

Part 71 Licensing Drawings and Welding

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Overview

- Introduction
- Problems that have been observed
- Discuss potential solutions
- Time frames for solutions
- Conclusion



Introduction

- Welding is used in every 10 CFR 71 application, yet RAIs are frequently written on welding issues.
- The overwhelming majority of RAIs are written as a result of inconsistencies between the SAR and the licensing drawings or incorrect references to welding codes.
- References which are not clear on the licensing drawings result in inspection findings during fabrication.

What problems?

References to an incorrect portion of a code of construction:

“Welding will be done in accordance with Section IX of the ASME Code.”

Vague references to a welding code:

“Welding will be done in accordance with the AWS Code.” Which Code?

“Welding will be done in accordance with the Section III, Division 1 of the ASME Code.” Which Subsection?

Contradictory references to welding codes:

The licensing drawings may prescribe that welds will be inspected with dye-penetrant, but Section 7 mentions a portion of the ASME Code which requires radiography. Which is correct? Both?

No exceptions to code of construction:

How do you radiograph joints that can't be radiographed?

What problems?

Incomplete references to a Code of Construction:

“Welding will be done in accordance with Section I, Division VIII of the ASME Code.” What inspection techniques will be used?

Not readily Accessible Codes:

“Welding will be done in accordance with the ISO Standards.” Does staff have immediate access to the codes for review? How does it compare with codes listed in staff guidance?

Multiple Codes:

- Welding will be done in accordance with AWS D1.6.
- Welding procedures and welders will be qualified to Section IX of the ASME Code.
- Inspection will be done in accordance with Section III, Division I Subsection NF (Class ?) of the ASME Code.
- Acceptance criteria?

Why is it confusing?

- NRC is formally updating guidance
- Guidance from industry?

Guidance Document	Publication Date
Standard Review Plan for Transportation Packages for Spent Nuclear Fuel (NUREG-1617)	March 2000
Standard Review Plan for Transportation Packages for Radioactive Material (NUREG-1609)	March 1999
Classification of Transportation Packaging and Dry Spent Fuel Storage System Components According to Importance to Safety (NUREG/CR-6407, INEL-95/0551)	February 1996
Engineering Drawings for 10 CFR Part 71 Package Approvals (NUREG/CR-5502)	May 1998

How do we solve this?

“Make things as simple as possible, but not simpler.”

- *Albert Einstein*

For each component on the licensing drawings specify:

- The material code associated with components
- The quality level of components
- The Code of Construction (if applicable) which covers qualification, welding, inspection, acceptance criteria, repair.
- Safety or non-safety related

Other thoughts:

- Cite a Code of Construction or welding code with exceptions on the drawings (or referenced from the drawings).
- Refer to the licensing drawings in the SAR. Don't reference codes twice or three times (avoids potential inconsistencies).
- Does the welding code address repair? Will the package be brought back into conformance with the licensing drawings?

How do we solve this?

1. All welding will be done in accordance with Section III, Division 1 of the ASME Code. Exceptions are listed in Section X.X.
2. Specifications for the Elastomer seal are described in Section X.X



ITEM	QTY	COMPONENT	MATERIAL	CODE	SAFETY CATAGORY
1	1	Containment Shell	ASTM 240-304	NB	A
2	4	Containment Bolts	ASTM 193-B8	NB	A
3	1	Containment Seal	Elastomer	-	A
4	2	Lifting Mounts	ASTM 240-304	NF Class 3	B
5	1	Label	Austenitic Stainless Steel	NITS	-

Incorporating Flexibility on the Licensing Drawings?

Minimum weld sizes shall be specified on the licensing drawings. Alternate weld configurations conforming to the applicable Subsection of the ASME Code may be used with the approval of the certificate of compliance holder, provided the stresses calculated for the alternate weld configurations are bounded by the allowable stresses defined in the safety analysis with safety factors equal to or greater than those used in the safety analysis.

[Note: This could only be applied to packages where the drop test was done by analysis]

Incorporating Flexibility on the Licensing Drawings?

Progressive NDE testing such as dye-penetrant testing or magnetic particle testing methods conforming to the applicable Subsection of the ASME Code may be substituted for volumetric examinations of welds where welding geometries prohibit volumetric testing techniques. The amount of material deposited per weld pass will be limited to the lesser of 3/8-inch or the critical flaw size, based on a flaw-size analysis in compliance with Section XI, Division III.

[Note: The flaw size analysis shall be a part of the SAR]

Time Frames for Solutions

- Formally updating guidance takes a time (1 – 2 years).
- Working through the RAI process to correct gaps in the regulatory guidance can be inefficient.
- Public meetings to discuss paths forward on generic technical issues can be relatively quick.

Conclusions

- The NRC is working on formally updating the guidance.
- Use accurate and simplified references to welding codes and list the exceptions. Is there industry interest in a standard list of exceptions?
- Possibilities for flexibility in the CoC conditions which meet Part 71 regulations and safety requirements may exist.
- Public meetings are one way of rapidly discussing and documenting potential paths forward.

Q&A

Welding to ASME Section III, Division I, Subsection NF (Class 3)



- The welder and welds are qualified.
- The inspector is qualified.
- The inspection methods are determined.
- The weld acceptance criteria is set.
- Repairs are described.