

NFPA 805 Transition

# **Harris Nuclear Plant (HNP) Risk-Informed Performance-Based Transition Change Evaluation Process**

HNP-ONS Pilot Meeting  
Bethesda, MD

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# Agenda

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- Background
- NFPA 805 Change Evaluation Process
- Pilot Plant Process and Observations

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# Background

# Background – Change Evaluations

## Addressed in Different Documents:

Document	Section(s)	Topic
10 CFR 50.48(c)	N/A	No specific discussion on change evaluations
NFPA 805	2.2(h), 2.2.9, 2.4.4, 4.2.4, A.2.2(h), A.2.4.4, D.5	Change Evaluation Risk of Recovery Actions (4.2.4)
NEI 04-02 Revision 1	4.4, 5.3, Appendix B, Appendix I, Appendix J	Change Evaluation, Change Evaluation Forms (App. I)
Reg. Guide 1.205 (May 2006)	2.2, 2.3, 3.2	LAR reporting requirements (B.2.2) Risk of operator manual actions (B.2.3) Change Evaluations (B.3.2) Circuit Analysis (B.3.3) PSA Peer Review (B.4.3)

# Change Evaluations – NFPA 805

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## 2.4.4\* Plant Change Evaluation.

A plant change evaluation shall be performed to ensure that a change to a previously approved fire protection program element is acceptable. The evaluation process shall consist of an integrated assessment of the acceptability of risk, defense-in-depth, & safety margins.

# Change Evaluations – NEI 04-02

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## Change Evaluation Process

### 4 Subtasks (NEI 04-02 Section 5.3, App. J)

- Defining the Change
- Preliminary Risk Screening
- Risk Evaluation
- Acceptance Criteria

# Change Evaluations – RG 1.205

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## Section C.2.2 – LAR

- The total risk increase associated with all FPP noncompliances (based on current deterministic FPP regulations) that the licensee does not intend to bring into compliance and the total risk change associated with plant changes planned for the transition to NFPA 805 should be estimated and reported in the LAR.
- The baseline FPP risk for the estimate of the net risk change is that for a plant that is fully compliant with the current deterministic regulations for the FPP, including NRC-approved exemptions/deviations.

# Change Evaluations – RG 1.205

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## Section C.2.2 – LAR (cont'd)

- The total change in risk associated with the transition to NFPA 805 should be consistent with the acceptance guidelines in RG 1.174
- Upon completing the transition to an NFPA 805 licensing basis, the baseline FPP risk will be the risk of the plant as-designed and operated according to the NRC-approved FPP licensing basis.



# Change Evaluations – RG 1.205

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## Section C.3.2 – NFPA 805 FPP Change Evaluation Process

- Guidance is more relevant in a post-transition environment.
- Includes guidance on NRC approval (e.g., NFPA 805 Ch. 3 requirements and thresholds of post-transition FP license condition)

