Sdp \ Introduction \
SDPpowerpoint.pdf

HRTD
Human Resources
Training & Development

Significance Determination Process

C-5

Technical Training Center
Chattanooga, Tennessee

Learning Objectives

- Given a scenario, use IMC-0612, Appendix B to determine if an issue has sufficient significance to warrant use of the significance determination process.
- Given a scenario, use IMC-0609, Appendix A, and a Phase 2 pre-solved table to determine the risk significance.

Purpose of SDP

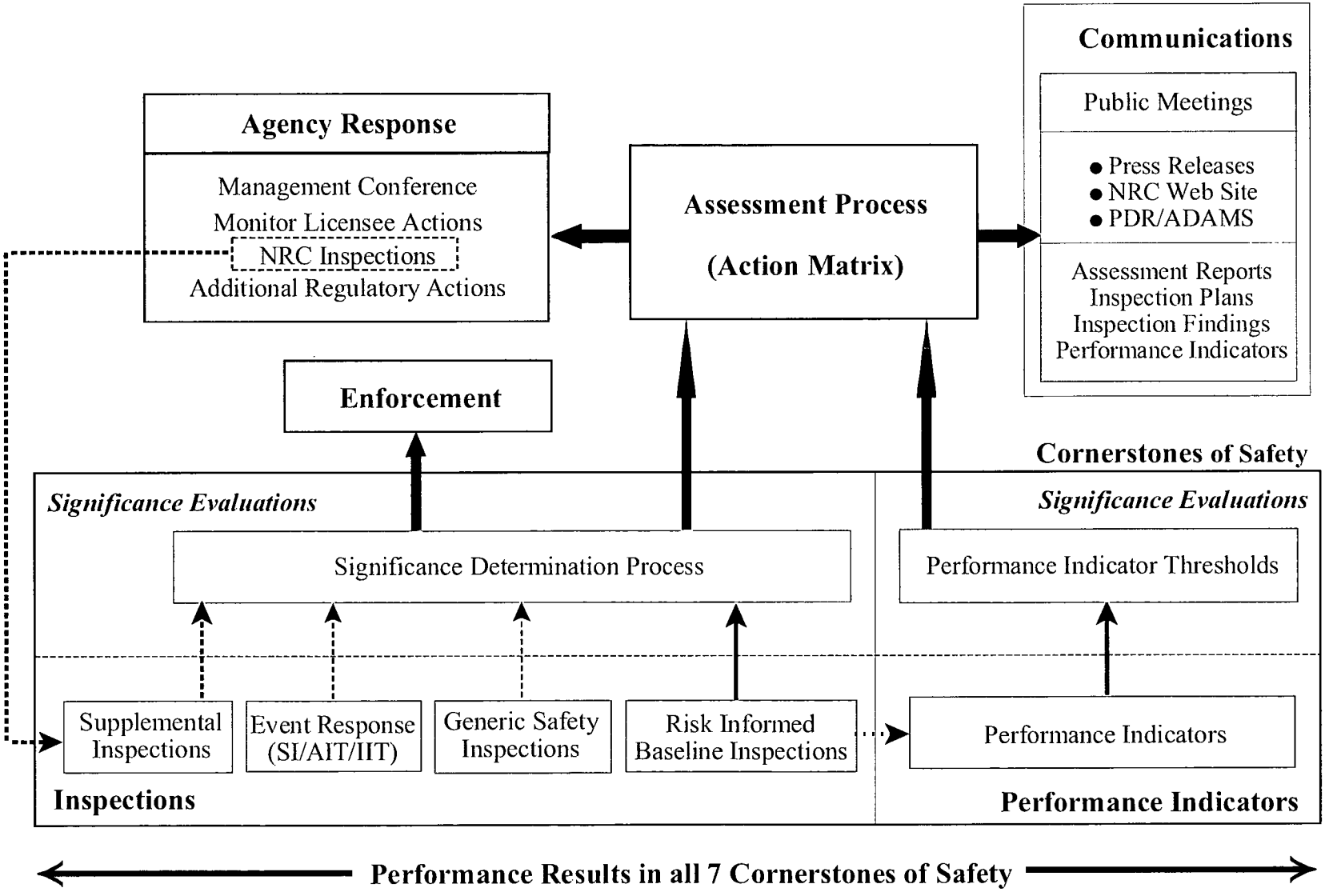
- **The Significance Determination Process (SDP) uses risk insights, where appropriate, to help the NRC inspectors and staff to determine the safety significance of inspection findings.**

SDP Objectives

- To characterize the significance of an inspection finding for the NRC licensee performance assessment process, using best available risk insights as appropriate.

