



# CRM-TEM

## Crew Resource Management - Threat Error Management

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### *Student Guide*

Prepared by:  
State & Member Training  
PJM©2025

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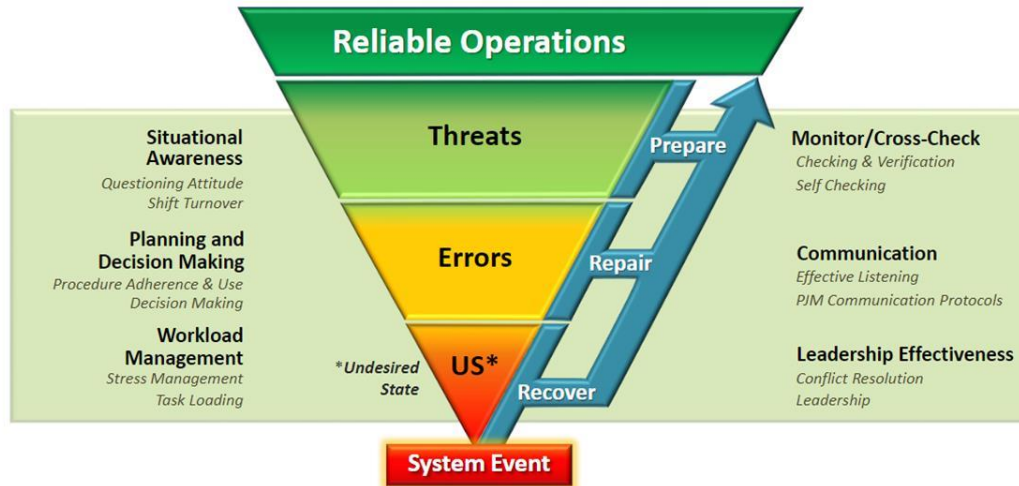
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# Objectives

- Identify the various error prevention tools used to increase operator awareness

# PJM's CRM-TEM Model

## PJM's CRM/TEM Model



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# Threats

## PJM's CRM-TEM Model



Threats refer to things that occur outside the control of the team that could pose challenges for the operator, increase operational complexity or require special attention to effectively manage.

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## What are your threats?



Examples of threats include:

- Weather events
- Shift changes
- Time pressures
- Tool unavailability
- Fatigue

We manage threats by identifying and preparing for the threat. This is what returns us to reliable operations.

- Identifying threats begins with situational awareness - recognizing the threat in the first place
- Preparing for a threat involves developing strategies to counter the threat