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# Change Evaluation Process

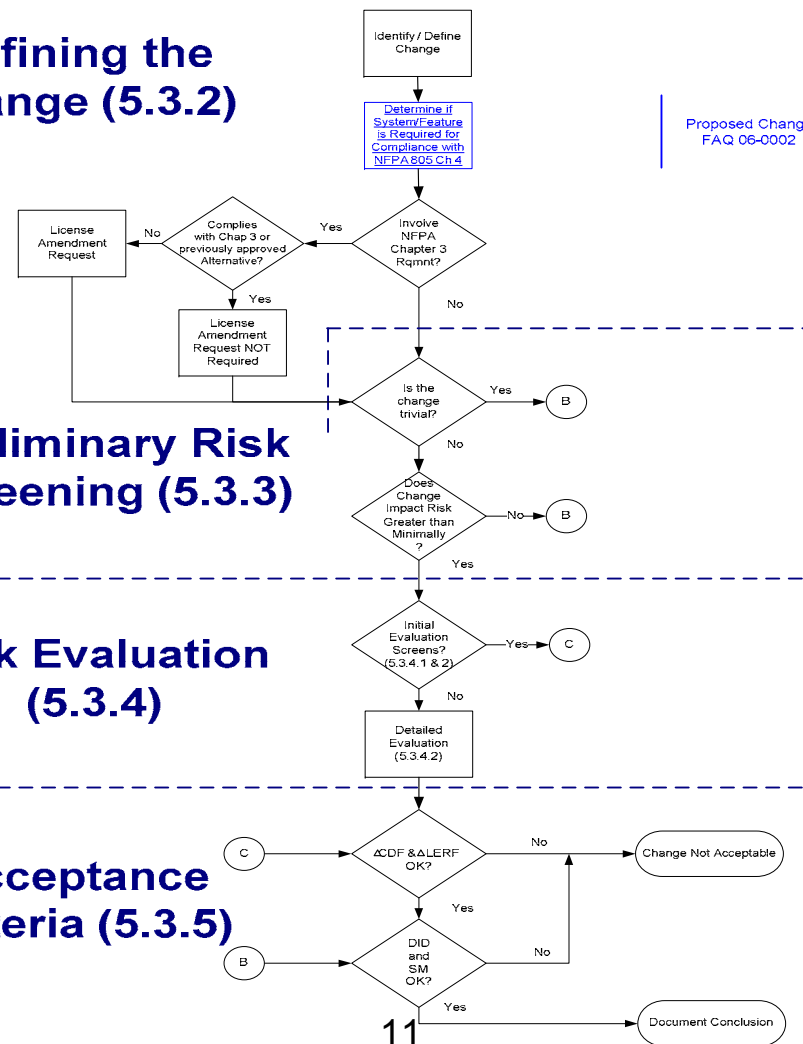
# Change Evaluation Process

## Defining the Change (5.3.2)

## Preliminary Risk Screening (5.3.3)

## Risk Evaluation (5.3.4)

## Acceptance Criteria (5.3.5)



# Defining the Change

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- Process begins by defining the change or altered condition to be examined & the baseline configuration
- **Baseline (a.k.a. compliant)** - Plant condition or configuration that is consistent with the CLB (pre-transition licensing basis) [FAQ 06-0010 addresses 'baseline']
- **Change** - The changed or altered condition or configuration, either 'as found' or proposed by a plant change, that is not consistent with the Licensing Basis
- The 'changes' associated with NFPA 805 transition are those non-compliances with the CLB that are not expected to be brought into compliance prior or during the transition process (Ref. RG 1.205)

