

Risk Informed Activities
Completed - Not Active – Replaced with Existing Website
(FY2021 Update)

The following risk-informed activity text was removed from the public website::

Fuel Cycle Sub-Arena, Risk-Website refers to existing website

Rulemaking – Cyber Security for Fuel Cycle Facilities

Cross-Cutting Activities Sub-Arena, Risk-Website refers to existing website

Rulemaking Activities

Cross-Cutting Activities Sub-Arena, Risk-Website refers to existing website

Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning Rulemaking

Operating Reactor Sub-Arena, Sunset

Design Compliance Enforcement Discretion (DCED): a Risk-Informed Approach for Addressing Low Risk, Low Safety Significance Design Compliance Issues

Operating Reactor Sub-Arena, Completed

Risk-Informed Compensatory Measures

Operating Reactor Sub-Arena, Risk-Website refers to existing website

Accident Sequence Precursor (ASP) Program

Fuel Cycle Sub-Arena, Risk-Website refers to existing website

Rulemaking – Cybersecurity for Fuel Cycle Facilities

Summary Description

In the March 24, 2015, [staff requirements memorandum \(SRM\)](#) for SECY-14-0147, "Cyber Security for Fuel Cycle Facilities," the Commission directed the U.S. Nuclear Regulatory Commission (NRC) staff to proceed with a high-priority cyber security rulemaking for fuel cycle facilities (FCFs). In response to the Commission's direction, the staff prepared a proposed rule that, if approved by the Commission, would amend the current regulations in 10 CFR Part 73, and make conforming changes to additional regulations in 10 CFR Part 40, "Domestic Licensing of Source Material," and Part 70, "Domestic Licensing of Special Nuclear Material," to establish cyber security requirements for certain FCF applicants and licensees. The proposed regulation, if approved, would require FCF applicants and licensees within the scope of the rule to establish, implement, and maintain a cyber security program designed to promote common defense and security and to provide reasonable assurance that the public health and safety remain adequately protected against the evolving risk of cyber attacks. As such, the licensee's cyber security program would enable the licensee to detect,

protect against, and respond to a cyber attack capable of causing one or more of the consequences of concern defined in the proposed rule.

The determination of which 10 CFR Part 40 or Part 70 applicants and licensees that are within the scope of the proposed rule was risk-informed. The proposed requirements would apply only to: (1) each applicant or licensee subject to the requirements of 10 CFR Part 40 for the operation of a uranium hexafluoride conversion or deconversion facility; and (2) each applicant or licensee subject to the requirements of 10 CFR 70.60, "Applicability." This risk-informed approach avoids applying cyber security requirements to applicants or licensees that are of low risk to public health and safety.

Also included in the proposed rule is a risk-informed screening process to identify in-scope digital assets whose function is maintained by an alternate means and, therefore, would not require additional cyber security controls. This risk-informed determination is intended to reduce the regulatory burden while ensuring adequate protection of public health and safety.

FY 2018

On October 4, 2017, the staff provided the proposed rule package to the Commission and referenced the associated draft guidance document via [SECY-17-0099](#). Specific details on current rulemaking activities are provided in the NRC's centralized rulemaking tracking and reporting system at [NRC Rules and Petitions](#).

FY 2019

This proposed rule package is with the Commission. Specific details on current rulemaking activities are provided in the NRC's centralized rulemaking tracking and reporting system at [NRC Rules and Petitions](#).

FY 2020

This proposed rule package is with the Commission. Specific details on current rulemaking activities are provided in the NRC's centralized rulemaking tracking and reporting system at [NRC Rules and Petitions](#).

Cross-Cutting Activities Sub-Arena, Risk-Website refers to existing website

Rulemaking Activities

Summary Description

Risk insights are a fundamental consideration in the analyses supporting the U.S. Nuclear Regulatory Commission's (NRC's) rulemaking activities. Specific details on current rulemaking activities are provided in the NRC's centralized rulemaking tracking and reporting system at [NRC Rules and Petitions](#).

