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RELIABILITY CORPORATION

ERO Enterprise Facility Ratings Themes and Best Practices

Tim Ponseti, VP Operations, SERC
ERO Facility Ratings Themes Report
May 24, 2023

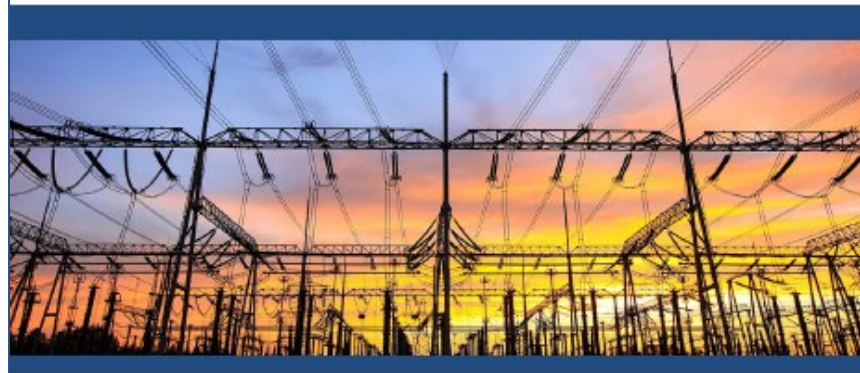
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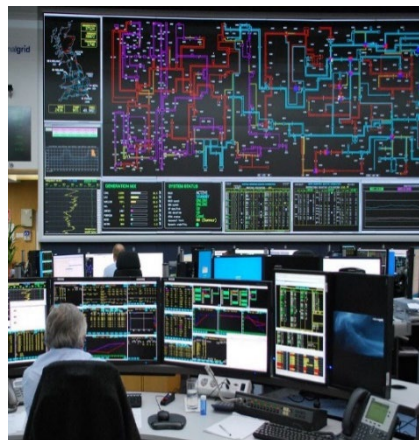
ERO Enterprise Themes and Best Practices for Sustaining Accurate Facility Ratings

October 20, 2022





**Facility Ratings
are
Foundational**



- They don't stand alone
- Nature of the evolving Grid
- Ambient Adjusted ratings – Order 881
- Confidence with Policy Makers

- Executive Summary
- Introduction
- Background
- **4 Themes**
- Sustaining Your Facility Ratings Program
- Conclusion
- **Appendix A: Facility Ratings Resources**

Framework used with each of 4 Themes:

- *Observations*
- *Suggestions to address the identified theme*
- *Corrective Actions*

Overall Objective:
Program Sustainability



Best Practices



- Define Environment and Internal Controls needed to Maintain Reliable System
- Clarity on the Foundational components of the Program
- Facility Ratings Program Sponsor
- Clearly defined process, with clear roles & responsibilities
- Training for all departments and contractors involved
- Test the program; validate and verify
- Establish Accurate Baseline
- Field Verification
- Identify all Equipment – Take Photos
- Account for all necessary pieces of equipment
- Establish a Corrective Action Program – risk management and continuous improvement

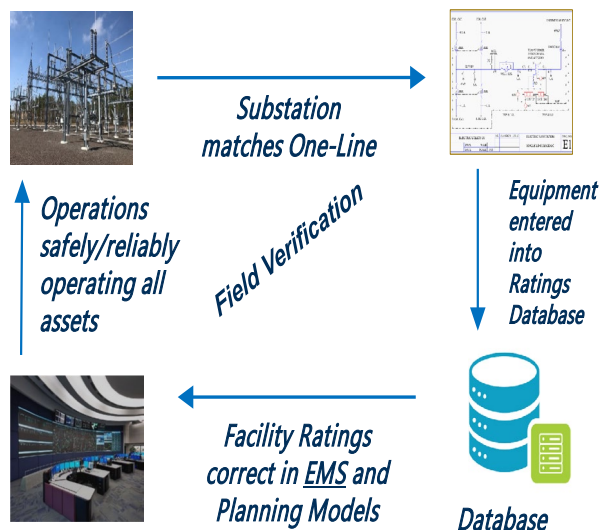
Best Practices

- Single Official Master Database
- Communicate location of database to all relevant personnel
- Document the process to obtain information from the field, and to enter into database
- Reinforce with Training, and workflow diagrams
- Peer review to ensure data entered correctly
- Implement strict access controls
- Contractor Management should be included



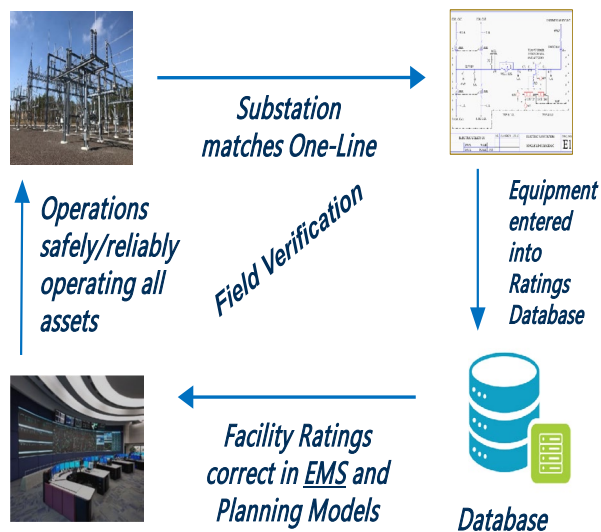
Challenges

- Emergency Restoration
- Inventory Management
- Mergers / Acquisitions
- Database Vendor Changes
- Coordination between Departments
- Equipment “removed from service”
- Changes to existing Equipment
- Commissioning of New Equipment
- Contractor work verification
- Local Office Redlines
- Underbuilds / Encroachments



Best Practices

- Change Checklist
- Quality Assurance Reviews after any change
- Validation through periodic reviews
- Data entry verification
- Periodic walk-downs
- Clearly outlined approval process
- Notification to update equipment inventory after a change is implemented
- Confirmation that change is implemented as planned
- Change process Flowchart