# Preliminary Risk Review

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- Once the definition of the change is established & groupings / organizations are established, a preliminary risk review is performed to identify & resolve minor changes to the fire protection program.

# Risk Evaluation

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- Changes are assessed using risk-informed, performance-based techniques
- Techniques include, but not limited to fire modeling & PRA
- The risk evaluation may be in the form of a limiting or bounding fire modeling / fire risk analysis or a detailed integrated analysis

[Ref.: NFPA 805 Section 4.2.4.2]

# Acceptability Determination

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- The risk evaluation shall be measured quantitatively for acceptability using the  $\Delta$ CDF &  $\Delta$ LERF criteria
- Acceptance criteria are in Regulatory Guide 1.174, as clarified in Section 5.3.5 of NEI 04-02 & RG 1.205
- An evaluation of defense-in-depth & safety margin shall also be performed

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# Pilot Plant Update & Observations



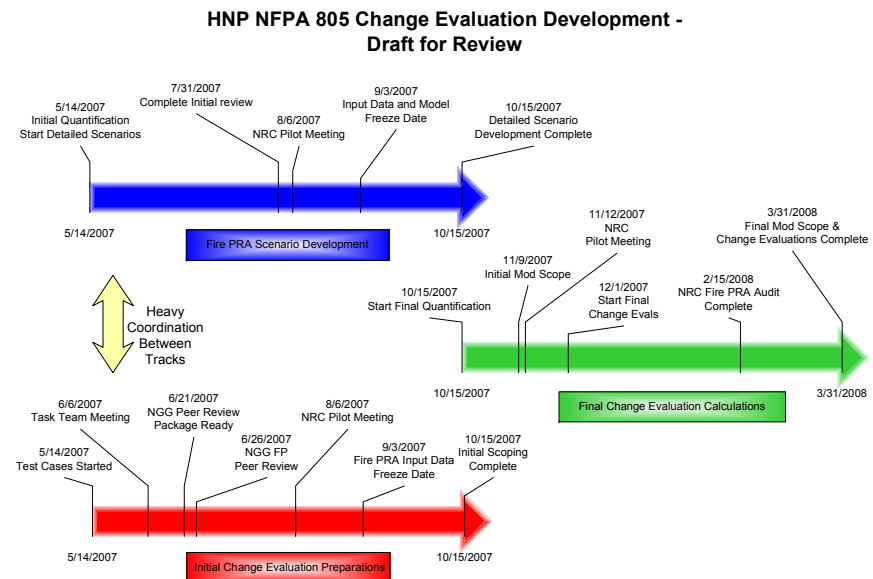
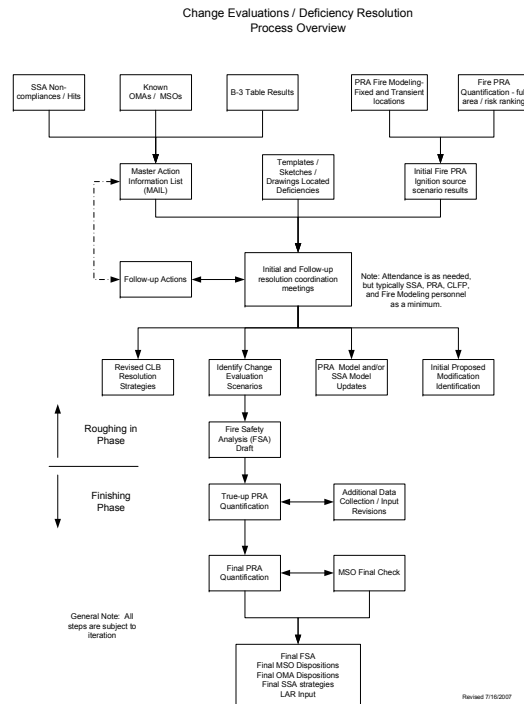
# Progress Energy Update

