NFPA 805 Transition

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

HNP-ONS Pilot Meeting
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Bethesda, MD

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Progress Energy

Agenda

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

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

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

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

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

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.

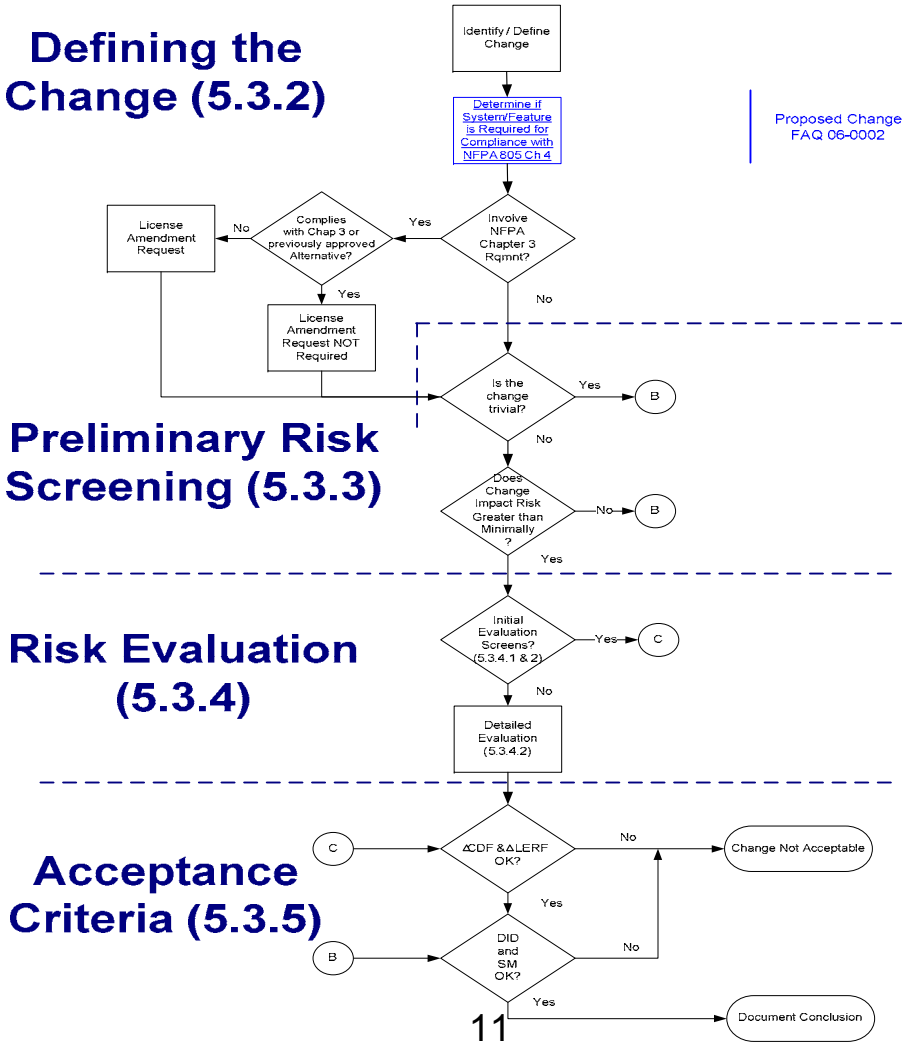
Change Evaluations – RG 1.205

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)