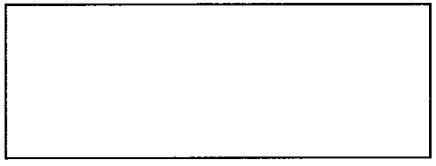
The SDP thus assigns a color to the inspection finding.

Exhibit 2: REACTOR OVERSIGHT PROCESS



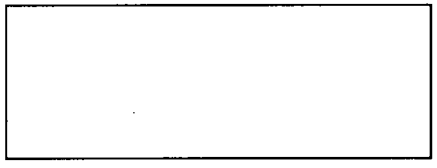
Technical Training Center
Chattanooga, Tennessee

SDP Colors

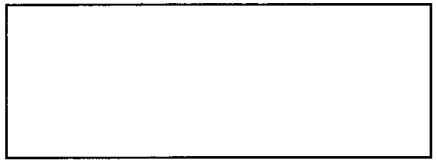


Green – very low safety significance.
$\Delta CDF < 1E\text{-}6$

White – low to moderate safety significance.
$1E\text{-}6 \leq \Delta CDF < 1E\text{-}5$



Yellow – substantial safety significance.
$1E\text{-}5 \leq \Delta CDF < 1E\text{-}4$



Red – high safety significance.
$1E\text{-}4 \leq \Delta CDF$

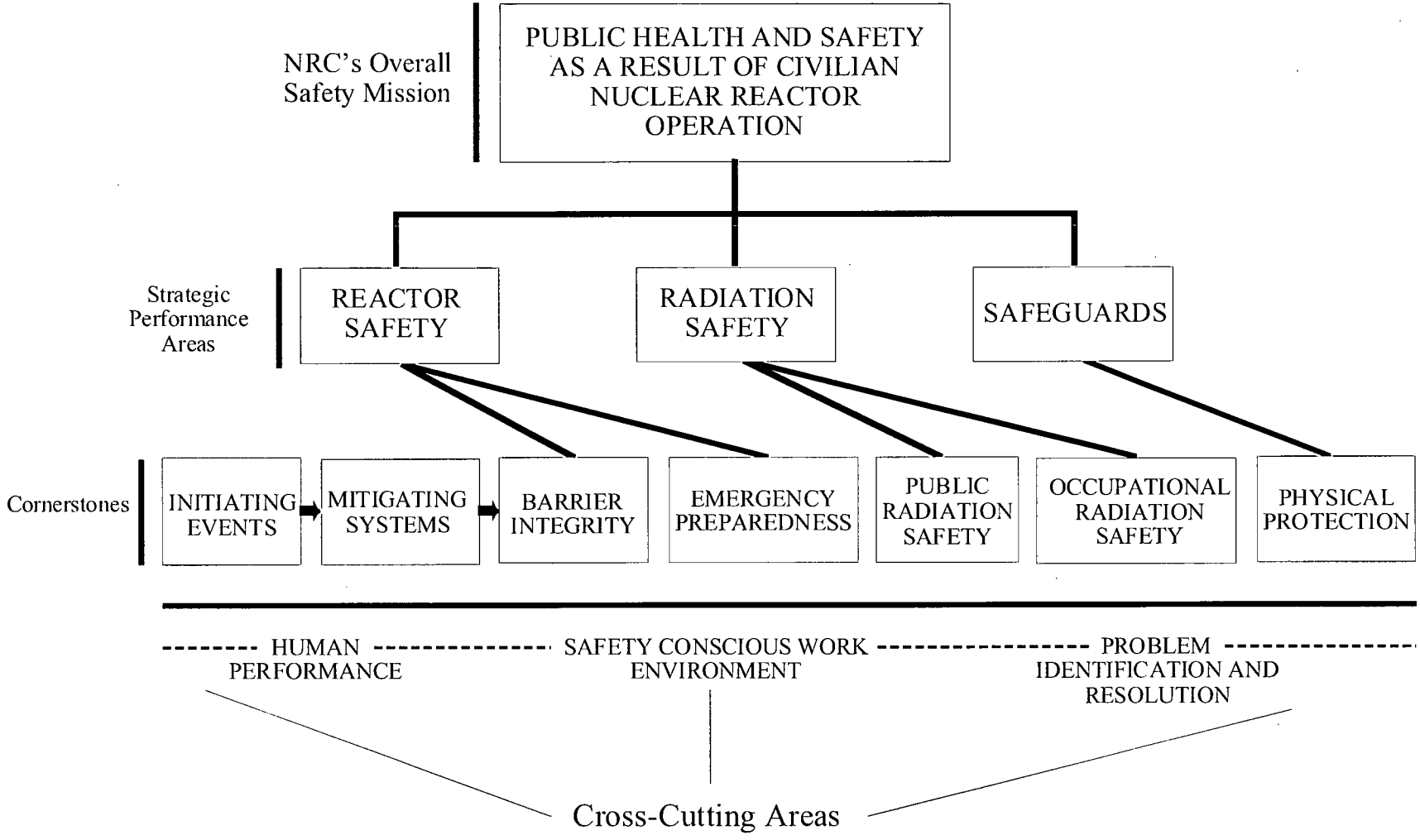
SDP Objectives (Continued)

