

POLICY ISSUE INFORMATION

June 28, 2000

SECY-00-0146

FOR: The Commissioners

FROM: William D. Travers
Executive Director for Operations

SUBJECT: STATUS OF RISK-BASED PERFORMANCE INDICATOR DEVELOPMENT
AND RELATED INITIATIVES

PURPOSE:

To provide the Commission with a status report on the development of risk-based performance indicators (RBPIs) and related initiatives in support of the Reactor Oversight Process (ROP).

BACKGROUND:

The current ROP utilizes performance indicators that were developed based on generic risk insights. These performance indicators provide a measure of plant performance in selected areas and utilize generic performance thresholds. They are described in SECY 99-007, "Recommendations for Reactor Oversight Process Improvement." When SECY 99-007 was developed, it was recognized that improved performance indicators could be developed to enhance the ROP. RBPIs are intended to provide improved indicators to the ROP.

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RBPIs are currently under development and the outcome of this development will determine the extent to which they are employed.

A white paper (Attachment 1) on the development of RBPIs was issued for comment in March 2000. The purpose of this white paper was to provide an overview of the current efforts to develop RBPIs. The development of the RBPI white paper was closely coordinated with the Office of Nuclear Reactor Regulation (NRR) and the Regions. In addition, a public meeting with external stakeholders was held to obtain their comments. Attendees included the Nuclear Energy Institute (NEI), Institute of Nuclear Power Operations (INPO), Union of Concerned Scientists, and Public Citizen.

DISCUSSION:

RBPIs provide performance measures that are related as explicitly as practical to risk-significant elements of plant operation. That is, they provide performance measures whose impact on core damage frequency (CDF) and large, early release frequency (LERF) can be established through a risk model or risk logic. In developing RBPIs, "performance" refers to activities in design, procurement, construction, operation, and maintenance that support achievement of the objectives of the cornerstones of safety in the ROP. Although the indicators are "risk-based" they will be used as an input to the "risk-informed" ROP decision making process.

The RBPIs could provide the following benefits to the ROP:

- More comprehensive coverage of risk-significant contributors to plant risk
 - Reliability indicators will be developed at the component/train/system level.
 - Indicators for shutdown modes and fire will be developed consistent with the state-of-the-art models, data, and methods that are currently available for these areas.
- More recognition of plant-specific attributes
 - The RBPI threshold values will be more plant-specific to reflect risk-significant differences in plant designs.
 - An indicator will be developed that could provide the capability to assess the integrated risk-significance of the performance indicators and the inspection findings on overall plant performance.
- Ability to trend risk-significant performance at an industry-wide level, including insights and identification of key contributors to any observed trends. This will include trending of existing indicators and other performance data such as accident sequence precursor (ASP) events and common-cause failure events that cannot be tracked at a plant-specific level.

- Additional information to assist the ROP in identifying risk-significant areas for inspection.

Development of RBPIs will be accomplished in phases. Phase-1 of the development will include reliability and availability indicators for full power mode, shutdown modes, internal events, fire events, and industry-wide performance trends. Phase-1 will include the initiating events, mitigating systems, and the containment portion of the barrier integrity cornerstones of safety. Additional phases of the RBPI development will include an integrated indicator, improvements to the Phase-1 RBPIs, consideration of other external events (e.g., seismic and wind), and follow-on work to improve existing indicators in response to the ROP implementation.

Interactions with Stakeholders

The RBPI development activities have been closely coordinated with NRR and the Regions. A number of meetings were held to review the general approach and concepts. The RBPI white paper reflects those review comments.

The ACRS was briefed on the RBPI white paper on April 5, 2000. The ACRS issued a letter on April 23, 2000, that documented the results of their evaluation of the RBPI development program (Attachment 2). The ACRS concluded that the RBPI development is very important for the successful transition to risk-informed regulation and recommended that the agency assign a high priority and adequate resources to this program. The ACRS also recommended that the staff should work with the industry to ensure that licensee reporting of reliability data becomes an industry self-imposed requirement of the Equipment Performance and Information Exchange (EPIX) database.

A public meeting with external stakeholders was held on April 28, 2000, to discuss their comments on the overall concept and technical approach outlined in the RBPI development white paper. A summary of their comments discussed at the meeting and the written comments provided by the external stakeholders are presented in Attachment 3. The external stakeholder comments were focused primarily on policy and implementation issues, which will be addressed following the Phase-1 effort to assess the technical feasibility of RBPI development. The key issues raised by external stakeholders were:

- Do we need broader risk coverage by PIs in order to have a successful ROP? Industry questions the need while other external stakeholders are in favor of additional coverage by PIs.
- Will increased PIs result in less inspection? NEI favors this approach while non-industry stakeholders oppose it.
- Standardized Plant Analysis Risk (SPAR) models used for plant-specific thresholds should be validated through review by utilities.
- Industry commenters question whether the increased data gathering demands for EPIX to support RBPIs will be commensurate with the benefits of having more PIs. External stakeholders are concerned that data used for regulatory decisions will not be available to the public.

Interface with Industry-Wide Performance Trending

Industry-wide performance trends are part of the industry-wide reactor safety performance “measures” discussed in the draft NRC Strategic Plan for FY 2000-2005. Currently, industry trends are monitored using a set of seven performance indicators (NUREG-1187, “Performance Indicators for Operating Commercial Nuclear Power Reactors”) and trends from the ASP program. In the future, performance indicators and inspection findings from the ROP and trends from the ASP program could be used to monitor industry trends. However, in addition to the above, performance indicators from the RBPI program could also be used since these would provide a broader coverage of risk and industry-wide trends, including risk-significant trends on performance elements that are difficult to trend on a plant-specific basis. These trends could also provide feedback to the ROP to assess the effectiveness of its oversight activities.

Ongoing Activities

The NRC staff is developing Phase-1 RBPIs using the overall concept described in the RBPI white paper. The preliminary results of this effort will be published in the summer of 2000. We plan to brief the Commission on study findings in December 2000 following interactions with internal and external stakeholders.

The EPIX database is an industry initiative that collects information on equipment performance for a number of applications. EPIX includes information on reliability and availability of certain components that are critical to the development of many potential RBPIs. We have been working with INPO on this activity in response to the SRM dated June 13, 1997, on SECY-97-101 directing the staff to work with industry on a voluntary alternative to the proposed Reliability and Availability Data Rule. Verification and validation of the EPIX data is a crucial element of the RBPI development. We are working with INPO and NEI on these issues.

/RA by Frank J. Miraglia Acting For/

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Attachments:

1. White Paper, “Development of Risk-Based Performance Indicators: Program Overview”
2. ACRS Letter “NRC Program For Risk-Based Analysis of Reactor Operating Experience”
3. Review Comments on RBPI Development White Paper from External Stakeholders

MEMORANDUM DATED: 6/28/00

SUBJECT: STATUS OF RISK-BASED PERFORMANCE INDICATOR DEVELOPMENT AND RELATED INITIATIVES

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Attachment 1

Development of Risk-Based Performance Indicators: Program Overview

Attachment 2

NRC Program for Risk-Based Analysis of Reactor
Operating Experience

Attachment 3

**Review Comments on RBPI Development
White Paper from External Stakeholders**