Operating Experience

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May 16-17, 2005
Tokyo, Japan

Presentation Outline

- Objectives of the USNRC's new Operating Experience (OpE) program
- OpE process overview
- OpE program information sources
- Changes affecting U.S. nuclear industry
- Accident Sequence Precursor (ASP) program
- ASP program risk assessment tools
- ASP role in OpE program

NRC Operating Experience

- Task Force
  - Functional elements of sound operating experience (OpE) exist
    - Short term, long term efforts of identifying safety issues
    - Assessing significance
    - Taking actions to address the issues
- Effectiveness
  - Work in concert with agency
    - Inspection, licensing, research programs

NRC Operating Experience

- Objectives of Program
  - OpE is collected, evaluated, communicated, and applied to support agency goal of ensuring safety
  - OpE is used to improve the effectiveness, efficiency, and realism of NRC decisions
  - Stakeholders provided with timely, accurate, and balanced information

NRC Operating Experience

- New internal gateway or portal
  - All OpE accessible to NRC staff via single access point
  - Improved search capabilities and techniques
  - Targeted communication system - @Operating Experience Community

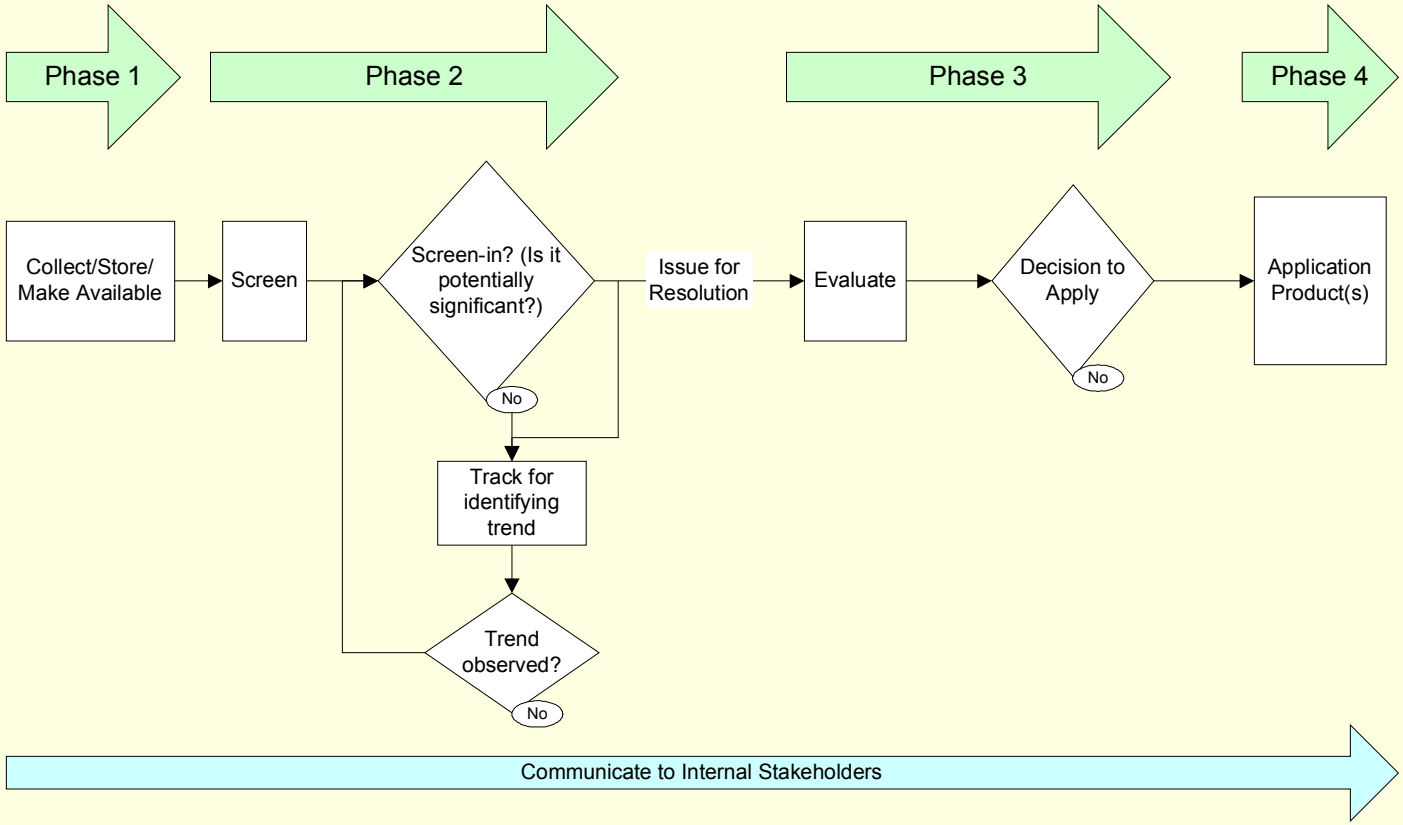
- Accomplishments
  - NRC Management Directive 8.7, “Reactor OpE Program,” issued in Draft form for use
    - Clearinghouse as a central organization to:
      - Collect
      - Screen
      - Make available
      - Communicate
      - Project manage decisionmaking

