

NERC

NORTH AMERICAN ELECTRIC
RELIABILITY CORPORATION

PER-005-2

Operations Support Personnel

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July 28, 2015

RELIABILITY | ACCOUNTABILITY



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- Operations Support Personnel Definition
- PER-005-2 Operations Support Personnel Requirement
- Analysis by Industry
- Questions to Ask
- Question Overview
- Entity Examples:
 - American Electric Power (AEP)
 - Otter Tail Power
- Examples of Job Titles
- PER-005-2 Draft RSAW
- Q&A

- Operations Support Personnel – *Individuals who perform current day or next day outage coordination or assessments or who determine SOLs, IROLs, or operating nomograms, in direct support of Real-time operations of the Bulk Electric System.*
 - Footnote one: *Nomograms are used in the WECC Region to describe element operating limits.*
 - Definition developed with PER-005-2

R5. Each Reliability Coordinator, Balancing Authority, and Transmission Operator shall use a systematic approach to develop and implement training for its identified Operations Support Personnel on how their job function(s) impact those BES company-specific Real-time reliability-related tasks identified by the entity pursuant to Requirement R1 part 1.1.
[Violation Risk Factor: Medium] [Time Horizon: Long-term Planning]

5.1 Each Reliability Coordinator, Balancing Authority, and Transmission Operator shall conduct an evaluation each calendar year of the training established in Requirement R5 to identify and implement changes to the training.

- Initial discussions have begun by registered entities
 - Job functions have an “impact” is baseline question
- NERC definition makes sense to those developing training
 - Observable handoffs to system operators
- Not a significant burden to incorporate additional personnel

- Which internal department responsible for determining equipment and line ratings?
 - Ratings used for SCADA alarms
 - Determining System Operating Limits (SOLs)
 - Determining Interconnection Operating Limits (IROLs)
- Which internal department responsible for “outage coordination” function ?
 - Creating switching schedules
 - Reviewing switching request information
 - Developing switching orders
 - Coordinating with internal department responsible for real-time/operational planning

- Which internal department responsible for “real time/operational planning” function that impact Real-time reliability-related tasks?
 - Conducting next day studies
 - Developing operating guides
 - Knowledgeable on state estimator
 - Data analysis for on-line power flow
 - Developing contingency analysis modules

American Electric Power (AEP)
Operations Support Personnel
PER-005-2; Requirement R5

Purpose:

The purpose of this presentation is to illustrate the methodology American Electric Power (AEP) implemented to identify their Operations Support Personnel in compliance to NERC Standard PER-005-2.

Objective:

1. Identify Operations Support Personnel in compliance to NERC Standard PER-005-2; Requirement R5.

There are several methodologies that functional entities can implement to identify their Operations Support Personnel in compliance to PER-005-2, Requirement R5. American Electric Power developed and implemented its Operations Support Personnel project plan based on the following items:

- NERC Standard PER-005-2; Requirement R5
- NERC definition of Operations Support Personnel
- Management commitment and support
- Organization functional and operational structure

- The training organization developed a project plan based on PER-005-2; Requirement R5, NERC definition of Operations Support Personnel and the organization's functional and operational structure.
- The project plan was submitted to Management and Compliance for discussion and approval.
- The process (analysis) to identify Operations Support Personnel began once Management approved the project plan.

R5: Each Reliability Coordinator, Balancing Authority, and Transmission Operator shall use a systematic approach to develop and implement training for its *identified* Operations Support Personnel on how their *job function(s) impact* those *BES company-specific Real-time reliability-related tasks* identified by the entity pursuant to *Requirement R1 part 1.1*.

5.1. Each Reliability Coordinator, Balancing Authority, and Transmission Operator shall conduct an evaluation each calendar year of the training established in Requirement R5 to identify and implement changes to the training.

Red Text = keys items in the AEP analysis process

Operations Support Personnel:

Individuals who perform *current day* or *next day outage coordination* or *assessments*, or who determine *SOLs*, IROs, or operating nomograms*, in *direct support* of *Real-time operations* of the Bulk Electric System.

**Nomograms are used in the Western Electricity Coordinating Council (WECC) Region to describe element operating limits.*

- American Electric Power has a defined process for transmission outage studies and System Operating Limits (SOL) coordination with the real-time System Operators.
- This process or set of tasks are performed by Operations Engineers within Transmission Operations. The Operations Engineers coordinate directly with System Operators and Reliability Coordinators.



