

May 1, 1998

SECY-98-096

FOR: The Commissioners

FROM: L. Joseph Callan /s/  
Executive Director for Operations

SUBJECT: QUARTERLY STATUS REPORT ON THE PROBABILISTIC RISK ASSESSMENT  
IMPLEMENTATION PLAN

PURPOSE:

To report the status of the Probabilistic Risk Assessment (PRA) Implementation Plan (PIP) for the period January 1 to March 31, 1998.

SUMMARY:

This paper describes accomplishments and changes to the staff's PIP for the period January 1 to March 31, 1998. The principal accomplishments in this first calendar quarter of 1998 are transmittal to the Commission of the final version of the standard review plan (SRP) and associated regulatory guide (RG) documenting general guidance on risk-informed decisionmaking for changes to the plant-specific licensing basis; transmittal of final versions of SRPs and associated RGs for risk-informed inservice testing (IST), technical specifications (TS), and graded quality assurance (GQA); completion of an additional eight Maintenance Rule baseline inspections; issuance of a preliminary IPEEE insights report; completion of an additional eight preliminary IPEEE reviews; issuance of a special study related to service water system operating experience; and completion of important milestones regarding staff training. The principal changes are transfer of Activity 1.7, "Regulatory Effectiveness," from NRR to RES; transfer of Activity 2.3, "Support for NRR Standard Reactor PRA Review," from RES to NRR in accordance with the Staff Requirements Memorandum

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(SRM) on DSI-22; and inclusion of a new Section 6, "Reactor Enforcement," summarizing activities in the risk-informed enforcement process.

#### BACKGROUND:

In a memorandum dated January 3, 1996, from the Executive Director for Operations to Chairman Jackson, the staff committed to submitting quarterly reports on the status of its development of risk-informed standards and guidance. Previous quarterly reports were sent to the Commission on March 26, June 20, and October 11, 1996; January 13, April 3, July 22, and October 14, 1997; and January 23, 1998. This quarterly report covers the period from January 1 to March 31, 1998.

#### DISCUSSION:

The significant accomplishments and changes for each individual section of the PIP are summarized here. More detailed information is included in Attachment 1. Attachment 2 presents a diagram that links PIP outputs to associated outcomes defined by the three program objectives: enhance safety decisions, make efficient use of NRC resources, and reduce unnecessary conservatism. The diagram also differentiates between regulatory programs/activities that generate guidance and those that utilize PRA in the decisionmaking process.

#### Section 1: Reactor Regulation

##### 1.1 Develop Standard Review Plans for Risk-Informed Regulation

The proposed final versions of SRP Chapter 19 and RG 1.174, documenting general guidance on the use of PRA in risk-informed decisionmaking for changes to the plant-specific licensing basis, were forwarded to the Commission in SECY-98-015 on January 30, 1998.

The staff has completed its review of public comments on the draft risk-informed RGs and SRPs for IST, TS, and GQA. The final versions of these documents incorporate public comments on the draft documents, changes made to the general guidance documents (RG 1.174 and SRP Chapter 19), experience gained during pilot plant interactions, additional management review, as well as OGC, ACRS, and CRGR comments. The staff discussed these documents with the ACRS Reliability and Probabilistic Risk Assessment Subcommittee on February 19, with CRGR on February 27, and with the full ACRS Committee on March 3, 1998. The proposed final versions of the risk-informed regulatory documents for IST (RG 1.175 and SRP Section 3.9.7), TS (RG 1.177 and SRP Section 16.1), and GQA (RG 1.176) were provided to the Commission in SECY-98-067 with the recommendation that they be published as final guidance documents and noticed in the *Federal Register*.

The guidance documents for risk-informed inservice inspection (ISI), RG 1.178 (formerly DG-1063) and SRP Section 3.9.8, have been revised to reflect the staff's consideration of public comments and to conform to the general risk-informed guidance documents (RG 1.174 and SRP Chapter 19). The major change to the risk-informed ISI guidance documents is that the staff will consider both partial-scope and full-scope submittals. Specifically, the licensees may submit a risk-informed application for a portion of the plant piping without performing a risk assessment for all piping

segments in the plant. This change was made because the risk from piping was found to be small compared to the risk from other events analyzed in a PRA, as well as in response to a number of public comments requesting that the staff consider partial-scope applications. The staff will provide proposed final versions of RG 1.178 and SRP Section 3.9.8 to the Commission in the near future.

## 1.2 Pilot Applications for Risk-Informed Regulatory Initiatives

The staff has developed a schedule for its review of the three risk-informed ISI pilot plant applications (Vermont Yankee–10/98, Arkansas Nuclear One Unit 2 (ANO2)–12/98, and Surry–12/98). These scheduled completion dates are subject to revision dependent upon the licensees meeting critical milestones. The submittals for Vermont Yankee and ANO applications reference ASME Code Cases N-560 and N-578, respectively; the Surry submittal references the Westinghouse Owners Group (WOG) topical report WCAP-14572. As discussed in the last PIP quarterly update, the staff's review for completeness noted that additional material was needed for the Vermont Yankee and Surry applications. Vermont Yankee supplied the requested additional material and the staff has forwarded a first round of requests for additional information (RAIs) to the licensee. The staff expects to complete the reviews of the pilots by 12/98. A long-term plan is being developed to address risk-informed reviews to be conducted following these pilot plant reviews.

On January 7, 1998, the staff sent a letter to Entergy Operations documenting completion of the volunteer GQA interactions at the Grand Gulf facility. The staff will soon send a similar letter documenting completion of volunteer GQA interactions with the licensee for the Palo Verde Nuclear Generating Station. Although neither of these licensees submitted GQA program changes for review and approval, the interactions with them and the information they provided informally have aided the staff in developing GQA guidance documents. The pilot program phase of volunteer interactions on GQA is considered complete. The staff will continue to monitor all volunteer plant GQA implementation as appropriate. Development of the GQA inspection guidance procedure will continue to be tracked under Activity 1.3.

The staff is continuing to develop the safety evaluation report (SER) for the Comanche Peak risk-informed IST program. The staff has been interacting with the pilot plant licensee (TU Electric) to develop a risk-informed IST program description that is sufficiently detailed and sufficiently consistent with the guidance in the proposed final RG 1.175. The staff expects that TU Electric will submit a final, more descriptive, risk-informed IST program description to the NRC by March 31, 1998. The staff now anticipates submitting a completed SER to the Commission on the risk-informed IST program at Comanche Peak in May 1998 rather than in March 1998.

In SECY-98-015, the staff has proposed a final SRP and RG applicable to risk-informed TS improvements. In this regard, the staff has received, reviewed, and prepared safety evaluations and license amendments for risk-informed TS applications, demonstrating the viability of the guidance. These applications include extended allowed outage times (AOT) for (1) ECCS equipment at San Onofre units 2/3, which is the Combustion Engineering Owners Group pilot application, and (2) emergency diesel generators (EDG) at the Vogtle station. The staff expects to issue these license amendments during this calendar quarter. In addition, the staff has received, reviewed, and is developing safety evaluations and license amendments, in accordance with the guidance, for follow-on risk-informed TS amendments, for example, the Southern California Edison supplemental request, received in January 1998, for extending the EDG AOT at San

Onofre. The staff anticipates issuing these license amendments later this year and proceeding to use the guidance improvements on an ongoing basis.

The staff received (on March 2, 1998) from the licensee for ANO1&2, a request for relief from the staff position in NUREG-0737 for hydrogen monitoring. The request was made in accordance with "Task Zero" of the Risk-Informed, Performance-Based Regulation Pilot Program ("Whole Plant Study") proposed by NEI. The staff is currently assessing the most appropriate licensing approach to this request.