Change Evaluation Process

Change Evaluation Process



Defining the Change

- 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

- 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

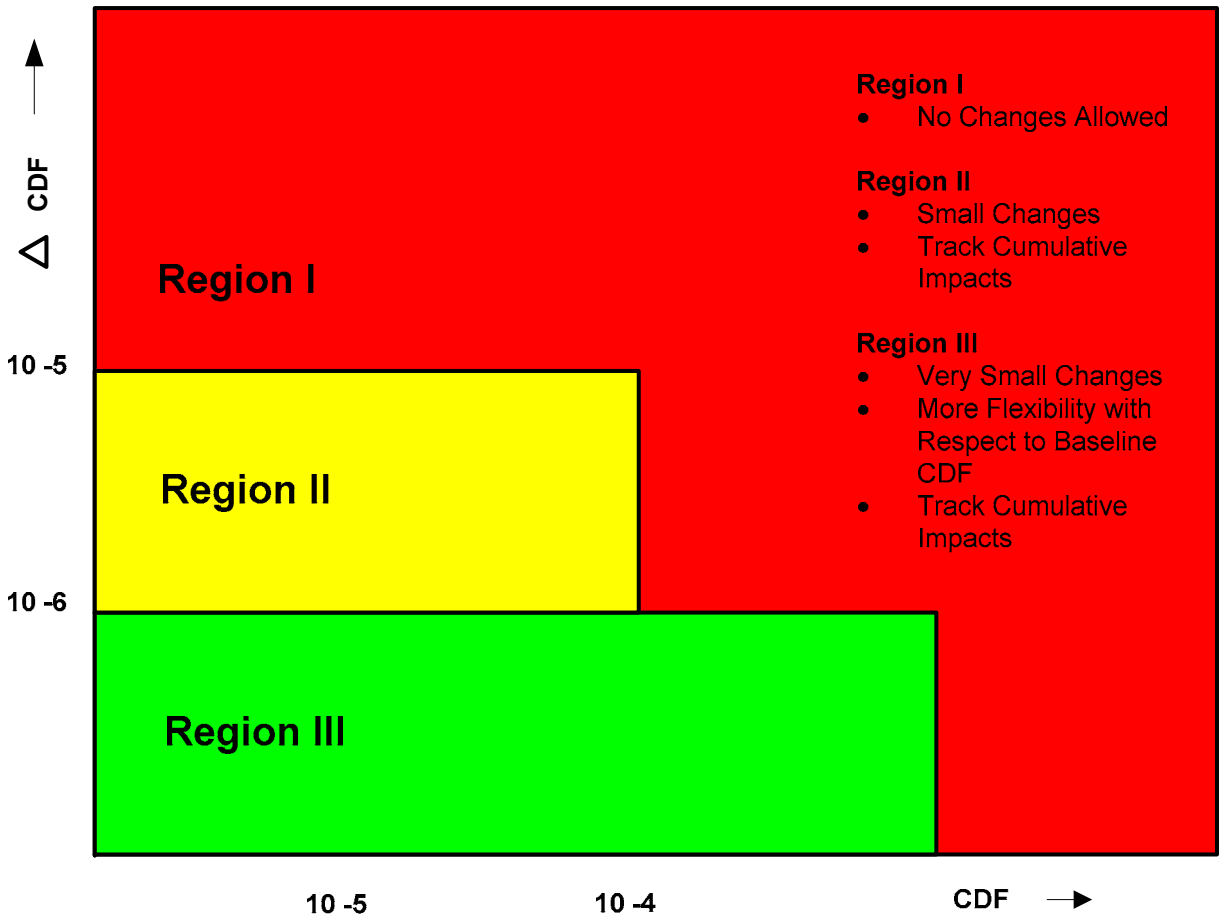
- Changes are assessed using risk-informed, performance-based techniques
- Techniques include, but not limited to fire modeling & PRA
- The risk evaluation may be in the form of a limiting or bounding fire modeling / fire risk analysis or a detailed integrated analysis

[Ref.: NFPA 805 Section 4.2.4.2]

Acceptability Determination

- The risk evaluation shall be measured quantitatively for acceptability using the ΔCDF & ΔLERF 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

Acceptability Determination (RG 1.174)