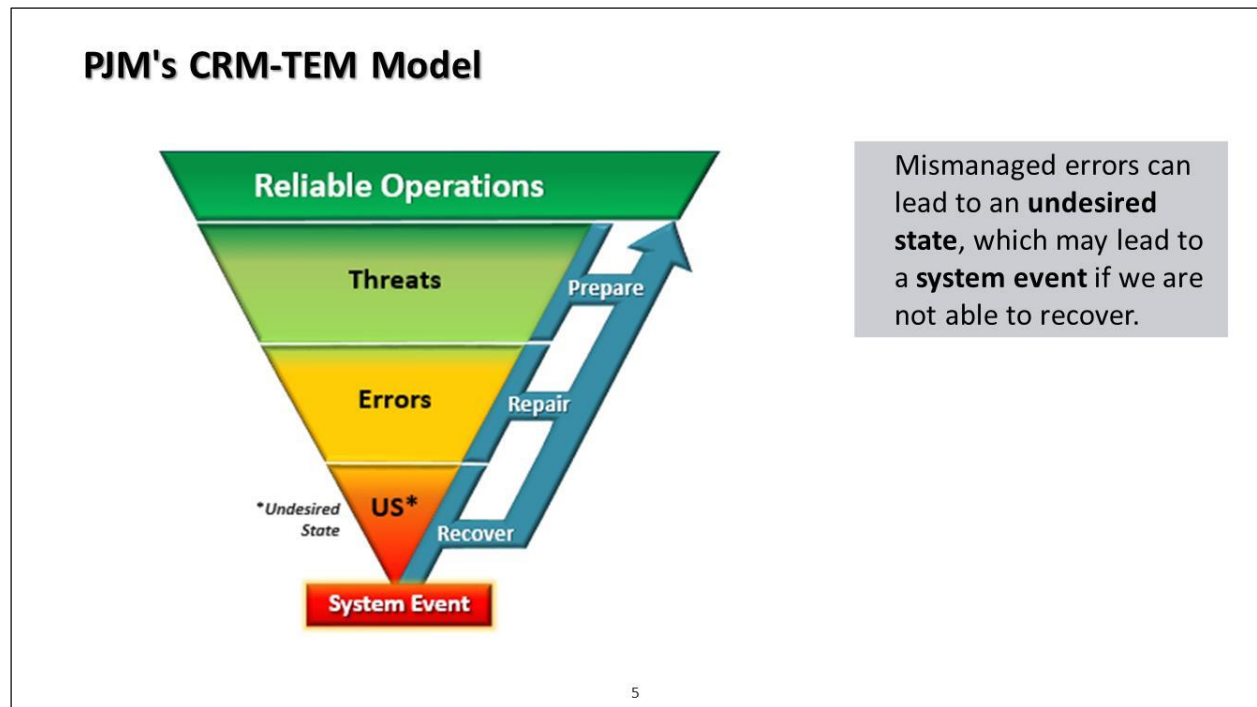
# Errors

## PJM's CRM-TEM Model



Errors are the result of a breakdown in one of the six CRM tools. Someone did or did not do something that resulted in an error.

# Undesired State/System Event



## Undesired State

Examples of an undesired state include:

- Facility overloads
- Unknown operating state

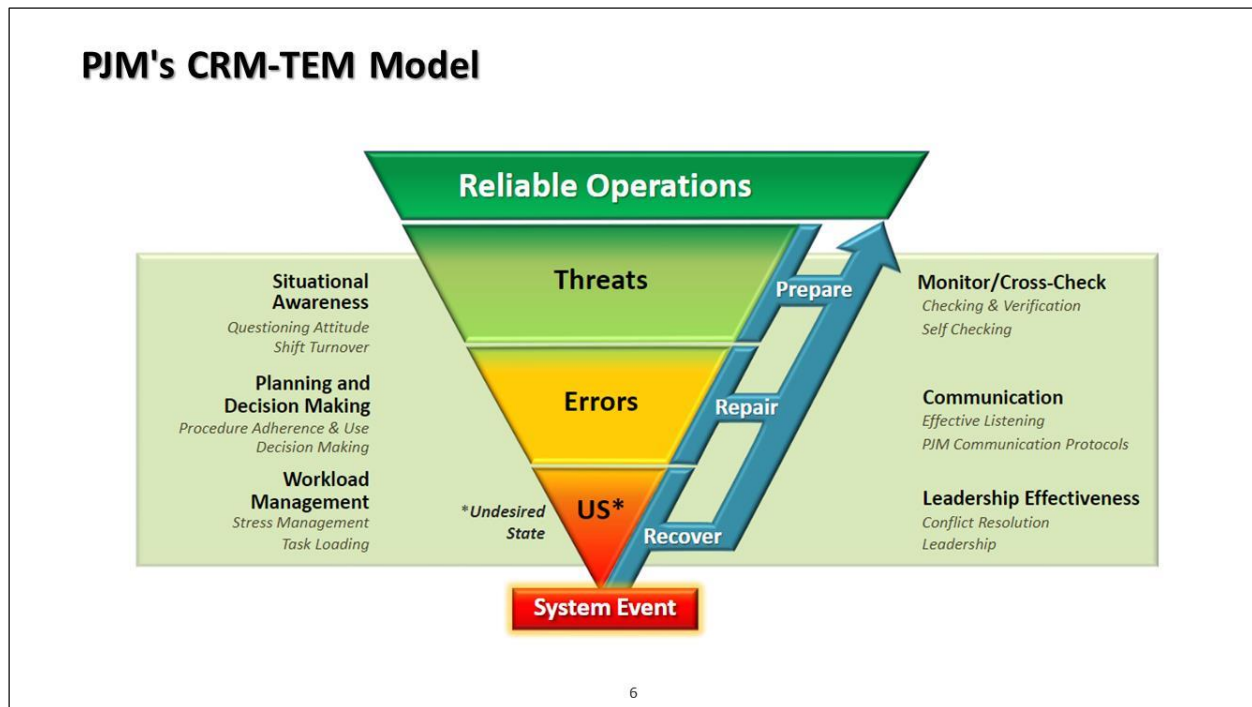
## System Event

Examples of a system event include:

- Load shed
- System blackout

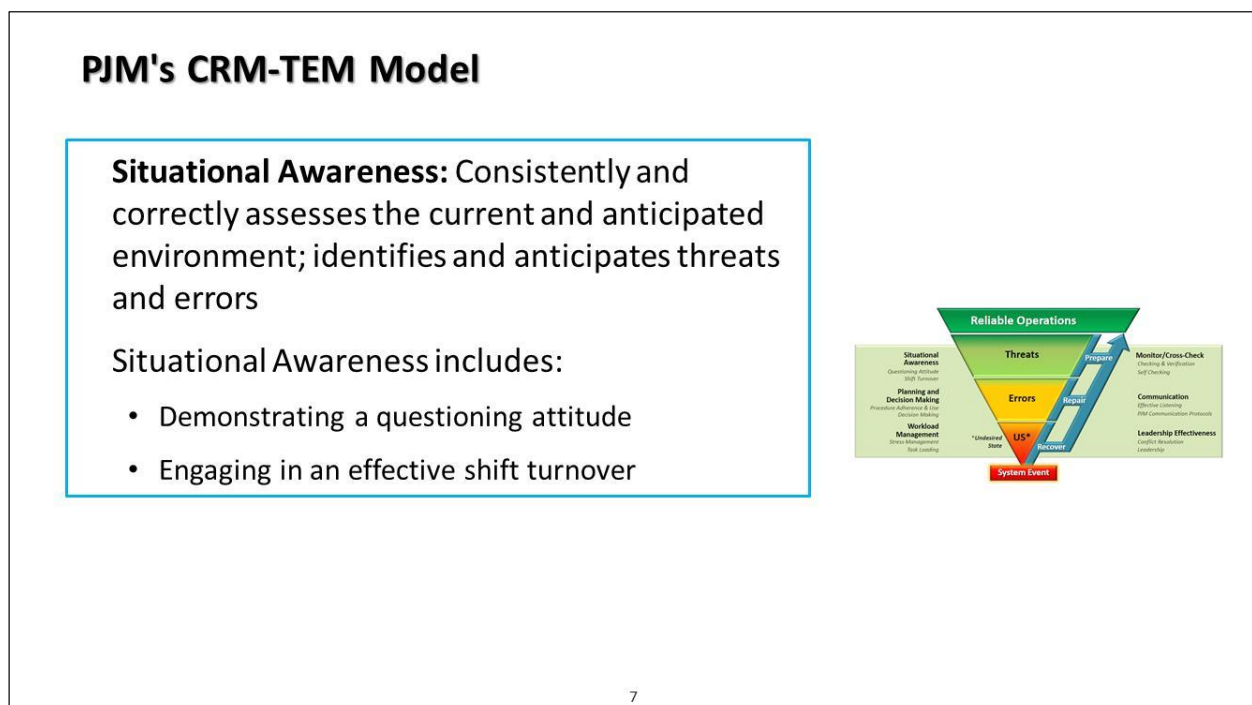


# Crew Resource Management (CRM) Model



**Crew Resource Management (CRM)** skills are the tools in the operators' toolkit to help identify, prepare, repair and recover. These skills represent the "How" behind the TEM model. The CRM tools are designed for error prevention and help reduce human error.