### 1.3 Inspections

The staff completed an additional eight Maintenance Rule baseline inspections during this quarter, which included inspection of licensee methods for using PRA in maintenance programs and inspection of safety assessments performed by licensees when removing equipment from service for maintenance in accordance with Paragraph (a)(3) of the Maintenance Rule. (The reported number of 45 completed Maintenance Rule inspections in the last quarterly report update (SECY-98-012) did not include the Dresden inspection, which was conducted in two parts: an independent safety inspection in September 1996, followed by a limited-scope Maintenance Rule inspection in May 1997.)

The scheduled date for completing revisions to the core inspection procedures (IPs) has been deferred to May 1998. Finalization of the core IP revisions entailed coordination with 10 NRR branches and resulted in a longer-than-anticipated review and concurrence cycle. Changes to two of the core IPs—IP 71007, "Licensed Operator Requalification Program Evaluation," and IP 82701, "Operational Status of the Emergency Preparedness Program,"— will be completed after April 1998 and will be separately tracked by the staff's action item tracking system.

The schedule for issuing the draft and final GQA IPs has been revised. The staff now expects to issue the draft GQA inspection guidance by July and the final guidance by October 1998. This change was made because key personnel were assigned to higher priority tasks, such as the finalization of the risk-informed documents for GQA and ISI and the Millstone restart team inspection.

For the purpose of making risk information more accessible to inspectors, a new subtask has been initiated. This subtask, "Evaluate Methods of Presenting Risk Analysis Results in a Form Most Useful to Inspectors and Develop Options Relating to Providing Inspectors With Plant-Specific Risk Information," is scheduled to be finished in December 1998.

### 1.6 Evaluate Use of PRA in Resolution of Generic Safety Issues

This activity relates to those generic safety issues (GSIs) that have been explicitly identified and addressed by licensees as part of the IPE process. The Office of Nuclear Regulatory Research (RES) is preparing a report entitled "Unresolved Safety Issues and Generic Safety Issues Related to the IPE Program." The RES report, scheduled to be completed in May 1998, identifies the GSIs that were proposed for resolution, and presents the staff's views on the adequacy of the proposed resolution. This report will serve as the basis for selecting which GSIs will be audited, and at which plants. The completion date for these activities has been revised to "to be determined;" a schedule will be developed after NRR staff completes its review of the RES report.

## 1.7 Regulatory Effectiveness Evaluation

This activity has been moved to Section 2 of the PIP (new Activity 2.11), to more closely link it with the Generic Safety Issue program and the Regulatory Excellence Plan, for which RES has the lead.

### Section 2: Reactor Safety Research

#### 2.1 Develop Regulatory Guides

As discussed above, the proposed final versions of SRP Chapter 19 and RG 1.174 were sent to the Commission in SECY-98-015 on January 30, 1998.

The proposed final versions of the regulatory documents for risk-informed IST (RG 1.175 and SRP Section 3.9.7), risk-informed TS (RG 1.177 and SRP Section 16.1), and risk-informed GQA (RG 1.176) were provided to the Commission in SECY-98-067.

The guidance documents for risk-informed ISI, RG 1.178 (formerly DG-1063) and SRP Section 3.9.8, have been revised to reflect public comments and to conform to the general guidance documents (RG 1.174 and SRP Chapter 19). The staff is scheduled to provide the proposed final versions to the Commission in the near future.

#### 2.3 Support for NRR Standard Reactor PRA Review

In accordance with the reassignment of rulemaking activities under DSI-22, this activity has been transferred from RES to NRR, and therefore it will be tracked as an item under Activity 1.8, "Advanced Reactor Reviews."

#### 2.5 IPE and IPEEE Reviews

The staff has reviewed all of the 76 IPE submittals and issued staff evaluation reports (SERs) on its findings to each licensee with one exception, Browns Ferry 3 (BF3) for which a draft SER has been prepared. In three of the SERs, the staff was not able to conclude that the licensee met the intent of Generic Letter 88-20 for their plant(s). These three IPEs include Crystal River 3, Susquehanna 1&2, BF3. During this quarter, the staff met with the licensees for both Crystal River 3 and Susquehanna 1&2. It appears that these licensees have addressed the staff concerns and the staff will issue updated SERs by the end of June 1998. RES forwarded to NRR a draft SER on BF3 in December 1997; the staff is planning to meet with the licensee in the near future.

The staff developed an interim report that presents preliminary IPEEE perspectives and summarizes the information in the first 24 IPEEE submittals reviewed; the interim report was sent to the Commission on January 20, 1998.

The staff has received 70 of the 74 expected IPEEE submittals. Two of the missing four submittals (Ginna and Vermont Yankee) are expected by the end of June 1998; the submittal date of the remaining two (Millstone 1 and Watts Bar 2) has yet to be determined. Currently, 65 submittals are under various stages of review; preliminary reviews have been completed on 57, eight of which were completed during this quarter. The staff has sent RAIs to licensees for 46 submittals, and has received responses for 29 submittals. The review for one plant, Diablo

Canyon, has been completed and the SER has been sent to the licensee. Similar to the IPE program, the staff will take prompt action should any significant vulnerabilities or safety insights be identified in these reviews (e.g., Quad Cities fire safe-shutdown issues).

## 2.8 PRA Standards Development

ASME has formed a task group, which includes a representative from the staff, to draft PRA standards. Although the staff continues working with ASME in this activity, it has some concern in regard to the scope of the group's work. The NRC sent a letter to ASME expressing the staff's concerns and desires. Attachments 3 and 4, respectively, are NRC's letter and ASME's response.

## Section 3: Analysis and Evaluation of Operating Experience and Training

### 3.1 Risk-Based Trends and Patterns Analysis

The staff issued a special study, "Operating Experience Feedback From Service Water System (SWS) Failures and Degradations," in February 1998. The study used SWS operating experience from 1986–1995 contained in licensee event reports (LERs). Major findings of the study are (1) there were no total failures of the SWS resulting in loss of core-cooling capability during the period; (2) the few short-term losses of SWS were recovered promptly; (3) licensee activities in response to Generic Letter 89-13 appear to have been successful in identifying safety-significant programmatic and design-related issues; and (4) although events affecting SWS performance were observed, they were not dominant contributors to risk.

In January 1998, the report on auxiliary feedwater system reliability and the updated report on loss of offsite power were sent out for review by NRC staff and external reviewers. The staff is incorporating reviewers comments and will issue the revised reports in June 1998.

The last PIP update report indicated that the common-cause-failure database was being sent to all nuclear power plant licensees. Distribution has been delayed in order to issue the database during the next quarter via an NRC administrative letter.

### 3.5 Compile Operating Experience Data

Revision 1 of NUREG-1022, "Event Reporting Guidelines, 10 CFR 50.72 and 50.73," was issued in January 1998. It has been determined that the LER rule should be revised to eliminate unnecessary and less safety-significant reporting and to capture better risk-related information. A plan to revise 10 CFR 50.72 and 50.73, was sent to the Commission on March 4, 1998. The final LER rule is expected to be published by December 1999.

### 3.6 Staff Training

The new 2-week PRA Technology and Regulatory Perspectives course (P-111) was offered for the first time from January 26 to February 6, 1998. It is scheduled to be offered three more times during 1998, in support of the staff's goal of having by the end of 1998 one resident inspector at each site who has completed this course.

The 4-day PRA Basics for Regulatory Applications course (P-105) was offered twice:

February 3 – 6 and February 24 – 27, 1998. This course will be offered five more times during 1998, to address the need for more NRC technical staff to attend this course.

The 3-day PRA for Technical Managers course (P-107) was offered twice, February 10 – 12 and March 17 – 19, 1998. This course will be offered three more times during 1998, to support the staff's goal of having by the end of 1998 two-thirds of the agency's technical managers complete it.

