Department of Energy
Washington, D.C. 20545
Docket No. 50-537
HQ:S:83:226

FEB 28 1983

Dr. J. Nelson Grace, Director
CRBR Program Office
Office of Nuclear Reactor Regulation
U.S. Nuclear Regulatory Commission
Washington, D.C. 20555

Dear Dr. Grace:

ADDITIONAL INFORMATION ON THE CLINCH RIVER BREEDER REACTOR PLANT (CRBRP) NON-DESTRUCTIVE EXAMINATION (NDE) PROCEDURE

Enclosed are two Preliminary Safety Analysis Report (PSAR) change pages concerning CRBRP inservice inspection that will be included in the next amendment to the PSAR. In addition to the PSAR change pages, some additional information is enclosed. This information was identified in discussions with the staff during the week of February 14, 1983.

As a result of the discussions referenced above, we believe that our preservice/inservice plans are largely consistent with the staff's position with the exception of NDE requirements for vessel welds. The PSAR change pages and the additional information enclosed clarify the design and provide your staff with the necessary information relative to the piping insulation and the NDE requirements for cell liners and fire supression decks. In addition, the NDE requirements for the reactor containment systems, specifically, the NDE and testing requirements on the steel containment system, are contained in PSAR Section 3.8.2.2, "Applicable Codes, Standards, and Specifications." These requirements are consistent with the light water reactor industry.

In early March we intend to submit documentation demonstrating that additional fabrication/preservice NDE of the vessels in the heat transport systems is not necessary. I hope we can reach a common understanding of the need for and impacts of additional vessel NDE and thus resolve the major issues identified by the staff in their Safety Evaluation Report review.

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Any questions regarding this matter should be addressed to Mr. R. Spear (FTS 626-6154) or Mr. D. Robinson (FTS 626-6098) of the Project Office Oak Ridge staff.

Sincerely,

John R. Longenecker

John R. Longenecker
Acting Director, Office of
Breeder Demonstration Projects
Office of Nuclear Energy

Enclosure

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d. A minimum of 10% of the total length of all liner seam welds will be examined ultrasonically in accordance with Article 5, "Ultrasonic Examination", of the ASME BPVC Section V. Welds examined will be located on the floor or on walls below the potential sodium pool level to the maximum extent possible.

5.0 NONDESTRUCTIVE EXAMINATION REQUIREMENTS

5.1 Cell Liners (except fuel handling cell)

5.1.1 Examination of Plate Seam Welds. Cell liner plate seam welds will be full penetration and will be examined in accordance with Article CC-5500 of ASME BPVC, Section III, Division 2. Acceptance standards for welds will be in accordance with Subarticle CC-5540 of ASME BPVC, Section III, Division 2.

Radiography is a code requirement when the plate welds are accessible, however if this is not feasible due to the method of construction, the following methods of examination will be used:

a) The entire length of all liner welds will be examined visually prior to placing the cell into service.

b) The entire length of all liner seam welds will be examined by the vacuum-box method using either a bubble solution or gas detector technique.

c) The entire length of all liner welds, except for welds examined by method d below, will be examined by liquid penetrant or magnetic particle method.

e) The entire length of all attachment welds will be examined by either the magnetic particle or liquid penetrant method.

Where radiographic examination is required, double film (two separate films in the same cassette) radiographic examination procedures will be utilized with the film properly exposed and developed for single film viewing.

5.1.2 Ultrasonic Examination of Plate. Pre-selected areas in the cell liner floor and wall plates below the postulated pool depth in three Reactor Containment Building and three Reactor Service Building cells will be examined ultrasonically in accordance with Article 5, "Ultrasonic Examination" of ASME BPVC, Section V, to determine the reference plate thickness to be used in the monitoring of cell liner plate corrosion. Areas to be selected in the test cells will include:

a) Four (4) locations on the floor near the corners of the cell.

b) One (1) location on the wall below the sodium pool level.

5.1.3 Inspection of Stud Welds. Studs will be visually inspected. Acceptance standards for all stud welds will be in accordance with Subarticle CC-5548 of ASME BPVC, Section III, Division 2. In addition to the above, if a visual inspection reveals any stud shear connector that does not show a full 360 degree leg weld flash, any stud that has been repaired by welding, or any stud in which the reduction in length due to welding is less than normal, such stud will be struck with a hammer and bent to an angle of 15 degrees from its original axis. For studs showing less than a 360 degree weld flash, the direction of bending will be opposite to the missing weld flash. Studs that crack in the weld, the base metal, or the shank under inspection or subsequent straightening will be removed and replaced.

d) A minimum of 10% of the total length of all liner seam welds will be examined ultrasonically in accordance with Article 5, "Ultrasonic Examination", of the ASME BPVC Section V.