## Situational Awareness



## Questioning Attitude

Demonstrating a questioning attitude:

- Ask questions
- Stop when unsure
- Avoid situations where "I think" or "I assume" are used

## Shift Turnover

Engaging in an effective shift turnover:

- Over-communicate details about current or anticipated conditions
- Write down important pieces of information
- Consider the question "What would I want to know?" and include this information in your handoff

## Planning/Decision Making

### PJM's CRM-TEM Model

**Planning/Decision Making:** Incorporates relevant information, develops operational strategies and chooses the best course of action consistent with safe, reliable, and efficient operations

Planning/Decision Making includes:

- Demonstrating procedures adherence & use
- Effective decision making



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## Procedure Adherence & Use

Demonstrating procedure adherence & use:

- Use current version
- Ensure the procedure is appropriate for the current conditions

- Follow steps in the appropriate sequence
- Identify and correct deficiencies in the process or documentation

## Decision Making

Effective decision making:

- Consult available and applicable resources
- Gather recommendations from team members
- Act on the most appropriate solution, even if it wasn't your idea
- Establish "Bottom Lines" or clear criteria for when you would move toward an alternative plan
- Resolve conflicts quickly

## Workload Management

### PJM's CRM-TEM Model

**Workload Management:** Effectively manages tasks to optimize overall performance

Workload Management includes:

- Stress management
- Being mindful of task loading



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## Stress Management

Stress management:

- Anticipate what might go wrong and consider contingencies
- Recognize stress in the team and take steps to calm the situation

- Acknowledge confusion and realign the team
- Communicate in a calm, constructive manner

## Task Loading

Be mindful of task loading

- Ask for help when feeling overwhelmed
- Look for ways to prioritize tasks
- Use checklists to ensure critical steps are captured
- Write things down

## Monitor/Cross-Check

### PJM's CRM-TEM Model

**Monitor/Cross-Check:** Actively verifies systems and other team member actions; resolves inconsistency and uncertainty

Monitor/Cross-Check includes engaging in:

- Self-checking
- Checking & Verification of peers







## STAR Method



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## STAR Method for Self-Check

 <b>Stop</b>	Pause, eliminate distractions and focus
 <b>Think</b>	Consider potential risks and expected outcomes
 <b>Act</b>	Ensure proper action is taken for every task
 <b>Review</b>	Verify that expectations and results were achieved

## Peer Check

### Concurrent Peer Check:

- A series of actions by 2 individuals (the performer and the peer-checker) working together at the same time and place, before and during a specific action, to prevent an error by the performer
- Opportunity to involve a co-worker at the same time you are about to perform the work in order to verify that the work to be performed is correct

### Independent Peer Check:

- Requires separation in time and space between the individuals involved to ensure “freedom of thought”
- Performer and peer-checker perform/verify task completion without interaction

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## Peer Check

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- Performer and peer-checker perform/verify task completion without interaction

Examples of when to apply peer check principles may include:

- Writing a switching order for an outage
- Running a power flow study
- Observing an individual during OJT
- Prior to inputting data
- During a training session on the simulator
- Prior to implementing a procedure or corrective action

# Communication

## PJM's CRM-TEM Model

**Communication:** The exchange of ideas, information, and instructions in a clear and timely manner

Communication includes:

- Effective listening
- Adhering to the PJM Communication Protocols



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Engaging in effective listening:

- Remove distractions
- Prepare yourself to listen and receive the information
- Be patient
- Listen for ideas, avoid focusing solely on the words used
- Wait and watch for non-verbal communication





# Leadership Effectiveness

## PJM's CRM-TEM Model

**Leadership Effectiveness:** Effectively exercises responsibilities in a manner that promotes teamwork, professionalism, and mentoring

Leadership Effectiveness includes:

- Conflict resolution
- Principles of strong leadership



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## Conflict Resolution

Effective conflict resolution:

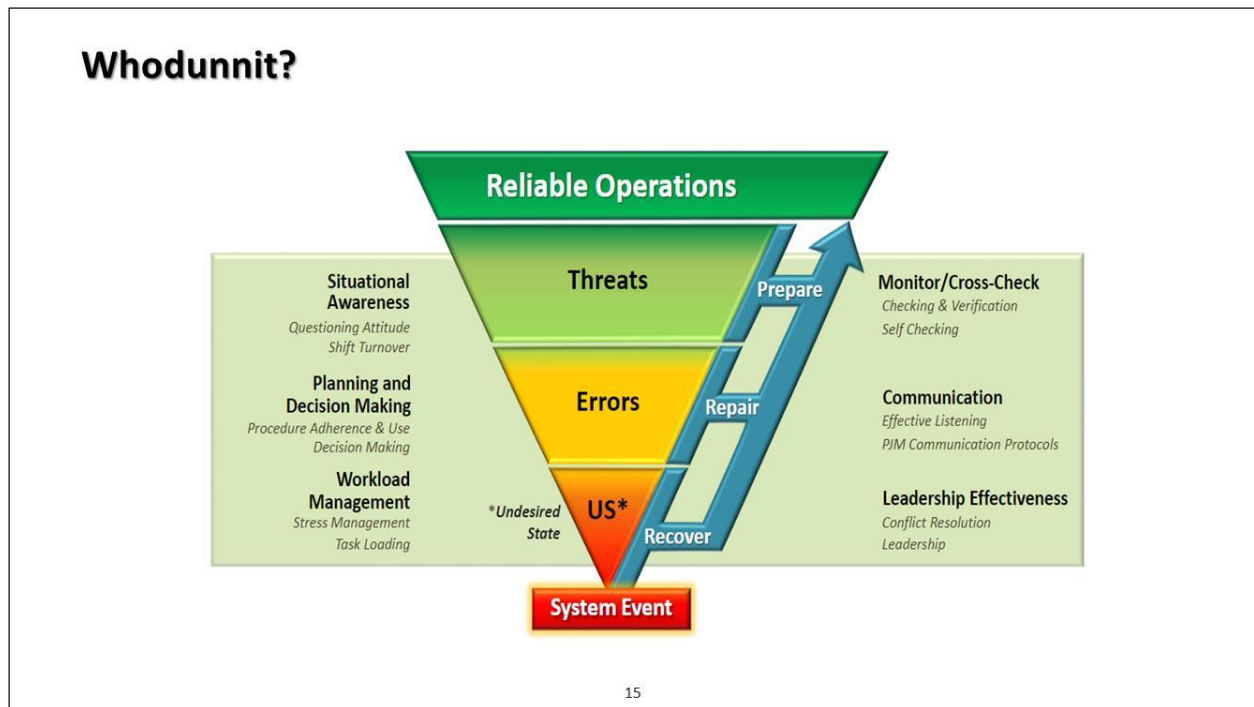
- Define the issue
  - What did I expect to hear, see or experience?
  - What did I actually hear, see or experience?
- Communicate
  - Let someone know
  - Don't stop until the conflict is resolved

## Strong Leadership

Principles of strong leadership:

- Use an open tone
- Respect expertise, but be willing to ask questions when clarity is needed
- Assign clear roles
- Plan and anticipate contingencies

# Knowledge Check!



Let's Review!

## 1. Fill in the blank.

What are some examples of threats that might impact an operator or reliable operations?

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## 2. Fill in the blank.

What are ways in which we can manage threats?

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# Summary

Summary



In this presentation, we:

- Identified the various error prevention tools used to increase operator awareness

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## Questions?

PJM Client Management & Services	
Telephone:	(610) 666-8980
Toll Free Telephone:	(866) 400-8980
Website:	www.PJM.com
Email:	trainingsupport@pjm.com



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