The modifications needed to incorporate information from the proposed final versions of RG 1.174 and SRP Chapter 19 into the course material for courses P-105, P-107, and P-111 have been completed and implemented.

Procurement actions are in progress for acquiring risk-monitor software. Current plans are to integrate the risk-monitor into the reactor technology and PRA technology curricula to improve student understanding of configuration management, the importance of plant operations to the risk profile of the plants, and use of the tool to gain insights regarding the industry's use of risk-informed applications. The risk-monitor will also be used to demonstrate the capabilities and limits of this and similar tools as they are being used by the industry.

## Section 5: High-Level Nuclear Waste Regulation

### 5.1 Regulation of High-Level Waste

On March 17 – 19, 1998, the Department of Energy (DOE) and the NRC staff held a technical exchange meeting in San Antonio, Texas. DOE's plans and methodology for conducting a total-system performance assessment in support of its upcoming viability assessment were discussed. Also discussed was the status of the staff's effort to develop its independent performance assessment review capability.

### 5.2 Apply PRA to Spent Fuel Storage Facilities

This study, which would have demonstrated methods for PRA of spent fuel storage facilities, was suspended because of current budget constraints. Potentially, the results of this study could have been used to support the adequacy of the existing dry-storage system designs, procedures, and regulations. Also, the results were expected to be used to make recommendations about the extent to which an expansion of PRA methods for dry-cask storage would provide further useful information. The staff believes this study should be resumed when resources permit.

## Section 6: Reactor Enforcement (new PIP section)

### 6.1 Develop Enforcement Guidance for Considering Risk in the Enforcement Process

The Office of Enforcement has developed guidance for the staff with respect to the consideration of risk in enforcement actions (Enforcement Guidance Memorandum (EGM) 97-011, June 1997). In the EGM, it is acknowledged that there are uncertainties associated with risk assessment due to the differences in PRA models utilized by the staff and licensees, and it is noted that there is a need to exercise judgement in using risk as a factor in enforcement decisions. However, it is also emphasized that risk has value as an assessment tool and it should be used, when warranted, as a factor in determining the appropriate enforcement sanctions.

### 6.2 Include Risk Insights During Weekly Enforcement Panels

EGM 97-011 directed that Enforcement Panel preparations should include risk insights developed by the regional Senior Reactor Analysts. This initiative is an ongoing activity, routinely utilized during the Weekly Enforcement Panels.

**6.3 Change the Enforcement Policy Supplements to Include Additional Examples of How Risk Should Influence Severity Level**

The Office of Enforcement has met with NRR (Probabilistic Safety Assessment Branch (SPSB)) on two occasions to work out the details associated with SPSB developing new examples to be included in the Enforcement Policy Supplements. These new examples may give the staff better guidance in determining the appropriated severity level of violations. It is expected that development of these examples will be completed in the Fall of 1998.

**COORDINATION**

The Office of the General Counsel has reviewed this paper and has no legal objection to the paper.

L. Joseph Callan  
Executive Director  
for Operations

Attachments:  
As stated

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PRA IMPLEMENTATION PLAN ACTIVITY TABLE (March 1998)

1.0 REACTOR REGULATION

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
1.1 STANDARD REVIEW PLANS FOR RISK-INFORMED REGULATION	Develop standard review plans (SRPs) to be used in risk-informed regulatory decisionmaking.	<ul style="list-style-type: none"> <li>* Evaluate available industry guidance</li> <li>* Develop broad-scope SRP chapters and a series of application-specific SRP chapters that correspond to industry initiatives</li> <li>* These SRPs will be consistent with the regulatory guides (RGs) developed for the industry</li> <li>* Draft SRPs transmitted to Commission to issue for public comment:                             <ul style="list-style-type: none"> <li>General</li> <li>IST</li> <li>ISI</li> <li>TS</li> </ul> </li> <li>* Final SRPs transmitted to Commission for approval                             <ul style="list-style-type: none"> <li>General</li> <li>IST</li> <li>ISI</li> <li>TS</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>4/97C<sup>2</sup></li> <li>4/97C</li> <li>8/97C</li> <li>4/97C</li> <li>1/98</li> <li>3/98</li> <li>TBD</li> <li>3/98</li> </ul>	NRR /RES	<ul style="list-style-type: none"> <li>Completed</li> <li>Completed</li> <li>Changed (Note 1)</li> <li>Completed</li> </ul>

<sup>1</sup> See Abbreviations Table at the end of this report

<sup>2</sup> C = Task previously completed

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
1.2 PILOT APPLICATIONS FOR RISK-INFORMED REGULATORY INITIATIVES	<p>Evaluate the PRA methodology and develop staff positions on emerging, risk-informed initiatives, including those associated with:</p> <ol style="list-style-type: none"> <li>1. Motor operated valves</li> <li>2. IST requirements               <ol style="list-style-type: none"> <li>2a. Comanche Peak</li> <li>2b. Palo Verde</li> </ol> </li> <li>3. ISI requirements</li> <li>4. Graded quality assurance (GQA)</li> <li>5. Maintenance Rule</li> <li>6. Technical specifications               <ol style="list-style-type: none"> <li>6a. Commission approval</li> <li>6b. Pilot amendments Issued</li> </ol> </li> <li>7. Other applications to be identified later (e.g., applications related to diesel generator start times and hydrogen control)               <ol style="list-style-type: none"> <li>7a. ANO request for relief from the staff position in NUREG-0737 for hydrogen monitoring, on the basis of "Task Zero" of the Risk-Informed, Performance-Based Regulation Pilot Program ("Whole Plant Study") proposed by NEI.</li> </ol> </li> </ol>	<p>* Interface with industry groups</p> <p>* Evaluation of appropriate documentation (e.g., 10 CFR, SRP, RGs, inspection procedures, and industry codes) to identify elements critical to achieving the intent of existing requirements</p> <p>* Evaluation of industry proposals</p> <p>* Evaluation of industry pilot program implementation</p> <p>* As appropriate, complete pilot reviews and issue staff findings on regulatory requests</p>	<p>1. 2/96C</p> <p>2a. 5/98 2b. TBD</p> <p>3. 12/98</p> <p>4. 1/98</p> <p>5. 9/95C</p> <p>6a. 5/97C 6b. 5/98</p> <p>7a. TBD</p>	NRR/RES	<p>Changed (Note 2)</p> <p>Completed (Note 3)</p> <p>Changed (Note 4)</p> <p>New (Note 5)</p>

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
1.3 INSPECTIONS	Provide guidance on the use of plant-specific and generic information from individual plant examinations (IPEs) and other plant-specific PRAs.	<ul style="list-style-type: none"> <li>* Develop IMC 9900 technical guidance on the use of PRAs in the power reactor inspection program</li> <li>* Revise IMC 2515 Appendix C on the use of PRAs in the power reactor inspection program</li> <li>* Propose guidance options for inspection procedures related to 50.59 evaluations and regular maintenance observations</li> <li>* Review core inspection procedures and propose PRA guidance where needed</li> <li>* Complete revision to proposed core inspection procedures</li> <li>* Issue draft GQA Inspection Procedure</li> <li>* Issue final GQA Inspection Procedure</li> <li>* Evaluate methods for presenting risk analysis results in a form most useful to inspectors and develop options for providing inspectors with plant-specific risk information</li> </ul>	<ul style="list-style-type: none"> <li>6/97C</li> <li>7/97 C</li> <li>10/97C</li> <li>10/97C</li> <li>5/98</li> <li>7/98</li> <li>10/98</li> <li>12/98</li> </ul>	NRR	<ul style="list-style-type: none"> <li>Changed (Note 6)</li> <li>Changed (Note 6)</li> <li>Changed (Note 7)</li> <li>New (Note 8)</li> </ul>
	Provide PRA training for inspectors and senior reactor analysts (SRAs).	<ul style="list-style-type: none"> <li>* Identify inspector functions that should utilize PRA methods, as input to AEOD/TTD for their development and refinement of PRA training for inspectors</li> <li>* Develop consolidated and comprehensive 2—3 week PRA for regulatory applications training course</li> <li>* Conduct training for Maintenance Rule baseline inspections</li> <li>* Conduct training courses according to SRA training programs</li> <li>* Rotational assignments for SRAs to gain working PRA experience</li> </ul>	<ul style="list-style-type: none"> <li>7/96C</li> <li>10/97C</li> <li>8/96C</li> <li>Ongoing</li> <li>Ongoing</li> </ul>	<ul style="list-style-type: none"> <li>NRR</li> <li>NRR/AEOD</li> <li>NRR</li> <li>AEOD</li> <li>NRR/RES</li> </ul>	