- To provide all stakeholders an objective and common framework for communicating the potential safety significance of inspection findings.
- To provide a basis for assessment and/or enforcement actions associated with an inspection finding.
- To provide the inspectors with plant-specific risk information for use in risk-informing the inspection program.

Types of SDPs

- At least one SDP supports each cornerstone associated with the strategic performance areas defined in IMC 2515.
- The SDPs and related instructions are found in IMC 0609.

Exhibit 1: REGULATORY FRAMEWORK



SDP Listing

A. Significance Determination of Reactor Inspection Findings for At-Power Situations

B. Emergency Preparedness SDP

C. Occupational Radiation Safety SDP

D. Public Radiation Safety SDP

E. Physical Protection SDP

F. Fire Protection SDP

SDP Listing

G. Shutdown Safety SDP

H. Containment Integrity SDP

I. Operator Requal. Human Performance SDP

J. SG Tube Integrity Findings SDP

K. Maint. Risk Assess. & Risk Management SDP

M. Significance Determination Process Using Qualitative Criteria

Determining the Significance of Reactor Inspection Findings for At-Power Situations

Technical Training Center
Chattanooga, Tennessee

Entry Conditions

- **This SDP provides a simplified risk-informed framework to estimate the increase in core damage frequency during at-power situations due to conditions which contribute to unintended risk increases caused by deficient licensee performance.**

Deficient Performance

- Deficient licensee performance or performance deficiency **is an issue that is the result of a licensee not meeting a requirement or standard where the cause was reasonably within the licensee's ability to foresee and correct, and that should have been prevented. A performance deficiency can exist if a licensee fails to meet a self-imposed standard or a standard required by regulation.** ***IMC 0612.***

Examples of Deficient Performance

- Safety-related pump discharge valve remained closed following surveillance testing.
- Debris left in safety-related tank following maintenance activities.
- Failing to take proper corrective action when testing demonstrated a problem.

Entry Conditions (Cont'd)

- Conditions which do not represent deficient licensee performance are considered part of the acceptable plant risk and are not candidates for SDP evaluation.
- Each Issue should be screened by using IMC 0612, Appendix B, to determine whether the issue is more than a minor issue.
- If issue is not minor, then it is a candidate for SDP evaluation.
- This SDP is not used for event evaluation.