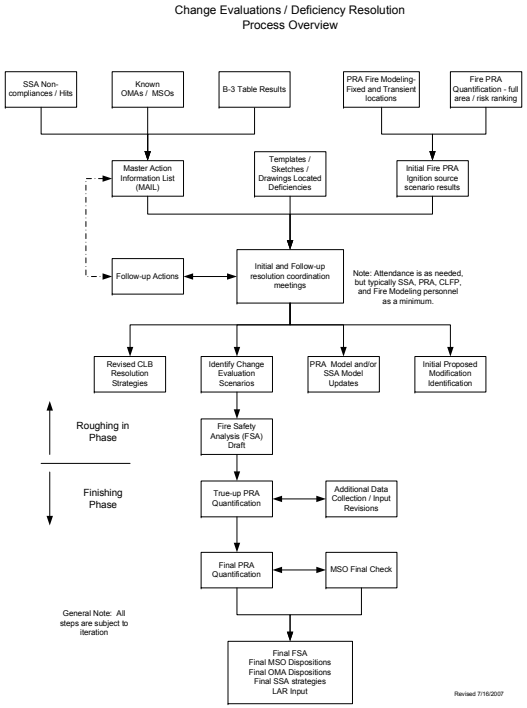
Pilot Plant Update & Observations

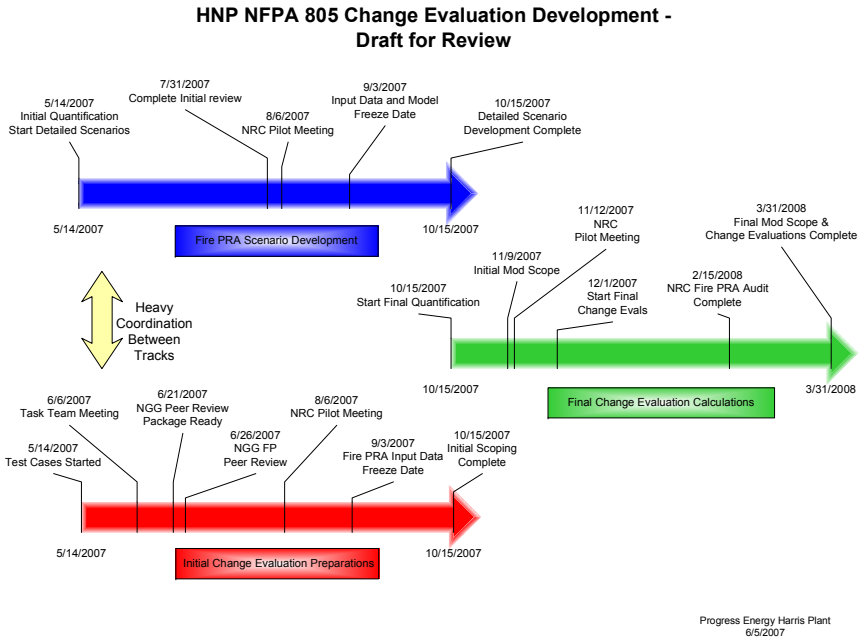
Progress Energy Update

- 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 – Refer to Handouts





Pilot Plant Update (cont'd)

- Items of Interest
  - Process includes check of discrepancy for appropriate modeling (PRA task 2/3)
  - Identifying "discrepancy" targets and use in fire modeling scope
  - What to do with risk significant "non-discrepancies"
  - Focus of DID-SM

