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SUBJECT: Forwards core shroud & shroud support repair assemblies reinspection plan for RFO15,including insp methods to be used & provisions for sample expansion,re GL 94-03, "Intergranular Stress Corrosion Cracking of Core...."

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December 30, 1998
NMP1L 1398

U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Washington, DC 20555

RE: Nine Mile Point Unit 1
Docket No. 50-220
DPR-63

Subject: ***Generic Letter 94-03, "Intergranular Stress Corrosion Cracking of Core Shrouds in Boiling Water Reactors"***

Gentlemen:

By letter dated May 8, 1997, the Staff issued a Safety Evaluation Report (SER) regarding the results of the inspections of the Nine Mile Point Unit 1 (NMP1) core shroud and core shroud repair assemblies performed during Refueling Outage No. 14 (RFO14). As delineated in the SER, Niagara Mohawk Power Corporation committed to submit to the Staff, reinspection plans at least three (3) months before the next scheduled outage. Additionally, as stated in the SER, the Staff requested the reinspection plan to include details regarding the inspection of the shroud repair components; the shroud repair anchorages; and the shroud's horizontal, vertical, and ring segment welds. The Staff also requested the reinspection plan to specify the inspection methods to be used, including the provisions for sample expansion.

The attachment to this letter contains the core shroud and shroud support repair assemblies reinspection plan for RFO15, including the inspection methods to be used and the provisions for sample expansion. RFO15 is scheduled to begin in April 1999.

Very truly yours,

Richard B. Abbott

Richard B. Abbott
Vice President Nuclear Engineering

RBA/IAA/kap
Attachment

xc: Mr. H. J. Miller, NRC Regional Administrator
Mr. S. S. Bajwa, Director, Project Directorate I-1, NRR
Mr. G. K. Hunegs, Senior Resident Inspector
Mr. D. S. Hood, Senior Project Manager, NRR
Records Management

ATTACHMENT

NINE MILE POINT NUCLEAR STATION UNIT 1
CORE SHROUD, CORE SHROUD REPAIR ASSEMBLIES & CORE SHROUD SUPPORT WELDS AUGMENTED INSERVICE INSPECTION (ISI)

The core shroud and its repair assemblies are classified as ASME Code Class B-N-2 components (core structural support). Thus, the reinspection plans, when approved by the NRC, will be incorporated into the ASME Section XI, Inservice Inspection (ISI) Program. The augmented inspections are described below.

GENERAL REQUIREMENTS:

The inspection scope will meet or exceed the inspection scope recommended for a repaired shroud in BWRVIP-07, "BWR Vessel and Internals Project Guidelines for Reinspection of BWR Core Shrouds." All examinations will be performed in accordance with the requirements set forth in BWRVIP-03, "Reactor Pressure Vessel and Examination Guidelines."

SHROUD VERTICAL WELDS:

A 100% inspection of all accessible portions of all of the shroud vertical welds will be performed by ultrasonic testing (UT) methods or a combination of UT and enhanced visual techniques (EVT-1). The vertical welds are designated as V3, V4, V7, V8, V9, V10, V11, V12, V15, and V16 as shown in Figure 1 (attached). The planned coverage is expected to duplicate and/or exceed that coverage obtained during Refueling Outage No. 14 (RFO14).

Provided the inspection results are bounded by the existing Nine Mile Point Unit 1 (NMP1) structural analysis following the planned inspection, no vertical weld repairs will be installed and the scope of the next inspection will be defined at least three (3) months prior to RFO16.

SHROUD HORIZONTAL CIRCUMFERENTIAL WELDS:

The horizontal circumferential shroud welds are structurally replaced by the shroud repair assemblies, and therefore, do not require inspection per BWRVIP-07.

SHROUD RING SEGMENT WELDS:

The following background information is provided regarding previous inspections and analyses performed for the ring segment welds. By letter dated February 7, 1997, Niagara Mohawk Power Corporation (NMPC) submitted General Electric Report GENE-B13-01805-116, Revision 0, entitled, "Effect of Radial Cracks in the Ring Segment Welds." This analysis report evaluated the effect of cracks in the ring segment welds and provided the minimum required ligaments needed to maintain the shroud stiffness. The NRC Staff previously reviewed this report and the previous inspections as discussed in two NRC Safety Evaluations (SEs). Refer to Section 2.2 of NRC SE dated March 3, 1997, entitled "Core Shroud

Reinspection Plans for RFO-14, Nine Mile Point Nuclear Station, Unit No. 1, (TAC No. M97917)" and Section 3.3/4.2.3 of NRC SE dated May 8, 1997, entitled "Modifications to Core Shroud Stabilizer Lower Wedge Retaining Clip and Evaluation of Shroud Vertical Weld Cracking, Nine Mile Point Nuclear Station Unit 1 (TAC No. M98170)."