IMC 0612

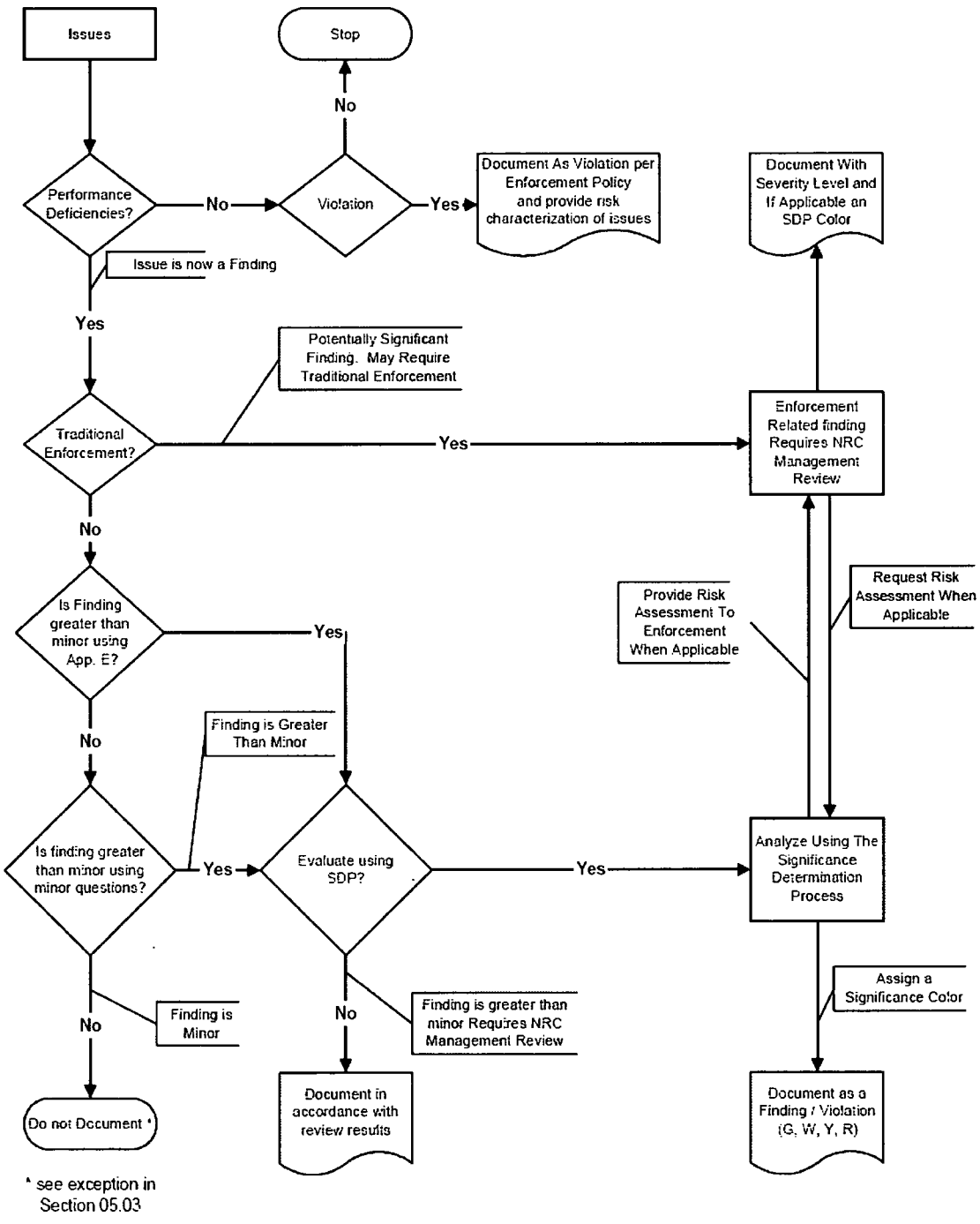
Appendix B:

Issue Screening

Technical Training Center
Chattanooga, Tennessee

Use Figure 1 and the questions listed below to determine if a finding has sufficient significance to warrant further analysis or documentation.