Best Practices

- Develop and maintain a detailed and comprehensive Facility Ratings methodology
- Use a single, consistent methodology applying the same criteria to components of a Facility
- Ensure consistent application of Facility Ratings methodology across multiple internal company divisions
- Provide the specific rating method for each class and type of element comprising a BES facility
- Train appropriate personnel on how to consistently apply the methodology
- Increase coordination with jointly-owned facilities to ensure common ratings are used



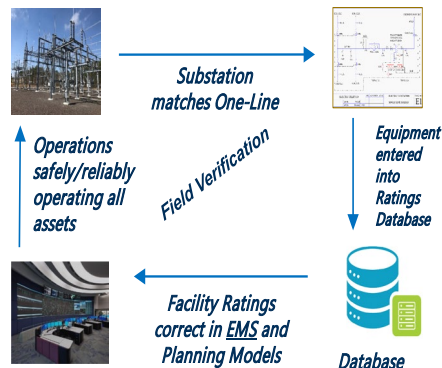
Theme 1: Lack of Awareness



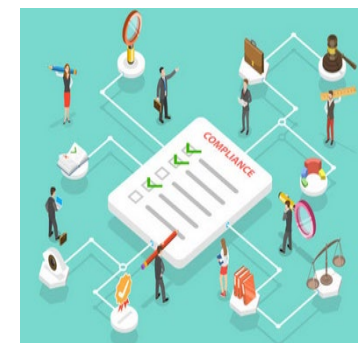
Theme 2: Inadequate Asset and Data Management

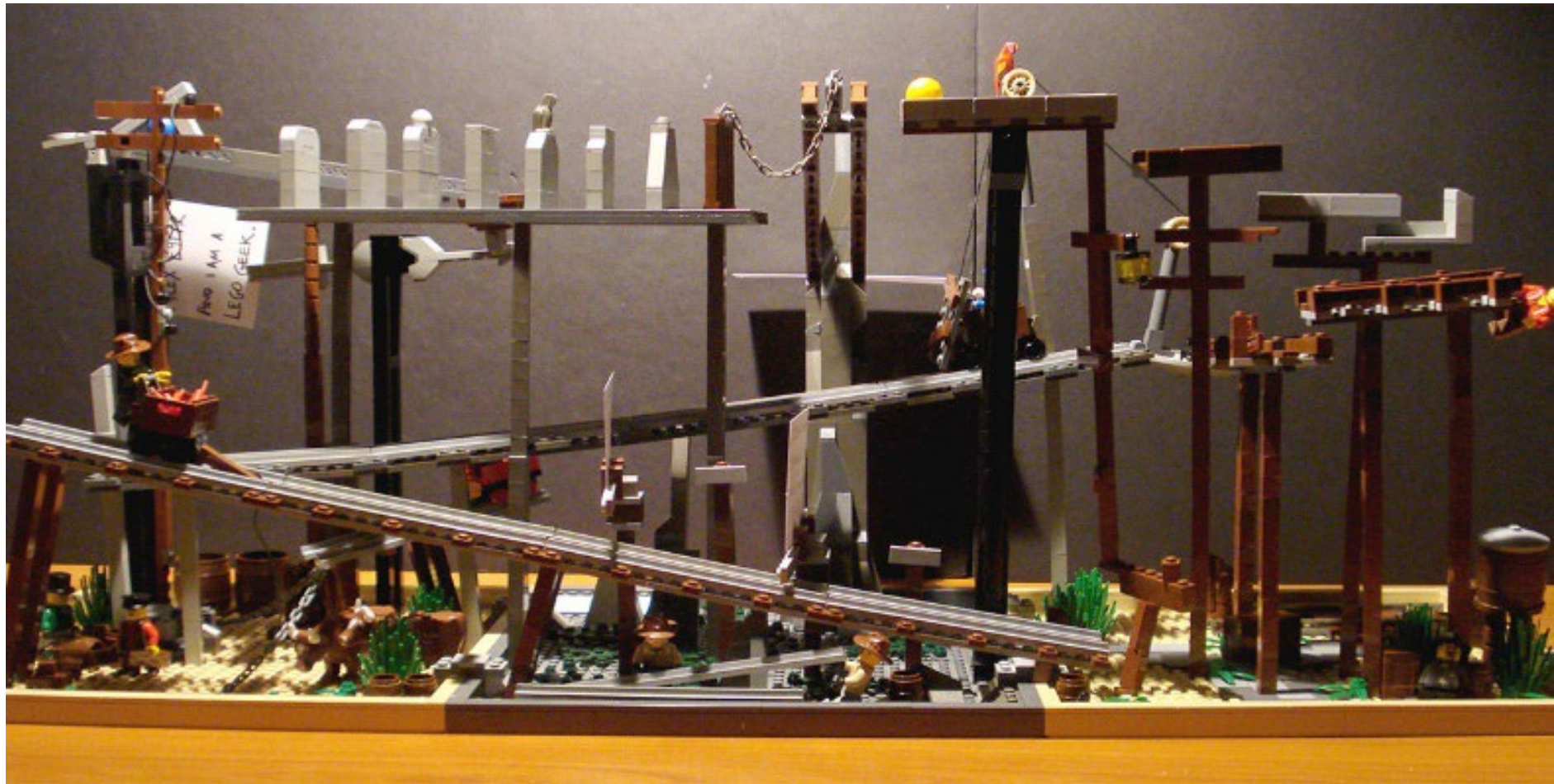


Theme 3: Inadequate Change Management



Theme 4: Inconsistent Development/ Application of Facility Rating Methodology







Appendix A: Facility Ratings Resources

The ERO Enterprise continues to enhance and expand its outreach efforts to stress the importance of accurate facility ratings, highlighting extent of condition, potential gaps, recommended mitigation activities, and best practices. Linked below are helpful resources for establishing and sustaining accurate facility ratings. In addition, the ERO Enterprise encourages registered entities to contact their Regional Entity(ies) with specific questions or concerns.