Progress FSA Outline

1.0 PURPOSE

2.0 REFERENCES

3.0 BODY OF CALCULATION

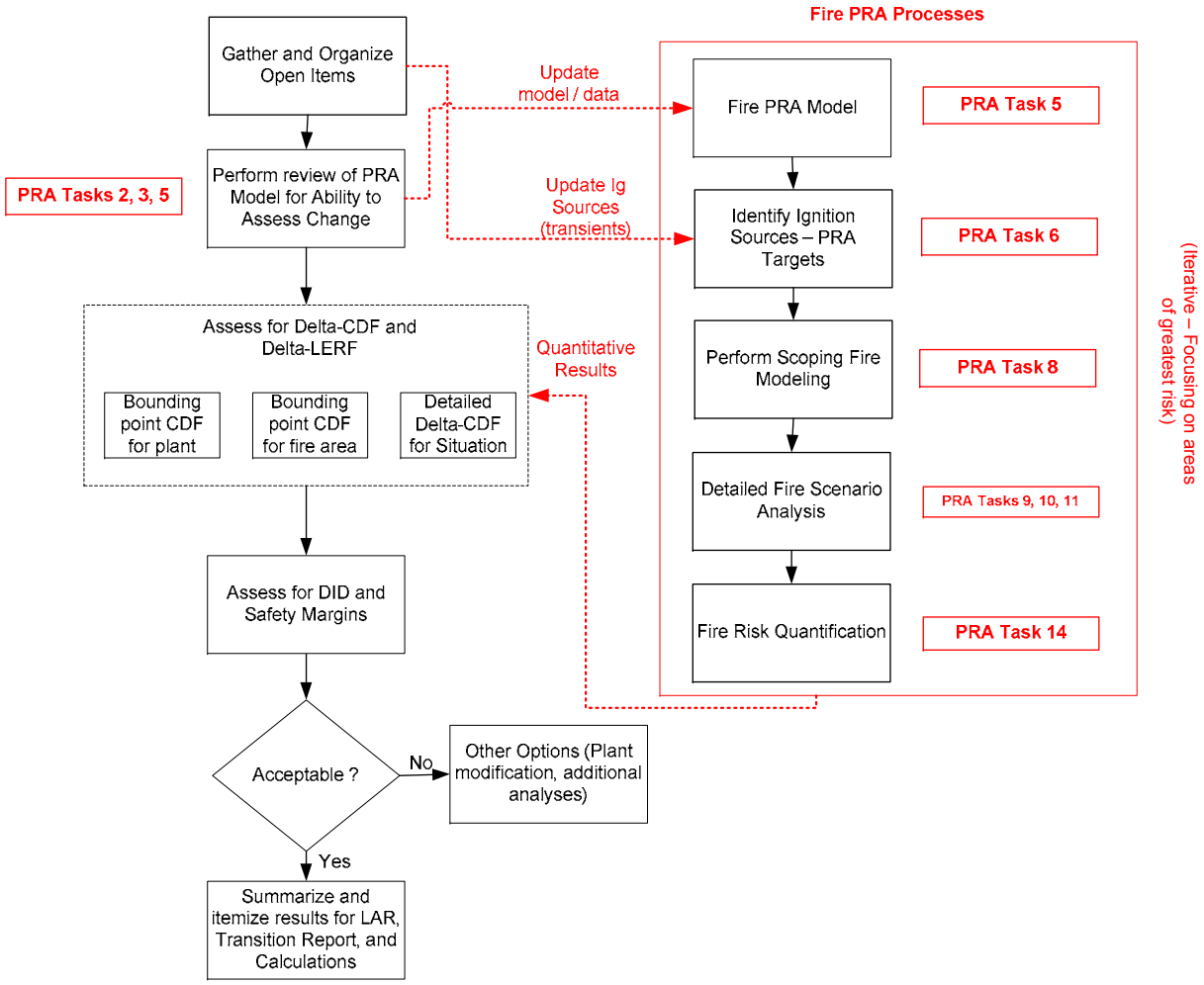
- 3.1 Fire Area Description
- 3.2 Fire Hazards Analysis
- 3.3 Nuclear Safety Capability Assessment (NSCA) Compliance Summary
- 3.4 Non-Power Operational Modes Compliance Summary
- 3.5 Radioactive Release Compliance Summary
- 3.6 Risk-Informed, Performance-Based Evaluations
  - 3.6.1 Transition Risk-Informed, Performance-Based Evaluations
  - 3.6.2 Post-Transition Risk-Informed, Performance-Based Evaluations
- 3.7 Probabilistic Risk Assessment – Summary of Results
- 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

