

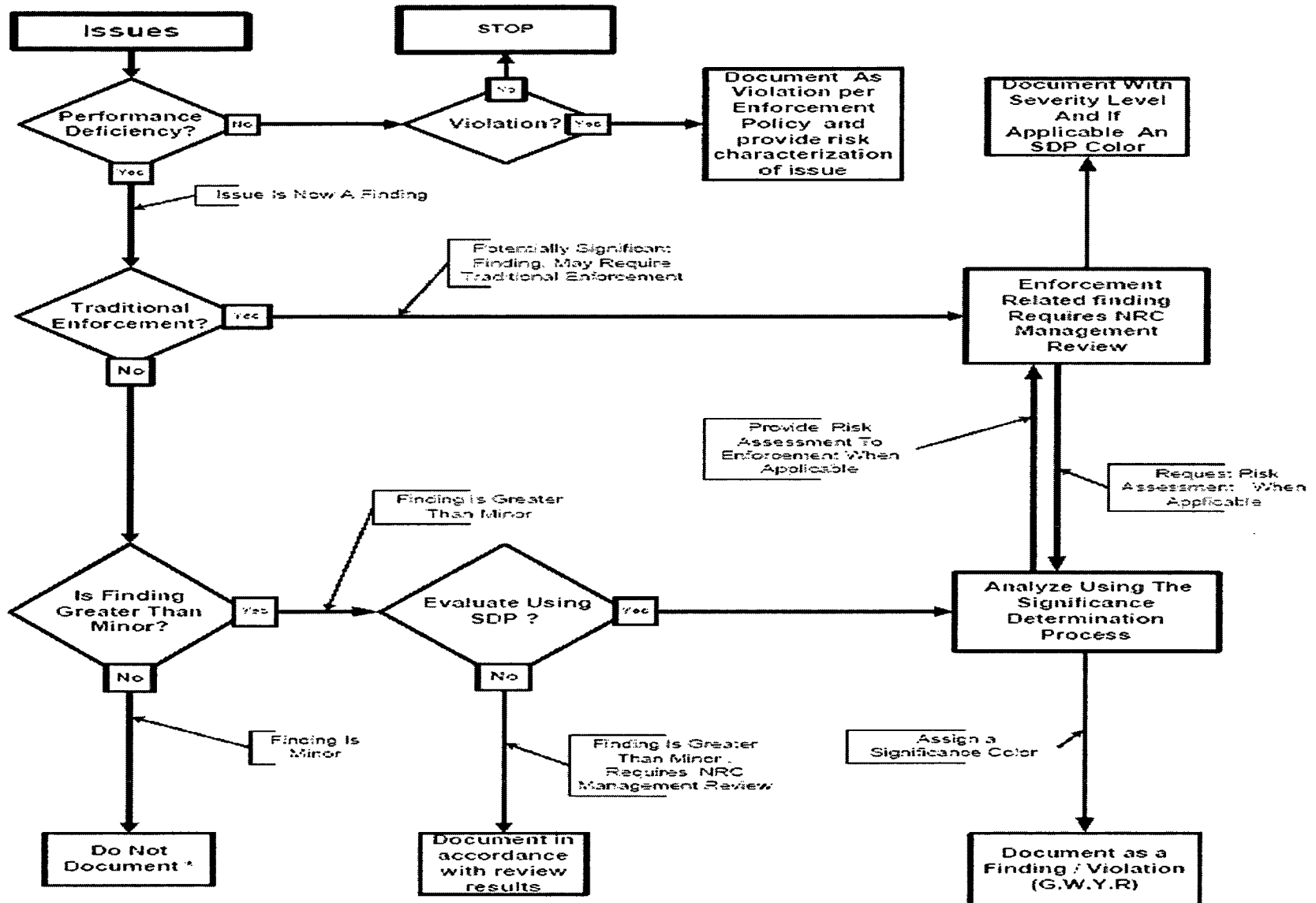
# Significance Determination Process

## Overview

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- ❑ Guidance provided in Inspection Manual Chapter 0609
- ❑ Risk Informed Reactor Safety Guidelines:
  - ❑ Appendix A: At-Power Situations
  - ❑ Appendix B: Emergency Preparedness
  - ❑ Appendix C: Occupational Radiation Safety
  - ❑ Appendix D: Public Radiation Safety
  - ❑ Appendix E: Physical Safety
  - ❑ Appendix F: Fire Protection
  - ❑ Appendix G: Shutdown Safety
  - ❑ Appendix H: Containment Integrity
  - ❑ Appendix I: Operator Requalification
  - ❑ Appendix J: Steam Generator Tube Integrity
  - ❑ Appendix K: Maintenance Risk Assessment and Management

# Issue Screening



\* see exception in Section C5.03

# Performance Deficiency and Minor Finding Determination

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- IMC 0612 clarifies:
  - If the issue is a performance deficiency.
  - If Traditional Enforcement is appropriate. If so, the Enforcement Process is followed.
  - If the issues is more than minor. (Similarity to examples in Appendix E or Appendix B questions)
  - If the issue can be evaluated within the SDP. If so, it is transferred to the appropriate section of IMC 0609.
  - How to review and document issues that can not be evaluated in the SDP.
  
- The inspectors should clearly be able to say why an issue is a performance deficiency, why traditional enforcement applies, or why an issue is more than minor.
  
- Open Items
  - URI if we are not sure there is a performance deficiency and more inspection is needed.
  - VIO or Finding with Significance TBD, if we know there is a performance deficiency. SDP timeliness goals have to be met.