During RFO15, a UT of the following ring segment welds will be performed:

- V1 & V2 in the upper shroud ring
- V5 & V6 in the shroud top guide ring
- V13 & V14 in the shroud core plate ring

The UT tooling will be capable of interrogating the rings for flaws while searching for the ring segment welds. In the event the ring segment welds cannot be located, a UT inspection of an amount of ring circumference determined to be sufficient to verify effectiveness of the shroud horizontal weld repair will be performed. This approach is consistent with current BWRVIP recommendations for radial ring welds that cannot be located. If flaws are detected, the above referenced finite analyses will be used to disposition the flaws.

SHROUD REPAIR ASSEMBLIES (TIE ROD ASSEMBLIES):

The tie rod inspections will include a combination of VT-3, EVT-1 and tie rod nut torquing to confirm the structural integrity and tightness of the assemblies. Figures 2, 2a, and 2b (attached) provide an illustration of the tie rod assemblies. Prior to performing the VT-3 and EVT-1 inspections and the torque procedure described below, a visual inspection of both sides of each of the four entire tie rod assemblies will be performed and recorded. This inspection is intended to be an overall visual scan from a distance back far enough from the tie rods to look for any obvious anomalies and to confirm proper arrangement of the assemblies.

VT-3 Examinations:

A VT-3 examination of each of the four entire tie rod assemblies will be performed. The VT-3 will verify that all tie rod assembly components remain in the as-installed condition by comparing the examination of each specific area listed below to the RFO14 examination results. The VT-3 examination will include the specific areas described below:

- Verify there is no presence of loose parts, debris, or abnormal corrosion products, wear, and erosion/corrosion on the stabilizer assemblies.
- Verify there is no sign of fretting at the stabilizer to Reactor Pressure Vessel (RPV) wall contact points.
- Verify the upper support remains in its installed position on the shroud ledge and steam dam.

- Verify the upper contact and upper wedge on the upper spring remain in contact with the RPV wall.
- Verify the lower spring contact and lower wedge on the lower spring remain in contact with the RPV and shroud walls.
- Verify the mid-support left and right foot remain in contact with the RPV wall.
- Verify the clevis pin remains seated in the lower support hook.
- Verify the upper spring remains seated and captured in the upper support.
- Verify the core plate spacer assemblies located inside the shroud remain in position as installed.
- Verify all retainer devices have remained in position.
- Verify the integrity of the crimp nuts on the lower support toggle bolts.
- Verify the lower support assembly remains in its installed position on the shroud support skirt.
- Verify the lower spring spacer (commonly referred to as the contact extension) remains in its installed position such that, it is seated and fully locked on the lower spring contact.
- Verify that the interface line of contact between the lower wedge and the bottom of the lower spring remains the same as the as-left interface during RFO14.

EVT-1 Examinations:

In addition to the VT-3 inspections described above, an EVT-1 inspection of the following areas on/at each of the four tie rod assemblies will be performed:

- Latches on upper support spring to upper support
- Latch on mid support to tie rod
- Latch on lower wedge to lower spring
- Top support
- Tie rod assembly anchorage consisting of the top surface of the support skirt around the edge of the lower support pedestal and the top surface of the H9 weld adjacent to the lower support assembly.

Tie Rod Assembly Tightness Inspections:

The tightness of the tie rod assemblies will be verified, as follows, with the visual examinations being performed prior to implementing the tie rod torque procedure described below:

- Verify the bottom horizontal surface of the tie rod nut is in contact with the top horizontal surface of the upper support. The area under the nut was proven to be difficult to inspect visually during RFO14 due to camera access restraints. A best effort examination only is needed to look for any gross anomalies as the tie rod nut torque procedure will provide a positive method to ensure that no gap is left under the nut.