- [ERO Enterprise CMEP Practice Guide](#)
- [2021 ERO Enterprise CMEP Implementation Plan](#)
- [MRO Standard Application Guide FAC-008-3](#)
- [NERC Facility Ratings Problem Statement](#)
- [NPCC Fall 2021 Compliance Webinar with FAC-008](#)
- [NPCC 2022 Focus on Facility Ratings Statement](#)
- [ReliabilityFirst Facility Ratings Webinar](#)
- [ReliabilityFirst Facility Ratings Workshop](#)
- [SERC Facility Ratings Overview Presentation](#)
- [SERC Facility Rating Expectations and Lesson Learned Presentation](#)
- [SERC Facility Ratings E-Learning Module](#)
- [Texas RE FAC-008 Common Themes](#)
- [Texas RE Resource Hub](#)
- [WECC FAC-008 Position Paper](#)
- [Key NATF Practices for Facility Ratings](#)
- [NATF Risk Construct for Prioritizing Facility Ratings Reviews](#)

Foundational Elements

1. *Identify a facility ratings sponsor and owner*
2. *Establish clarity on the foundational components of the facility ratings process or program*
3. *Manage data to ensure accuracy*
4. *Establish an accurate baseline to determine accuracy of facility ratings*
5. *Establish comprehensive work practices for planned construction, acquired facilities, and unplanned or restoration work*
6. *Validate through periodic reviews*
7. *Implement human performance measures*

Best Practices

1. Robust documented change management process
2. Inventory Tools with Required Training
3. Checklists for new inventory
4. Effective data capture
5. Single database for master record keeping
6. Access controls to Tools
7. Quality Assurance review, Internal Controls
8. Periodic field validation / field walk-downs
9. Facility Ratings Program Owner
10. Management Oversight



ERO



STAKEHOLDERS





Questions and Answers

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Facility Ratings Task Force

Work Plan Items

Al McMeekin, Senior Technical Advisor
Facility Rating Management Webinar
May 24, 2023

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- **Implementation Guidance for FAC-008-5**

- Provide examples and approaches on how entities can demonstrate compliance with the standard requirements
- Incorporate best practices used by entities to address factors such as:
 - Lack of Awareness
 - Inadequate Asset and Data Management
 - Inadequate Change Management
 - Inconsistent Development and Application of Facility Ratings Methodologies
- Build upon the 2017 IG developed by the MRO Standards Committee

- Scheduled completion date: March 2024

- Co-leads: **Robert Reinmueller & Brian Evans-Mongeon**

- **Support Project 2021-08 Modifications to FAC-008 Standard Drafting Team**
 - Focusing FAC-008-6 on the most Limiting Element & next most Limiting Element
 - Clarifying the meaning of the term “jointly owned”
 - Developing strawman definitions to provide clarity for other terms used in the standard other terms already included in the NERC Glossary of Terms such as:
 - Facility vs facility
 - Facility Rating
 - Equipment Rating
 - Rating
 - Element
- Scheduled completion date: March 2024
- Co-leads: **Dre Pliodzinkas & Jeremy Harris**

- **Whitepaper on Sampling for Facility Rating programs**
 - What is sampling in the context of a Facility Ratings Program?
 - Why sample Facility Ratings?
 - What are types of sampling?
 - How sampling reduces or mitigates risk.
- Scheduled completion date: March 2024
- Co-leads: **Jennifer Flandermeyer & John Stephens**

Contact Information

Al.McMeekin@NERC.net

[Facility Ratings Task Force](#)



Questions and Answers

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Project 2021-08 Modifications to FAC-008

Ben Wu, Senior Standards Developer, NERC
Facility Rating Management Webinar
May 24, 2023

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- In July, 2021, Tri-State Generation and Transmission Association, Inc. submitted a Standard Authorization Request (SAR) to address:
 - Clarification of the term “jointly owned” and
 - Permitting the inclusion of non-electrical equipment in the determination of GO Facility Ratings

- On October 20, 2021, the Standards Committee (SC) accepted the SAR. The SC also authorized soliciting for members for the SAR Drafting Team.
- The formal comment period for the SAR and the solicitation for the SAR Drafting Team (DT) occurred from December 9, 2021 to January 27, 2022.
- On April 20, 2022, the SC appointed chair, vice chair, and members to the Project 2021-08 Modifications to FAC-008 SAR DT.

- On September 21, 2022, the SC accepted the Project 2021-08 Modifications to FAC-008-5 SAR; Authorized drafting revisions to the Reliability Standard identified in the SAR; and Appointed the Project 2021-08 SAR DT as the Project 2021-08 Standard Drafting Team (SDT).
- From October 17, 2022 to May 22, 2023, the SDT conducted 13 meetings (including a two-day in person meeting) to make revisions to the standard language, associated Implementation Plan, and VRFs and VSLs.
- The Quality Review (QR) for this posting was performed from April 12, 2023 through April 25, 2023.
- The SDT reviewed all comments and revised the proposed Standard and Implementation Plan where appropriate.

- Send the final draft to the Standards Committee for approval for initial posting (June 2023).