- The training department identified potential Operations Support Personnel within the Operations Engineering department (Operations Engineers).
- A survey based on the NERC definition of Operations Support Personnel was administered to each Operations Engineer.
- The survey was used to self identify candidates that met the criteria of Operations Support Personnel.

None thinking about technology...

We'd like to understand your opinions towards technology, how much you agree or disagree with...

	Definitely Disagree	Disagree	Neither	Agree	Definitely Agree	Don't know / Not applicable
People often ask me opinions about the latest gadget/ technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
I like to be well informed about gadget/ technologies	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>
Typically I'm one of the first people to buy the latest technological gadget (i.e. MP3 mobile phone/DVD etc)	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like to have a different mobile phone to everyone else	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I like my gadgets and appliances to reflect my sense of style	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I invest a lot in new technology	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I tend to look out for new technological gadget (i.e. MP3 mobile phone/DVD etc)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
I use my mobile for things other than calling / texting (i.e. mobile viewing, downloading etc)	<input type="radio"/>	<input checked="" type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>



- The candidates completed a fill-in form providing a describing of their daily tasks a few weeks after the survey. A task format example was provided on the fill-in form for each Operations Engineer.
- This process was used to verify/validate the survey information.



- Trainers interviewed and observed candidates performing their job function (tasks) several weeks after the task fill-in form was completed.
- This process was used to verify/validate the survey and task fill-in form information.