- Verify there are no gaps between the clevis pin and hook as compared to the RFO14 examination. Each side of the clevis pin must be in contact with its respective hook in the lower support assembly.

- Verify the crimps are maintained on the lower support crimp nuts.

- If no evidence of gaps in the tie rod assemblies is identified by the visual inspections, then the tie rod nut will be retorqued to the original installation torque. Torquing the tie rod nuts will eliminate sole dependence on the visual examination to ensure that there is no gap left under the nut. In the event that some mechanical settling has occurred such that gaps are identified by the visual examinations, an evaluation will be performed, and corrective measures will be implemented as required.

PROVISIONS FOR SAMPLE EXPANSION:

The Staff also requested that the reinspection plans specify provisions for sample expansion. As described above, it is NMPC's plan to inspect essentially 100% of all the accessible vertical and ring segment welds and to inspect and check preload on all four tie rod assemblies. Therefore, no further provisions for sample expansion are specified at this time.

SHROUD SUPPORT WELD H8:

The H8 weld was inspected during RFO13 in 1995 and during RFO14 in 1997 using a combination of EVT-1 and UT techniques. One UT indication identified in 1995 was reinspected in 1997 and no growth was evident. Five small indications identified in 1995 by EVT-1 were reinspected in 1997 and no growth was evident. One other indication was identified in 1997 by EVT-1 in an area that was not previously examined by EVT-1 in 1995. Both the 1995 and 1997 inspections showed no structurally significant cracking of the H8 weld.

General Electric report GE-NE-523-B13-01805-83, Revision 2, "H8 Shroud Reinspection Analysis for NMP1" was previously submitted to the NRC Staff in February 1997. The analyses provided the basis for a 6 year H8 weld UT inspection interval. The NRC concurred that a UT inspection of the H8 weld during the Spring 1997 RFO14 was not required as discussed in the NRC's SE dated March 3, 1997, "Core Shroud Reinspection Plans for RFO14, NMP Nuclear Station Unit No. 1, (TAC No. M97917)."

NMPC has applied the BWRVIP-07 NRC recommended (n/2 +1) formula to the above referenced analyses. As a result, the maximum inspection interval for UT of the H8 weld is defined as two 24-month fuel cycles. NMPC elected to reinspect the H8 weld during RFO14 (1997) using UT in addition to the planned EVT-1 inspection as indicated by the inspection results discussed above. Therefore, the Spring 1999 RFO15 inspection of the H8 weld does not require a UT. The next required H8 UT inspection based on a two fuel cycle interval will be during RFO16 (year 2001). The indications identified by EVT-1 during the previous two refueling outages will be reinspected by EVT-1 during RFO15.

SHROUD SUPPORT WELD H9:

An EVT-1 of the H9 weld from the annulus is planned for RFO15, consistent with the inspection recommendations in BWRVIP-38, "BWR Shroud Support Inspection and Flaw Evaluation Guidelines."