Questions and Answers

ERO Sustaining Accurate Facility Ratings

The Human Factor of Change

Agenda

- The Nature of Change
- How we deal with Change
- Dealing with Change

Background

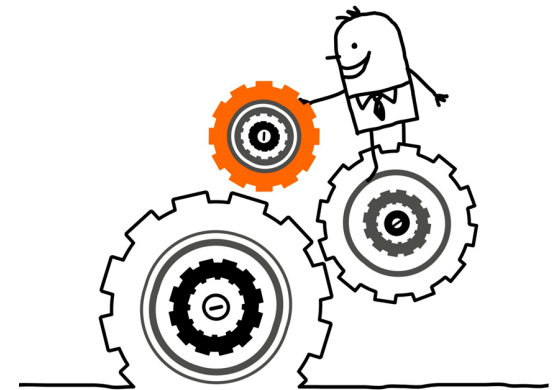
- ERO identified areas of concern with entities that had no prior facility ratings challenges but had weak change management controls that could ultimately affect the entity's ability to maintain the accuracy of their facility ratings

Identified approaches:

- Change checklists
 - Quality assurance reviews after any changes
 - Validation through periodic reviews
 - Data entry verification
 - Periodic in-field verifications
-

The Core to Facility Ratings

- All of the initiatives involve getting people to do things differently – to Change
- All the best systems and approaches will fail if we don't take into account that the work is done by human beings
- Processes will help immensely but how do you get people to use the systems?
- The answer is Managerial Leadership to bring about the Change we need



Our Topic – Change

- The Nature of Change for Human Beings
- How we deal with Change
- Leading Change

Change – Our Distinction

- **Change Leadership** is about **People** – managing the emotions, feelings, and attitudes as you Lead People through Change
- **Change Management** is a **Process** – it's about managing the planning, execution, and minutiae of any changes that need to be brought about

Dealing with Change and Anaklesis

The Personal Impact of Change

- What does change feel like?



Anaklesis

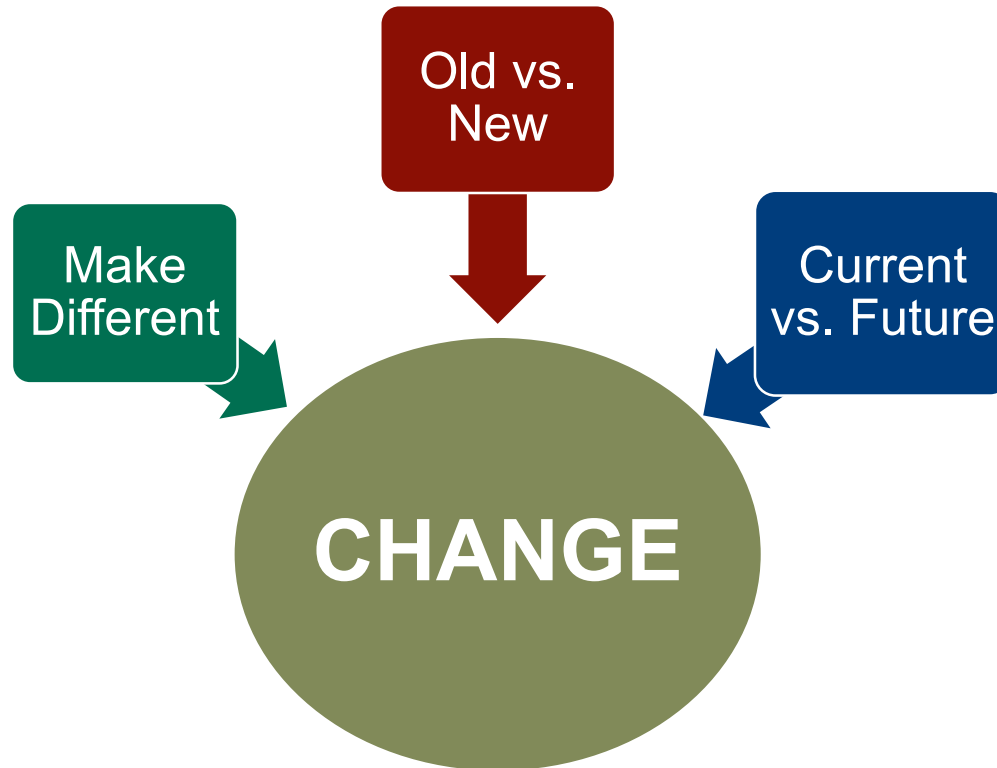
The fear of undermining
our relationship with our
experiences, opinions, and
people



