

Activity title and RIRIP activity identifier, which relates the activity to the Agency's strategic arenas, performance goals, and strategies described in the NRC Strategic Plan (NUREG-1614).\*

Lead and support organization

Schedule date provided when the milestone first appeared in the RIRIP.

Project considerations may include relationships to other activities and organizational entities, critical path items, special training and communication requirements, and special resource requirements.

Related Agency performance goals and associated strategies.

Activity description

RS-MS8-8 Reactor Safety Arena

**Implementation Activity:** Develop the technical basis to revise the PTS rule. (RES)

**Primary Performance Goal:** Maintain safety, protection of the environment, and the common defense and security.

**Strategy 8:** We will continue to develop and incrementally use risk-informed and, where appropriate, less prescriptive performance-based regulatory approaches to maintain safety.

The staff is working to develop the technical basis to improve the deterministic evaluations of reactor pressure vessel (RPV) integrity to support risk informed approaches to the regulations associated with RPV integrity. The staff is evaluating the application of advanced fracture mechanics concepts to the revision of the regulatory framework for RPV integrity to provide analysis codes and techniques for evaluating potential embrittlements pertaining to RPV integrity, particularly as related to pressurized thermal shock (PTS). The staff is also conducting the research and analyses needed to develop statistical models for generic flaw density and size distribution for reactor vessel welds and for the base staff and licensees in performing probabilistic fracture evaluations of reactor pressure vessels. In addition, the staff is performing an experimental program and analytical studies to support rulemaking for PTS and guidance for reactor vessel embrittlement. The results of these efforts will be reflected in review guidance documents and in modifications to regulations addressing issues associated with reactor pressure vessel integrity and associated operating pressure-temperature limits and LTOP setpoints, and in applying the 10 CFR 50.61 pressurized thermal shock (PTS) screening criteria. Some specific staff activities include: the mechanistic and statistical assessments of plant embrittlement data; a study of the effects of heat treatment and chemistry unavailability on embrittlement trends; development of the technical bases for revision of RG 1.99; irradiation of high-Cu, high-Ni welds and generation of embrittlement trend curves; an expert elicitation to verify that a generalized flaw size and density distribution can be properly developed for the entire population of U.S. RPVs and to assist in developing a flaw distribution; and calculations to provide technical basis for revising 10 CFR 50.61 (the PTS rule).

RES Priority: 8.4

Priority assigned by lead and supporting program offices through the Planning, Budgeting, and Performance Management (PBPM) process

Reactor Safety Arena RS-MS8-8

**Project Considerations:** The timely completion of activities associated with this implementation activity requires close coordination, cooperation, and communication among numerous organizational units.

Resources Budgeted		
Fiscal Year	Staff Resources (FTE)	Fiscal Resources (K\$)
2001	1.8	300
2002	2.0	450

Selected Major Milestones and Schedules		
Major Milestones	Original Target Date	Revised Date
Identify accident sequences significant to PTS for four representative plants	10/2001	
Integrate the results of thermal/hydraulic, fracture mechanics, and sequence frequency analyses, using a probabilistic fracture mechanics code (FAVOR), to calculate the frequency of vessel failure and the resultant core damage.	1/2002	
Recommend changes to operational limits associated with PTS acceptance criteria		
Assess the need for PTS rule changes and provide recommendations		2002

Implementation Activity Tasks, Interdependencies, and Schedules by Calendar Year	
Task	Schedule
Identify PTS-related accident sequences for four representative plants	10/01 - 10/01
Integrate the results of sequential analyses to calculate the frequency of vessel failure and the resultant core damage	1/02 - 1/02
Recommend changes to operational limits associated with PTS acceptance criteria	1/02 - 1/02
Assess the need for PTS rule changes and provide recommendations	2/02 - 2/02

Allocated resources to conduct the activity.

Major milestones and schedules.

Detailed schedule consistent with operating plans maintained by individual program offices.

Staff's current best estimated completion date.

\*The first two letters of the activity identifier indicate the relevant strategic arena (RS for reactor safety, MS for materials safety, WS for waste safety). The remaining letters and the first number indicate the Agency performance goal (MS: maintain safety; PC: public confidence; EER: effectiveness, efficiency, and realism; RB: reduce unnecessary regulatory burden) and the particular strategy to which the activity is primarily related. The last number of the activity identifier is unique to the particular activity.

## Layout and Format of Activity Descriptions