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CRANE NUCLEAR, INC. 860 REMINGTON BOULEVARD BOLINGBROOK, IL. 60440

Date: September 30, 2015

**Attn: Edward H. Roach, Chief
Mechanical Vendor Inspection Branch
Division of Construction Inspection
and Operational Programs
Office of New Reactors**

Subject: 10CFR21 Investigation Summary and Deliverables
Pressure Retaining Rings Used in Pressure Seal Valves

Dear Sir:

Crane Nuclear, Inc. has completed all actions associated with the 10CFR part 21 Interim Report dated August 10th, 2015 investigation into ASME Boiler and Pressure Vessel Section III Code design Pressure Seal Valve orders for retaining rings. The information required for this notification is provided below:

(i) Name and address of the individual or individuals informing the Commission.

Jason Klein
Engineering Manager

Rosalie Nava
Director Safety and Quality

Crane Nuclear
860 Remington Blvd
Bolingbrook, IL 60440

(ii) Identification of the basic component supplied for such facility or such activity within the United States which may fail to comply or contains a potential defect

Pressure Seal Valve orders may potentially have misclassified material and non-destructive examination requirements for retaining ring designs.

(iii) Identification of the firm supplying the basic component which fails to comply or contains a defect.

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(iv) Nature of the defect or failure to comply and the safety hazard which is created or could be created by such defect or failure to comply.

Crane Nuclear uses a parts classification procedure (03-107) to ensure that appropriate requirements are specified when processing valve and valve part orders. The procedure is based on the ASME



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Code Case N-62 which is currently part of the 2015 Edition of the ASME Boiler and Pressure Vessel Section III Code, non-Mandatory Appendix HH.

A threaded retaining ring requires the material to be purchased Safety Related, ASME B&PV Section II, Part D materials, and required NDE (reference Category 3 valve items per N-62). Retaining rings may have been processed to material requirements resulting in the incorrect material specification and non-destructive examination specified.

(v) The date on which the information of such defect or failure to comply was obtained.

July 21, 2015.

(vi) In the case of a basic component which contains a defect or fails to comply, the number and location of these components in use at, supplied for, being supplied for, or may be supplied for, manufactured, or being manufactured for one or more facilities or activities subject to the regulations in this part.

Data in the CNI engineering database search was conducted for orders from 1992 to present and was filtered by pressure seal valve types with a description field filtered for valves and ASME Section III design. The assembly drawings in the population were reviewed to determine if the retaining ring had the correct pressure retaining material designation.

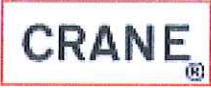
CNI identified a total of 112 orders that required review during this search. Of these orders, one order was supplied with non-compliant retaining ring material for the valve assemblies. The order is as follows:

1. CNI SO# 32634-01, Dominion, Millstone, P.O. 45572185 – Quantity shipped = 1, Walworth, 18", Fig 5247PSB, Class 900, ASME Class 3, 1974 Ed.

The search was extended to investigate all orders from Crane, Walworth, Chapman, and Aloyco designs not within the 1992 databases. The search consisted of manually retrieving 2511 order files and reviewing the order content for pressure seal valves or components. Each order was reviewed against original OEM requirements and order requirements. Possible categorization by one of the following:

Processed consistent with retaining ring requirements
Processed not meeting retaining requirements

The following chart in Figure 1 shows the decision tree for the investigation.



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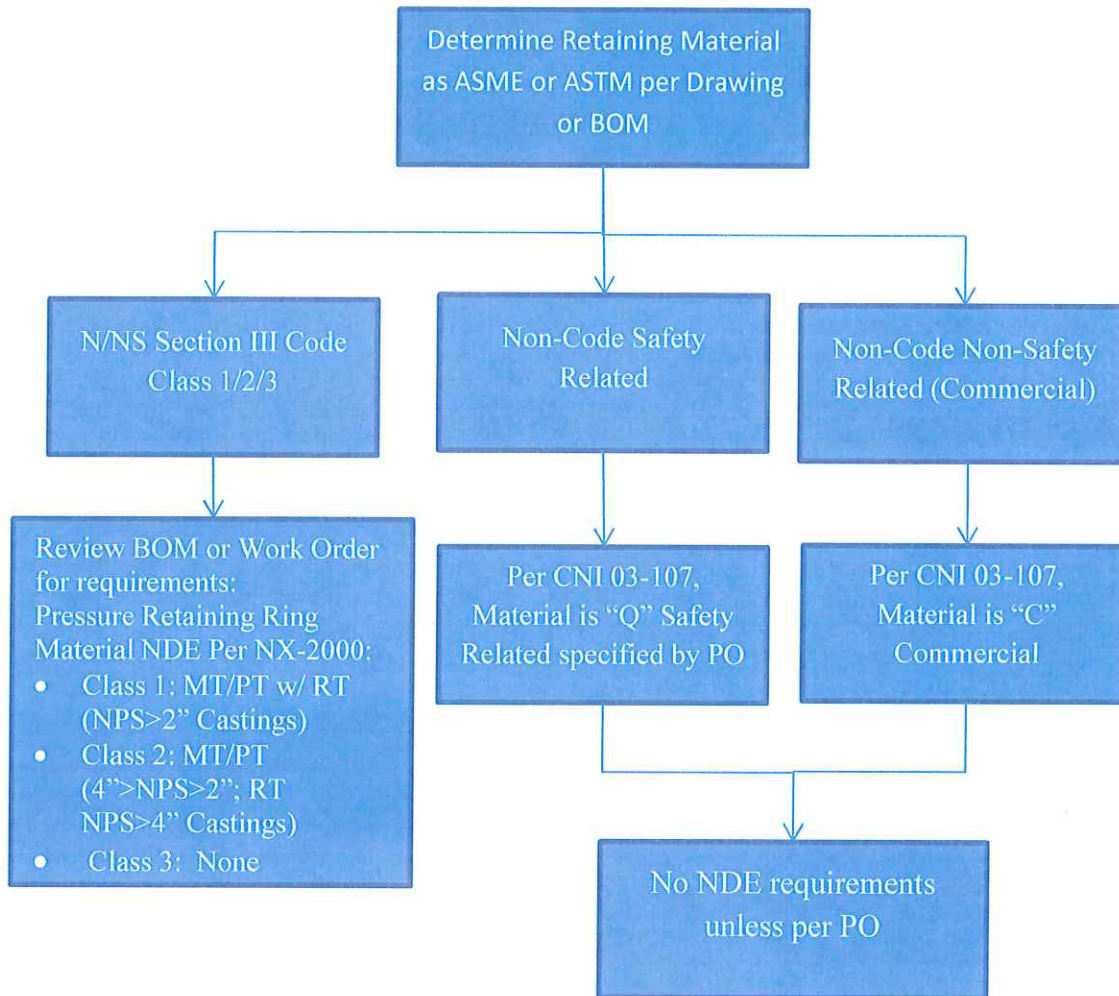