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
	Continue to provide expertise in risk assessment to support regional inspection activities and to communicate inspection program guidance and examples of its implementation.	<ul style="list-style-type: none"> <li>* Monitor the use of risk in inspection reports</li> <li>* Develop new methodologies and communicate appropriate uses of risk insights to regional offices</li> <li>* Update inspection procedures as needed</li> <li>* Assist regional offices as needed</li> <li>* Conduct Maintenance Rule baseline inspections</li> </ul>	Ongoing Ongoing Ongoing Ongoing 7/98	NRR	
1.4 OPERATOR LICENSING	Monitor insights from human reliability analyses (HRAs) of PRAs (including IPEs and individual plant examinations for external events (IPEEEs)) and operating experience to identify possible enhancements for inclusion in planned revisions to guidance for operator licensing activities (initial and requalification).	<ul style="list-style-type: none"> <li>* Revise the Knowledge and Abilities Catalogs (NUREGs 1122 and 1123) to incorporate operating experience and risk insights</li> <li>* Revise the Examiner Standards (NUREG-1021), as needed to reflect PRA insights</li> </ul>	8/95C  3/97C	NRR	
1.5 EVENT ASSESSMENT	Continue to conduct quantitative event assessments of reactor events while at-power and during low power and shutdown conditions.	<ul style="list-style-type: none"> <li>* Continue to evaluate 50.72 events using accident sequence precursor (ASP) models</li> </ul>	Ongoing	NRR	
	Assess the desirability and feasibility of conducting quantitative risk assessments on non-power reactor events.	<ul style="list-style-type: none"> <li>* Define the current use of risk analysis methods and insights in current event assessments</li> <li>* Assess the feasibility of developing appropriate risk assessment models</li> <li>* Develop recommendations on the feasibility and desirability of conducting quantitative risk assessments</li> </ul>	TBD	NRR	
1.6 USE OF PRA IN RESOLUTION OF GENERIC SAFETY ISSUES	Audit the adequacy of licensee analyses in IPEs and IPEEEs to identify plant-specific applicability of generic safety issues closed out based on IPE and IPEEE programs.	<ul style="list-style-type: none"> <li>* Identify generic safety issues to be audited</li> <li>* Select plants to be audited for each issue</li> <li>* Describe and discuss licensees' analyses supporting issue resolution</li> <li>* Evaluate results to determine regulatory response; i.e., no action, additional audits, or regulatory action</li> </ul>	TBD TBD TBD TBD	NRR/RES	Changed (Note 9) Changed (Note 9)

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
1.7 REGULATORY EFFECTIVENESS EVALUATION	Assess the effectiveness of major safety issue resolution efforts for reducing risk to public health and safety.	<ul style="list-style-type: none"> <li>* Develop process/guidance for assessing regulatory effectiveness</li> <li>* Apply method to assess reduction in risk</li> <li>* Evaluate resulting effectiveness of station blackout and ATWS rules and Unresolved Safety Issue A-45</li> <li>* Propose modifications to resolution approaches, as needed (SBO rule implementation and RCP seal issue)</li> <li>* Identify other issues for assessment if appropriate</li> </ul>	<p>ongoing</p> <p>ongoing</p> <p>12/98</p> <p>TBD</p> <p>ongoing</p>	RES/NRR	Changed (Note 10)
1.8 ADVANCED REACTOR REVIEWS	Continue staff reviews of PRAs for design-certification applications.	* Continue to apply current staff review process	ongoing	NRR	
	Develop SRP to support review of PRAs for design certification reviews of evolutionary reactors (ABWR and System 80+).	<ul style="list-style-type: none"> <li>* Develop draft SRP to tech staff for review and concurrence</li> <li>* Finalize SRP</li> </ul>	TBD TBD	NRR	
	Develop independent technical analyses and criteria for evaluating industry initiatives and petitions regarding simplification of Emergency Preparedness (EP) regulations.	* Reevaluate risk-based aspects of the technical bases for EP (NUREG-0396) using insights from NUREG-1150, the new source term information from NUREG-1465, and available plant design and PRA information for the passive and evolutionary reactor designs	12/96C	NRR/RES	
	Modify 10 CFR 52 and develop guidance on the use of updated PRAs beyond design certification (as described in SECY 93-087).	<ul style="list-style-type: none"> <li>* Develop draft guidance and rule</li> <li>* Solicit public comment</li> <li>* Finalize staff guidance and rule</li> </ul>	5/98 11/98 12/99	NRR	Changed (Note 11)
1.9 ACCIDENT MANAGEMENT	Develop generic and plant specific risk insights to support staff audits of utility accident management (A/M) programs at selected plants.	* Develop plant-specific A/M insights/information for selected plants to serve as a basis for assessing completeness of utility A/M program elements (e.g., severe accident training)	TBD	NRR/RES	

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
1.10 EVALUATE IPE INSIGHTS TO DETERMINE NECESSARY FOLLOW-UP ACTIVITIES	Use insights from the staff review of IPEs to identify potential safety, policy, and technical issues and to determine an appropriate course of action to address these potential issues.	<ul style="list-style-type: none"> <li>* Review NUREG-1560, "IPE Program: Perspectives on Reactor Safety and Plant Performance," to identify an initial list of follow-up staff and industry actions (if any), including actions related to A/M</li> <li>* Review IPE results and interact with licensees</li> <li>* Complete backfit analysis and actions</li> <li>* Follow up on accident management programs and licensee-stated actions</li> </ul>	9/97C	NRR/RES	
	Determine appropriate approach for tracking the regulatory uses of IPE/IPEEE results.	<ul style="list-style-type: none"> <li>* Define use for information, clarify "regulatory use," and assess the most effective methods for data collection</li> <li>* If appropriate, develop approach for linking IPE/IPEEE databases</li> </ul>	5/98  12/98	NRR/RES	Changed (Note 12)