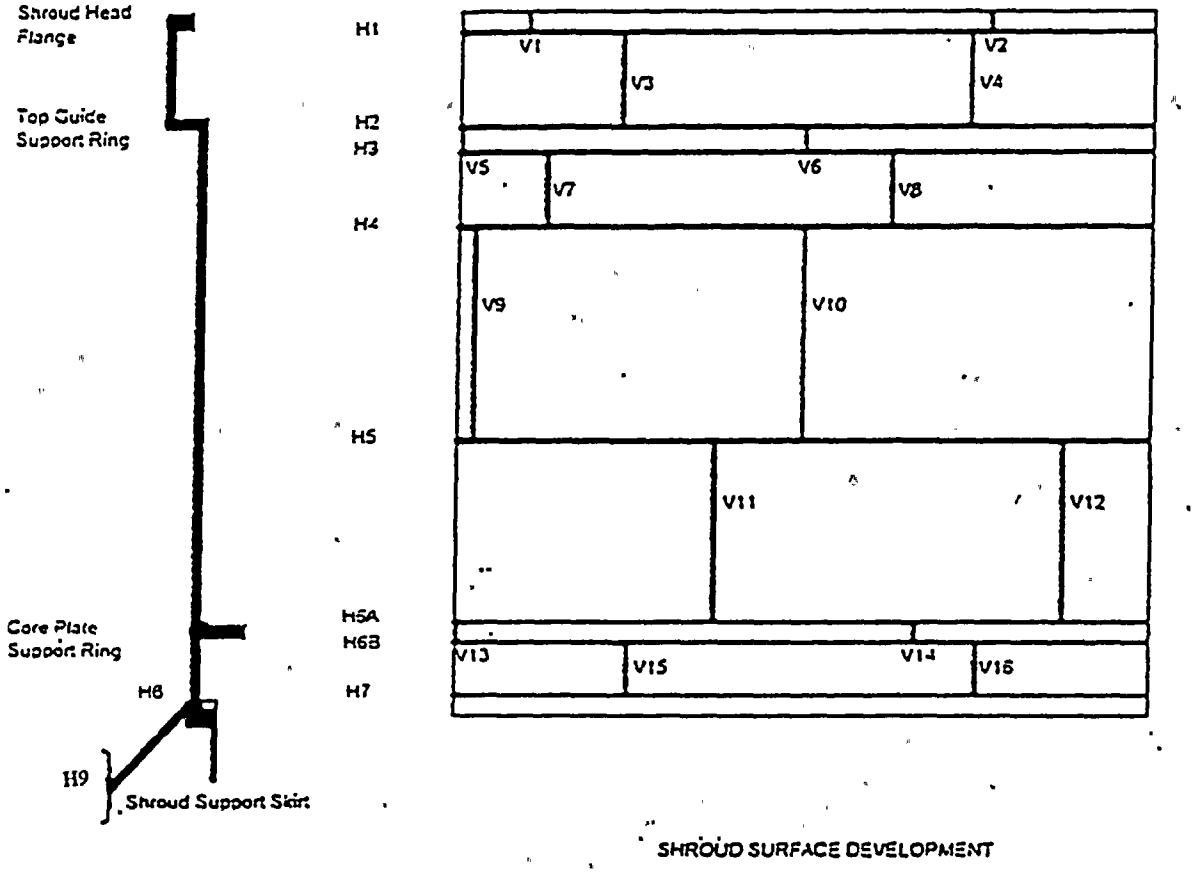


Figure 1. Nine Mile Point Unit 1 Shroud Configuration

