

REGULATORY ANALYSIS

DRAFT REGULATORY GUIDE DG-1382 PREPARING PROBABILISTIC FRACTURE MECHANICS SUBMITTALS (Proposed New Regulatory Guide 1.245)

1. Statement of the Problem

The U.S. Nuclear Regulatory Commission (NRC) is considering issuing a new Regulatory Guide (RG) to provide applicants and licensees subject to Title 10 of the *Code of Federal Regulations* (10 CFR) Part 50, "Domestic Licensing of Production and Utilization Facilities," 10 CFR Part 52, "Licenses, Certifications, and Approvals for Nuclear Power Plants," 10 CFR Part 71, "Domestic Licensing of Special Nuclear Material," or 10 CFR Part 72, "Licensing Requirements for the Independent Storage of Spent Nuclear Fuel, High-Level Radioactive Waste, and Reactor-Related Greater Than Class C Waste," with guidance on methods and procedures for preparing probabilistic fracture mechanics (PFM) analyses. Specifically, this guide will describe a framework for developing the contents of a licensing submittal that the staff of the U.S. Nuclear Regulatory Commission (NRC) considers acceptable when performing PFM analyses in support of regulatory applications.

Currently, the NRC has no guidance for licensees to follow when preparing licensing submittals that employ PFM analyses as a part of the technical basis for a regulatory application. This absence of guidance has resulted in inefficient reviews and uncertainty in regulatory outcomes.

2. Objective

The staff developed this regulatory guide to support the increasing trend toward the use of PFM analyses in regulatory applications. This regulatory guide is intended to ensure that minimum expectations are clear with regards to the contents of regulatory applications that contain PFM analyses and results. By providing a set of common guidelines for applicant submittals, the issuance of this regulatory guide will increase the efficiency of reviews for regulatory applications that use PFM as a supporting technical basis.

3. Alternative Approaches

The NRC staff considered two alternative approaches:

- (1) Do not issue Regulatory Guide 1.245.
- (2) Issue Regulatory Guide 1.245 to clarify the NRC's position on PFM submittals in support of regulatory applications.

Alternative 1: Do not issue Regulatory Guide 1.245

Under this alternative, the NRC would not revise or issue additional guidance, and the current guidance would be retained. If the NRC takes no action, then there would be no changes in costs or benefits to the public, licensees, or the NRC. This alternative is considered the "no action" alternative and provides a baseline condition from which any other alternatives will be assessed. However, the "no action" alternative would not address identified concerns

with the current inefficiencies and lack of predictable and reproducible outcomes when reviewing licensing applications that use probabilistic fracture mechanics. The NRC would continue to review each application on a case-by-case basis, and inefficiencies in review (e.g., increased number of requests for additional information and longer review times) would remain, as well as uncertainty in regulatory outcomes.

Alternative 2: Issue Regulatory Guide 1.245 to clarify the NRC's position on PFM submittals in support of regulatory applications

Under this alternative, the NRC would issue Regulatory Guide 1.245. This new regulatory guide would describe what the NRC believes is an acceptable framework to develop the contents of a licensing submittal when performing PFM analyses in support of regulatory applications. By doing so, the NRC would ensure that the guidance regarding PFM accurately reflects the staff's current position.

The impact to the NRC would be the costs associated with preparing and issuing the new regulatory guide (including upfront costs for developing the regulatory guide, resolving comments, etc.). The impact to the public would be the voluntary costs associated with reviewing and providing comments to the NRC during the public comment period. The value to the NRC staff and the agency's applicants would be the benefits associated with enhanced efficiency and effectiveness in using a common guidance document as the technical basis for license applications and other interactions between the NRC and its regulated entities. In addition, applicant use of the guidance would reduce the number of requests for additional information and shorten review times, resulting in ongoing cost savings to the industry. Finally, by making PFM easier to employ in support of regulatory applications, the guidance would allow for the more frequent, efficient use of PFM as the basis for safety arguments, thus increasing the use of risk-informed decision making.

Conclusion

Based on this regulatory analysis, the NRC staff concludes that issuance of a new regulatory guide is warranted. The action will enhance confidence in licensing applications that rely on PFM as part of their technical basis, which is a way to risk-inform licensing applications. It could also lead to cost savings for the industry, especially with regards to more efficient NRC reviews and to the predictability of regulatory outcomes when PFM is used as part of the technical basis.