

REGULATORY ANALYSIS

DRAFT REGULATORY GUIDE – DG-1304 SAFETY-RELATED STEEL STRUCTURES AND STEEL-PLATE COMPOSITE (SC) WALLS FOR OTHER THAN REACTOR VESSELS AND CONTAINMENTS (For New Regulatory Guide)

1. Introduction

This document presents the results of a regulatory analysis of the U.S. Nuclear Regulatory Commission's (NRC's) determination of whether to issue Draft Regulatory Guide (DG) 1304, "Safety-Related Steel Structures and Steel-Plate Composite (SC) Walls for other than Reactor Vessels and Containments." The analysis provides the public with an insight in how the NRC arrives at a decision.

2. Statement of the Problem

ANSI/ANS N690-2018, "Specification for Safety-Related Steel Structures for Nuclear Facilities" provides design approaches, characterization of loads and load combinations, materials and construction technologies including Steel-Plate Composite (SC) structures, which is a modular construction approach that has been adopted by new reactor designs as one of the major features for some of their structures. Former editions of this specification have been used by the NRC for staff guidance in NUREG-0800, "The Standard Review Plan for the Review of Safety Analysis Reports for Nuclear Power Plants: LWR Edition," (SRP). The SRP refers to ANSI/AISC N690-1994 including its Supplement 2 published in 2004. This is done in Section 3.8.3, "Concrete and Steel Internal Structures of Steel or Concrete Containments," and Section 3.8.4, Other Seismic Category I Structures. However, there are no exceptions or clarifications of the standard in the SRP and in some places this is needed. In addition, since issuance of ANSI/ANS N690-1994 and its 2004 Supplement 2, the standard has been revised several times leading to the current version namely ANSI/ANS N690-2018. It differs significantly from ANSI/ANS N690-1994 and the 2002 Supplement 2 to provide updated guidance applicable to the design, fabrication and erection of steel and composite structures. There is need to update and provide guidance in this area particularly with regard to clarifications and exceptions to the code.

To address updated methods and standards the NRC's guidance should be updated regularly to reflect current generally accepted professional standards, methods and procedures available for the design, fabrication, and erection of safety-related steel structures for nuclear facilities. Without the updated guidance, applicants would have to either: (i) use outdated methods and procedures for the design, fabrication, and erection of safety-related steel structures and SC walls for other than reactor vessels and containments, or (ii) propose and justify alternate methods to be reviewed on a case-specific basis.

3. Objective

The objective of this regulatory action is to assess the need to update the NRC guidance on the design, fabrication, and erection of safety-related steel structures and SC walls for other than reactor vessels and containments in nuclear power plants.

4. Identification and Analysis of Alternative Approaches

The NRC staff considered the following alternative approaches for providing NRC guidance on acceptable methods and procedures for the design, fabrication, and erection of safety-related steel structures and SC walls for other than reactor vessels and containments in nuclear power plants:

1. Do not issue a new Regulatory Guide (RG)
2. Issue a new RG

Alternative 1: Do not issue a new RG

Under this alternative, the NRC would not develop and issue a new RG. If NRC takes no action, there would be no cost to NRC in issuing developing and issuing a new guide. However, the “no-action” alternative would not provide an update to address the matters identified above. Applicants/Licensees requests would continue to be evaluated on a case-specific basis which potentially would result in a high number of requests from NRC to applicants/licensees for additional information (RAI). The requests would impose a burden on the NRC staff in preparing them, in reviewing them, and in determining a path forward following review. Applicants/Licensees would be burdened by the effort required to respond to such RAIs.

Alternative 2: Issue a new RG

Under this alternative, the NRC would develop and issue a new RG to endorse the current versions of the referenced codes/standards. NRC and applicants/licensees would benefit from new developments and technical advances addressed by the current versions of these codes/standards. While this alternative has a cost impact associated with preparing and issuing an updated RG, it provides for potential cost savings related to the reduction in additional staff resources and schedule impacts associated with the application review and RAI procedures.

5. Comparison of Alternatives

The two alternatives were compared against each other with respect to safety, as well as NRC’s and applicant/licensee’s resources.

With respect to safety, Alternative 1 does not signify unsafe results since applicants/licensees would adopt methods that would be evaluated by NRC staff on a case-specific basis to establish its reasonable assurance of safety finding. Alternative 2 would be superior to Alternative 1 in that it would issue a new Regulatory Guide (RG) to include, where appropriate, updated codes/standards maintaining and or potentially enhancing safety, improving clarity, and increasing uniformity in application reviews.

With respect to NRC resources, Alternative 2 represents the greatest initial cost to the NRC, which is attributable to the costs associated with preparing and issuing the RG. However, over the lifetime of the RG the overall NRC cost of Alternative 2 is estimated to be less than the overall cost of Alternative 1 by reducing the cost related to additional staff resources and schedule impacts associated with the application review and RAI procedures.

With respect to applicants/licensees' resources, Alternative 2 results in the least costs when compared to Alternative 1. Having a new RG should reduce the need for RAIs and therefore the need for applicants/licensees to perform additional analyses to address them. Accordingly, costs to applicants/licensees associated with these additional activities are estimated to be lower with Alternative 2.

6. Decision Rationale

Based on this regulatory analysis, the NRC staff concludes that issuing a new RG is the best alternative for providing NRC guidance on the design, fabrication, and erection of safety-related steel structures and SC walls for other than reactor vessels and containments in nuclear power plants. The proposed action would provide for increased regulatory stability as an updated guide is expected to reduce the need for RAIs and the need for applicants/licensees to perform additional analyses to address them. As a result, time and costs incurred by the NRC and by applicants/licensees, in applications related to the referenced subject, are expected to be reduced. In summary, the benefits of issuing this RG are estimated to be more than the benefits of not issuing a new RG.