# At Power SDP

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- Three phase process:
  - Phase 1, Screening Worksheet
  - Phase 2, estimate risk using Plant Specific Risk-Informed Inspection Notebooks
  - Phase 3, evaluate risk by modification of the Phase 2 and/or using other risk tools, as needed
- Phases 1 and 2 are generally performed by inspection staff, with assistance of a Senior Reactor Analyst (SRA), as necessary
- Phase 3 is defined as ANY departure from the Phase 2 process, performed by an SRA

# Risk Metrics

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Green Finding: very low safety significance

( $\text{delta-CDF}_{\text{total}} < 1\text{E-}6$ ,  $\text{delta-LERF} < 1\text{E-}7$  )

White Finding: low to moderate safety significance

( $\text{delta-CDF}_{\text{total}} 1\text{E-}6 - 1\text{E-}5$ ,  $\text{delta-LERF} 1\text{E-}7 - 1\text{E-}6$ )

Yellow Finding: substantial safety significance

( $\text{delta-CDF}_{\text{total}} 1\text{E-}5 - 1\text{E-}4$ ,  $\text{delta-LERF} 1\text{E-}6 - 1\text{E-}5$ )

Red Finding: high safety significance

( $\text{delta-CDF}_{\text{total}} > 1\text{E-}4$ ,  $\text{delta-LERF} > 1\text{E-}5$ )

- The  $\text{delta-CDF}_{\text{total}}$  includes the contribution from external initiating events, if the internal delta-CDF is greater than or equal to  $1\text{E-}7$  per year.
- The delta-LERF is evaluated if the internal and external delta CDF is greater than or equal to  $1\text{E-}7$  per year

# Phase 1 Screening

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- Greater than minor findings are processed using the Phase 1 Screening Worksheet, which prioritizes the need for continued risk assessment.
  - Screens clearly very low significance issues, as soon as possible
  - Use Phase 2 Notebook
  - Use Phase 3 for some issues that are not covered in the Notebook

# SRA - PRA Staff Interactions

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- The SRAs routinely speak with the inspectors about pending issues and how to proceed in the SDP.
- Likewise as issues come up the SRAs routine call the PRA staffs and vice versa. We have very good working relationships will all the Regional PRA staffs
- Once Phase 2 is entered the PRA staff will be contacted if
  - There are plant assumption questions based on the Phase 2 Notebook
  - A quick look at Phase 2 indicates it may be greater than green.
- Additional PRA types of information may be requested or exchanged to allow more detailed understanding and modeling of the plant in a modified Phase 2 or in the Phase 3 SPAR model. This may include
  - Design documents related to deficiency
  - Procedures to support recovery credit
  - PRA modeling information
- We try to keep these information exchanges as informal as possible.
- Interactions will continue, to ensure a common understanding and comparison of assumptions and results, all the way through development of the SERP package and review of additional information provided following a greater-than-green preliminary finding and the issuance of the Final Risk Determination.

# Phase 2 Process

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- Findings are evaluated using the Risk Informed Inspection Notebooks.
  - Rev 1 was benchmarked against the Licensee's PRA between 2001 and 2003
  - Rev 2 is being issues shortly, and was based in recent information
  - Trip Reports provide comparison of Notebook results and Licensee PRA calculated RAW values
- Notebooks assist the inspectors in estimating the increase in Core Damage Probability (delta-CDP) given the finding, based on
  - The Initiating Events and mitigating systems impacted
  - The accident sequences affected
  - Exposure Time assumed(>30 days assumes a year; 3- 30 days assumes a 10<sup>th</sup> of a year and < 3 days assumes a 100<sup>th</sup> of a year)
  - The SDP then spreads the delta-CDP over a year to get delta-CDF (per year) (same numerical value)



## Phase 2 Process (Cont'd)

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- Phase 2 results may be conservative if the actual exposure time is in the low end of the exposure band (i.e., 45 day finding will assume a years worth of exposure).
- If Green, SRA usually prepares the analysis section writeup.
- If Greater than Green, usually proceed to Phase 3 – unless agreement (SERP and Licensee) can be reached on the suitability of the Phase 2 result.

# External Initiator Contribution

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- ❑ External risk contribution may potentially be 10 times greater than internal risk
- ❑ SRA must evaluate the finding for external event contribution to core damage as required in NRC Inspection Manual Chapter 0609, Appendix A, Attachment 1, if the internal events delta-CDF is greater than or equal to  $1E-7$  per year
- ❑ Predominately Fire, Flooding, and Seismic (and possibly High Winds)
- ❑ The SRA will try to gather IPEEE information and discuss it with the PRA staff
- ❑ The PRA staff may have more current information, including possibly a fully internal and external initiating events PRA
- ❑ External delta-CDF contributions are added to the Internal to get an estimate of the total delta-CDF.

# Large Early Release Frequency

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- Increase in Large Early Release Frequency (delta-LERF) is a separate metric for inspection findings, as in the MD 8.3 the criteria are one order of magnitude lower than the delta CDF.
- The SRA will perform a delta-LERF review, as required per NRC Inspection Manual Chapter 0609, Appendix A, Attachment 1, for all sequences (internal or external) that have a delta CDF of greater than or equal to  $1E-7$  per year.
- An initial screening is performed using IMC -0609 Appendix H, which is dependent on the cores damage sequence and the type of containment.
- The PRA staff may be contacted to review the sequences and provide information from the Level 2 PRA for Phase 3 evaluations.