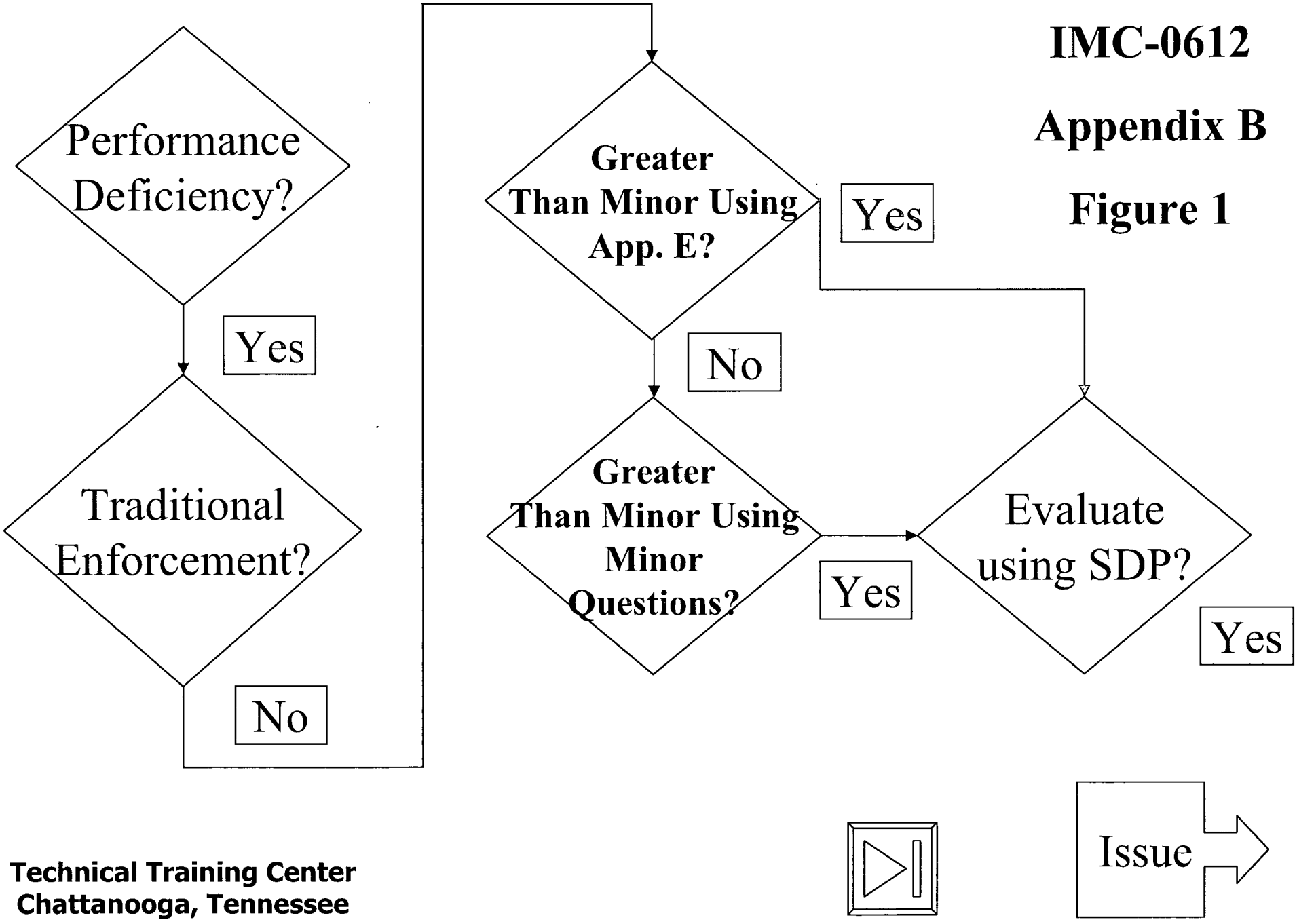
Figure 1



IMC-0612

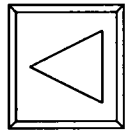
Appendix B

Figure 1



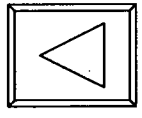
Performance Deficiency Question

- Did the licensee fail to meet a requirement or standard, where the cause was reasonably within the licensee's ability to foresee and correct and which should have been prevented?
- A performance deficiency can exist if a licensee fails to meet a self-imposed standard or a standard required by regulation.



Traditional Enforcement Questions

- Does the issue have actual safety consequence (overexposure, excessive radioactive release)?
- Does the issue have the potential for impacting the NRC's ability to perform its regulatory function?
- Are there any willful aspects of the violation?



Minor Questions

- Could the issue be reasonably viewed as a precursor to a significant event?
- If left uncorrected, could the finding become a more significant safety concern?
- Does the finding relate to a performance indicator that would have caused the PI to exceed a threshold?
- Is the finding associated with one of the cornerstone attributes listed at the end of this attachment and does the finding affect the associated cornerstone objective?
- 9 maintenance risk assessment and risk management questions (not listed here).