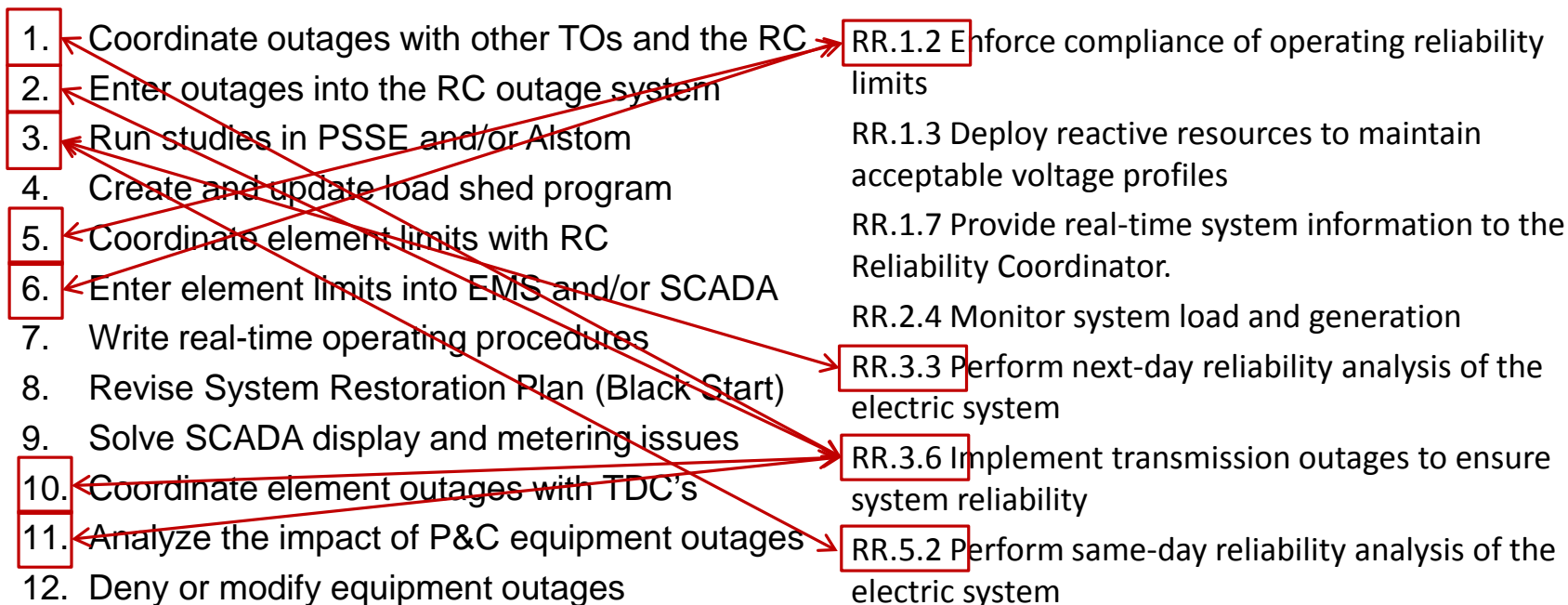


- The initial tasks list for Operations Support Personnel was based on the survey, task fill-in form and interview/observation information (process).
 - **Example: This is a limited Initial Tasks List**
 1. Coordinate outages with other TOs and the RC
 2. Enter outages into the RC outage system
 3. Run studies in PSSE and/or Alstom
 4. Create and update load shed program
 5. Coordinate element limits with RC
 6. Enter element limits into EMS and/or SCADA
 7. Write real-time operating procedures
 8. Revise System Restoration Plan (Black Start)
 9. Solve SCADA display and metering issues
 10. Coordinate element outages with transmission dispatch centers
 11. Analyze the impact of protection and control equipment outages
 12. Deny or modify equipment outages



- The initial tasks list was mapped to the Bulk Electric System (BES) company-specific Real-time reliability-related tasks identified pursuant to PER-005-2; Requirement R1 (1.1).

- **These are limited examples**



- The mapped tasks (PER-005-2; Requirement R1 part 1.1) were selected for Operations Support Personnel.
 - **Example: Tasks List**
 - RR.1.2 Enforce compliance of operating reliability limits
 - RR.3.3 Perform next-day reliability analysis of the electric system
 - RR.3.6 Implement transmission outages to ensure system reliability
 - RR.5.2 Perform same-day reliability analysis of the electric system
 - RR.N.N Additional Tasks



- The mapped tasks (PER-005-2; Requirement R1 part 1.1) were converted to knowledge-based tasks.
 - RR.1.2 Enforce compliance of operating reliability limits
 - The trainee will recognize the impact of enforcing compliance of operating reliability limits in accordance with RTO policy.
 - RR.3.3 Perform next-day reliability analysis of the electric system
 - The trainee will recognize the impact of performing next-day reliability analysis of the electric system in accordance with RTO policy.