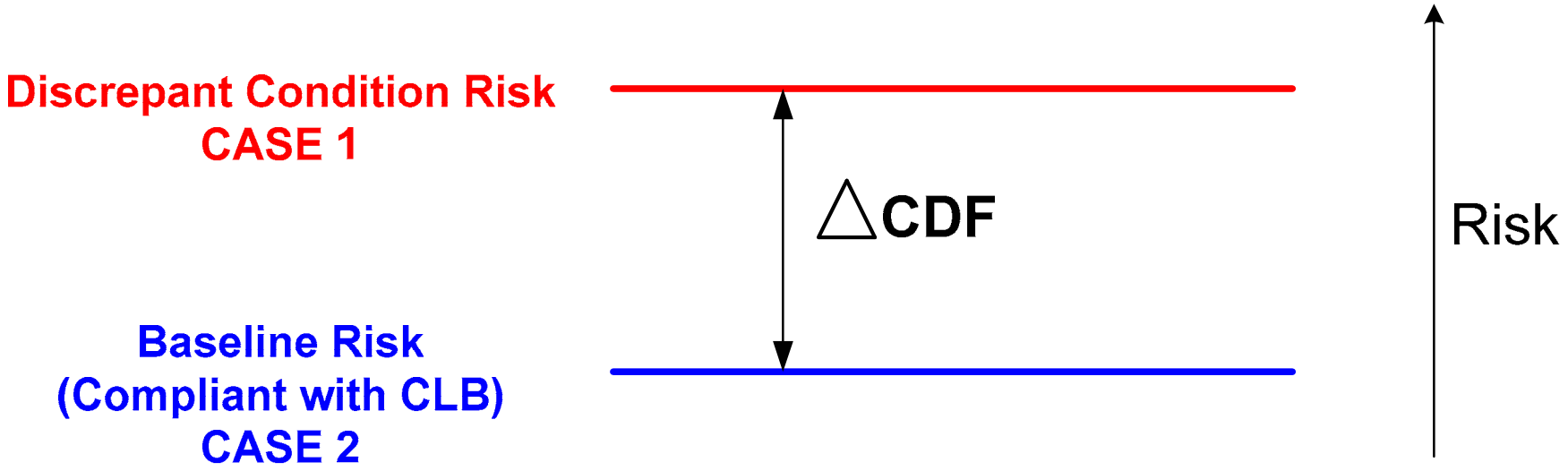
Process Insights



Pilot Plant Insights

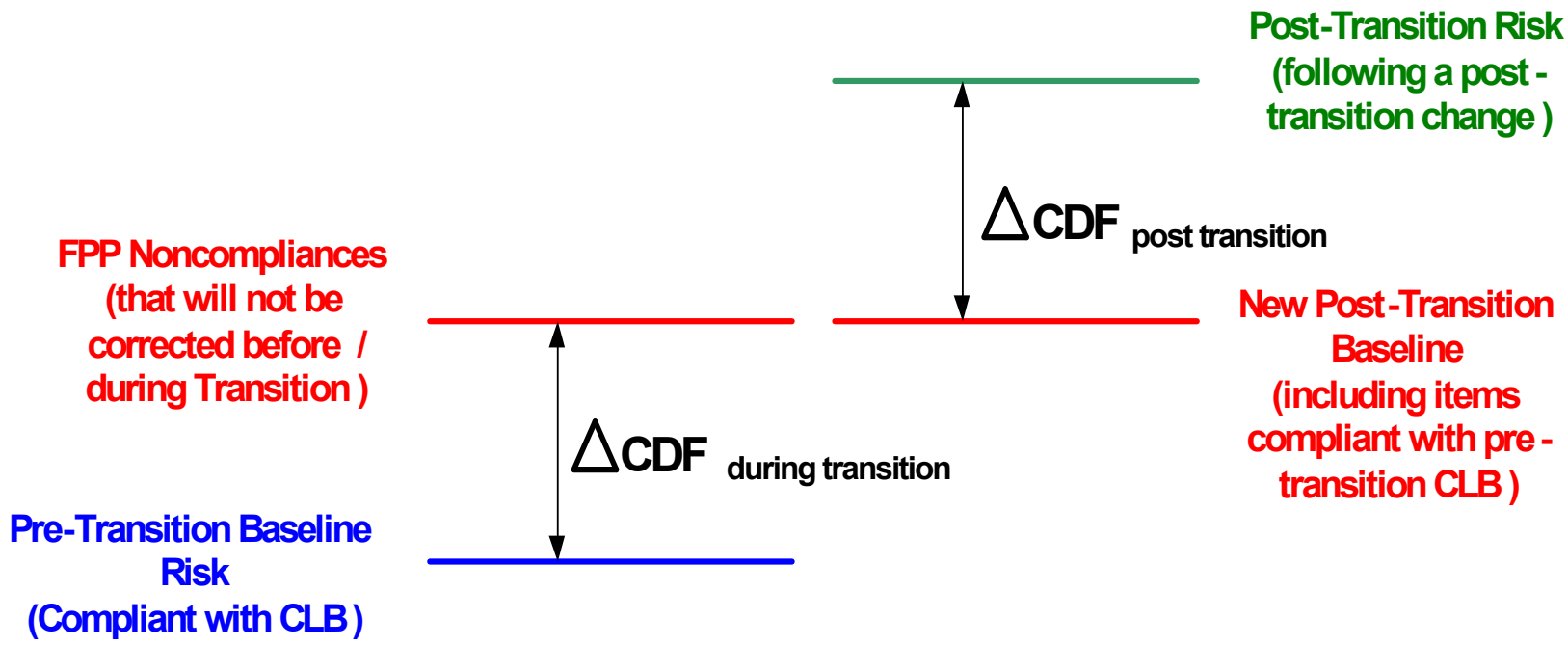
- Simple individual changes are straight forward
- Discrepant condition can be assessed as unprotected for the “as found” or “changed” condition (Case 1)
- Discrepant conditions (cables) can be assessed as protected (i.e., wrapped or outside of the fire area) for the baseline “compliant” case (Case 2)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