## 2.0 REACTOR SAFETY RESEARCH

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
2.1 REGULATORY GUIDES	Develop RGs to provide a basis for the industry to use in risk-informed regulation.	<ul style="list-style-type: none"> <li>* Draft PRA GRs transmitted to Commission for approval to issue for public comment.</li> <li style="padding-left: 20px;">General</li> <li style="padding-left: 20px;">IST</li> <li style="padding-left: 20px;">ISI</li> <li style="padding-left: 20px;">GQA</li> <li style="padding-left: 20px;">TS</li> <li>* Final PRA RGs transmitted to Commission for approval:</li> <li style="padding-left: 20px;">General</li> <li style="padding-left: 20px;">IST</li> <li style="padding-left: 20px;">ISI</li> <li style="padding-left: 20px;">GQA</li> <li style="padding-left: 20px;">TS</li> </ul>	 C C C C C C  1/98 3/98 TBD 3/98 3/98	RES/NRR	         Competed Completed Changed (Note 1) Completed Completed
2.2 TECHNICAL SUPPORT	Provide technical support to NRC staff using risk assessment in risk-based regulation activities, technical reviews, issue risk assessments, statistical analyses, and develop guidance for agency uses of risk assessment.	<ul style="list-style-type: none"> <li>* Continue to provide ad hoc technical support to agency PRA users</li> <li>* Expand the use of PRA models available; expand the scope of available models to include external, low power, and shutdown events; refine the tools needed to use these models; and continue maintenance and user support for SAPHIRE and MACCS computer codes</li> <li>* Support agency efforts in reactor safety improvements in former Soviet Union countries</li> </ul>	 Continuing  Continuing   Continuing	RES	
2.3 SUPPORT FOR NRR STANDARD REACTOR PRA REVIEW	Modify 10 CFR 52 and develop guidance on the use of updated PRAs beyond design certification (as described in SECY 93-087).	<ul style="list-style-type: none"> <li>* Develop draft guidance and rule</li> <li>* Solicit public comment</li> <li>* Finalize staff guidance and rule</li> </ul>	 5/98 11/98 12/99	NRR	Changed (Note 11)
2.4 METHODS DEVELOPMENT AND DEMONSTRATION	Develop, demonstrate, maintain, and ensure the quality of methods for performing, reviewing, and using PRAs and related techniques for existing reactor designs.	<ul style="list-style-type: none"> <li>* Develop and demonstrate methods for including aging effects in PRAs.</li> <li>* Develop and demonstrate methods for including human errors of commission in PRAs.</li> <li>* Develop and demonstrate methods to incorporate organizational performance into PRAs</li> <li>* Identify and prioritize key areas to improve fire risk analysis</li> <li>* Develop and demonstrate improved methods for selected areas</li> <li>* Develop and demonstrate methods for assessing reliability/risk of digital systems</li> </ul>	 10/98 9/98 TBD 9/98 6/99	RES	 Changed (Note 13)    Changed (Note 14)

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
2.5 IPE AND IPEEE REVIEWS	Evaluate IPE/IPEEE submittals to obtain reasonable assurance that the licensees have adequately analyzed plant design and operations to discover vulnerabilities; and document significant safety insights resulting from IPE/IPEEEs.	<ul style="list-style-type: none"> <li>* Complete the reviews of the three outstanding IPE submittals: Susquehanna Crystal River Draft SER for Browns Ferry 3</li> <li>* Continue regional IPE presentations.</li> <li>* Issue IPE insights report for public comment.</li> <li>* Final IPE insights report</li> <li>* Issue preliminary IPEEE insights report</li> <li>* Initiate review of eight additional IPEEE submittals</li> <li>* Complete contractor evaluations of twelve IPEEE submittals.</li> <li>* Complete reviews of IPEEE submittals.</li> <li>* Issue draft IPEEE insights report for comment</li> <li>* Issue final IPEEE insights report</li> </ul>	<ul style="list-style-type: none"> <li>6/98</li> <li>6/98</li> <li>TBD</li> <li>12/97C</li> <li>10/96C</li> <li>12/97C</li> <li>1/98</li> <li>6/98</li> <li>6/98</li> <li>6/99</li> <li>6/99</li> <li>12/99</li> </ul>	RES	<p>Changed (Note 15)</p> <p>Completed</p>
2.6 GENERIC SAFETY ISSUES PROGRAM	To conduct generic safety issue management activities, including prioritization, resolution, and documentation, for issues relating to currently operating reactors, for advanced reactors as appropriate, and for development or revision of associated regulatory and standards instruments.	<ul style="list-style-type: none"> <li>* Continue to prioritize and resolve generic safety issues</li> </ul>	Continuing	RES	
2.7 NEI INITIATIVE TO CONDUCT "WHOLE PLANT" RISK STUDY	Review NEI initiative to conduct three pilot "whole plant" risk-informed studies of requirements vs. risk and cost.	<ul style="list-style-type: none"> <li>* Agree on ground rules for study</li> <li>* Complete study</li> </ul>	<ul style="list-style-type: none"> <li>TBD</li> <li>TBD</li> </ul>	RES/NRR	Changed (Note 16)
2.8 PRA STANDARDS DEVELOPMENT	Work with industry to develop national consensus standard for PRA scope and quality.	<ul style="list-style-type: none"> <li>* Initiate activity</li> <li>* Finalize standard</li> </ul>	<ul style="list-style-type: none"> <li>9/97C</li> <li>TBD</li> </ul>	RES	See Note 17
2.9 LOW POWER AND SHUTDOWN BENCHMARK RISK STUDY	Collect studies of LP&S risk as a benchmark for assessing the need for further staff activities.	<ul style="list-style-type: none"> <li>* Collect and review existing LP&amp;S risk information (domestic and foreign)</li> <li>* Initiate additional work</li> </ul>	<ul style="list-style-type: none"> <li>9/98</li> <li>10/98</li> </ul>	RES	
2.10 SAFETY GOAL REVISION	Assess need to revise Commission's Safety Goal to make core damage frequency a fundamental goal and make other changes.	<ul style="list-style-type: none"> <li>* Initiate discussion with ACRS</li> <li>* Recommendation to Commission</li> </ul>	<ul style="list-style-type: none"> <li>2/98</li> <li>4/98</li> </ul>	RES	<p>Completed</p> <p>Changed (Note 18)</p>

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
2.11 REGULATORY EFFECTIVENESS EVALUATION	Assess the effectiveness of major safety issue resolution efforts for reducing risk to public health and safety.	<ul style="list-style-type: none"> <li>* Develop process/guidance for assessing regulatory effectiveness</li> <li>* Apply method to assess reduction in risk</li> <li>* Evaluate resulting effectiveness of station blackout and ATWS rules and Unresolved Safety Issue A-45</li> <li>* Propose modifications to resolution approaches, as needed (SBO rule implementation and RCP seal issue)</li> <li>* Identify other issues for assessment if appropriate</li> </ul>	<p>ongoing</p> <p>ongoing</p> <p>12/98</p> <p>TBD</p> <p>ongoing</p>	RES/NRR	Changed (Note 10)

3.0 ANALYSIS AND EVALUATION OF OPERATING EXPERIENCE, AND TRAINING

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office	Status (this quarter)
3.1 RISK-BASED TRENDS AND PATTERNS ANALYSIS	Use reactor operating experience data to assess the trends and patterns in equipment, systems, initiating events, human performance, and important accident sequence.	<ul style="list-style-type: none"> <li>* Trend performance of risk-important components</li> <li>* Trend performance of risk-important systems</li> <li>* Trend frequency of risk-important initiating events</li> <li>* Trend human performance for reliability characteristics</li> </ul>	12/98  12/98  7/98  TBD	AEOD	Changed (Note 19)
	Evaluate the effectiveness of licensee actions taken to resolve risk significant safety issues.	* Trend reactor operating experience associated with specific safety issues and assess risk implications as a measure of safety performance	As needed	AEOD	
	Develop trending methods and special databases for use in AEOD trending activities and for PRA applications in other NRC offices.	<ul style="list-style-type: none"> <li>* Develop standard trending and statistical analysis procedures for identified areas for reliability and statistical applications</li> <li>* Develop special software and databases (e.g. common cause failure) for use in trending analyses and PRA studies</li> </ul>	C  C (Periodic updates)	AEOD	
3.2 ACCIDENT SEQUENCE PRECURSOR (ASP) PROGRAM	Identify and rank risk significance of operational events.	<ul style="list-style-type: none"> <li>* Screen and analyze LERs, AITs, IITs, and events identified from other sources to obtain ASP events</li> <li>* Perform independent review of each ASP analyses. Licensees and NRC staff peer review of each analysis</li> <li>* Complete quality assurance of Revision 2 simplified plant specific models</li> <li>* Complete feasibility study for low power and shutdown models</li> <li>* Complete initial containment performance and consequence models.</li> <li>* Complete development of the Level 2/3 models</li> <li>* Complete the Revision 3 simplified plant-specific models</li> <li>* Complete external event models for fire and earthquake</li> <li>* Complete low power/shutdown models</li> </ul>	Ongoing  Annual report, Ongoing  3/97C  11/96C  C  7/99  11/01  TBD  TBD	AEOD  AEOD  RES  RES  RES  RES  RES  RES	