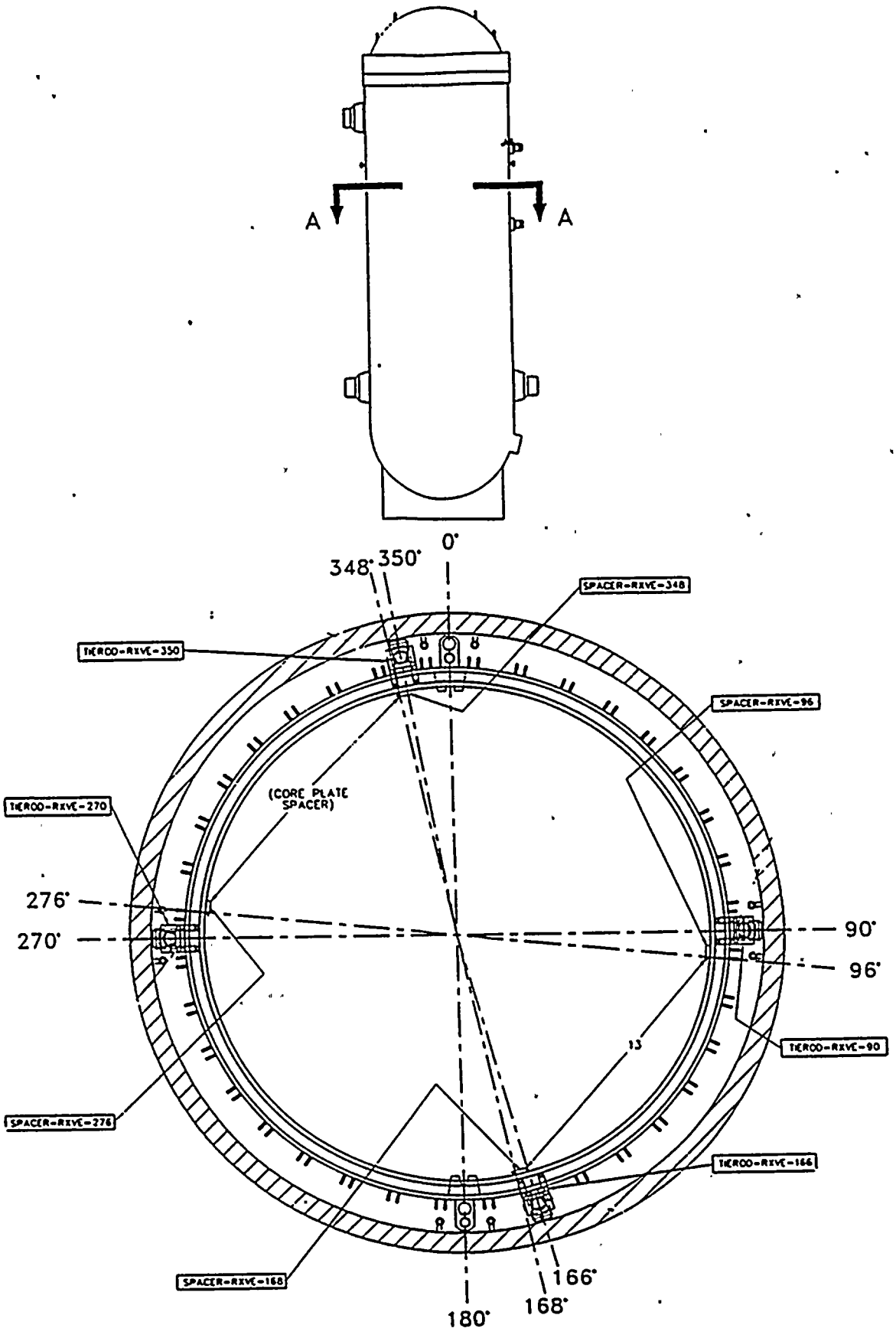
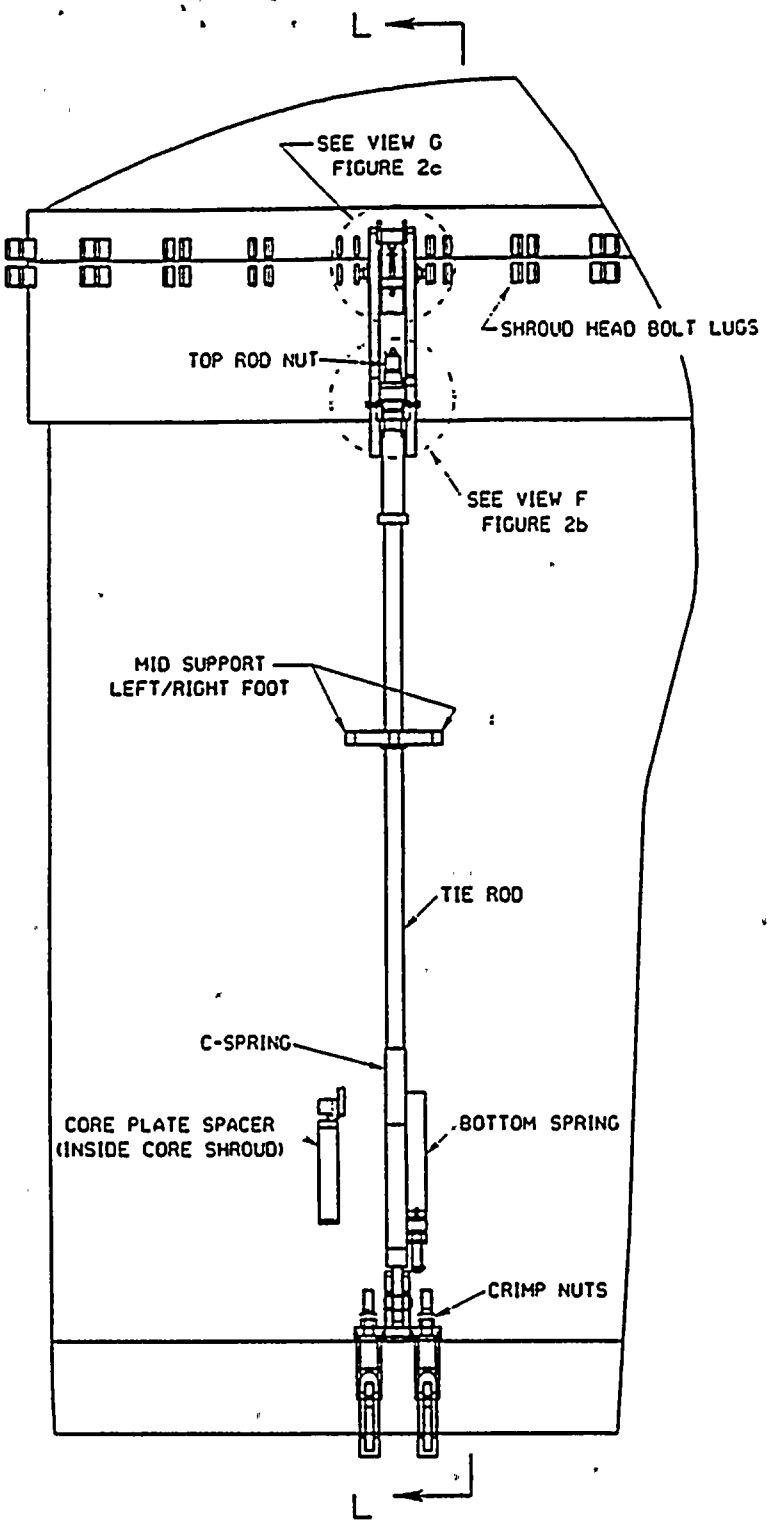