The NRC has developed reference materials to support qualitative and quantitative assessment of costs and benefits (including risk) in rulemaking, including NUREG/BR-0058, "Regulatory Analysis Guidelines of the U.S. Nuclear Regulatory Commission." An effort was initiated in 2014 to restructure

and consolidate the NRC cost benefit guidance into this NUREG. The update to NUREG/BR 0058 also incorporates improvements in methods for assessing factors that are difficult to quantify and includes relevant best practices identified in U.S. Government Accountability Office (GAO) guidance and in recommendations from GAO in GAO 15 98, "Nuclear Regulatory Commission: NRC Needs to Improve Its Cost Estimates by Incorporating More Best Practices," dated December 12, 2014. Finally, the update incorporates NRC experience and improvements in uncertainty analysis for use in cost benefit analysis.

FY 2016

A public workshop on the revision to NUREG/BR-0058 was held in March 2016.

FY 2017

An Advisory Committee on Reactor Safeguards (ACRS) Regulatory Policies and Practices Subcommittee meeting was held on February 7, 2017 and an ACRS Full Committee was held on March 9, 2017. On April 17, 2017, the draft NUREG/BR-0058, Revision 5, was published for a 60-day public comment period. A Category 3 public meeting was held in May 2017.

FY 2018

On March 29, 2018, the draft final NUREG (main document and five appendices) was submitted to the Commission for its review and approval. Efforts continue in developing and updating additional supporting appendices to NUREG/BR-0058, including those that address the non reactor arena. This includes fuel cycle activities that interface with the reactor arena (from uranium recovery through fuel fabrication and spent fuel storage through disposal) and other byproduct material uses (e.g., medical uses and well-logging). These efforts are continuing into FY 2019.

FY 2019

In the staff requirements memorandum to SECY-18-0042, "Draft Final NUREG/BR-0058, Revision 5, 'Regulatory Analysis Guidelines Of The U.S. Nuclear Regulatory Commission,'" dated July 26, 2019, the Commission directed the staff to conform Revision 5 of NUREG/BR-0058 to Management Directive 8.4, "Management of Backfitting, Forward Fitting, Issue Finality, and Information Requests," and resubmit it to the Commission for approval by January 27, 2020. In parallel, the staff has developed four additional supporting appendices to the NUREG, including regulatory analysis methods and data for nuclear facilities other than power reactors, which are currently in concurrence. These efforts are continuing into FY 2020.

FY 2020

On January 28, 2020, the staff resubmitted to the Commission for approval the "Draft Final NUREG/BR-0058, Revision 5, 'Regulatory Analysis Guidelines Of The U.S. Nuclear Regulatory Commission.'" NUREG/BR-0058 is with the Commission.

Cross-Cutting Activities Sub-Arena, Risk-Website refers to existing website

Regulatory Improvements for Production and Utilization Facilities Transitioning to Decommissioning Rulemaking

Summary Description

The NRC is developing a proposed rule to amend the regulations to provide an appropriate regulatory framework for nuclear power reactors transitioning from operations to decommissioning. The goals of this rulemaking are to provide for a safe, effective, and efficient decommissioning process; to reduce the need for license amendment requests and exemptions from existing regulations; and to address other decommissioning issues deemed relevant by the NRC. For several technical areas (emergency preparedness, physical security, cyber security, and offsite and onsite financial protection requirements and indemnity agreements), the NRC staff plans to adopt a graded approach that would align regulatory requirements with the reduction in radiological risk that occurs over time, while continuing to maintain safety and security. The NRC staff also plans to make several of the new requirements non-mandatory alternatives to the existing requirements. In November 2017, the NRC issued a Regulatory Basis Document for this rulemaking (82 FR 55954; November 27, 2017). In May 2018, the NRC staff submitted the proposed rule to the Commission for review and approval ([ML18012A019](#)). Specific details on current rulemaking activities are provided in the NRC's centralized rulemaking tracking and reporting system at [NRC Rules and Petitions](#).