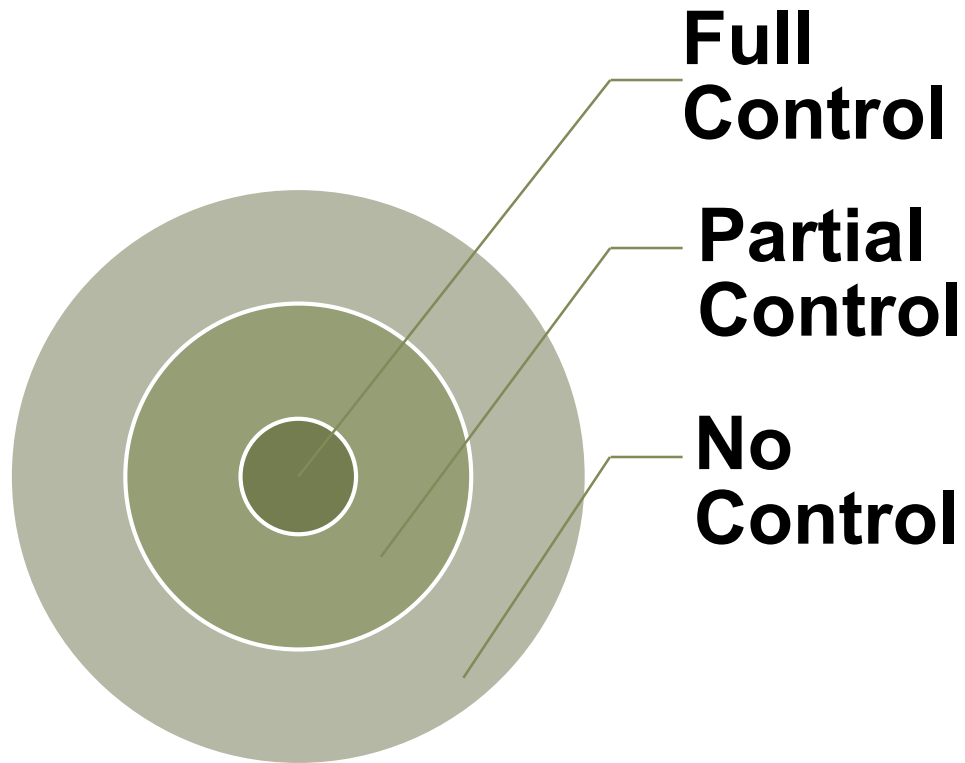
Anaklesis & Change



Anaklesis & Change



Change and Control – The States of Control



Analytic Manifestation – 6 Stages of Change



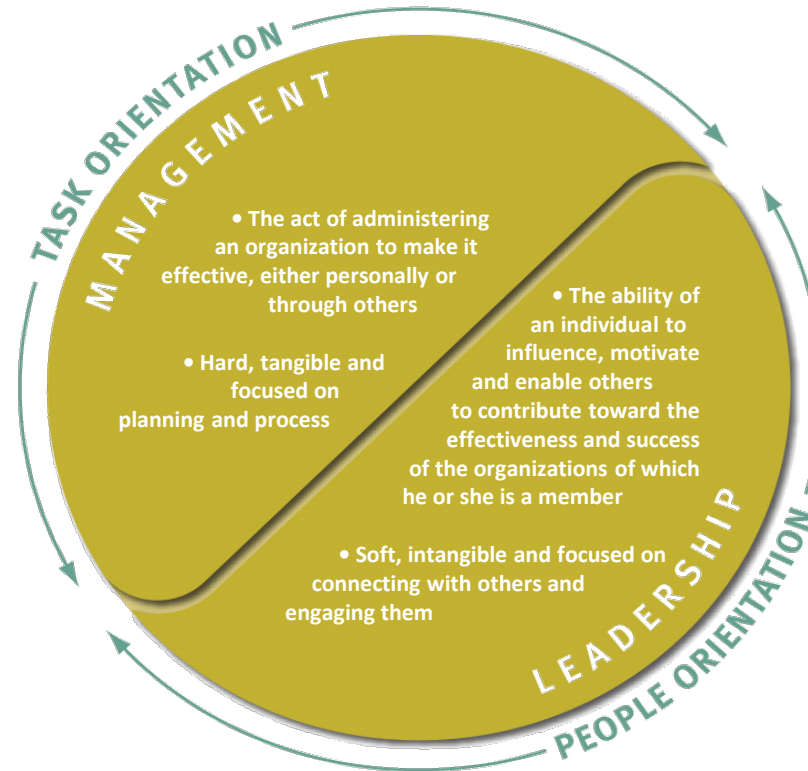
The Other Face of Anaklesis

“Dancing around the fire trying not to be burned by the embers.”



The Role of The Managerial Leader

Managerial Leadership Defined



The Managerial Leadership Lifecycle



Accountability and Responsibility

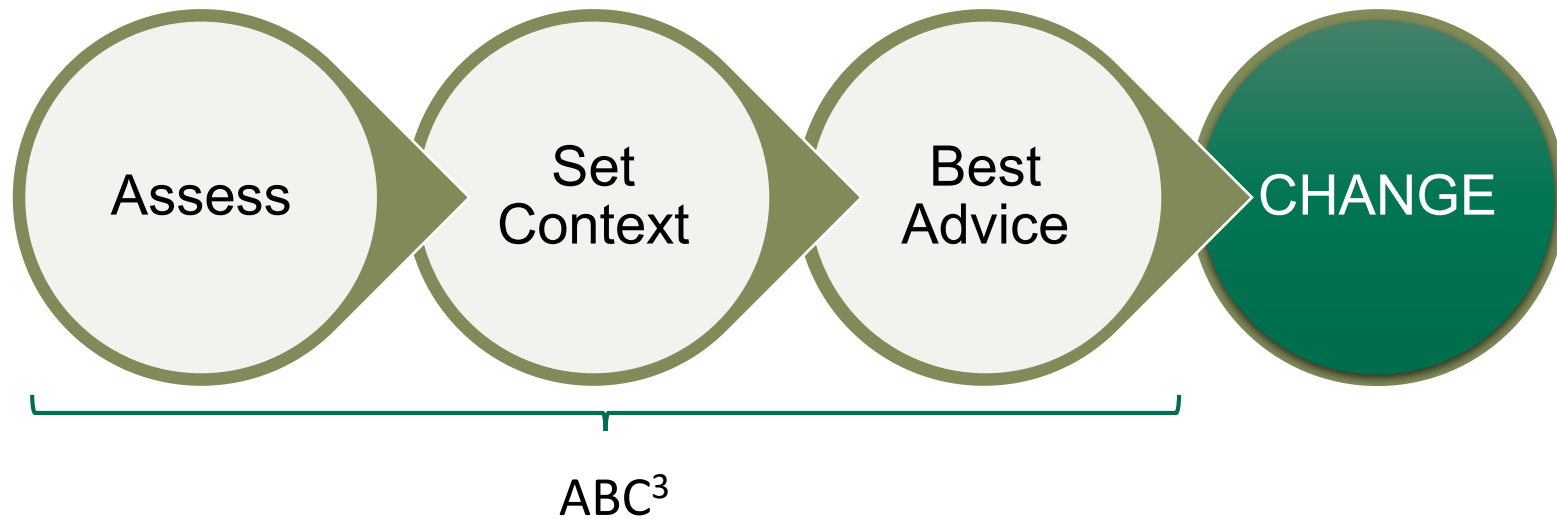
- These are not the same thing
- **Responsibility** is doing what we do because we FEEL it is the right thing to do
- **Accountability** comes from KNOWING what is expected of us because our Manager has made it clear



