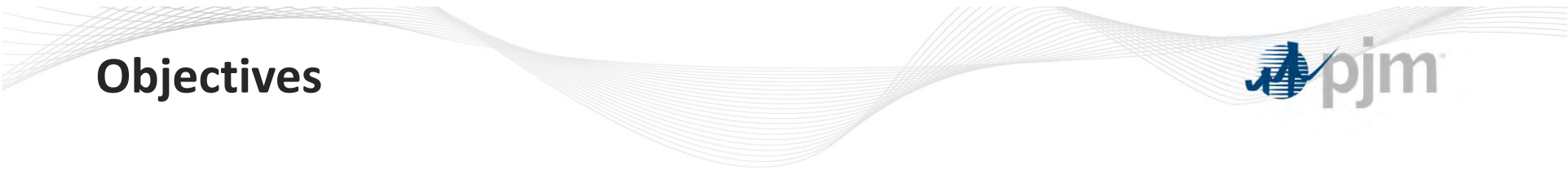


PJM Communications



Objectives

Students will be able to:

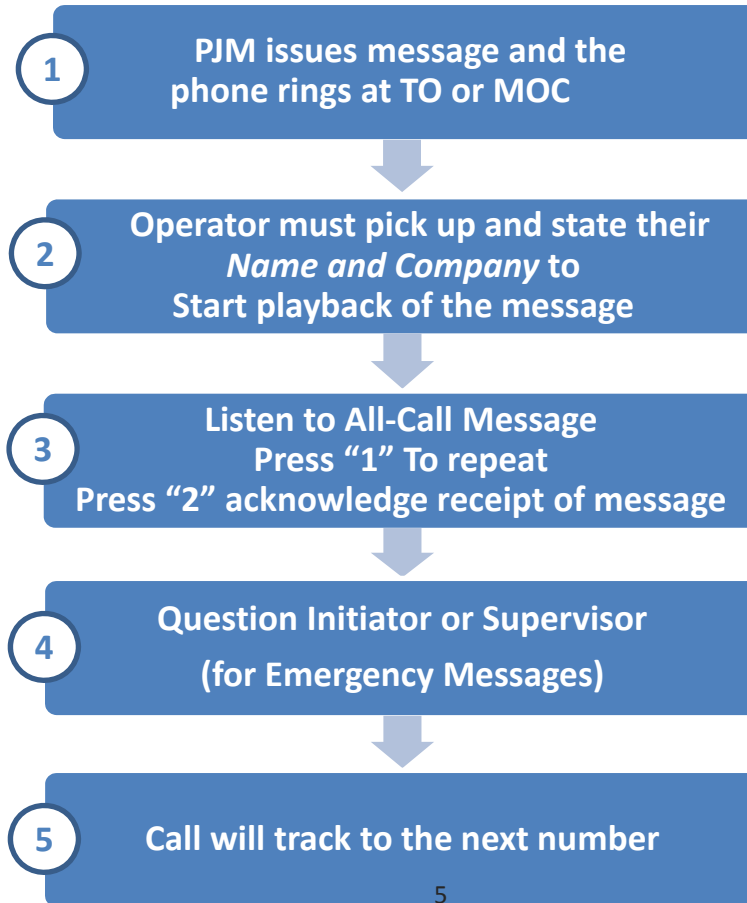
- Identify the various PJM communication protocols and procedures
- Identify the various PJM communication tools

PJM All-Call

PJM All-Call Process

- The PJM All-Call process is a one-way communication system used to send messages to member companies
- PJM All-Call messages are issued during both normal and emergency conditions
- PJM Member Control Centers are required to have a dedicated line for the primary All-Call number

Receiving PJM All-Call Messages



Message Categories

There are 3 categories for All-Call Messages:

- Operational
- Informational
- Emergency Procedures

Message Categories

OPERATIONAL MESSAGES	
Gen Checkout	Master Coordinator
Regulation Requirements	Master Coordinator
Instantaneous Reserve Checks	Generation Dispatcher
Off SCED Control	Generation Dispatcher
Geo-Magnetic Disturbance Information (Warning or Activity)	Generation Dispatcher
Initiating Time Correction	Generation Dispatcher
Regulation Requirements	Master Coordinator

Message Categories

INFORMATIONAL MESSAGES	
Scheduling Information	Master Coordinator

Message Categories

EMERGENCY MESSAGES	
Emergency Alerts, Warnings, and Actions	GD, PD, MC or SS depending on message
Minimum Generation Alert	Master Coordinator
Synchronized Reserve Activations	Generation Dispatcher
Supplementary Status Report	Master Coordinator

Sample Script

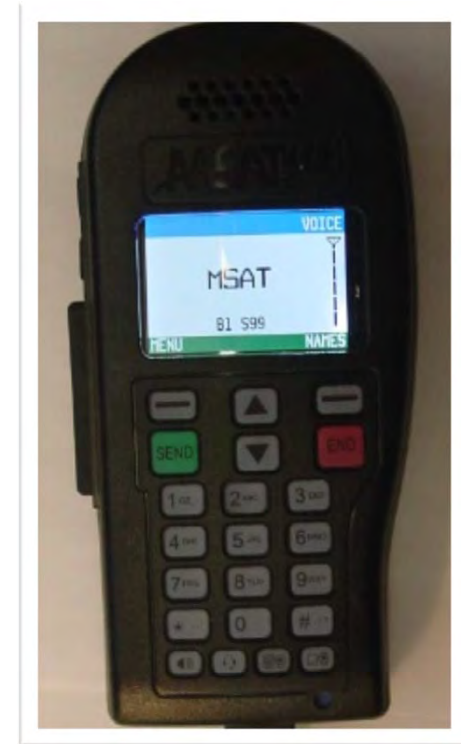
Instantaneous Reserve Check:

“This is (name) with an operational message. At (state time), PJM is requesting an Instantaneous Reserve Check for the entire PJM RTO. Please verify and enter reserve numbers in e-DART. This is (name); that is all”

Satellite Phone Testing

Satellite Phone Review

- Tests are conducted to verify that all equipment is working correctly and proper communication protocols are being used
- Two tests are conducted including the use of the Push-to-Talk (PTT) and Two-way Point-to-Point systems



Satellite Phone Review

When Does Testing Take Place?