FY 2018

Upon Commission approval, the NRC will publish the proposed rule in the Federal Register for public comment and hold a public meeting.

FY 2019

The Commission is evaluating the proposed rule. Upon Commission approval, the NRC will publish the proposed rule in the Federal Register for public comment and hold a public meeting.

FY 2020

The Commission is evaluating the proposed rule. Upon Commission approval, the NRC will publish the proposed rule in the Federal Register for public comment and hold a public meeting. Specific details on current rulemaking activities are provided in the NRC's centralized rulemaking tracking and reporting system at [NRC Rules and Petitions](#).

Operating Reactors Sub-Arena, Sunset

Design Compliance Enforcement Discretion (DCED): a Risk-Informed Approach for Addressing Low Risk, Low Safety Significance Design Compliance Issues

Summary Description

The agency is developing a risk-informed approach to resolve licensee design issues that render a technical specification structure, system or component inoperable and are determined to be of low risk/low safety significance. The goal is to provide a tool to the staff that provides a risk-informed alternative to enforcement of technical specification compliance when it can be demonstrated that the non-compliance does not pose an undue risk to public health and safety.

The staff envisions developing a risk-informed process that would ensure that the level of licensee and staff resources applied to a design non-conformance issue correlate to the potential risk and safety significance of the issue. The staff envisions that this approach would focus first on evaluating the risk and safety significance of the non-compliance. If the issue is determined to be of low risk and low safety significance, then the staff interaction with the licensee would focus on establishing a reasonable timetable for corrective action by the licensee combined with implementing appropriate interim compensatory measures that would maintain adequate safety while the corrective action is being taken. The approach would include enforcement discretion (possibly for a long duration) to provide the licensee adequate time for implementing corrective action. This approach is envisioned to be an improvement over the current practice in that it would eliminate the need for urgent action to be taken for low risk significance compliance issues.

This approach is consistent with the NRC's Enforcement Policy ([NUREG-1600](#), "General Statement of Policy and Procedure for NRC Enforcement Action", Section 1.5 "Adequate Protection Standard," which states:

"Adequate protection of the public health and safety and assurance of the common defense and security and protection of the environment are the NRC's fundamental regulatory objectives. Compliance with NRC requirements plays a critical role in giving the NRC confidence that safety and security are being maintained. While adequate protection is presumptively assured by compliance with NRC requirements, circumstances may arise where new information reveals that an unforeseen hazard or security issue or security event exists or that a substantially greater potential exists for a known hazard to occur. In such situations, the NRC has the statutory authority to require action by licensees, their employees and contractors, and certificate holders above and beyond existing regulations to maintain the level of protection necessary to avoid undue risk to public health and safety, and to ensure security of materials.

The NRC also has the authority to exercise discretion to permit continued operations — despite the existence of a noncompliance — where the noncompliance is not significant from a risk perspective and does not, in the particular circumstances, pose an undue risk to public health and safety. When noncompliance with NRC requirements occurs, the NRC must evaluate the degree of risk posed by that noncompliance to determine whether immediate action is required. If the NRC determines that the noncompliance itself is of such safety significance that adequate protection is no longer provided, or that the noncompliance was caused by a failure of licensee controls so significant that it calls into question the licensee's ability to ensure adequate protection, the NRC may demand immediate action, up to and including a shutdown or suspension of licensed activities. Based on the NRC's evaluation of noncompliance, the appropriate action could include refraining from taking any action, taking specific enforcement action including the use of civil penalties, issuing Orders, or providing input to other regulatory actions or assessments, such as increased NRC oversight of a licensee's activities. Since some requirements are more important to safety than others, the NRC endeavors to use a risk-informed approach when applying NRC resources to the oversight of licensed activities, including enforcement activities."