The Tools of the Managerial Leader

1. Assess
2. Context
3. Best Advice
4. ABC³

Change

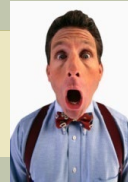


Assess the Change

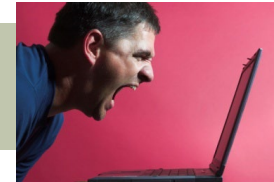
1. **A**voidance



2. **B**etrayal



3. **R**esistance



4. **U**ncertainty



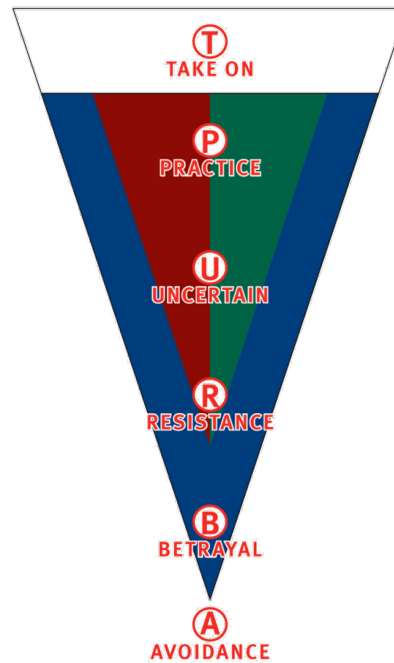
5. **P**ractice



6. **T**ake On



The ABRUPT™ Change Model – Feelings



Match Change Leader Behaviours to Feelings



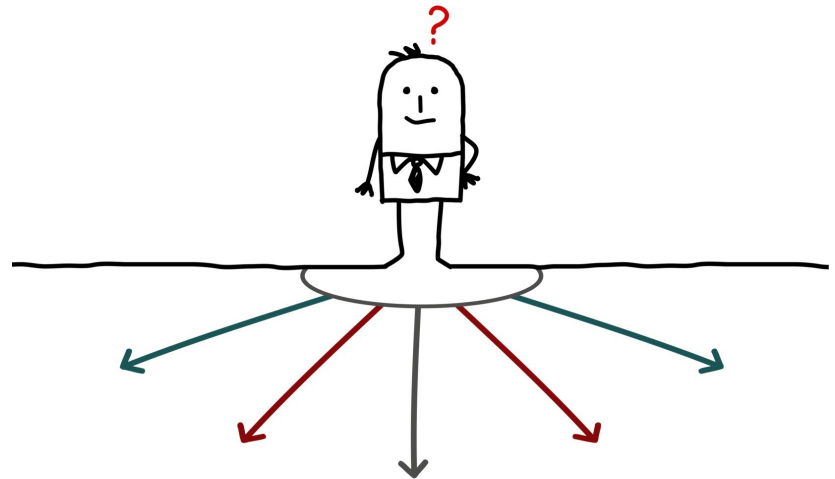
Context Setting

The “Why”

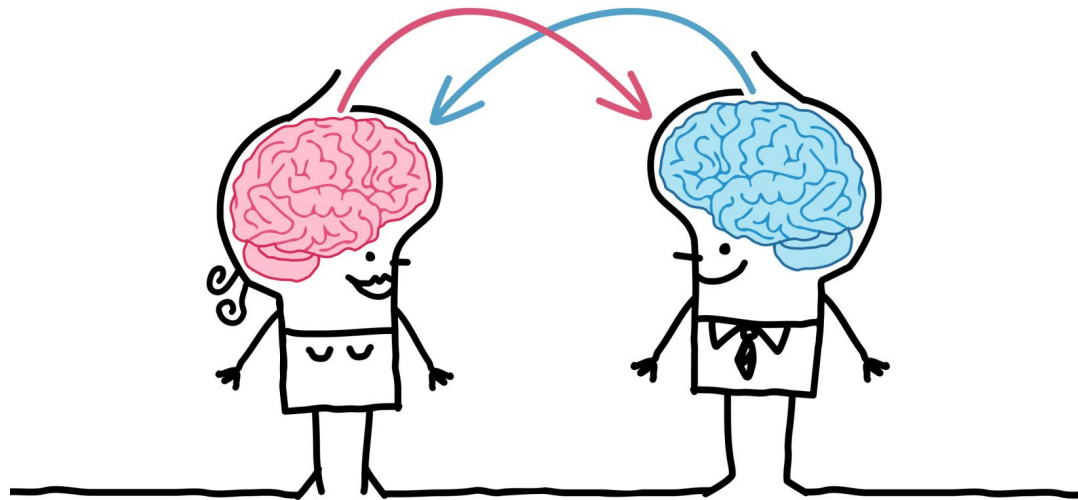
Why is it important?

How does it fit into success?

What sort of authority is required?



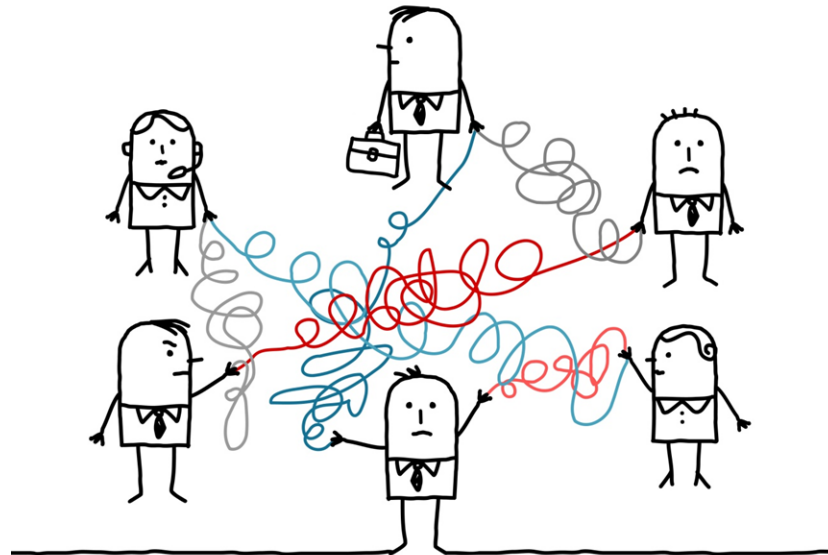
Best Advice



Best Advice

- Core to engagement:
 - It is about demanding Best Advice
 - It is about being willing to hear Best Advice
 - It is about judgement and discretion

