

June 21, 000

MEMORANDUM TO: See Attached List

FROM: Cynthia A. Carpenter, Chief **/RA/**
Generic Issues, Financial, Environmental and Rulemaking Branch
Division of Regulatory Improvement Programs

SUBJECT: RISK-INFORMED REGULATION IMPLEMENTATION PLAN (RIRIP)
(MA9107)

SECY-00-0062 transmitted the initial draft of the RIRIP (successor document to the PRA Implementation Plan). The purpose of the RIRIP is to describe the overall agency plan for deciding what, how and when to risk-inform regulations and regulatory processes. The plan will provide objectives and linkage of risk-informed activities to the Strategic Plan and to the PRA Policy Statement, as well as priorities, milestones and measures of success.

Following a Commission briefing on March 31, the staff was tasked to provide a complete RIRIP by October 27, 2000. The plan covers the strategic arenas of reactor safety, nuclear materials safety, and nuclear waste safety. The Office of Research has the lead for the overall product. RGEB will coordinate NRR's input into the RIRIP. The following steps are planned in the near term in order to meet the SRM due date:

1. Identify activities to include within the RIRIP. Attachment 1 includes a suggested list of activities (some of which have been completed, others of which are under development) that are part of the NRC's overall actions to use risk information in its regulatory processes. Each branch is requested to review this list and to propose any additional topics that seem appropriate, or to suggest deletion or modification of topics. As noted, the list includes activities that are being sponsored or conducted by both NRR and RES. As part of this effort, please also indicate your views as to whether the listed activities are needed to support our current regulatory needs and planned initiatives, or are being developed in anticipation of future initiatives.

Note that while NRR's primary focus is on the reactor safety arena, NRR is also undertaking risk-informed initiatives that fall within other arenas (e.g, reactor decommissioning in the waste arena) that need to be included in the RIRIP (and for which NRR will take the lead on providing suitable input).

2. Complete activity writeups. A draft template for what information would be included for each activity is provided in Attachment 2. RGEB will take the lead to prepare the writeup for each activity, but we will need appropriate background material from each branch. Therefore, for each activity, you are requested to provide necessary reference material, as well as the name of a point of contact for further information (as needed).

The above actions should be completed by July 7, 2000. Questions and your responses may be directed to Stu Magruder or Eileen McKenna, in RGEB. You will be provided the opportunity to review and comment on the activity writeups and the complete report at a later date.

Attachments: As stated

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Attachments: As stated

DISTRIBUTION:

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LIST OF ADDRESSEES

Tad Marsh, Chief, Events Assessment, Generic Communications and Non-power Reactors Branch

Chris Grimes, Chief, License Renewal and Standardization Branch

Bill Beckner, Chief, Technical Specifications Branch

Glenn Tracy, Chief, Operator Licensing, Human Performance and Plant Support Branch

Ted Quay, Chief, QA, Vendor Inspection, Maintenance and Allegations Branch

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Gene Imbro, Chief, Mechanical and Civil Engineering Branch

Bill Bateman, Chief, Materials and Chemical Engineering Branch

Jose Calvo, Chief, Electrical and Instrumentation and Controls Branch

LIST OF TOPICS FOR REACTOR SAFETY ARENA

Note: Organization designations shown below are for purposes of lead responsibility for preparation of the activity writeup.

Revised Reactor Oversight Process	(NRR/DIPM)
- Baseline inspection program	
- Significance Determination process (plant worksheets)	
- Performance indicators	
Risk-based performance indicators	(RES)
Accident sequence precursor program	(RES)
IPE and IPEEE followup activities	(RES)
GSI Prioritization	(RES)
Risk-informed licensing actions	(NRR/DLPM)
Guidance for risk-informed licensing activities	(NRR)
RG 1.174	DSSA
for non-risk-informed applications	DSSA
issue-specific guides (ISI, IST, QA, TS)	DSSA
Improved TS	DRIP
-- “magnificent seven” improvements	
-- other activities (e.g., TS and 50.65(a)(4))	
Risk assessments of Maintenance activities (50.65(a)(4))	(NRR/DIPM)
Reporting rule revisions (50.72/50.73)	(NRR/DRIP)
Data	(RES)
EPIX	
RIP50 (Option 2 - special treatment)	(NRR/DRIP)
RIP50 (Option 3)	(RES)
- framework	
- 50.44	
- 50.46	
Other risk-informed rules	
PTS	(RES)
Fire protection	(NRR/DSSA)
Safeguards	(NRR/DIPM)
Alternative Source Term	(NRR/DSSA)

