

UNITED STATES  
NUCLEAR REGULATORY COMMISSION  
OFFICE OF NUCLEAR REACTOR REGULATION  
WASHINGTON, D.C. 20555-0001

December 6, 2006

**NRC REGULATORY ISSUE SUMMARY 2006-24  
REVISED REVIEW AND TRANSMITTAL PROCESS FOR ACCIDENT  
SEQUENCE PRECURSOR ANALYSES**

**ADDRESSEES**

All holders of licenses for nuclear power reactors, except those who have permanently ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

**INTENT**

The U.S. Nuclear Regulatory Commission (NRC) is issuing this regulatory issue summary (RIS) to inform addressees that a revised process for accident sequence precursor (ASP) analyses has been implemented. This includes a revised process for licensee review of the ASP analyses. This RIS requires no action or written response on the part of an addressee.

**BACKGROUND INFORMATION**

The NRC established the ASP program in 1979 in response to the Risk Assessment Review Group report (see NUREG/CR-0400, dated September 1978). The ASP program systematically evaluates U.S. commercial nuclear power plant operating experience to identify, document, and rank the operating events and conditions that were most likely to have led to inadequate core cooling and severe core damage (precursors), considering the likelihood of additional failures.

To identify potential precursors, the NRC staff reviews plant events based on information contained in licensee event reports and NRC inspection reports. The staff then analyzes the identified potential precursors by calculating the probability of an event leading to a core damage state. A plant event can be one of two types: (1) an occurrence of an initiating event, such as a reactor trip or a loss of offsite power, with any subsequent equipment unavailability or degradation or (2) a degraded plant condition (e.g., unavailability or degradation of equipment) without an occurrence of an initiating event.

An initiating event with a conditional core damage probability (CCDP) greater than or equal to  $1 \times 10^{-6}$  (one in a million) or a degraded plant condition resulting in an increase in core damage probability (CDP) greater than or equal to  $1 \times 10^{-6}$  is considered a precursor in the ASP program. An initiating event with a CCDP greater than or equal to  $1 \times 10^{-3}$  or a degraded plant condition resulting in a CDP greater than or equal to  $1 \times 10^{-3}$  is considered a significant precursor in the ASP program.

**ML060900007**

The ASP program is one of three agency programs that assess the risk significance of issues and events. The other two programs are the Significance Determination Process (SDP) and the event response evaluation process, as defined in Management Directive (MD) 8.3, "NRC Incident Investigation Program." Since these programs serve different functions, there are some inherent differences in the processes. For example, the SDP, which is used to determine the safety significance of inspection findings, analyzes each finding individually and screens out events where there are no licensee performance deficiencies. In contrast, the ASP program evaluates all potentially significant plant events and degraded conditions, and analyzes concurrent multiple degraded conditions together.

In the past, the ASP program would perform risk evaluations of all events that had not been eliminated by the screening criteria to determine if these events were potential precursors to core damage accidents. The preliminary ASP analyses were then transmitted to the licensees for review and comment. After these reviews were completed and the comments resolved, the final analyses would be transmitted to all stakeholders. This ASP evaluation process was sometimes duplicative in that, in some cases, there would also be evaluations of the same events produced by the SDP or MD 8.3 programs. Also, the review process could be resource consuming, and the licensees have generally limited their comments to high-profile and/or high-risk analyses, commenting on only a few low-risk analyses (i.e., CCDP or CDP less than  $1 \times 10^{-5}$ ).

The NRC staff has developed a more efficient ASP process to reduce the number of evaluations performed, and a more risk-informed approach to the review and transmittal process to reduce administrative and review burdens on the NRC staff and the licensees.

## SUMMARY OF THE ISSUE

**New ASP evaluation process.** The new ASP process has been revised to utilize the results of the SDP or MD 8.3 programs, when appropriate, to achieve better efficiencies.

- **Selection of precursors with an SDP or documented MD 8.3 evaluation.** For degraded conditions or significant operational occurrences for which there is an SDP or documented MD 8.3 quantitative risk evaluation, the ASP program will utilize the results of these evaluations, where applicable, without performing a separate ASP analysis.
- **Selection of precursors with no SDP or documented MD 8.3 evaluation.** The ASP program will continue to perform analyses for those events for which there is no SDP or MD 8.3 evaluation. Examples of these types of events include most initiating events, and plant conditions for which there are no performance deficiencies or where there are concurrent multiple degraded conditions.
- **Potentially significant precursors.** For all events (including those being evaluated by the SDP or MD 8.3 processes) that, based on preliminary evaluations, could be significant precursors, the ASP program will perform an expedited analysis, in order to support the reporting requirements in the annual NRC Performance and Accountability Report to Congress, NUREG-1542, and to support the proposed new Abnormal Occurrence criteria described in SECY-05-0137.

**New ASP review process.** The new ASP review process has been revised to be more risk-informed, as described below.

- **Lower risk events.** If an ASP analysis results in a CCDP or CDP of less than  $1 \times 10^{-4}$ , formal review comments by the licensee will no longer be requested. A summary of the analysis and results will be issued to the pertinent licensee and other stakeholders for information. However, if the licensee or other stakeholders choose to comment on these analyses, the NRC will continue to address their comments.
- **Higher risk events.** If an ASP analysis results in a CCDP or CDP greater than  $1 \times 10^{-4}$ , formal review comments by the licensee will continue to be requested. These ASP analyses will be issued as final to all stakeholders after resolution of the review comments.

### **BACKFIT DISCUSSION**

This RIS requires no action or written response and is; therefore, not a backfit under 10 CFR 50.109. Consequently, the staff did not perform a backfit analysis.

### **FEDERAL REGISTER NOTIFICATION**

A notice of opportunity for public comment on this RIS was not published in the *Federal Register* because it is informational and requires no specific action or written response.

### **CONGRESSIONAL REVIEW ACT**

This RIS is not a rule as designated by the Congressional Act (5 U. S. C. §§ 801-808) and; therefore, is not subject to the Act.

### **PAPERWORK REDUCTION ACT STATEMENT**

This RIS does not contain any information collections and; therefore, is not subject to the requirements of the Paperwork Reduction Act of 1995 (44 U.S.C. 3501 et seq.).

### **CONTACT**

Please direct any questions about this matter to the technical contact listed below.

**/RA/**

Michael J. Case, Director  
Division of Policy and Rulemaking  
Office of Nuclear Reactor Regulation

Technical Contact: Anne-Marie Grady, RES  
Phone: 301-415-7645  
E-mail: [axg5@nrc.gov](mailto:axg5@nrc.gov)

Note: NRC generic communications may be found on the NRC public Web site, <http://www.nrc.gov>, under Electronic Reading Room/Document Collections.