In September 2015, a working group with members from NRR, the Regions, OGC, and OE was formed, and began evaluating the feasibility of the proposed approach, including verifying the legality of the approach determining how the risk significance would be evaluated, and gaging the industry's interest in participating in the process once developed. The working group also looked at the process for implementing this new approach. One implementation method that was considered was modifying the Notice of Enforcement Discretion (NOED) process to provide a process for addressing for low risk, low safety significance design compliance issues in a risk-informed manner.

FY 2016

Three public meetings were held to discuss this initiative. The meetings were held at NRC Headquarters on February 3, 2016, April 11, 2016, and May 23, 2016. The Commission was also briefed on the initiative during the Operating Reactor Business Line briefing on July 7, 2016. A draft outline of the proposed process was developed and circulated within NRR, the Regional Offices, OE and OGC for comment.

FY 2017 – FY 2018

After modification of the draft outline based on internal feedback, the outline was made publicly available for feedback from external stakeholders. Based on feedback received from internal and external stakeholders from the review of the draft outline for the proposed DCED process, a draft DCED procedure was developed and circulated internally for review and a draft Commission Notation Vote paper was prepared. However, the DCED Commission Paper due date was extended to October 2018 for the following reasons:

1. So the staff can examine new guidance documents that are under development (e.g., backfit guidance resulting in part from Commission direction in [SRM-COMSECY-16-0020](#) and operability guidance under development by NEI) and evaluate their potential for reducing the number of low risk and low safety significance operability issues created by non-compliances with design requirements.
2. If the staff concludes that the new guidance documents are unlikely to significantly reduce the number of DCED candidate issues, the staff will explore additional options consistent with feedback received from both internal and external stakeholders. The options will seek to:
 - a. better balance the public's hearing rights with risk-informing the agency's response to low risk, low safety significance operability issues,
 - b. align on the extent to which technical specifications can and should be risk-informed, and
 - c. engage more extensively with external stakeholders.

The proposed process will utilize risk insights as one of the criteria to determine if a design issue is a candidate for the licensee to request enforcement discretion under the proposed DCED process.

FY 2019

The agency was developing a risk-informed approach to resolve licensee design issues that render a technical specification structure, system or component inoperable and are determined to be of low risk/low safety significance. The goal was to provide a tool to the staff that provides a risk-informed alternative to enforcement of technical specification compliance when it can be demonstrated that the non-compliance does not pose an undue risk to public health and safety. This initiative has been sunset as several other initiatives are anticipated to reduce the number of candidate design

noncompliance issues such as (1) Backfit Guidance and Training, (2) Industry Operability Initiative and revision of IMC 0326, and (3) Risk-Informed Technical Specification Initiative 4b, "Risk-Informed Completion Times." Therefore, the agency no longer sees a need for the proposed DCED process. However, agency will continue to explore resource-appropriate ways to address issues of low risk and low safety significance as opportunities arise.

FY 2020

The DCED activity has been sunset. For FY 2020, agency efforts to address issues of low risk and low safety significance are discussed under the LSSIR effort.

Operating Reactor Sub-Arena, Completed

Risk-Informed Compensatory Measures

Summary Description

Licensees would be able to use a more risk-informed process to determine implementing timeframes for security compensatory measures, based on site-specific threat conditions.

FY 2018

This is anticipated to be accomplished through approval of an industry proposal.

FY 2019

NSIR staff finalized a risk-informed process to determine implementing timeframes for security compensatory measures, based on site-specific threat conditions. This work followed NRC's approval for use of revised NEI 03-12, "Template for Security Plan, Training and Qualification, Safeguards Contingency Plan, [and Independent Spent Fuel Storage Installation Security Program]," particularly Section 21, "Compensatory Measures." As part of this process, NSIR staff provided presentations to security inspectors and Resident Inspectors in each of the four Regions and briefed industry security managers on the activities to ensure mutual understanding of the new process.

FY 2020

This revised process has been implemented. The Security Issues Forum (SIF) is used to promote consistency during regional inspection activities.