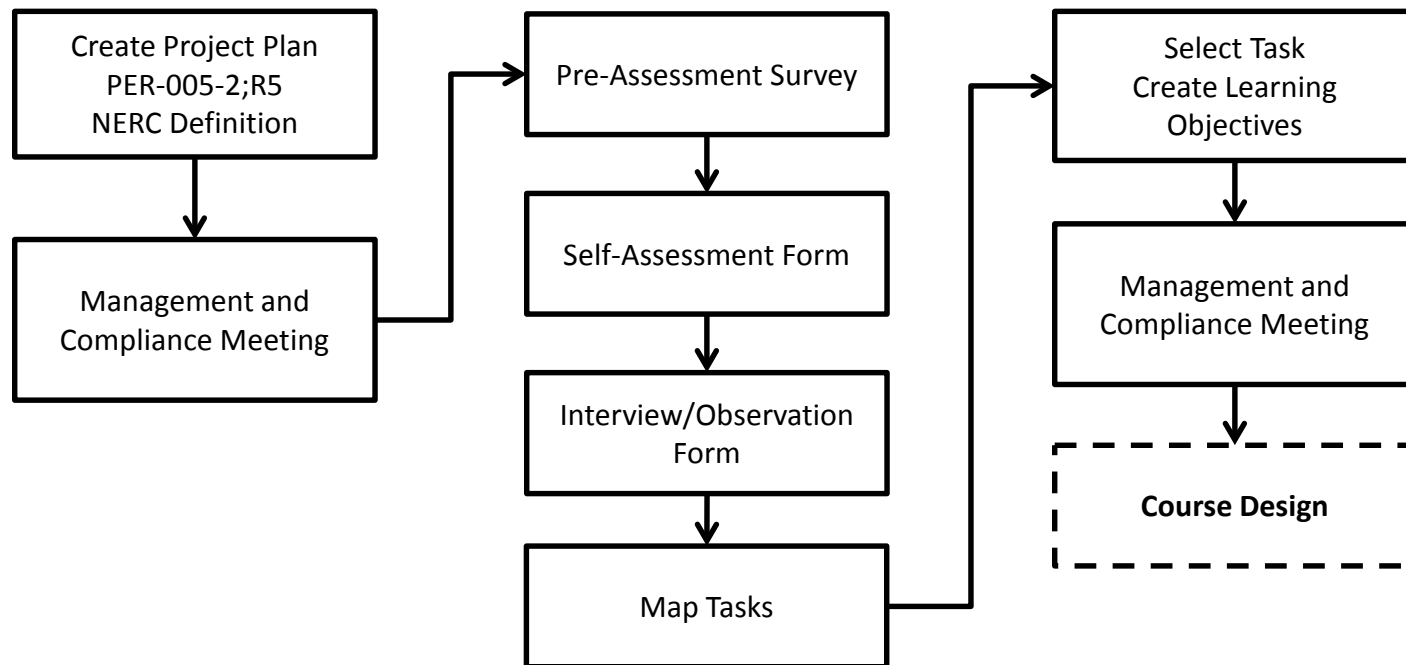


- The training team provided project status (update) to Management and Compliance.



- Next Step: **Course Design**

- Identification of Operations Support Personnel





Purpose:

Define the methodology Otter Tail Power Company(OTP) implemented in compliance to PER-005-2 Requirement R5, and review considerations utilized in the determination of their course of action.

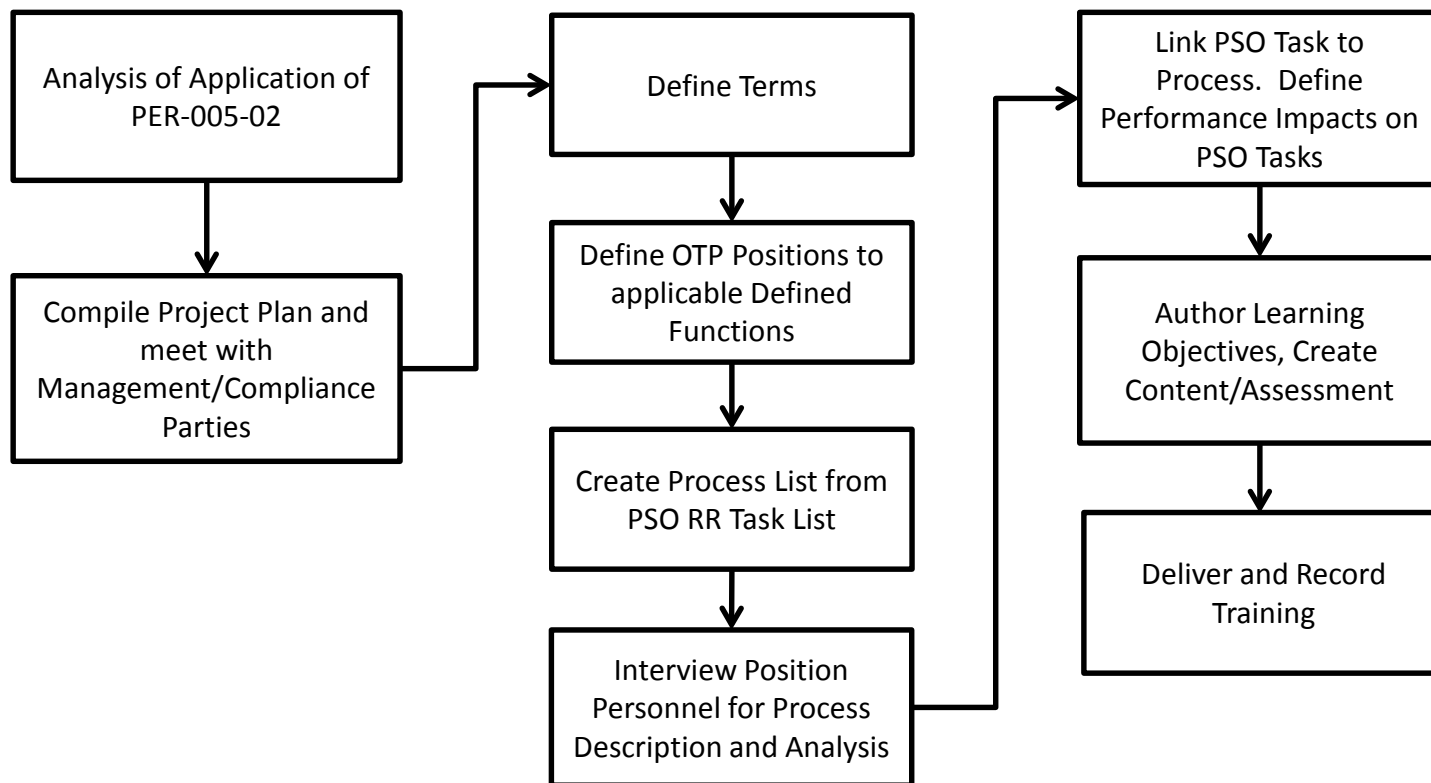
Objective:

1. Define OTP's Process utilized in PER-005-2 Requirement R5 Compliance Efforts.
2. Describe attributes for others to consider while instituting their application of the standard.
3. List Resources to further explain requirements and the measurements of the Standard.

The purpose of this presentation section is to review the application of process regarding Otter Tail Power Company's method to ensure both Operational Excellence while also providing a basis for regulatory compliance evidence.

The following explanation of process and methods utilized by Otter Tail Power Company does not guarantee compliance for another registered entity. These illustrations are offered to our industry peers in an informational sharing spirit to aid in the sharing of information and methods to ensure we all move forward together in the effort to operate the North American Electrical Grid as reliably and efficiently as possible.



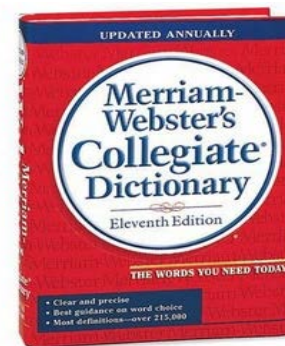


Implementation Questions Otter Tail Power Company Addressed

- How do we define “Impact” of Operations Support Personnel actions on Power System Operator Tasks?
- How to define what job positions have an impact on Power System Operator Tasks?
- Does the training program need to be in place by the implementation date?
- Does the training have to be completed by the Standard Implementation date?
- Can job incumbents forgo training if there is no individual training need or performance gap?
- What internal group will complete the project, and who will maintain the program once implemented?



- **What is the definition of Impact?** NERC uses this term in the Standard as follows: “...*impact* on those BES company-specific Real-time reliability-related tasks”). NERC does not have a stated definition for “impact”. The Webster Dictionary uses these phrases in its definition: “to have a direct effect” and to “to make contact”. One suggestion is to define “impact” as a ***critical input*** used in BES real-time reliability tasks. The point of analysis would be at the observable handoff (e.g. next day study, switching schedule, switching orders, operating guide, etc.).



- **What job positions have an “impact”?** The NERC definition of Operations Support Personnel provides some guidance: “Individuals, who perform current day or next day outage coordination or assessments, or who determine SOLs, IROs, or operating nomograms, in direct support of Real-time, operations of the Bulk Electric System”.

Job Function Analysis for: OTP Outage Coordinator Process # 1.1.1

Process Author(s): Cletus Fandrich/ Neil Lindgren DATE: 06/17/2015

CATEGORY (EMS) 1 SUB-CATEGORY 1 TASKNUMBER 1

JOB PROCESS DESCRIPTION:

Determine proper data (i.e. analog, status, control) to be on display for the system operator on the EMS system. Instruct EMS support to implement displaying of data on the EMS display.

JOB FUNCTION LEARNING OBJECTIVE

Student will recall and explain the Operation Coordinator job function impact on the associated PSO task completion for both proper and improper completion of the outage coordinator function.

JOB FUNCTION SUPPORTS THE FOLLOWING PSO TASK NUMBER AND DESCRIPTION:

- 1.1.2- Respond to a actual and/or potential transmission system equipment rating violations.
- 1.1.3- Monitor condition of neighboring transmission systems to identify potential impacts on Otter Tail Power Electrical System.
- 1.1.5- Monitor, interpret, and respond to substation alarms utilizing the EMS Application.
- 1.2.1- Monitor voltage at all remote terminal unit buses utilizing the EMS Application and identify a actual or potential voltage violations.
- 1.2.2- Monitor VAR flows to ensure that they are within acceptable limits on an actual and contingency basis.
- 1.2.3- Respond to actual or contingency voltage deviations.
- 1.2.6- Coordinate with generating plant owners/operators to a adjust unit output voltage as required.