Initiating Events

- **Objective – to limit the likelihood of those events that upset plant stability and challenge critical safety functions during shutdown as well as power operations.**
- **Attributes: design control, protection against external factors, configuration control, equipment performance, procedure quality, and human performance.**

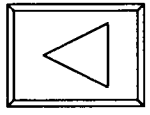
Mitigating Systems

- Objective – to ensure the availability, reliability, and capability of systems that respond to initiating events to prevent undesirable consequences (i.e., core damage).
- Attributes: design control, protection against external factors, configuration control, equipment performance, procedure quality, and human performance.

Barrier Integrity

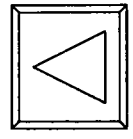
- **Objective – to provide reasonable assurance that physical design barriers (fuel cladding, RCS, and containment) protect the public from radionuclide releases caused by accidents.**

- **Attributes: design control, configuration control, procedure quality, human performance, cladding performance (cladding), RCS equipment and barrier performance (RCS), and SSC and barrier performance (containment).**



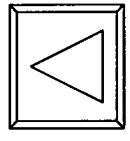
SDP Questions

- Is the event associated with an increase in the likelihood of an initiating event?
- Is the finding associated with the operability, availability, reliability, or function of a system or train in a mitigating system?
- Is the finding associated with the integrity of fuel cladding, the reactor coolant system, reactor containment, control room envelope, auxiliary building (PWR), or ... (BWR)?
- Is the finding associated with degraded conditions that could concurrently influence any mitigation equipment and an initiating event?



SDP Questions (cont'd)

- Is the finding associated with or involve impairment or degradation of a fire protection feature?
- Is the finding associated with the spent fuel pool cooling system radiological barrier?
- Is the finding associated with inadequate 10 CFR 50.65(a)(4) risk assessment (quantitative only) and/or risk management?

