

GE Nuclear Energy

DRAFT

25A5580

SH NO. 1

REV. A

EIS IDENT: SHROUD STABILIZERS

REVISION STATUS SHEET

DOC TITLE SHROUD STABILIZERS

LEGEND OR DESCRIPTION OF GROUPS

TYPE: CODE DESIGN SPECIFICATION

FMF: PEACH BOTTOM 2 AND 3

MPL NO: PRODUCT SUMMARY SEC. 7

THIS ITEM IS OR CONTAINS A SAFETY RELATED ITEM YES ☒ NO ☐ EQUIP CLASS CODE P

THIS ITEM IS OR CONTAINS A SAFETY RELATED ITEM						REVISION		I	
A	RM-01386	SEP 12 1994							
					PRINTS TO				
MADE BY		APPROVALS			GENERAL ELECTRIC COMPANY				
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1. SCOPE

1.1 This document defines the ASME Code design requirements for the shroud repair for welds H1 through H7.

2. APPLICABLE DOCUMENTS

2.1 General Electric Documents. The following documents form a part of this specification to the extent specified herein.

2.1.1 Supporting Documents

- | | |
|--|----------------|
| a. Reactor Vessel - Power Rerate | 25A5341 Rev. 0 |
| b. Reactor Pressure Vessel, Purchase Specification | 21A1111 Rev. 9 |
| c. Reactor Vessel, Purchase Part | 886D499 P2 |

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| d. Reactor Thermal Cycles | 729E762 Rev. 0 |
| e. Nozzle Thermal Cycles | 135B9990 |

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| f. Vessel Flange Bolting | 885D911 Rev.2 |
| g. Nozzle End Preparation | 107C5305 Rev.2 |
| h. Standard Requirements For Core Structure | 21A3319 Rev.1 |

2.1.2 Supplemental Documents. Documents under the following identities are to be used with this specification:

- | | |
|--|---------|
| a. Shroud Stabilizer Hardware Design Specification | 25A5579 |
|--|---------|



2.2 Codes and Standards. The following documents of the specified issue form a part of this specification to the extent specified herein.

2.2.1 American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code

- a. Section III, 1965 Edition and Addenda through Winter 1965
- b. Section XI, 1980 Edition and Addenda through Winter 1981

2.2.2 Other Documents

- a. UFSAR, Peach Bottom 2 and 3
- b. Shroud Support VPF 1896-064-7
- c. Design Certification VPF 1896-142-1
- d. Design Stress Report VPF 1896-146-1
- e. Final Design Report VPF 1896-148-2

3. GENERAL DEFINITION

3.1 The purpose of the shroud stabilizers is to structurally replace all of the horizontal welds (H1 through H7) in the shroud. These welds were required to both horizontally and vertically support the core top guide, core support plate, and shroud head, and to prevent core bypass flow to the downcomer region. The core top guide and core support plate horizontally support the fuel assemblies and maintain the correct fuel channel spacing to permit control rod insertion, as well as having other structural functions.

3.2 All of the non ASME Code requirements for the shroud stabilizers are defined in the Document of Paragraph 2.1.2.a. The ASME Code requirements are defined herein.

4. REQUIREMENTS

4.1 The shroud stabilizer construction shall be performed in accordance with a Section XI Replacement Program per the requirements of Article IWA-7000. The core shroud was not supplied as a ASME Code component. However, Section XI requires In Service Inspection (ISI) of the Core Support Structures. The required Replacement Program is different than most Replacement Programs, because the stabilizers are not a direct replacement. Instead, the structural functions of the shroud horizontal welds are replaced by new components. Any defects found in the shroud horizontal welds are acceptable after the installation of the stabilizers.



4.2 The shroud stabilizers shall be constructed to the original Owners Requirements (document of Paragraph 2.1.1.h) for the shroud, as there was no Code of Construction.

4.3 The shroud stabilizers change the points of application of the forces applied to the reactor pressure vessel from the core shroud. These new forces shall be analyzed in accordance with the original Code of Construction (document in Paragraph 2.2.1.a).

4.4 The new forces and their points of application are defined in Figure 1, and in Table 1. The values given in Figure 1, and in Table 1 shall be combined with the forces defined in the Design Specification (documents of Paragraphs 2.1.1.a through 2.1.1.e).