HOW THIS JOB FUNCTION IMPACTS THE ASSOCIATED OTP PSO TASK(S)

If the Outage Coordinator properly completes the process, the PSO will have the proper data to monitor the system and their response and correlative outcome will be supported in such a fashion as to enable proper operations of the electrical system.

HOW WOULD IMPROPER PERFORMANCE OF THIS SUPPORT FUNCTION AFFECT THE ABILITY OF THE PSO TO PROPERLY COMPLETE THEIR TASK(S)?

If the Outage Coordinator improperly completes the process, the PSO will not have the proper data to monitor the system and their response and correlative outcome may be greatly misguided causing damage to equipment, harm to personnel, or affect the reliability of the electrical system in an unwanted manner.



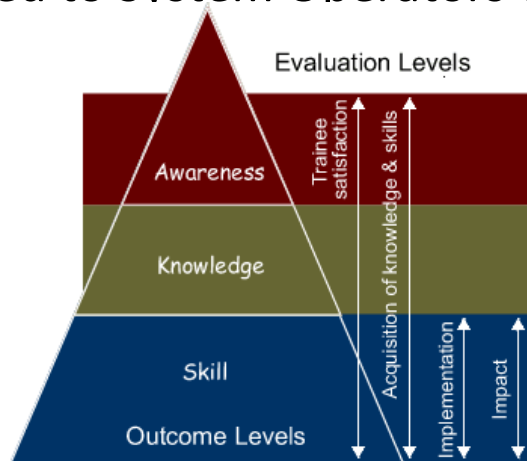
- **Systematic Approach to Training - Needs analysis**

- The PER-005 Standard R5 states that each “Reliability Coordinator, Balancing Authority, and Transmission Operator shall use a systematic approach to develop and implement training for its identified Operations Support Personnel on how their job function(s) impact on those BES company-specific Real-time reliability-related tasks identified by the entity pursuant to Requirement R1 part 1.1.”



- **What level of training is needed?**

- NERC documents refer to the possibility of using existing System Operator training to help meet requirement R5. This suggests that the “spirit of the Standard” is to use a more robust approach.
- OTP’s approach was to create independent training modules for each OSP Position ensuring the LO’s are both specific to their awareness of impact of the performance of the support staff as to the identification of dependency of the PSO RR Task on that of the OSP Function.
- A more conservative approach is to build the training program using some of the courses delivered to System Operators with the incorporation of the impact awareness.

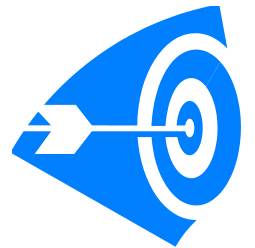


Deadline for Training Program Creation ?

- The creation of a training program that identifies training needs, training solutions, and evaluation should be done by the implementation date of July 01, 2016. In addition, the following steps should be completed: Needs Analysis, Training Solutions (program or courses), and Training Records.

Deadline for Completion of Training ?

- Are we only required to have the training in place or do we also need to have the training completed?
- This suggests that training should be completed by the implementation date. OTP has taken the approach that it will be completed by the July 01, 2016 compliance implementation date.



- *M5. Each Reliability Coordinator, Balancing Authority, and Transmission Operator shall have available for inspection evidence that Operations Support Personnel completed training in accordance with its systematic approach. This evidence may be documents such as training records showing successful completion of training. Documentation of training shall include employee name and date of training.*
- *M5.1 Each Reliability Coordinator, Balancing Authority, and Transmission Operator shall have available for inspection evidence (such as instructor observations, trainee feedback, supervisor feedback, course evaluations, learning assessments, or internal audit results) that it performed an evaluation each calendar year, as specified in Requirement R5 part 5.1.*



Much of the content Discussion was provided as a summary of discussions held by Members of the MISO SOTWG with major contributions from:

- ***Will Behnke*** (*Alliant Energy*)
- ***Shannon Bolan/Brian Goracke*** (*NPPD*)
- ***John Pettingill*** (*Xcel*)

- Below are some examples, but are not limited to these titles:
 - Clearance coordinators
 - Real-time planning engineers
 - Outage Coordinators
 - Operating Engineers
 - Etc.

- PER-005-2 standard effective July 1, 2016
- Draft RSAW located on [PER-005-2 Project Page](#)



Questions and Answers

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