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- Project Instruction for Transition Change Evaluations Developed (FPIP-0128)
  - General & specific guidance
  - Significant Focus on managing open items, target identification, & fire modeling
  - Includes general guidance on MSOs and OMAs
  - Submitted to NRC 7/19/07

# Progress Energy Update

## Process – Previously Discussed



Progress Energy Harris Plant  
6/5/2007

# Pilot Plant Update (cont'd)

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- Items of Interest
  - Process includes check of discrepancy for appropriate modeling in Fire PRA
  - Need to Identify deterministic non-compliances (targets) and use in fire modeling scope
  - What to do with risk significant compliances
  - Focus of DID-SM

# Progress FSA Outline

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- 1.0 PURPOSE
- 2.0 REFERENCES
- 3.0 BODY OF CALCULATION
  - 3.1 Fire Area Description
  - 3.2 Fire Hazards Analysis
  - 3.3 Nuclear Safety Capability Assessment (NSCA)  
Compliance Summary
  - 3.4 Non-Power Operational Modes Compliance  
Summary
  - 3.5 Radioactive Release Compliance Summary

# Progress FSA Outline - Cont

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## 3.6 Risk-Informed, Performance-Based Evaluations

3.6.1 Transition Risk-Informed, Performance-Based Evaluations

3.6.2 Post-Transition Risk-Informed, Performance-Based Evaluations

## 3.7 Probabilistic Risk Assessment – Summary

## 3.8 Defense-in-Depth

## 3.9 Safety Margin / Sensitivity Analysis

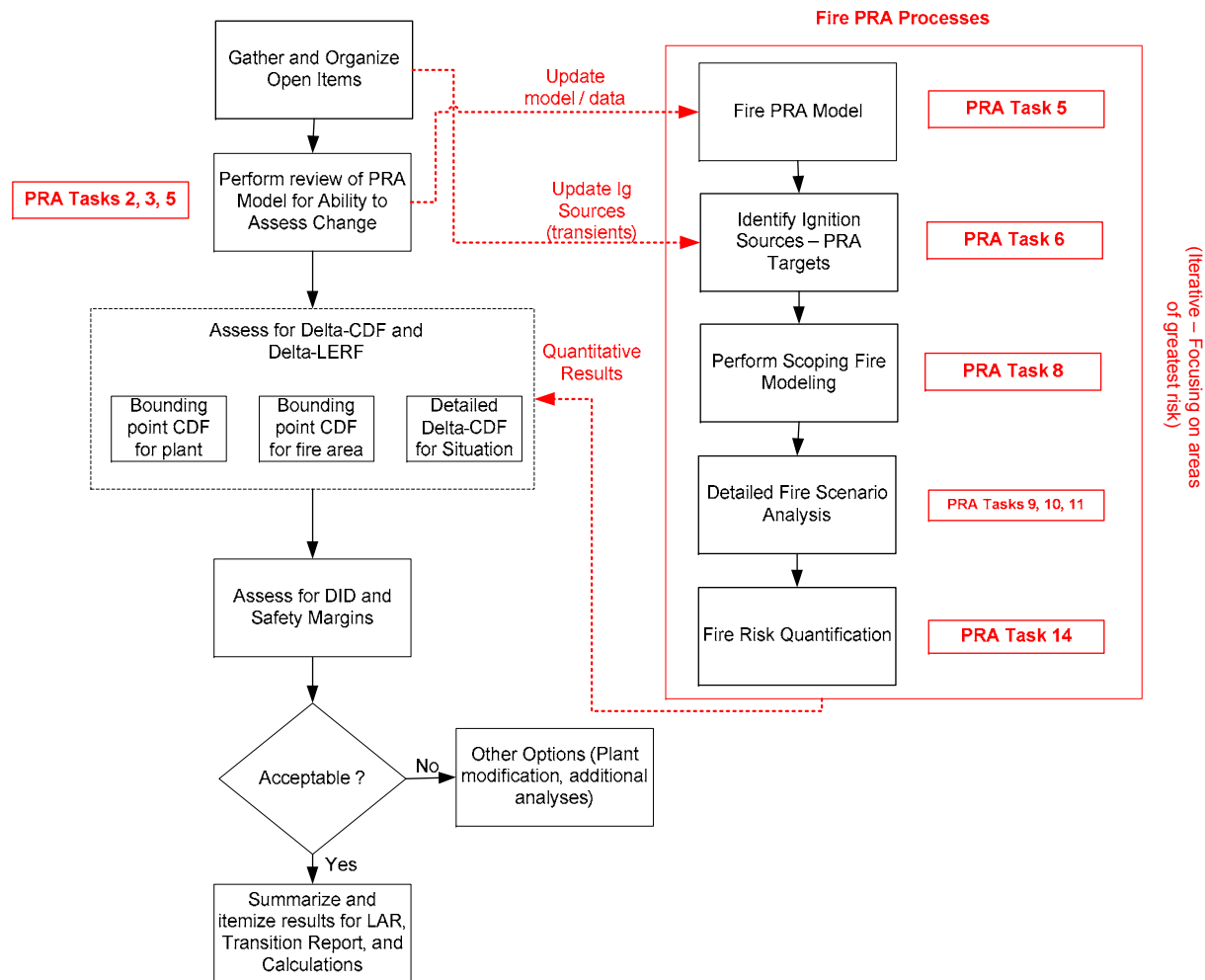
## 3.10 Monitoring Program Input

## 4.0 CONCLUSION

## 5.0 ATTACHMENTS

- ◆ 1 - Fire Area 1-A-BAL-C – B-3 Table - Nuclear Safety Capability Assessment Summary
- ◆ 2 – Fire Area 1-A-BAL-C – Scenario Discussions - Change Evaluations