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office	Status (this quarter)
	Provide supplemental information on plant specific performance.	* Share ASP analyses and insights with other NRC offices and Regions	Annual rpt	AEOD	
3.3 INDUSTRY RISK TRENDS	Provide a measure of industry risk that is as complete as possible to determine whether risk is increasing, decreasing, or remaining constant over time.	<ul style="list-style-type: none"> <li>* Develop program plan to integrate NRR, RES, and AEOD activities using design and operating experience to assess the implied level of risk and how it is changing</li> <li>* Update plan for risk-based analysis of reactor operating experience</li> <li>* Implement program plan elements to include plant-specific models and insights from IPEs, component and system reliability data, and other risk-important design and operational data in an integrated frame work to periodically evaluate industry trends</li> </ul>	C          6/99	AEOD	
3.4 RISK-BASED PERFORMANCE INDICATORS	Establish a comprehensive set of performance indicators and supplementary performance measures which are more closely related to risk and provide both early indication and confirmation of plant performance problems.	<ul style="list-style-type: none"> <li>* Identify new or improved risk-based PIs which use component and system reliability models &amp; human and organizational performance evaluation methods</li> <li>* Develop and test candidate PIs/performance measures</li> <li>* Implement risk-based PIs with Commission approval</li> </ul>	C   9/00  1/01	AEOD	

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office	Status (this quarter)
3.5 COMPILE OPERATING EXPERIENCE DATA	Compile operating experience information in database systems suitable for quantitative reliability and risk analysis applications. Information should be scrutable to the source at the event level to the extent practical and be sufficient for estimating reliability and availability parameters for NRC applications.	<ul style="list-style-type: none"> <li>* Manage and maintain SCSS and the PI data base, provide oversight and access to NPRDS/EPIX, obtain INPO's SSPI, compile IPE failure data, collect plant-specific reliability and availability data</li> <li>* Develop, manage, and maintain agency databases for reliability/availability data (equipment performance, initiating events, CCF, ASP, and human performance data)</li> <li>* Determine need to revise LER rule to eliminate unnecessary and less safety-significant reporting</li> <li>* Determine need to revise reporting rules and to better capture ASP, CCF, and human performance events</li> <li>* Publish revised LER rule</li> </ul>	<p>Ongoing</p> <p>Ongoing</p> <p>6/98</p> <p>6/98</p> <p>12/99</p>	AEOD	<p>Completed</p> <p>Completed</p> <p>Changed (Note 20)</p>
3.6 STAFF TRAINING	Present PRA curriculum as presently scheduled for FY 1998.	<ul style="list-style-type: none"> <li>* Continue current contracts to present courses as scheduled</li> <li>* Maintain current reactor technology courses that include PRA insights and applications</li> <li>* Improve courses via feedback</li> <li>* Review current PRA course material to ensure consistency with Appendix C</li> </ul>	<p>Ongoing</p> <p>Ongoing</p> <p>Ongoing</p> <p>Complete</p>	AEOD	

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office	Status (this quarter)
	Develop and present Appendix C training courses.	<ul style="list-style-type: none"> <li>* Prepare course material based on Appendix C</li> <li>* Present courses on Appendix C</li> </ul>	C C	RES/AEOD	
	Determine staff requirements for training, including analysis of knowledge and skills, needed by the NRC staff.	<ul style="list-style-type: none"> <li>* Review JTAs performed to date</li> <li>* Perform representative JTAs for staff positions (JTA Pilot Program)</li> <li>* Evaluate staff training requirements as identified in the PRA Implementation Plan and the Technical Training Needs Survey (Phase 2) and incorporate them into the training requirements analysis</li> <li>* Analyze the results of the JTA Pilot Program and determine requirements for additional JTAs</li> <li>* Complete JTAs for other staff positions as needed</li> <li>* Solicit a review of the proposed training requirements</li> <li>* Finalize the requirements</li> </ul>	C C C C C C C	AEOD	
	Revise current PRA curriculum and develop new training program to fulfill identified staff needs.	<ul style="list-style-type: none"> <li>* Prepare new courses to meet identified needs</li> <li>* Revise current PRA courses to meet identified needs</li> <li>* Revise current and New PRA course to include Reg Guide and SRP information</li> <li>* Revise current reactor technology courses as necessary to include additional PRA insights and applications</li> </ul>	Ongoing Ongoing 9/97C Ongoing	AEOD	
	Present revised PRA training curriculum.	<ul style="list-style-type: none"> <li>* Establish contracts for presentation of new PRA curriculum</li> <li>* Present revised reactor technology courses</li> <li>* Improve courses based on feedback</li> </ul>	Ongoing Ongoing Ongoing	AEOD	

## 4.0 NUCLEAR MATERIALS AND LOW-LEVEL WASTE SAFETY AND SAFEGUARDS REGULATION

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
4.1 VALIDATE RISK ANALYSIS METHODOLOGY DEVELOPED TO ASSESS MOST LIKELY FAILURE MODES AND HUMAN PERFORMANCE IN THE USE OF INDUSTRIAL AND MEDICAL RADIATION DEVICES	Validate risk analysis methodology developed to assess the relative profile of most likely contributors to misadministration for the gamma stereotactic device (gamma knife).	* Hold a workshop consisting of experts in PRA and HRA to examine existing work and to provide recommendations for further methodological development	8/94 C	NMSS	
		* Examine the use of Monte Carlo simulation and its application to relative risk profiling	9/95 C		
		* Examine the use of expert judgement in developing error rates and consequence measures	9/95 C		
	Continue the development of the relative risk methodology, with the addition of event tree modeling of the brachytherapy remote after loader.	* Develop functionally based generic event trees	TBD	RES/ NMSS	
	Extend the application of the methodology and its further development into additional devices, including teletherapy and the pulsed high dose rate after loader.	* Develop generic risk approaches	TBD	RES/ NMSS	
4.2 CONTINUE USE OF RISK ASSESSMENT OF ALLOWABLE RADIATION RELEASES AND DOSES ASSOCIATED WITH LOW-LEVEL RADIOACTIVE WASTE AND RESIDUAL ACTIVITY.	Develop decision criteria to support regulatory decision making that incorporates both deterministic and risk-based engineering judgement.	* Conduct enhanced participatory rulemaking to establish radiological criteria for decommissioning nuclear sites; technical support for rulemaking including comprehensive risk based assessment of residual contamination  * Develop guidance for implementing the radiological criteria for license termination  * Work with DOE and EPA to the extent practicable to develop common approaches, assumptions, and models for evaluating risks and alternative remediation methodologies (risk harmonization)	8/94 C Final rule published 7/97 C  3/98  Ongoing	RES/NMSS	Completed (Note 21)
4.3 DEVELOP GUIDANCE FOR THE REVIEW OF RISK ASSOCIATED WITH WASTE REPOSITORIES.	Develop a Branch Technical Position on conducting a Performance Assessment of a LLW disposal facility.	* Solicit public comments  * Publish final Branch Technical Position	5/97 C  TBD, Dependent on resources	NMSS/RES	
4.4 RISK ASSESSMENT OF MATERIAL USES.	Develop and demonstrate a risk assessment for industrial gauges containing cesium-137 and cobalt-60 using PRA and other related techniques.  The assessment should allow for modification based on changes in regulatory requirements.  Use empirical data as much as practicable.	* Develop and demonstrate methods for determining the risk associated with industrial gauges containing cesium-137 and cobalt-60  * Final report as NUREG	9/98  12/98		Changed (Note 22)