A certificate of welder or welding operator performance qualification test shall contain the information as detailed in Form QW484 of ASME Section IX, and be available for Purchaser review if desired.

All welding repairs shall be made in accordance with a written welding procedure.

4.3 STORAGE, CONDITIONING AND HANDLING OF WELDING MATERIALS

4.3.1 Filler materials shall be stored, conditioned and handled in accordance with the appendices of ASME Code - Section II, Part C which are mandatory parts of this specification.

5.0 NON-DESTRUCTIVE EXAMINATION REQUIREMENTS

5.1 Plate The catch pan plate seam welds shall be full penetration and will be examined in accordance with Article CC5500 of the ASME BPVC, Section III, Division 2 requirements. Acceptance standards for welds shall be in accordance with subarticle CC-5540.

The entire length of catch pan plate seam welds shall be examined visually prior to performing any other examination.

Where plate weld joints are made without the use of back up bars, and the weld is accessible, radiography shall be used. Where plate joints are made with the aid of backup bars or if it is not feasible to radiograph the welds, due to the method of construction, the following methods of examination shall be used:

a. The entire length of catch pan plate seam welds shall be examined by the vacuum box method using either a bubble solution or gas detector technique, and , except for welds examined by method d,

b. The entire length of catch pan plate seam welds shall be examined by the magnetic particle method.

c. The entire length of all attachment welds shall be examined by the magnetic particle method.

d. Where radiographic examination is required, the builder shall use double film (two separate films in the same cassette) radiographic examination procedures with the film properly exposed and developed for single film viewing.

5.2 Ultrasonic Examination

Pre-selected areas in the catch pan floor and wall plates below the postulated pool depth in two SGB and one RSB cell shall be examined ultrasonically in accordance with Article 5, "Ultrasonic Examination" of the ASME Code, Section V, to determine the reference plate thickness to be used in the monitoring of the catch pan plate corrosion. Areas to be selected in the test cells include:

NSSS Thermal Insulation Removability for PHTS and IHTS Piping for Inservice Inspection

I. Introduction

There are two (2) insulation removability concepts utilized for inservice inspection (ISI) of PHTS and IHTS pipe welds. These same two designs also apply to all NSSS Na containing piping and components. The designs differ for ALARA and economic considerations. For components in high radiation zones, the design allows for rapid removal of the insulation and attached components (trace heating and leak detection components). For components in low radiation zones, the removal and replacement of the insulation and attached components is more time consuming.

Both designs utilize structural and insulating materials that are compatible to the component or pipe materials that they contact and are also compatible with Na (i.e., the materials neither react with Na or support combination).

II. Description of NSSS Thermal Insulation Used in Low Radiation Zones

The insulating material used throughout the NSSS is a refractory fiber (alumina silica) in blanket form. The material will be Cerrawool Blanket. A small amount of MIN-K is also utilized where space envelope and allowable heat loss to the cell prohibits the use of Cerrawool Blanket. The structural materials used are all 304 or 316 stainless steel.

An annulus is formed between the pipe/component and the insulation by the use of "stainless steel standoffs" and sheet stainless steel. The purpose of the annulus is to allow formation of an aerosol, in case of a Na leak, in order that the Na leak detection system may detect the leak and also to house and protect the trace heating system trace heaters and instrumentation. The inner insulation sheath that forms the annulus is held in place by stainless steel banding straps.

Cerrawool Blanket insulation is then layered over the inner sheath and retained by stainless steel tie-wire. The insulation then is encapsulated by covering it with a stainless steel outer sheath held in place by banding straps.

