 - Voting member companies can purchase up to 5 additional connections

Non-Redundant



Redundant



* values for discussion purposes

4.1.1 PJMnet Communications System

PJMnet is the primary wide-area private network for secure Control Center data communication to and from PJM. PJMnet will support:

- Inter-Control Center Communications Protocol (ICCP) data links to Control Centers.
- SCADA links to plants via remote terminal units (RTUs) using Distributed Network Protocol (DNP3.0 Implementation Level 2 over TCP/IP).

PJMnet is a robust multi protocol label switching (MPLS) network that connects member Control Centers and plants to PJM's dual redundant Control Centers. Private voice and data permanent virtual circuits (PVCs) are provided to link to PJM's dual redundant Control Centers. The number of physical interfaces and their capacity will be determined by the impact of the member's facilities on overall PJM Operations. ...

(OPTION A:) If the facility doesn't meet the MW thresholds as detailed in Exhibit 3 and still desires a PJMnet Connection, then the member can purchase a single PJMnet Connection.

(OPTION B:) If the facility doesn't meet the MW thresholds as detailed in Exhibit 3 or does meet a threshold and desires to purchase additional PJMnet connections, they have the option to purchase up to 5 additional PJMnet Connections.

Metering Installation						
Connection	Generator Size	IED	Data Model	Configuration	Monitoring Period	Protocol
Internet SCADA	Very Small (<10 MW)	Data Concentrator	All data types available OR Collect MWh and MVARh only	Dedicated TCP/IP with encryption gateway over secure internet.	varies	DNP 3.0
Internet SCADA	Small (10–100 MW)	Data Concentrator	All data types available	Dedicated TCP/IP with encryption gateway over secure internet.	varies	DNP 3.0
PJMNet	Medium (>100–500 MW)	Data Concentrator	All data types available	Dedicated TCP/IP with single router to redundant frame relay networks.	2 – 10 Second Periodic	DNP 3.0 or ICCP
PJMNet	Large >500 MW)	Data Concentrator, SCADA, EMS or GMS	All data types available	Dedicated TCP/IP with dual routers to redundant frame relay networks—Single Local Area Network	2 – 10 Second Periodic	DNP 3.0 or ICCP

Exhibit 3: Guidelines for Metering Installation