NRC Operating Experience

- Program supports regulatory decision-making in our core programs
  - Licensing
  - Oversight
  - Incident Response
  - Rulemaking
  - Physical Security
- Based on inter-dependent model where all organizations work toward applying operating experience

Program at a Glance

Overview of OpE Process -- 4 Phases



OpE Information Sources

- Inspection Findings
- Generic Communications
- 50.72 Event Notifications
- 50.73 Licensee Event Report
- Inspection Report
- INPO SEE-IN Documents
- Industry Trends Program
- Part 21 Reports
- Morning Reports
- Preliminary Notifications
- Foreign OpE
- Office of RES Studies
- Accident Sequence Precursor program
- OpE Briefing

NRC Operating Experience

- Examples of Current Issues under Evaluation
  - Single failure vulnerability in electrical distribution
  - Tsunami experience
  - Long term loss of emergency diesel generator (EDG) due to unrecognized blown fuse
  - Recirculation pump shaft cracking and vibration
  - Secondary leakage masking primary leakage
  - Carbon dioxide mitigation from fire suppression systems

NRC Operating Experience

- Effectiveness of Improved Communication
  - Anecdotal successes
    - Single failure vulnerability electrical distribution
    - Turbine building flooding
    - Halon misconnections
    - Flow accelerated corrosion
    - Voiding in emergency core cooling systems (ECCS)

Changes Affecting U.S. Industry

- Task Force concluded that existing requirements governing licensee review of OpE were adequate
- Expect more direct follow-up of actions taken in response to generic communications

Changes Affecting U.S. Industry

- Inspection Procedure 71552, “Identification and Resolution of Problems” Revised
  - Mandatory sampling of generic communication actions biennially
- Generic communications audited during project managers triennial review

ASP Program Objectives

ASP has been a part of NRC events analysis activities for about 25 years, and it has a variety of internal and external users.

- Primary
  - Systematically evaluate U. S. nuclear power plant operating experience to identify, document, and rank those operating events that were most significant in terms of the potential for inadequate core cooling and core damage (precursors).
- Secondary
  - Categorize the precursors for plant-specific and generic implications.
  - Provide a measure that can be used to trend nuclear plant core damage risk.
  - Provide a partial check on PRA-predicted dominant core damage scenarios.
  - Results reported to the U.S. Congress

ASP Program
Long Term Event/Condition Risk Analysis

- Systematic independent review and evaluation of operational events or conditions
- Provides a safety significance perspective of nuclear power plant operational experience
- Tools Used: SPAR (*Standardized Plant Analysis Risk*) models, modified as needed, and simplified event trees for events that SPAR models are not suitable (mainly fire and shutdown events)

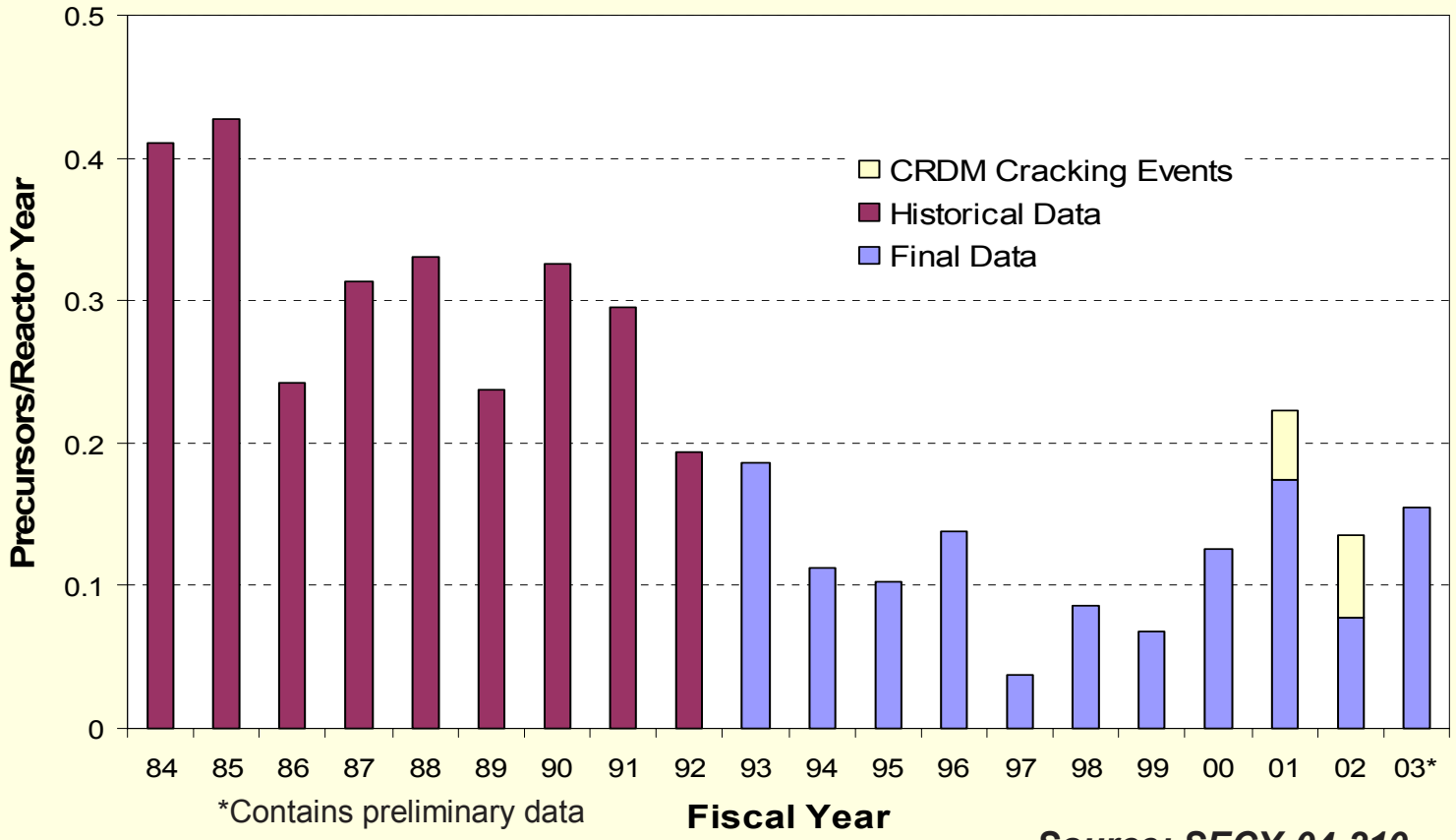
ASP Program
Long Term Event/Condition Risk Analysis – cont.