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
	Develop and demonstrate risk assessment methods for application to medical and industrial licensee activities.	* Working Group with contractor assistance to identify and document a technical basis for a risk-informed approach to the regulation of nuclear byproduct material, and to develop plans for a graded approach to nuclear byproduct material regulation based on risk information	9/98		
4.5 FRAMEWORK FOR USE OF PRA IN REGULATING NUCLEAR MATERIALS	Develop a framework for applying PRA to nuclear material uses, similar to the one developed for reactor regulation (SECY-95-280), where appropriate.	* Provide plan for developing framework * Complete framework	1/98 TBD	NMSS	Changed ( Note 23)

## 5.0 HIGH-LEVEL NUCLEAR WASTE REGULATION

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
5.1 REGULATION OF HIGH-LEVEL WASTE	Develop guidance for the NRC and CNWRA staffs in the use of performance assessment (PA) to evaluate the safety of HLW programs.	<ul style="list-style-type: none"> <li>* Assist the staff in pre-licensing activities and in license application reviews</li> <li>* Develop a technical assessment capability in total-system and subsystem PA for use in licensing and pre-licensing reviews</li> <li>* Combine specialized technical disciplines (earth sciences and engineering) with those of system modelers to improve methodology</li> </ul>	Ongoing	NMSS	
	Identify significant events, processes, and parameters affecting total system performance.	<ul style="list-style-type: none"> <li>* Perform sensitivity studies of key technical issues using iterative PA (IPA)</li> </ul>	Ongoing	NMSS	
	Use PA and PSA methods, results and insights to evaluate proposed changes to regulations governing the potential repository at Yucca Mountain.	<ul style="list-style-type: none"> <li>* Assist the staff to maintain and to refine the regulatory structure in HLW disposal regulations that pertain to PA</li> <li>* Apply IPA analyses to advise EPA in its development of a Yucca Mountain regulation</li> <li>* Apply IPA analyses to develop a site-specific regulation for a Yucca Mountain site</li> </ul>	Ongoing	NMSS	
	Continue PA activities during interactions with DOE during the pre-licensing phase of repository development, site characterization, and repository design.	<ul style="list-style-type: none"> <li>* Provide guidance to the DOE on site characterization requirements, ongoing design work, and licensing issues important to the DOE's development of a complete and high-quality license application</li> <li>* Compare results of NRC's iterative performance assessment to DOE's Viability Assessment (VA) to identify major differences/issues</li> </ul>	Ongoing	NMSS	See Note 24
5.2 APPLY PRA TO SPENT FUEL STORAGE FACILITIES	Demonstrate methods for PRA of spent fuel storage facilities.	<ul style="list-style-type: none"> <li>* Prepare user needs letter to RES</li> </ul>	4/97C	RES/NMSS	
		<ul style="list-style-type: none"> <li>* Conduct PRA of dry cask storage</li> </ul>	TBD		Changed (Note 25)

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
5.3 CONTINUE USE OF RISK ASSESSMENT IN SUPPORT OF RADIOACTIVE MATERIAL TRANSPORTATION	Use PRA methods, results, and insights to evaluate regulations governing the transportation of radioactive material.	<ul style="list-style-type: none"> <li>* Update the database on transportation of radioactive materials for future applications</li> <li>* Revalidate the results of NUREG-0170 for spent fuel shipment risk estimates</li> </ul>	<ul style="list-style-type: none"> <li>6/01</li> <li>12/99</li> </ul>	NMSS	<ul style="list-style-type: none"> <li>Changed (Note 26)</li> <li>Changed (Note 27)</li> </ul>

## 6.0 REACTOR ENFORCEMENT

Regulatory Activity	Objectives	Methods	Target Schedule	Lead Office(s)	Status (this quarter)
6.1 DEVELOP ENFORCEMENT GUIDANCE FOR CONSIDERING RISK IN THE ENFORCEMENT PROCESS	Ensure the consistent Application of the Enforcement Policy in the Area of Risk Informed Enforcement Actions.	* Prepare an Enforcement Guidance Memorandum (EGM)	6/ 97	OE	Completed (Note 28)
		* Update the Enforcement Manual to reflect the guidance developed in the EGM	8/98	OE	Ongoing
6.2 INCLUDE RISK INSIGHTS DURING WEEKLY ENFORCEMENT PANELS	Ensure Risk-Informed Decisions are Made in Developing Enforcement Actions.	* Include Regional Senior Reactor Analyst Evaluation on Paneled Enforcement Cases when warranted	Ongoing	OE	New (Note 29)
6.3 CHANGE THE ENFORCEMENT POLICY SUPPLEMENTS TO INCLUDE ADDITIONAL EXAMPLES OF HOW RISK SHOULD INFLUENCE SEVERITY LEVEL	Provide the staff with more useful guidance for determining the Severity Level of Violations.	* Interface with NRR (SPSB) to consider additional examples for the Policy Supplements	Fall 98	OE	New (Note 30)

## NOTES

1. Completion date is under management review.
2. The staff's risk-informed (RI) IST team has continued to work with TU Electric to develop a RI-IST Program Description for Comanche Peak that is sufficiently detailed and consistent with the proposed final RI-IST guidance provided in RG 1.175. The staff received a draft RI-IST Program Description from TU Electric on February 13, 1998. The staff has discussed this draft with TU Electric and expects that the pilot licensee will submit a final, more descriptive, RI-IST Program Description to the NRC. The staff will continue to develop its SER based on the licensee's responses to the staff's requests for additional information and discussions with the licensee. The staff anticipates having a completed SER to the Commission on the RI-IST program at Comanche Peak in May 1998. This is a change from the previous date of March 1998.
3. For the purposes of clearer status tracking within the PRA implementation plan, the graded quality assurance pilot application at South Texas Project has been revised to reflect completion of the pilot program effective November 1997. As discussed in SECY-98-012, the licensee was informed by letter on November 6, 1997, that the staff had approved the GQA change and was provided with the associated staff safety evaluation. On January 7, 1998, the staff issued a letter to Entergy Operations documenting completion of the volunteer GQA interactions at the Grand Gulf facility. A similar letter documenting completion of volunteer GQA interactions with the licensee for the Palo Verde Nuclear Generating Station will be issued by the staff in the near future. Therefore, the pilot program phase of volunteer interactions on GQA is considered complete. Development of the GQA inspection guidance procedure will continue to be tracked under Activity 1.3.
4. The staff received a supplemental amendment request for the TS lead plant, San Onofre Nuclear Generating Station (SONGS), in early January 1998. The staff has completed preparation of the safety evaluation for changes to the SONGS TS for the safety injection tanks and low pressure safety injection system. The amendment package is being reviewed by the NRR technical staff and the Office of the General Counsel for concurrence. The staff expects to issue the SONGS amendments in May 1998. This is a change from the previous date of March 1998.
5. In a letter dated March 2, 1998, the licensee for Arkansas Nuclear One (ANO), Units 1 and 2, requested relief from the staff's position in NUREG-0737 for hydrogen monitoring. The request was made in accordance with "Task Zero" of the Risk-Informed, Performance-Based Regulation Pilot Program ("Whole Plant Study") proposed by NEI. The staff is currently assessing the most appropriate licensing approach to this request.
6. The target schedule for completion of revisions to the core inspection has been revised to May 1998. Finalization of the core inspection procedure revisions required coordination with 10 NRR branches and resulted in a longer than anticipated review and concurrence cycle.
7. The schedule for issuance of the draft and final GQA inspection procedures has been revised. The staff expects to issue the draft GQA inspection guidance by July 1998 and the final guidance by October 1998. This schedule change was necessitated by key personnel

being assigned to higher priority tasks such as the finalization of the risk-informed regulatory documents for graded quality assurance and inservice inspection and the Millstone restart team inspection.