Operating Reactor Sub-Arena, Risk-Website refers to existing website

Accident Sequence Precursor (ASP) Program

Summary Description

In 1979, the U.S. Nuclear Regulatory Commission (NRC) established the [ASP Program](#) in response to the Risk Assessment Review Group report issued in September 1978 ([NUREG/CR-0400](#), "Risk Assessment Review Group Report to the U.S. Nuclear Regulatory Commission"). The evaluations performed for events that occurred between 1969 and 1979 were the first efforts in this type of analysis. The ASP Program systematically evaluates U.S. nuclear power plant operating experience to identify, document, and rank operational events by calculating a conditional core damage probability (CCDP) or an increase in core damage probability (Δ CDP).

The ASP Program identifies potential precursors by reviewing operational events from licensee event reports on a plant unit basis. An operational event can be one of two types: (1) the occurrence of an initiating event, such as a reactor trip or a loss of offsite power, with or without any subsequent equipment unavailability or degradation; or (2) a degraded plant condition characterized by the unavailability or degradation of equipment without the occurrence of an initiating event.

For the first type of event, the staff calculates a CCDP. This metric represents a conditional probability that a core damage state is reached given the occurrence of the observed initiating event (and any subsequent equipment failures or degradations). For the second type of event, the staff calculates a Δ CDP. This metric represents the increase in core damage probability for the time period during which a component or multiple components were deemed unavailable or degraded.

Starting in 2006, to minimize overlap and improve efficiency, Significance Determination Process (SDP) results have been used in lieu of independent ASP analyses to the extent practical and consistent with the overall objectives of both programs. More information regarding the details of this change is documented in [NRC Regulatory Issue Summary 2006-24](#).

The ASP Program is one of three agency programs that assess the risk significance of issues and events. The other two programs are the Reactor Oversight Process and the event response evaluation process, as defined in Management Directive 8.3, "NRC Incident Investigation Program." In contrast to the other two programs, a comprehensive and integrated risk analysis under the ASP Program includes all anomalies observed at the time of the event or discovered after the event. These anomalies may include unavailable and degraded plant structures, systems, and components (SSCs); human errors; and/or an initiating event (e.g., reactor trip). An unavailable or degraded SSC does not have to be a performance deficiency (PD) or an analyzed condition in the plant design basis, as required in the SDP. The ASP Program analyzes concurrent, multiple PDs or degraded conditions together, unlike the SDP that analyzes PDs individually.

FY 2015

The ASP Program independently identified five precursor events in Fiscal Year (FY) 2015. In addition, four precursor events were analyzed by the SDP and accepted into the ASP Program (as described in NRC Regulatory Issue Summary 2006-24). See [SECY-15-0124](#), "Status of the Accident Sequence Precursor Program and the Standardized Plant Analysis Risk Models," for more information on the status of the ASP Program for FY 2015.

FY 2016

In FY 2016, the ASP Program implemented a variety of administrative changes. In accordance with Project AIM, and by direction of the Commission, the status of the ASP Program will no longer be reported in the annual SECY paper "Status of the Accident Sequence Precursor Program and the Standardized Plant Analysis Risk Models." Instead, an annual summary of the ASP Program will be provided as a publicly available document. In addition, the ASP Program transitioned from a FY

reporting cycle to a calendar year (CY) reporting cycle. Operational events will be organized based on the CY in which the licensee event report is submitted to the NRC. As part of this transition, the FY 2015 annual report was combined with the CY 2016 report. Annual summary reports will be made available to the public in the following CY (e.g., the CY 2016 annual report was made available to the public in CY 2017).

The NRC's Risk-Informed Steering Committee initiated an internal evaluation of the ASP Program in July 2016, performed by staff within the Office of Nuclear Reactor Regulation. A public meeting was held on October 13, 2016, to solicit feedback from external stakeholders and members of the public (see the [meeting summary](#) for additional information).