Figure 2: Tie Rod & Core Plate Spacer Locations

CORE SHROUD STABILIZERS



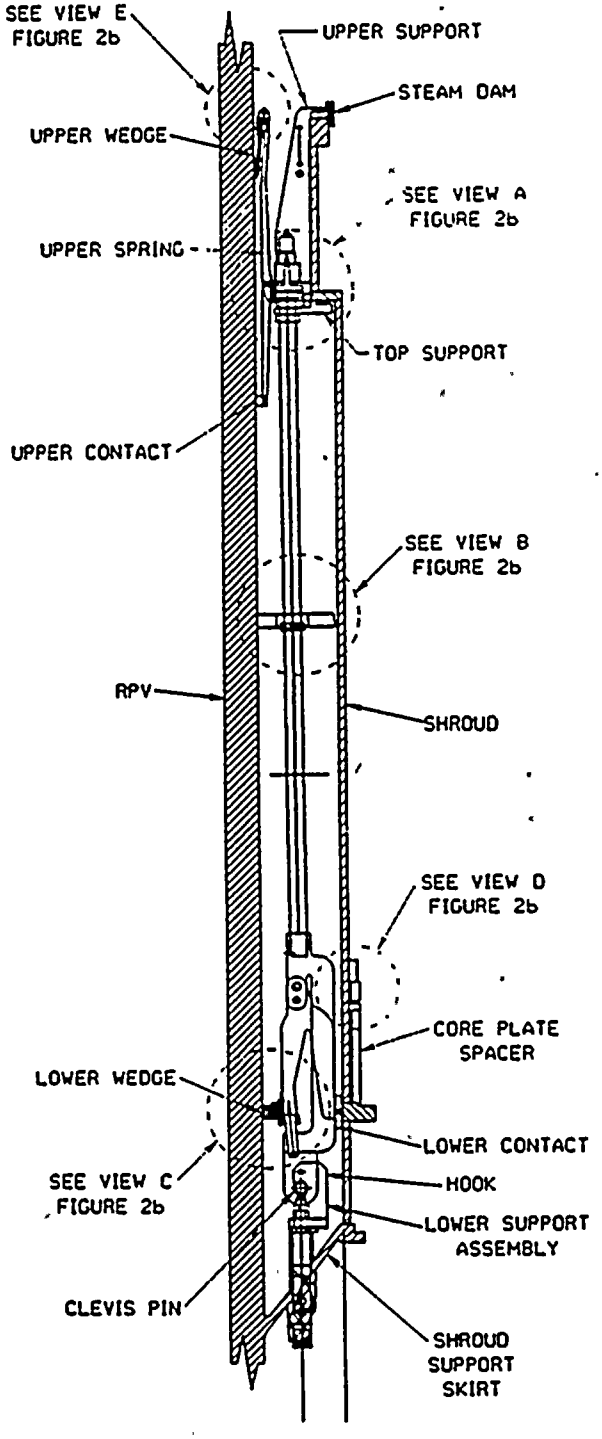


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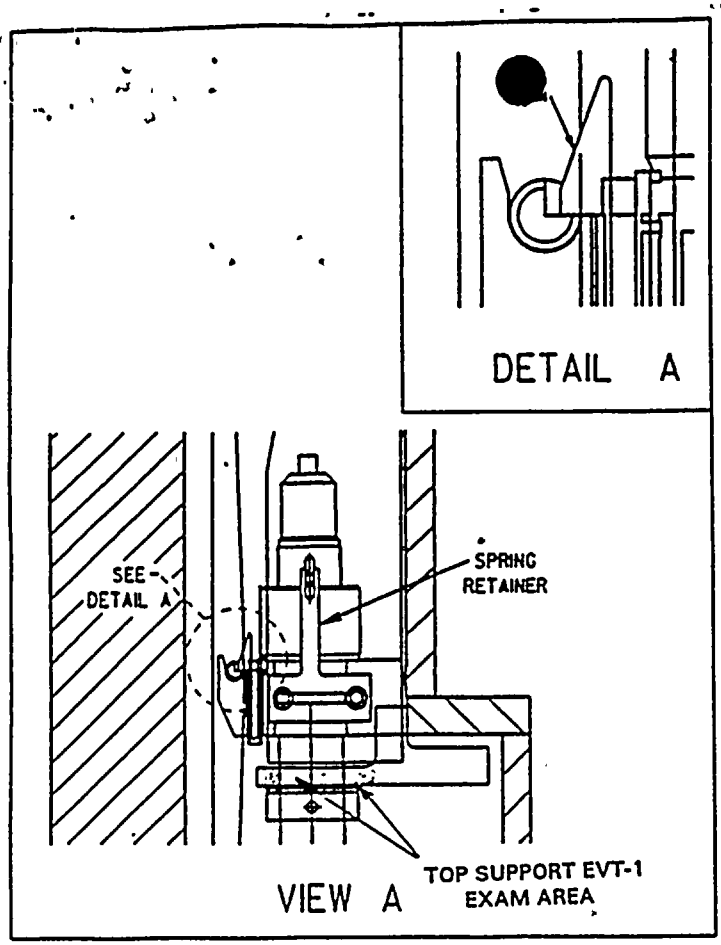