8. In order to improve the accessibility of risk information for inspector use, a new subtask has been added to Activity 1.3. This new item, "evaluate methods of presenting risk analysis results in a form most useful to inspectors and develop options relating to providing inspectors with plant-specific risk information," has a completion target schedule of December 1998.
9. The Office of Research is preparing a report entitled "Unresolved Safety Issues and Generic Safety Issues Related to the IPE Program". The RES report (to be completed in May 1998) identifies generic issues and staff views on the adequacy of the proposed resolution and will serve as the basis for the selection of generic safety issues to be audited, and at which plants. The staff has revised the completion date for these milestones to TBD. A schedule for completion of these tasks will be developed after a review of the RES report by NRR is completed.
10. Activity 1.7, "Regulatory Effectiveness Evaluation," has been moved to Section 2 of the PIP (new Activity 2.11), to more closely link it with the Generic Safety Issues program and the Regulatory Excellence Plan, for which RES has the lead.
11. In accordance with the reassignment of rule-making activities under DSI-22, Activity 2.3, "Support For NRR Standard Reactor PRA," has been moved to Section 1 of the PIP because it has been transferred to NRR; it will be tracked as an item under Activity 1.8, "Advanced Reactor Reviews."
12. The item "define use for information, clarify 'regulatory use,' and assess the most effective methods for data collection" was inadvertently deleted from Activity 1.10 in the last quarterly update (SECY-98-012). This item has been added back into the Activity Table
13. Change in the project's principal investigator and funding availability resulted in the slippage of this target date.
14. A preliminary prioritization of issues has been developed based on input from RES, NRR, and AEOD. Work will be initiated in FY 98 for those issues for which there is a consensus that they are of high priority.
15. The staff has reviewed all the 76 IPE submittals and issued staff evaluation reports (SERs) on their findings to each licensee with one exception, Browns Ferry 3 (BF3). In three of the SERs, it is indicated that the staff was not able to conclude that the licensee met the intent of Generic Letter 88-20 for their plant(s). These three IPEs include Crystal River 3, Susquehanna 1&2, and BF3. The staff met with the licensees for both Crystal River 3 and Susquehanna 1&2. It appears that these licensees have addressed the staff concerns and the staff will issue updated SERs by the end of June 1998. RES forwarded to NRR a draft SER on BF3 in December 1997; the staff is planning to meet with the BF3 licensee during the second calendar quarter.

16. The staff has not yet received a revised plan for the NEI initiative. The completion date for an initial review has therefore been changed to TBD.
17. ASME has formed a task group, which includes a representative from the staff, to draft PRA standards. Although the staff continues working with ASME in this activity, has some concern in regard to the scope of the group's work. The NRC sent a letter to ASME expressing the staff's concerns and desires. Attachments 3 and 4, respectively, are NRC's letter and ASME's response.
18. A Commission paper with the staff's recommendations will be provided in April, 1998, instead of March.
19. The date for the final report was changed because more time was needed to analyze new frequencies for large, medium, and small break loss of coolant accidents and allow more time for external review. The date has been changed to July 1998.
20. The date to publish the revised LER rule was changed from October 1999 to December 1999 to agree with the proposed rulemaking plan.
21. The target schedule to develop guidance for implementing the radiological criteria for license termination was extended one month to March, 1998 to address unforeseen technical complexities. The guidance was forwarded to the Commission in March and will be issued following Commission approval.
22. The target schedule has been changed to correct a typographical error.
23. The target schedule to develop a framework for the use of PRA in regulating nuclear materials has been extended indefinitely to incorporate definitions and concepts from the paper, "Risk-Informed, Performance-Based Regulation," that is now being developed by the Commission.
24. On March 17-19 1998, the Department of Energy (DOE) and the staff held a technical exchange in San Antonio, Texas. DOE's plans and methodology for conducting a total-system performance assessment in support of its upcoming Viability Assessment were discussed. Also discussed was the status of the staff's effort to develop its independent performance assessment review capability.
25. This study, which would have demonstrated methods for PRA of spent fuel storage facilities, has been suspended consistent with current budget constraints. Potentially, the results of this study could have been used to support the adequacy of the existing dry-storage system designs, procedures, and regulations. Also, the results were expected to be used to make recommendations about the extent to which an expansion of PRA methods for dry-cask storage would provide further useful information. The staff believes this study should be resumed when resources permit.
26. The target schedule for updating the database on transportation of radioactive materials for future applications has been extended from the end of FY 99 to June, 2001 because of a delay in funding.
27. The target schedule for revalidating the results of NUREG-0170 for spent fuel shipment risk estimates has been extended from June, 1999 to December, 1999 because of a delay in funding.

28. The Office of Enforcement developed enforcement guidance in June 1997, that provided guidance to the staff in the consideration of risk in enforcement actions (Enforcement Guidance Memorandum (EGM) 97-011). The EGM acknowledged the uncertainties associated with risk assessment due to the differences of PRA models utilized by the staff and licensees and noted the need for judgement to be applied in using risk as a factor in enforcement decisions. However, the EGM emphasized that risk has value as an assessment tool and should be used, when warranted, as a factor in determining the appropriate enforcement sanctions.
29. Include Regional Senior Analyst evaluation on Paneled Enforcement cases when warranted.
30. Interface with NRR SPSB to consider additional examples for the Policy Supplements

## ABBREVIATIONS

ABWR	advanced boiling-water reactor
AEOD	Office of Analysis and Evaluation of Operational Data
ACRS	Advisory Committee on Reactor Safeguards
AIT	augmented inspection team
ANO	Arkansas Nuclear One
A/M	accident management
ASME	American Society of Mechanical Engineers
ASP	accident sequence precursor
ATWS	anticipated transient without scram
C	completed
CCF	common-cause failures
CFR	<i>Code of Federal Regulations</i>
CRGR	Committee to Review Generic Requirements
CNWRA	Center for Nuclear Waste Regulatory Activities
DOE	Department of Energy
DSI	Direction Strategic Issue
EGM	Enforcement Guidance Memorandum
EP	emergency preparedness
EPIX	Equipment Performance and Information Exchange
HLW	high -level waste
HRA	human reliability analysis
GQA	graded quality assurance
GSI	generic safety issue
JTA	job task analysis
IMC	inspection manual chapter
INPO	Institute of Nuclear Power Operations
IP	inspection procedure
IPA	iterative performance assessment
IPE	individual plant examination
IPEEE	individual plant examinations of external events
IIT	Incident inspection team
IST	inservice testing
ISI	inservice inspection
LER	licensee event report
LLW	low-level waste
LP&S	low power and shutdown
MACCS	MELCOR Accident Consequence Code System
NEI	Nuclear Energy Institute
NPRDS	nuclear plant reliability data system
NRR	Office of Nuclear Reactor Regulation
NMSS	Office of Nuclear Material Safety and Safeguards
OGC	Office of the General Council
PA	Performance Assessment
PI	performance indicator
PIP	PRA Implementation Plan
PRA	Probabilistic Risk Assessment

PSBS	Probabilistic Safety Assessment Branch
RAI	request for additional information
RCP	reactor coolant pump
RES	Office of Nuclear Regulatory Research
RG	Regulatory Guide
SAPHIRE	Systems Analysis Programs for Hands -on Integrated Reliability Evaluations
SBO	station blackout
SECY	Office of Secretary of the Commission
SER	safety evaluation report
SCSS	sequence coding and search system
SRP	standard review plan
SRA	senior reactor analysts
SSPI	Safety System Performance Indicator
SWS	service water system
TTD	Technical Training Division
TS	technical specifications
FY	Fiscal Year
VA	Viability Assessment