ABC³



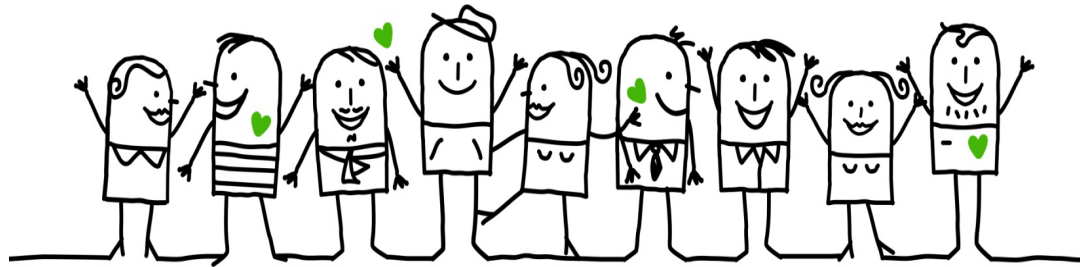
Change – Easy as ABC

- Always Be Communicating
- Always Be Closing
- Always Be Caring



At every stage of the ABRUPT™ Change Model

In the end...



Thank You

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Field Verification FAC-008 Entity Walkdowns

Herb Schrayshuen, Power Advisors, LLC
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May 24, 2023

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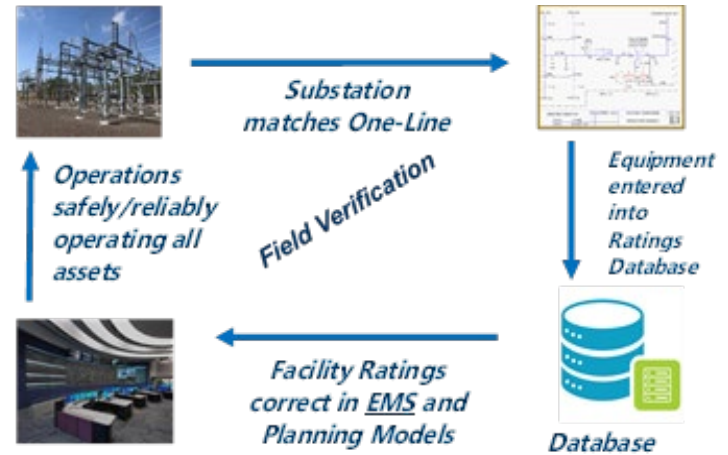


- What is the need
- What is the experience?
- Guidance for Improvement for Consideration

Asset and Data Management



Change Management



- NERC Regions are implementing Facilities Ratings related walk-downs in order to evaluate validity of the information being provided for facility ratings.
 - In some cases, findings in the field have been disappointing.
- The Best Practices guidance discussed earlier provides the advice that BES asset owners should
 - Perform their own field verification of their BES Asset component power delivery capabilities.
 - Improve record keeping to stay current with their BES Facility configuration

- In my opinion, a strong internal control process involves the establishment of a Facilities baseline
 - This is necessary to have an effective Facility Ratings Methodology.
 - However, for a large utility this is a major undertaking if done on a stand-alone basis.
- Utilities can create reasonable facility rating field verification programs that integrate the facility component reviews with already implemented asset management programs.
 - Integrating data collection efforts with other asset management information, particularly when facilities and components are being modified, is a less costly way of assuring reliable performance of your portions of the power system

- The speed at which a baseline review is carried out depends on the level of confidence a utility currently has about its existing knowledge and quality of records regarding its installed equipment.

- If you choose to establish a base line for your ratings tracking system, you can start with the existing records.
 - Review selected substations as samples.
- The rate at which you review your system will be up to you.
- The possibility of finding unrecorded BES components may be either high or low depending on your company's history.
- The possibility of finding equipment in the field that you did not even consider in your Facilities Rating Methodology might be either high or low.
- One way to get a handle on the situation is to sample selected Facilities.
- Then you can decide.

- The key component of a field review effort is to thoughtfully establish a protocol for field verification of the BES Element components to be reviewed.
- Some key components of the field review protocol.
 - Identify each piece of series connected equipment which may have a rating of its own. Devices such as:
 - Test points
 - Buss Links
 - Expansion Joints
 - Braided conductor links used for isolation to perform testing.
 - Actively cooled devices (transformers, iso phase buss work with cooling on and cooling off)
 - Tap changing devices (fixed vs. auto changing taps) – e.g., what ratings are used in operations and in planning for auto tap changing transformers?



*Test Terminal with
removable link*

*This device is separately
purchased for application
to transformers and circuit
breakers for instance.*

*It has its own rating
manufacturer's rating.*

- Substation changes
 - interim configurations – that are in service long enough, so the changes need to be brought into the facility ratings process
 - E.g., Transfer busses, how frequently are they used. How long are they used.
 - CT ratio verification – sometime easy and sometimes hard to check
 - Test Links – often retrofitted and installed in series on some current carrying equipment that require regular electrical testing
 - Active vs. static cooling – do you ever operate a device with cooling off?
 - Changes from power line carrier to fiberoptic communications for protection systems
 - Leaving unneeded wave traps in service or failing to record the removal of wave traps.
 - Replacement of circuit breakers, with higher capability equipment, but not recording it.
 - Changing out buss work with greater capability conductors and not recording it.

- Test your protocol by using it to implement a walkdown for a sample of your substations and lines.
- Note new devices found
 - Consider whether your BES Element component records are adequate.
- Improve the protocol based on your findings
 - New devices or other situations previously not thought of
- Select substations that have undergone frequent equipment and configuration changes such as:
 - Change outs of oil circuit breakers for newer circuit interrupting technologies
 - Addition of new substation bays and circuits
 - Generator upgrades or replacements
 - Transformer upgrades or replacements
 - Conductor upgrades or replacements.