- Test are normally conducted on weekly basis
 - Target test day is *Saturday at 12:30 hrs*
- Tests may need to take place more frequently depending on current security level
- Satellite phones are also tested during a PJM sponsored emergency procedures drills

Satellite Phone Review

Who Participates In The Testing?

- Generation Operator (GO) Control Centers must have satellite phones when one or more units total 500 MW or greater
- Transmission Owners also participate in the satellite phone tests

Satellite Phone Review

What Are The Main Purposes of Testing?

- The testing ensures proper functionality and reliability of the satellite phone system at both PJM & Member Company locations
- Allows the opportunity to test readiness level of Operators
- Operators have the opportunity to become familiar with the satellite phone equipment



Satellite Phone Review

Communication Protocols & Testing

- Testing ensures proper communication protocols are being followed when using the satellite phone system
 - Speak clearly, slowly and be mindful of pronunciations
- Use proper “code words” when communicating
 - “Over” when message/statement complete
 - “Out” when terminating transmissions (Initiator)
- Always identify your company and your name

PJM Communication Protocols

3-Part Communication

PJM Communication Protocols

- PJM Communication Protocols have been updated based on NERC Standard COM-002-4*
- Communication Protocols from PJM Manual 1
- PJM has adapted and started using these protocols in November of 2014

*PJM Manual-1, Section 4.2.4

PJM Communication Protocols

- Communication protocols are based on issuance of an Operating Instruction
- The use of 3-part communication would be required when issuing or receiving an Operating Instruction
- This would apply during both normal and emergency operations

*PJM Manual-1, Section 4.2.4

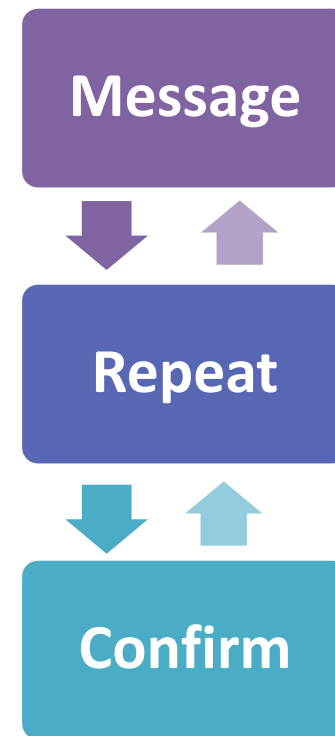
PJM Communication Protocols

Operating Instruction Definition

- A command by operating personnel responsible for the Real-Time operation of the interconnected Bulk Electric System to change or preserve the state, status, output or input of an Element of the Bulk Electric System or Facility of the Bulk Electric System

3-Part Communication

- “Operating Instructions” as defined in M-1 required the use of 3-Part Communication
- Internal audits are performed to verify use of 3-Part Communication
- Best practice:
 - Use of 3-Part Communication for all exchanges



3-Part Communication

Message



- ✓ Clear & Concise
- ✓ Speak Slowly
- ✓ Re-start communication process when signs of confusion are present

3-Part Communication

Repeat



- ✓ Ask for clarification if necessary
- ✓ *Understand* information
- ✓ Repeat back information correctly and thoroughly

Note: Provider/Sender of information should prompt repeat of information if not done voluntarily

3-Part Communication

Confirm



- ✓ Repeat message if necessary
- ✓ Correct receiver of information if repeated incorrectly
- ✓ Provide proper confirmation

Acceptable	Unacceptable
Yes, that is correct	Yeah, man
Ok, that is correct	OK
Correct	Alright, yeah, bye

PJM Communication Protocols

Operating Instruction Examples*

Ordering Transmission equipment in or out of service

Load shed instructions

Ordering generation MW/MVAR output changes

Ordering generation online or offline (real-time or in advance)

*Partial List

PJM Communication Protocols

Non-Operating Instruction Examples*

Confirmation of ratings or power flows

Discussion of operational options

Discussions of generator status availability

*Partial List

PJM Communication Protocols

Additional Protocols & Requirements

- Last name should always be used for identification (at a minimum) along with company name
- All-Call Messages will be confirmed based on confirmation of acknowledgement of message
 - Indicated by Operators selecting “2” to acknowledgement the message

PJM Communication Protocols

Additional Protocols & Requirements cont.

- Time references should be stated in 24 hour format using time zones when appropriate
- Phonetic alphabetic may be used to clarify information as necessary

PJM Communication Protocol

Equipment & Transmission Line Identification

- **Transmission Lines** – Terminal to Terminal, Voltage level and line number
- **Other Equipment/Substation** – Station name, equipment number equipment type
- **Generating Station** – Station name, unit number

Summary

- Review of PJM Communication Protocols
 - Definition of Operating Instruction
 - Requirements for use of 3-Part Communication
 - Review of 3-Part Communication Steps
 - Various other Communication Protocols

Questions?

Resources & References

- PJM Interconnection. (2014). *PJM Manual 1: Control Center & Data Exchange Requirements (Section 4)*. Retrieved from: <http://www.pjm.com/~media/documents/manuals/m01.ashx>