- Information Source: LERs, Inspection Reports, and 10CFR21 reports
- Risk Metrics Used: CCDP/ΔCDP
- Results Published Annually in NUREG/CR-4764 (last one published in 2000 for 1998)

ASP RESULTS, TRENDS & INSIGHTS

No trend was identified in the rates of occurrence of all precursors during the period from FY 1993 through FY 2002

Number of Precursors by Fiscal Year



Source: SECY-04-210

ASP Program – Path Forward

- Improve timeliness of ASP analyses
- Achieve real time interaction with the Significance Determination Process and other events assessment activities in RES, NRR and the Regions through processes such as RASP (*Risk Assessment Standardization Project*)
- Continue to concentrate on potentially significant events
- Complete study of ASP trends and insights
- Continued development of risk assessment tools including the SPAR (*Standardized Plant Analysis Risk*) models

SPAR MODEL DEVELOPMENT PROGRAM
Purpose and Scope

- NRC Primary Risk Tool to Evaluate Events for ASP program, ROP/SDP, and Incident Investigation
- To develop PRA-based models that are used by staff analysts in performing their risk-informed regulatory activities.
- Spans the following PRA areas:
  - Level 1: Internal events, full power operation (completed)
  - Level 1: Internal events, low power & shutdown operation
  - Level 1: External events (fires, floods, seismic, etc.)
  - Level 2: Large Early Release Frequency (LERF)

LEVEL 1, REVISION 3 SPAR MODELS

- Consists of 72 plant-specific, event tree-fault tree linked risk models for use by staff analysts in activities such as: Significant Determination Process (SDP) Phase 3 analyses, the Accident Sequence Precursor (ASP) Program, and Generic Safety Issue (GSI) resolution.

- Revision 3 Models were completed in August 2003

LOW POWER/SHUTDOWN SPAR MODELS

- Currently consists of LP/SD SPAR models for 11 plants, of which 5 have been through the onsite review process to review the SPAR models against the licensees' shutdown PRAs.

- Future plans include:
  - Develop models for additional plants and perform onsite reviews of the models. Number of models will depend on available resources and availability of licensee shutdown PRAs
  - Issue SPAR-H methodology report as NUREG/CR.
  - Prepare guidelines for performing risk analyses using the LP/SD SPAR models.

SUMMARY
Accident Sequence Precursor (ASP) Program

- The ASP Program continues to evaluate the safety significance of operating events at nuclear power plants and to provide insights to NRC's regulatory programs.
- Since its inception, the ASP program has evaluated and documented in excess of 600 precursors which are maintained in the NRC's ASP database.
- The NRC staff informs the Commission of the results of the ASP program in an annual SECY paper.
- The Reactor Operating Experience Task Force includes ASP analysis as a necessary function for an effective OpE program and noted that "the limited evaluation of the overall ASP results for feedback to other regulatory processes is a missed opportunity to identify lessons learned."

OpE Challenges

- Vigilance in effectively using OpE information
- ASP timeliness (RASP initiative)
- Risk-informed (not risk-based) decision-making for emergent safety issues requiring prompt USNRC action

The End

Questions & Answers…..