- The power system is not static.
 - Facilities ratings are not static
 - The components are continually be replaced and upgraded.
- The Facilities Ratings Methodology and field verification programs (sampling or a complete baseline check) need to be implemented as the system configuration changes.
- Train field personnel across geographic areas to look for and record FAC-008 information (e.g., nameplate photographs) and include in the enterprise asset management systems that you use.
- Add all newly discovered types of devices to the Facility Rating Methodology
 - Look for any new devices system wide as you discover them in certain substations



Questions and Answers

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Mitigation Data and Trends

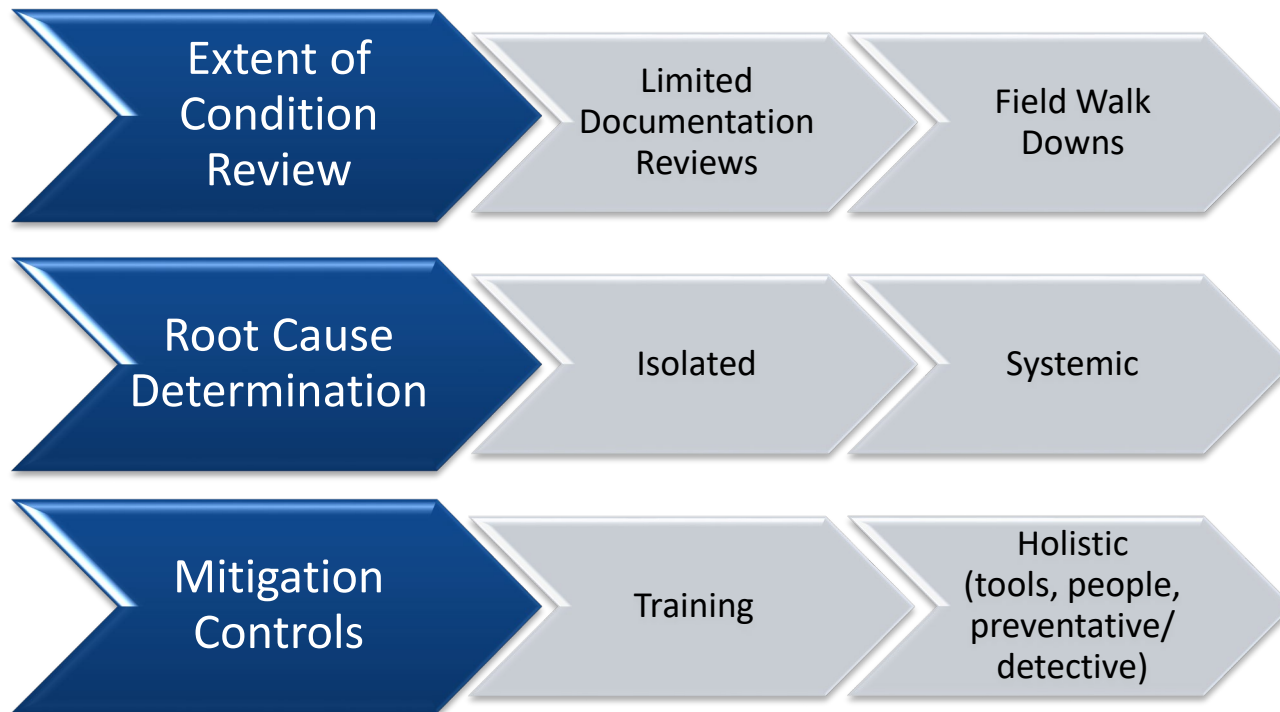
Kristen Senk, Director, Legal and Enforcement
ReliabilityFirst Corporation
May 24, 2023

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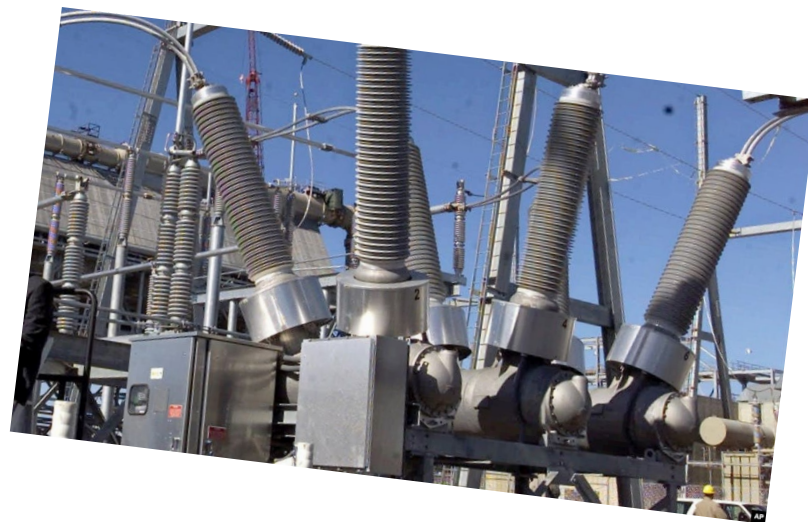
Evolution of Mitigation Approach

- Increased focus on Facility Ratings
 - RF: Letter to entities; surveys; targeted outreach
 - ERO: collaboration with industry forums; webinars; guidance documents, consistent risk and mitigation approach
- Evolution of Mitigation Approach



Extent of Condition Reviews

- Review databases and drawings
- Conduct full field reviews
 - Review initial sample
 - Prioritize based on risk or other factors
 - Actively manage contractors
 - *Ensure methodology is clear (e.g., defining Facility)*
 - *Train on methodology and tools*
 - *Conduct initial reviews together*
 - *Verify contractor's work (early in process)*



- Root Cause Analysis
 - Change Management (controls to monitor/process changes)
 - Asset Management (track inventory)
 - Contractor Management (training and oversight)
 - Designed versus as-built
- Mitigating Controls
 - Consolidate or connect databases/tools (single platform)
 - Train all applicable personnel (including contractors)
 - Real-time data entry
 - Periodic detective controls

A stylized map of North America is shown in the background. The map is divided into three horizontal color bands: a light blue band at the top, a dark blue band in the middle, and a light grey band at the bottom. The dark blue band is the widest and contains the main title. The map shows the outlines of the United States, Canada, and Mexico.

Questions and Answers