Measuring Change in Risk (individual changes)

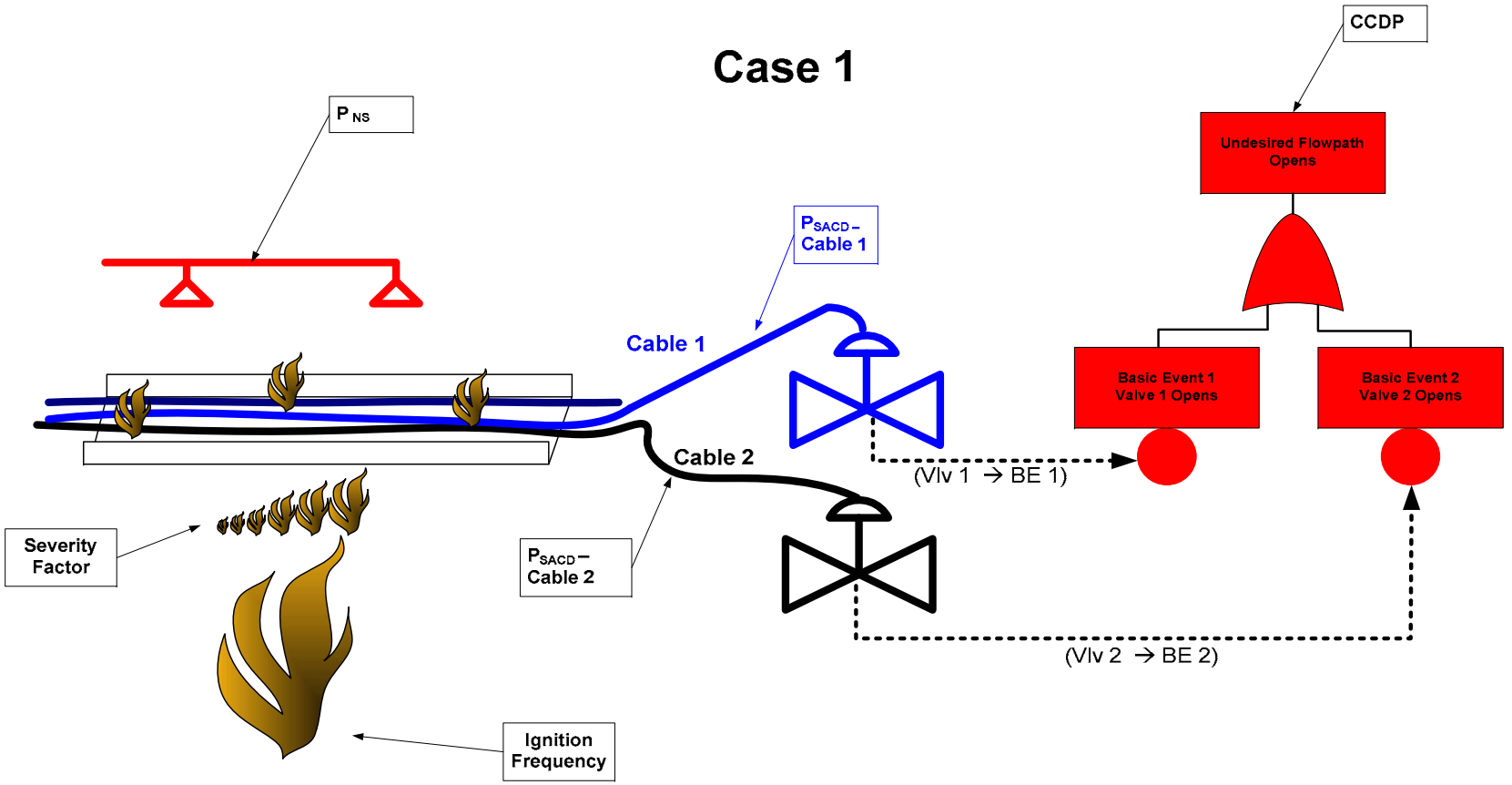


$$\triangle CDF = CDF_{CASE\ 1} - CDF_{CASE\ 2}$$

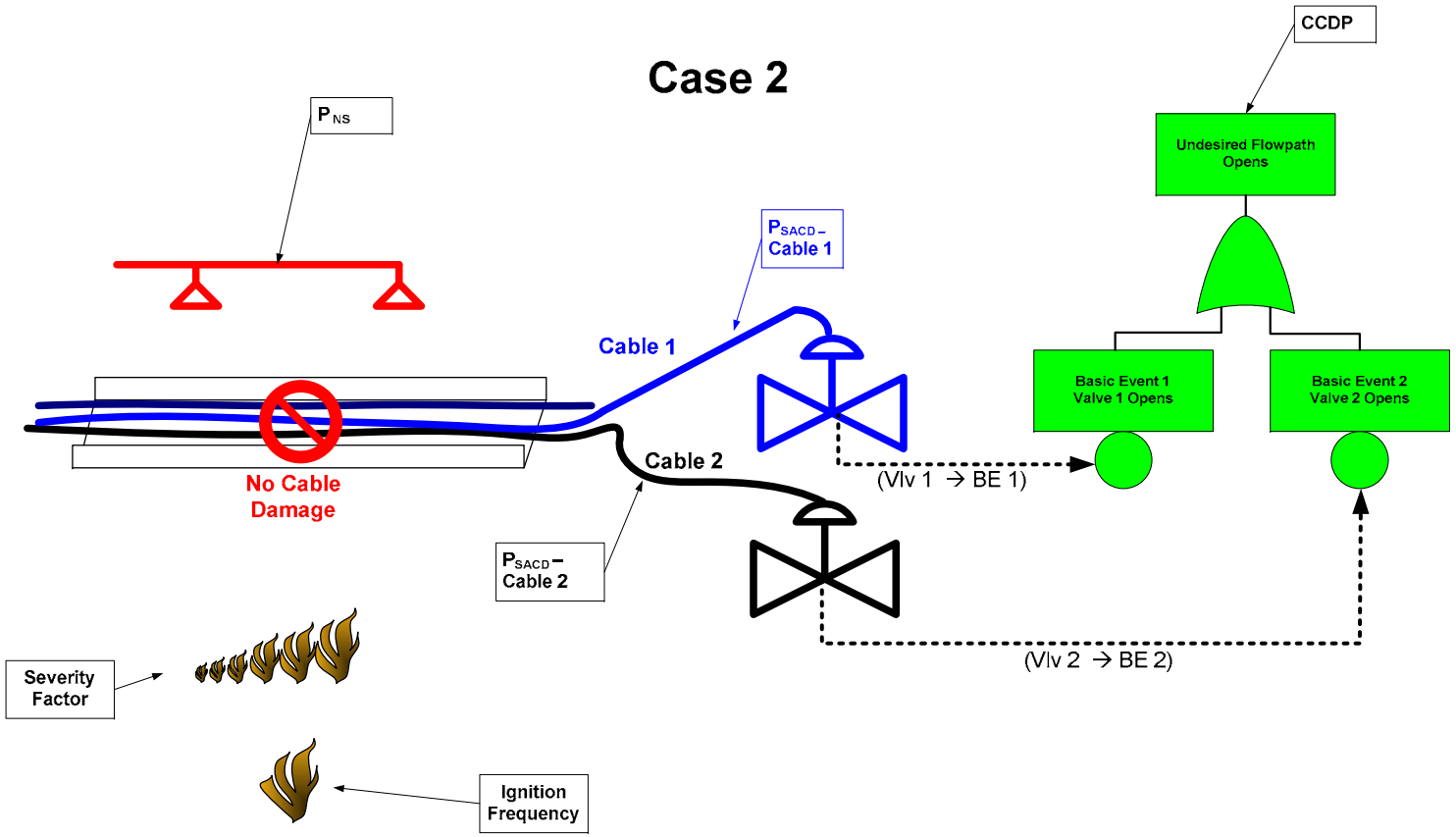
Measuring Change in Risk (pre and post-transition)



Example with Cable Damage (non-compliant case)



Example without Cable Damage (compliant case)



Pilot Plant Insights

- 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.