Standards	
ASME Standard	(RES)
ANS Standard (seismic)	(RES)
ANS Standard (low power and shutdown)	(RES)
NEI peer certification	(NRR/DSSA)
NFPA standard	(NRR/DSSA)
Regulatory effectiveness review	(RES)
Methods improvements	
- human performance	(RES)
- influence of QA	(RES)
- low power and shutdown	(RES)
- digital instrumentation and control	(RES)
- containment performance	(RES)
- fire protection	(RES)
Allegation review process	(NRR/DIPM)
(Severe) Accident Management Program	(NRR/DSSA)
Part 52 Lessons-learned (including living PRA)	(NRR/DRIP)
Training and information dissemination	(Both)
web sites	
other	

NOTE: The following activity appears in the Nuclear Waste Strategic Arena

Integrated Decommissioning requirements	(NRR/DLPM)
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Reactor Safety Arena (EXAMPLE WRITEUP)

Performance Goal: Make NRC activities and decisions more effective, efficient, and realistic.

Strategy 1: *We will use risk information to improve the effectiveness and efficiency of our activities and decisions.*

Implementation Activity 2: Develop improved methods for calculating risk in support of risk-informed regulatory decision making

[Provide a brief perspective on the state-of-the-art or status quo.] From the groundbreaking work of the WASH-1400 study and the NUREG-1150 reactor risk studies through the individual plant examinations and present risk studies, tremendous advancements have been made in PRA methods. Over this time frame, development of PRA methods has progressively supported more risk-informed decisions across a broadening range of topics.

[Provide a brief rationale for what we plan to do.] The 1995 policy statement on the NRC's expanded use of PRA states that, "PRA evaluations in support of regulatory decisions should be as realistic as practicable." Consistent with this direction, the NRC is continuing to develop methods needed to better support realistic, risk-informed decision making. The new methods will complement the methods developed to-date, further reducing uncertainties and improving realism.

[Provide a brief discussion of how we plan our activities.] Decisions to pursue development of methods and models are made based on three general considerations: (1) the importance of new methods to risk informing our regulations; (2) the adequacy of existing methods for understanding the risk implications of experimental findings and operational experience; and (3) the availability of methods for assessing the risk associated with the introduction of new technologies and new reactor designs. These criteria are associated with the issue of PRA model completeness and the degree to which PRA models adequately characterize risk-important failure modes and mechanisms. Thus, the more complete our understanding of plant risk, the more free are we to identify and remove unnecessary conservatism from our regulations and decision making.

[Provide a brief discussion of the work involved in this particular implementation activity.]With these three considerations in mind, the following research efforts have been identified:

- **[Provide a few words to provide the regulatory context.]**In the effort to risk inform Part 50 requirements, quality assurance requirements were identified as high-priority candidates to be risk informed. A study is being conducted to assess the feasibility of modeling the influence of quality assurance activities on plant risk within the context of PRA. Dependent on the results of this study, future work may be pursued to develop such models.
- The development of performance-based fire standards and regulations requires a sound understanding of fire and its contribution to power plant risk. Current fire PRA models are not adequate to support credible, risk-informed changes to these standards and regulations. A fire risk program has been developed and is being implemented to address the complex issues associated with fire risk.

- Level 2 PRA methods address containment performance. An evaluation of the implications of hydrogen research findings on the realism of existing level 2 PRA methods is underway and may suggest needed improvements. Such improvements in the PRA methods are expected to support more realistic regulatory decisions.
- Digital components and systems are replacing analog monitoring and control equipment in nuclear power plants. Methods are being pursued to calculate digital hardware and software reliability and its contribution to plant risk. The results of these analyses may suggest changes in our inspection program and regulatory requirements.
- Regulatory Guide 1.174 provides guidance for making changes to a plant's licensing bases based on total plant risk. Plant risk during all plant operating modes has not yet been calculated, most notably during low power and shutdown operations. The consequences of incomplete risk profiles are that conservative decisions are made to compensate for the lack of risk information and uncertainty exists in our knowledge of defense-in-depth and safety margins during such operating modes. No research is underway at this time to calculate the risk associated with low power and shutdown operations.
- PRA models are living models in the sense that they are updated to account for newly discovered failure modes and performance information. Experimental findings and operational data are reviewed to identify needed upgrades to PRA models.

Major Milestones

2.1	Issue report on human reliability assessment in fire scenario	2000
2.2	Issue report on fire suppression analysis methods	2000
2.3	Complete feasibility study on developing PRA models on QA effects	
2.4	Develop methods for calculating digital system and software risk (Rulemaking)	