Removal of the insulation for ISI purposes consists of:

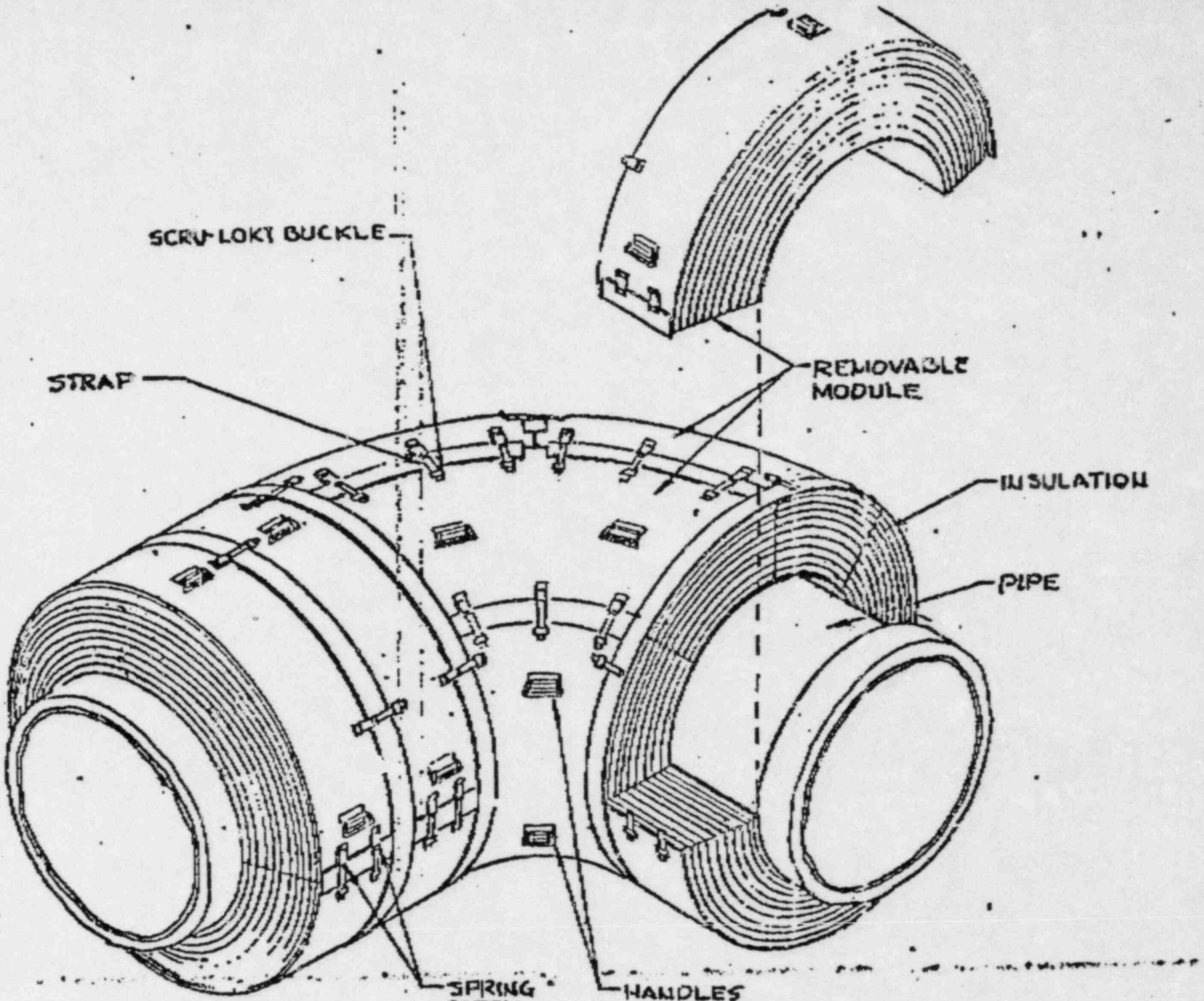
1. Remove outer sheath banding straps
2. Remove outer sheath
3. Remove insulation tie-wires
4. Remove insulation
5. Remove inner sheath banding straps
6. Remove inner sheath
7. Perform inspection

III. Description of NSSS Thermal Insulation Used in High Radiation Zones

For those portions of components and piping that do not require ISI, the design is identical to that described in Section II above. For selected areas that may require ISI, the insulation is in modular sections with each module retained by quick-release mechanisms and outer banding straps with quick releasing mechanisms where required for seismic loads. The materials used are the same as defined in Section II.

Removal of this insulation for ISI purposes is as follows:

1. Release insulation quick-release mechanisms
2. Remove module/modules
3. Pefform inspection



CROSS OVER REMOVABLE MODULES