Figure 1: Decision Tree Chart for Retaining Ring Investigation

The search found 55 total orders as pressure seal designs. The results did not uncover any additional misclassified retaining ring components.

(vii) The corrective action which has been, is being, or will be taken; the name of the individual or organization responsible for the action; and the length of time that has been or will be taken to complete the action.

CNI SO# 32634-01

Customer: Dominion, Millstone

P.O. 45572185 Walworth, 18", Fig 5247PSB, Class 900, ASME Class 3, 1974 Ed.



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Investigation Results:

Retaining Ring material was not specified as ASME Table 1a material per ND-2000. NDE was specified correct (RT invoked).

The original Walworth Order #PP37653, which was a like-for-like order for CNI SO#32634-01, and was identified as an issue in Interim Report submitted 8/10/15 to the NRC, was determined to be processed correctly for the retaining ring (see below).

Cause of Condition:

CNI SO# 32634-01: The valve order was for a "Like for Like" replacement of a Walworth's Supplied Order #PP37653, Walworth drawing A-12275-M-11D. The retaining ring was misclassified by Crane as not specifying ASME material for the valve based on the original Walworth material construction from the BOM specifying ASTM materials; however, this was not correct. The investigation found the Walworth material specification, W421, "duo certifies" the ASTM material as ASME which is allowed by the Code. The incorrect material selection occurrence for CNI SO# 32634-01 was due to recreating the original BOM for the Walworth valve without confirming the duo certification from ASTM to ASME material. The reason for the issue was lack of training to the pressure retaining ring design feature.

Containment and Corrective Actions:

- Training held for engineers involved in classification of components for pressure retaining rings completed 8/10/15.
- Look-across and where-used at all pressure seal valve orders completed 8/23/15.
- Revise Procedure 03-107 to add figures reflecting configurations and clarify classifications completed 8/24/15.
- Revise assembly drawing CD04461 Rev B (attached) to correct item identification as pressure retaining material and CNI reconciliation of the retaining ring materials from ASTM to ASME classification revision completed 8/28/15.

(viii) Any advice related to the defect or failure to comply about the facility, activity, or basic component that has been, is being, or will be given to purchasers or licensees.

Pressure seal valves provide a mechanically rigid bearing surface that captures the pressure seal ring between it and the bonnet. This prevents the upward movement of the pressure seal ring. Upward force of the bonnet (due to system pressure) is converted into a radial force on the seal ring creating a seal on the body neck inside diameter. The bearing surface is created by a retaining ring set or threaded into the body.

When a retaining ring is used, it is held in-place by directly threading it into the body inside diameter (Code Case N-62-7 Figure 1) or capturing it with a locking ring threaded to the outside diameter of the body neck. Per the Code Case, it is grouped with the stem and the gate (wedge), i.e. flow/pressure blocking elements.

Pressure under the bonnet creates a rejection load that is resisted in shear and bending by the threaded connection. If the shear or bending stresses exceed the allowable yield strength of the material the



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threads could plastically deform allowing the pressure seal ring to deform and violate the pressure boundary.

There are no known instances of pressure retaining threads failing in any application – nuclear or non-nuclear.

Crane Nuclear has notified and reconciled the material and documentation for the customer that has been identified.

(ix) In the case of an early site permit, the entities to whom an early site permit was transferred.

Not applicable.

Should you have any questions regarding this matter, please contact Jason Klein, Engineering Manager at (630) 226-4953 or Rosalie Nava, Director of Safety and Quality at (630) 226-4940.

Regards,

A handwritten signature in black ink, appearing to read "JK", with a long horizontal flourish extending to the right.

Jason Klein
Engineering Manager
630 226-4953
jklein@cranevs.com