# Process Insights

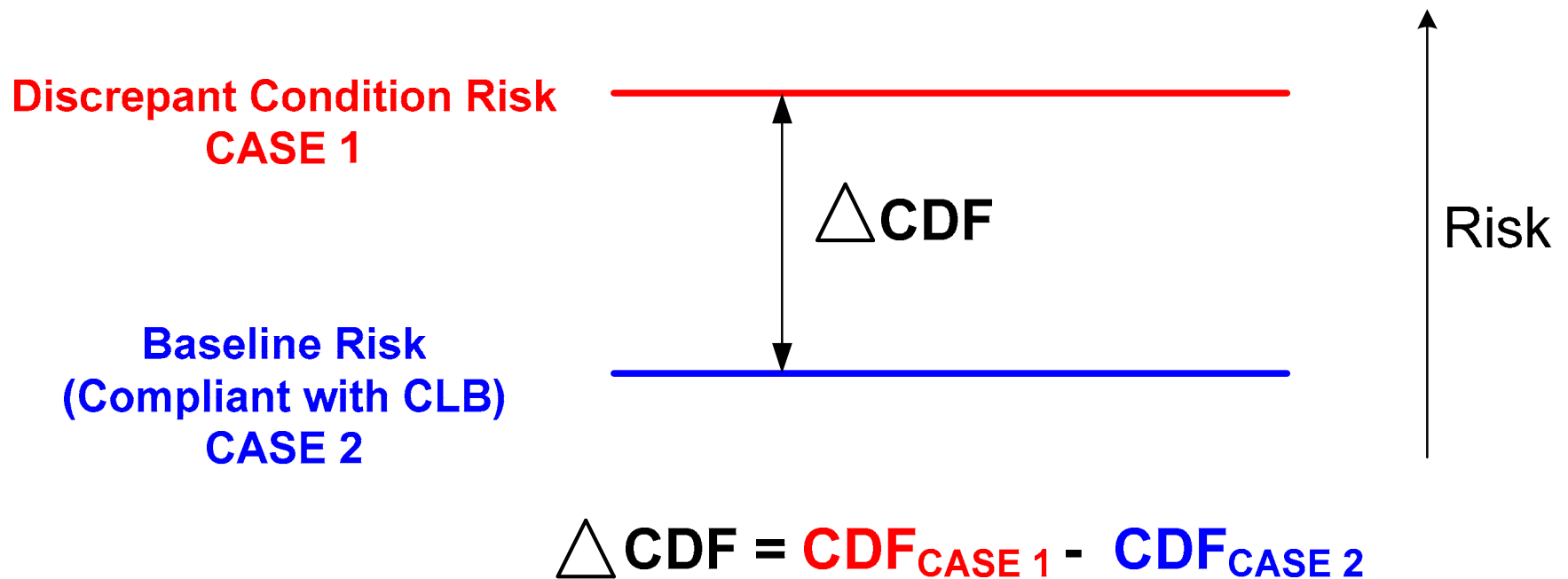


# Pilot Plant Insights

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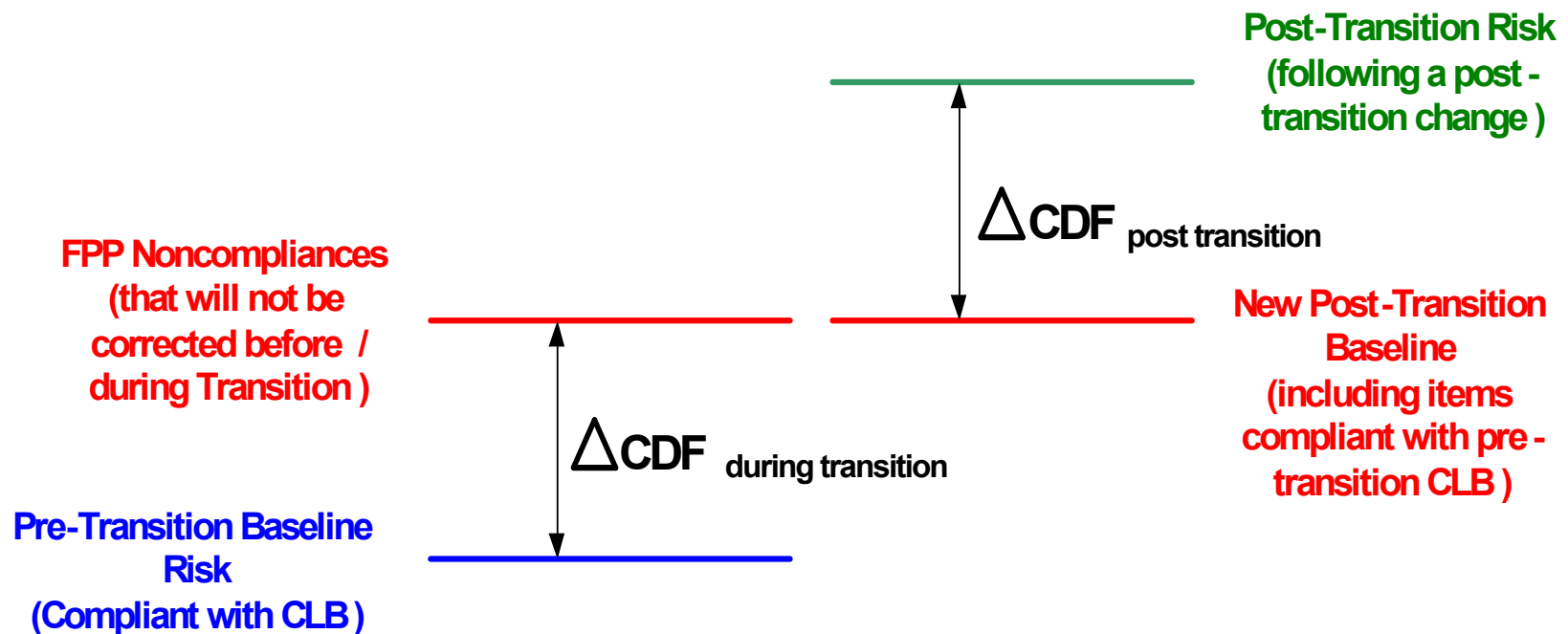
- Simple individual changes are straight forward
- Condition can be assessed as unprotected for the “as found” or “changed” condition (Case 1)
- Conditions (cables) can be assessed as protected (i.e., wrapped or outside of the fire area) for the baseline “compliant” case (Case 2)
- Change in risk can be measured

# Measuring Change in Risk (individual changes)





# Measuring Change in Risk (pre and post-transition)



# Pilot Plant Insights

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- Multiple plant changes related to a single area or issue are more challenging to assess and manage
- The ability to use CDF estimates for scenarios/fire areas to account for the sum of all changes may be a key factor in effectively assessing change evaluations during transition.