FY 2017

In FY 2017, the ASP Program published the "[U.S. Nuclear Regulatory Commission Accident Sequence Precursor Program 2016 Annual Report](#)," which summarizes the results of ASP analyses for events reported between October 2014 and December 2016. Twenty-three events were determined to be precursors. Of these 23 precursors, 15 precursors utilized SDP results in accordance with RIS 2006-24 and the remaining 8 precursors were identified via independent ASP analyses. Three of the events identified by ASP analyses had a CCDP or Δ CDP greater than or equal to 1×10^{-5} .

The NRC continues its internal evaluation of the ASP Program with a focus on identifying resource efficiencies through process changes, increasing the use of ASP results in other NRC processes, and ensuring timeliness of ASP analyses to support internal and external stakeholder needs. Recommended changes to the ASP Program will likely be communicated in early FY 2018.

FY 2018

In FY 2018, the ASP Program published the "[U.S. Nuclear Regulatory Commission Accident Sequence Precursor Program 2017 Annual Report](#)," which summarizes the results of ASP analyses for events reported in CY 2017. Eleven events were determined to be precursors. Of these 11 precursors, three precursors utilized SDP results in accordance with [RIS 2006-24](#) and the remaining eight precursors were identified via independent ASP analyses. Six of the events identified by ASP analyses had a CCDP or Δ CDP greater than or equal to 1×10^{-5} .

The NRC completed its internal evaluation of the ASP Program in February 2018. The ASP Program has implemented the recommendations made by NRC management. Additional information on the internal ASP Program review, including conclusions and recommendations, is [available](#).

FY 2019

In FY 2019, the ASP Program published the "[U.S. Nuclear Regulatory Commission Accident Sequence Precursor Program 2018 Annual Report](#)," which summarizes the results of ASP analyses for events reported in CY 2018. Six events were determined to be precursors. Of these six precursors, three precursors utilized SDP results in accordance with [RIS 2006-24](#) and the remaining three precursors were identified via independent ASP analyses. CY 2018 was the first time in ASP Program history in which no precursors with a CCDP or Δ CDP greater than or equal to 1×10^{-5} were identified.

Historically, ASP analyses have been focused on the risk due to internal events unless an external hazard (e.g., fires, floods, seismic) resulted in a reactor trip (e.g., seismically induced loss of offsite

power) or a degraded condition was specific to an external hazard (e.g., degraded fire barrier). This limitation was due to lack of external event modeling in the Standardized Plant Analysis Risk (SPAR) models for all plants. However, the incorporation of seismic hazards in all SPAR models was completed in December 2017. Therefore, the decision was made to evaluate seismic risk for all degraded conditions. The inclusion of seismic hazard risk in ASP analyses will improve the SPAR models by identifying issues and insights specific to seismic scenarios. Seismic hazards were not a significant risk impact in any 2018 ASP analysis.

FY 2020

In FY 2020, the ASP Program published the "U.S. Nuclear Regulatory Commission Accident Sequence Precursor Program 2019 Annual Report," which summarizes the results of ASP analyses for events reported in CY 2019. Only two events were determined to be precursors, which is a historical low. Both precursors were evaluated via an independent ASP analysis. There were no greater than Green inspection findings with risk impacts to core damage identified in 2019. For the second year in a row, no precursors with a CCDP or Δ CDP greater than or equal to 1×10^{-5} were identified.

The 10-year precursor occurrence rates for all precursors and most precursor subgroups (e.g., high-risk precursor, initiating events, degraded conditions, LOOPs, and precursors occurring at PWRs) exhibit a statistically significant decreasing trends. No trend exists for precursors occurring at BWRs or from emergency diesel generator failures for the past decade, which are the only precursor trends not decreasing. In addition to the decreasing precursor occurrence rates, the integrated ASP index shows a decreasing overall risk due to precursors. The number of LERs and potential precursors identified continues to decrease to historical lows. These results and insights support the conclusion that current oversight programs and licensee activities remain effective.