4.5 The original purchase specification for the reactor pressure vessel (document of Paragraph 2.1.1.b) specified that the boundary of jurisdiction of Section III of the ASME Code (document of Paragraph 2.2.1.a) shall include all attachments to the pressure boundary parts, but does not include the components that are welded to the attachments. Thus, the jurisdiction of the original Code of Construction included all weld build up pads used to attach internal components to the reactor pressure vessel, but did not include the shroud support within the boundary of Code jurisdiction. The boundary of ASME Code jurisdiction is shown in Figure 2. The document of Paragraph 2.2.1.a shall be used as a guide for the analysis of the shroud support.

4.6 The analysis required by this Design Specification shall be Certified.

5.0 PROFESSIONAL ENGINEER CERTIFICATION

To the best of my knowledge and belief, this Design Specification satisfies the requirements of the ASME Boiler and Pressure Vessel Code 1965 Edition with Addenda through Winter 1965.

Signature: _____

Date: _____

License Number: _____

State: _____



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ADDITIONAL DESIGN MECHANICAL LOADS

<u>Force</u>	<u>DBE + Normal Pressure</u>	<u>MCE + LOCA</u>
F ₁	33,400 lbs	89,600 lbs
F ₂	16,800 lbs	31,200 lbs
F ₃	168,600 lbs	448,770 lbs

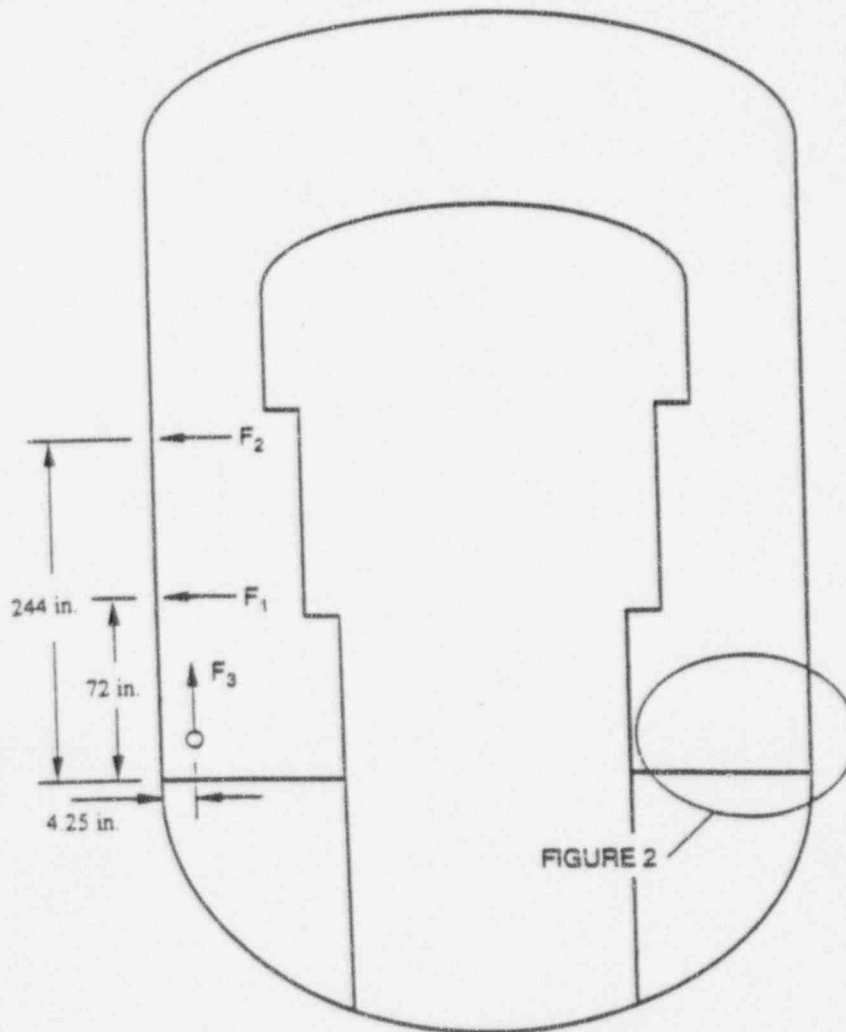
F₁, F₂, and F₃ are discrete loads applied over a small area. At any one point in time, F₁ and F₂ are each applied to one location. At any one point in time, F₃ is applied to 4 locations 90° apart for the installation of four shroud stabilizer assemblies. DBE is a Design Basis Earthquake (OBE). MCE is a Maximum Credible Earthquake (SSE).