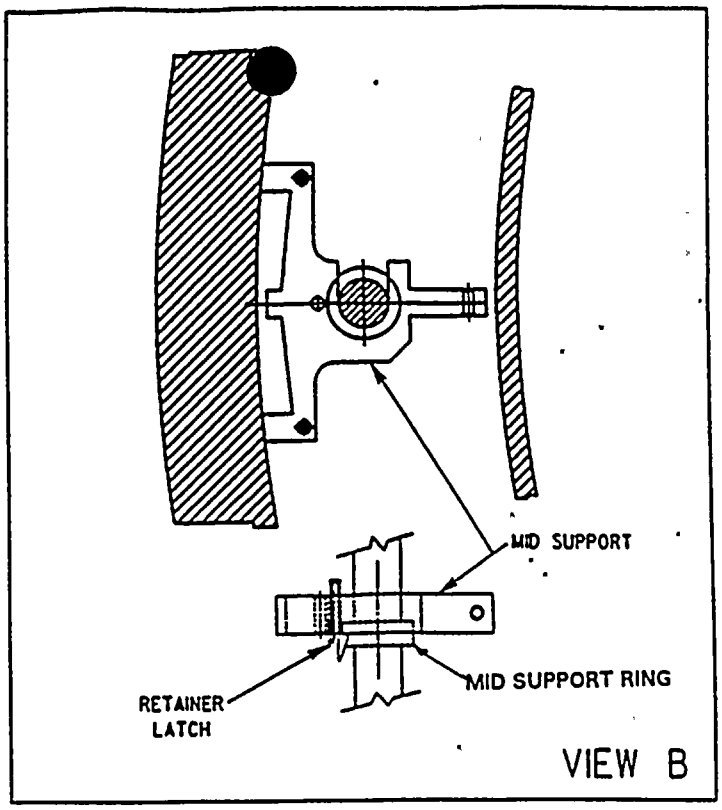
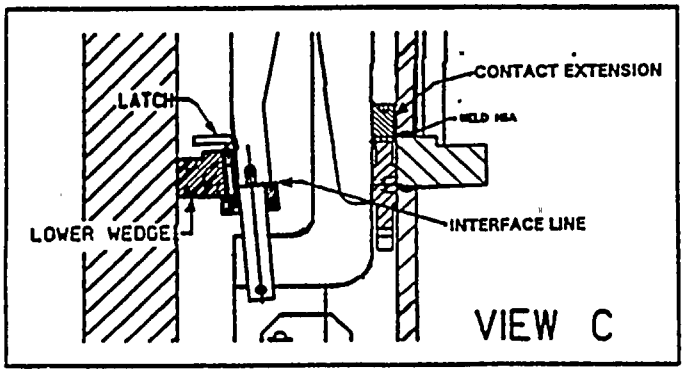
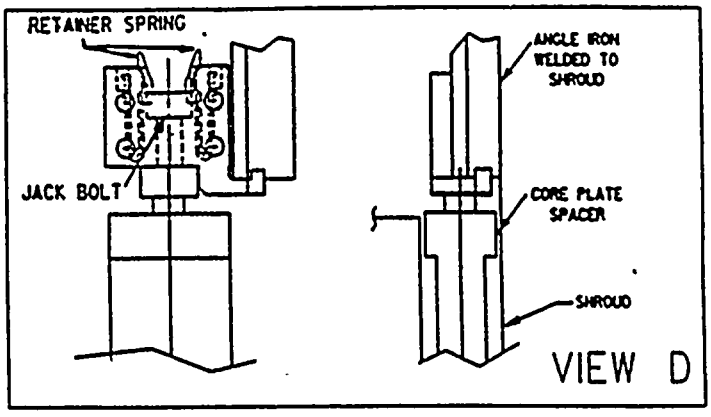
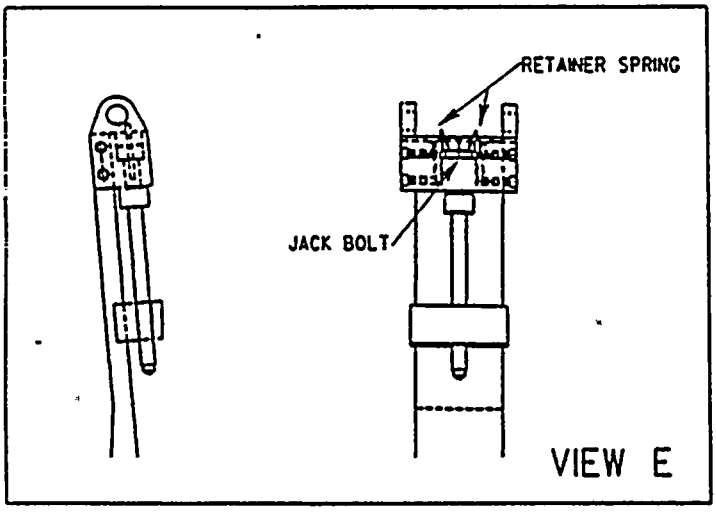
FIGURE 2a