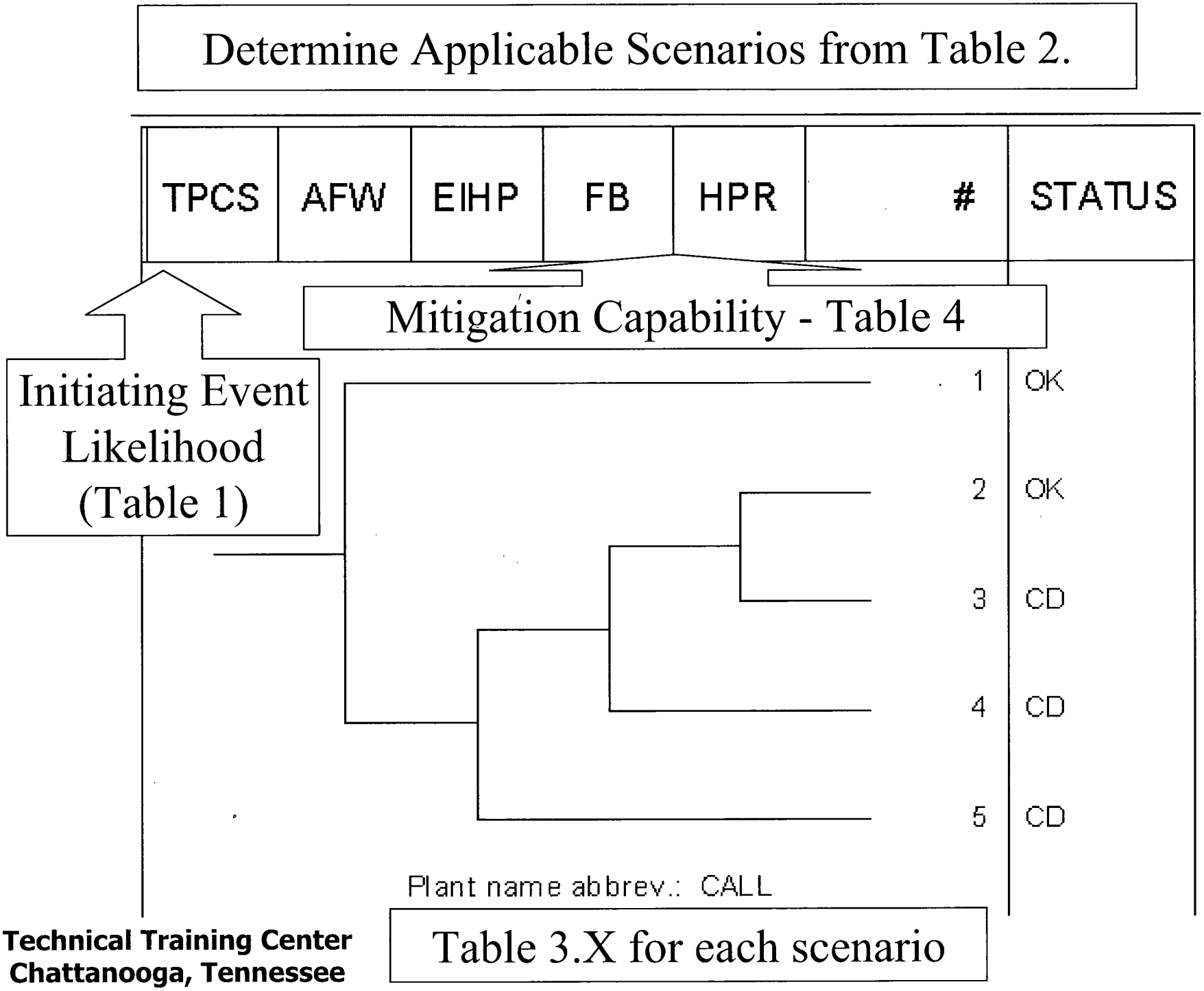


SDP Phases

- **Phase 1 – Characterization and Initial Screening of Findings**
  - Characterization of the finding and an initial screening of low-significance findings for disposition by the licensee's corrective action program.
- **Phase 2 – Risk Significance Estimation and Justification Using the Site Specific Risk-Informed Inspection Notebook and Pre-Solved Table**
  - Plant-specific estimation of the risk significance of an inspection finding and development of the basis for the determination.

SDP Phases (Continued)

- **Phase 3 – Risk Significance Estimation Using Any Risk Basis That Departs from the Phase 1 or Phase 2 Process**
  - Any departure from the guidance provided for Phase 1 or 2 constitutes a Phase 3 analysis. Phase 3 analysis methods will utilize appropriate PRA techniques and rely on the expertise of NRC risk analysts.


Determine Applicable Scenarios from Table 2.
TPCS
AFW
EIHP
FB
HPR
#
STATUS
Mitigation Capability - Table 4
Initiating Event Likelihood (Table 1)
1
OK
2
OK
3
CD
4
CD
5
CD
Plant name abbrev.: CALL
Table 3.X for each scenario

A Little Math

- **If events A and B are independent, then the Pr(A and B) is:**

$$\Pr(A \text{ and } B) = \Pr(A)\Pr(B)$$

- **Logarithms**

$$\log AB = \log A + \log B$$

SDP Tables

- **In IMC - 0609**
  - Table 4, Remaining Mitigation Capability Credit
  - Table 5, Counting Rule Worksheet
- **In Site Specific Workbook**
  - Table 1, Categories of Initiating Events
  - Table 2, Initiators and Dependency
  - Table 3.X, Worksheets for required initiating event scenarios.

Example using notebook

Technical Training Center
Chattanooga, Tennessee

SDP Phase 2 Steps (IMC 0609, App. A, Att. 1)

Step 2.1.1: Check for the most current version of SDP Notebook and Pre-solved Worksheet.

Step 2.1.2: Determine the exposure time.

1.1 Exposure Time

- **If the inception of the condition is unknown:**
  - determine last successful demonstration of functionality.
  - Exposure time = (date discovered inoperable - date of functionality demonstration)/2
  - called t/2

SDP Phase 2 Steps (IMC 0609, App. A, Att. 1 – cont'd)

Step 2.1.3: Find the appropriate target for the inspection finding in the pre-solved table.

Step 2.1.4: Determine the risk significance of the inspection finding and the potential risk contribution due to Large Early Release Frequency (LERF).

Callaway pre-solved table.

SDP Phase 2 Steps (IMC 0609, App. A, Att. 1 – cont'd)

Step 2.1.5: Screen for the potential risk contribution due to external events if results from Step 2.1.4 are Green and is greater than or equal to 1E-7.