The stress intensities shall meet the stress allowables of the ASME Code, Section III, for the load combinations defined by the Peach Bottom UFSAR. The original Code of Construction did not include Faulted load combinations. Faulted load combinations shall meet the stress allowables as defined by the Peach Bottom UFSAR for the reactor pressure vessel.

TABLE 1



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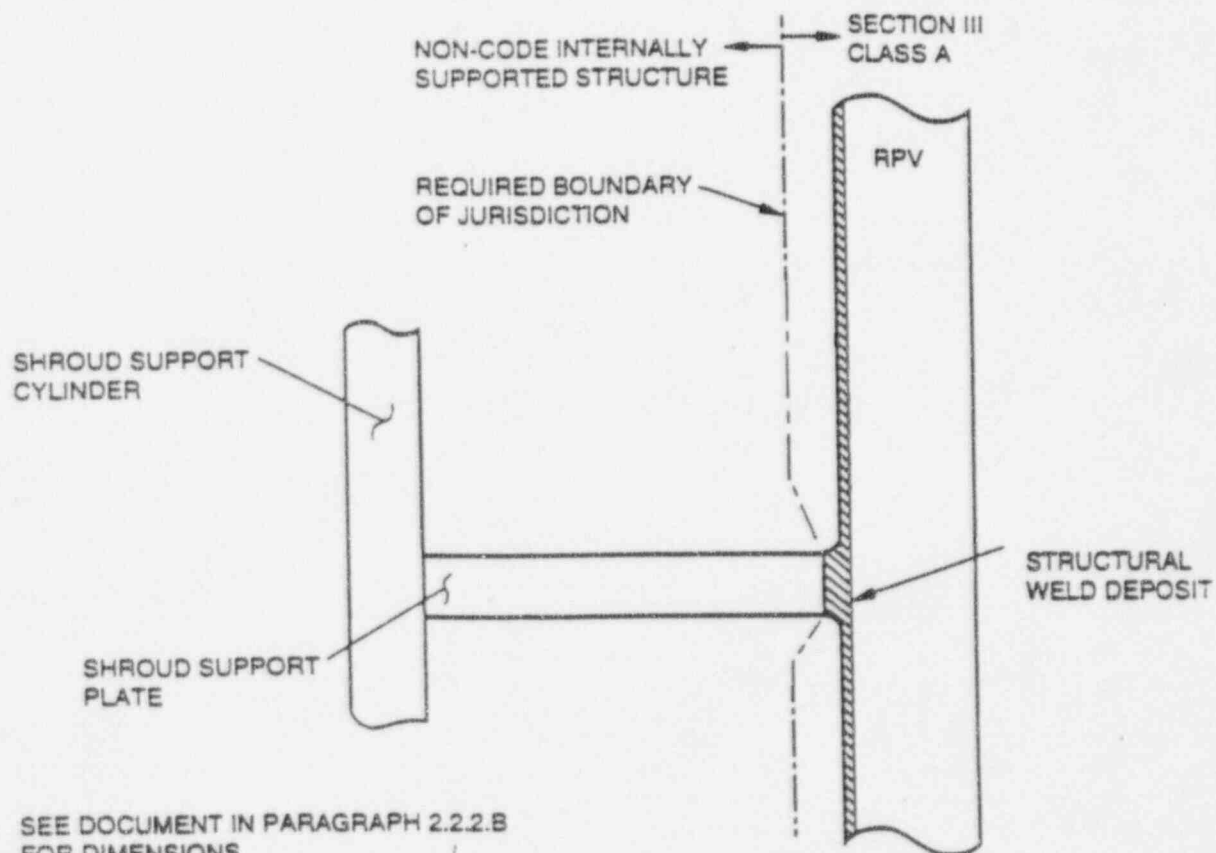


APPLICATION OF DESIGN MECHANICAL LOADS

FIGURE 1



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BOUNDARY OF ASME CODE JURISDICTION

FIGURE 2