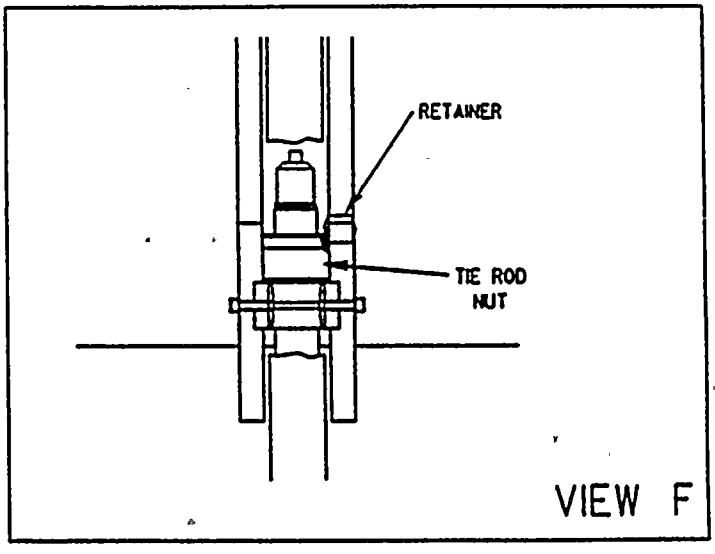












TIE ROD ASSEMBLY RETAINERS

FIGURE 2b