Dominion Nuclear Connecticut, Inc.
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Dominion

April 28, 2017

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

Serial No. 17-187
NRA/WDC R0
Docket No. 50-336
License No. DPR-65

DOMINION NUCLEAR CONNECTICUT, INC.
MILLSTONE POWER STATION UNIT 2
ASME SECTION XI RELIEF REQUEST RR-04-26

Pursuant to 10 CFR 50.55a(z)(2), Dominion Nuclear Connecticut, Inc. (DNC) requests relief from IWB-3142 of Section XI of the American Society of Mechanical Engineers (ASME) Boiler and Pressure Vessel Code for the Millstone Power Station Unit 2 (MPS2) 'B' boric acid pump which has a through-wall leak in the stuffing box cover. The 'B' boric acid pump is one of two redundant pumps used for boron injection into the reactor coolant system via the suction of the charging pump.

Based on recent liquid penetrant examinations, hydrostatic testing, and comparison with typical ASME code design rules, DNC has assessed the condition of the stuffing box cover as structurally acceptable for continued service. Delivery of a new stuffing box cover is not expected until mid-June 2017. Continued availability of the 'B' boric acid pump is needed to provide defense-in-depth for reactivity control until a permanent code repair of the stuffing box cover is complete.

Since ASME Section XI requires the defect be corrected prior to returning the affected component to service, compliance with the requirements of 10 CFR 50.55a would result in a hardship without a compensating increase in the level of quality and safety. Attachment 1 to this letter describes the engineering evaluation of the defect, actions that will be implemented by DNC, and the basis for the proposed relief request. Attachment 2 provides the non-destructive examination and hydrostatic test reports.

DNC requests approval of this relief request by May 5, 2017 to support Cycle 25 operation. This relief request has been approved by the Millstone Facility Safety Review Committee.

If you have any questions regarding this submittal, please contact Wanda Craft at (804) 273-4687.

Sincerely,

Mark D. Sartain
Vice President – Nuclear Engineering and Fleet Support

A047
NRR

Attachment:

1. ASME Section XI Relief Request RR-04-26, Boric Acid Pump P-19B Stuffing Box Cover
2. Non-destructive Examination (NDE) and Hydrostatic Test Reports

Commitments made in this letter: None

cc: U.S. Nuclear Regulatory Commission
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Serial No. 17-187
Docket No. 50-336

ATTACHMENT 1

ASME SECTION XI RELIEF REQUEST RR-04-26
BORIC ACID PUMP P-19B STUFFING BOX COVER

MILLSTONE POWER STATION UNIT 2
DOMINION NUCLEAR CONNECTICUT, INC.

Proposed Relief Request RR-04-26
In Accordance with 10 CFR 50.55a(z)(2)

--Hardship or Unusual Difficulty
Without Compensating Increase in Level of Quality or Safety--

1. ASME Code Components Affected

ASME Code Class:	Code Class 2
Reference:	ASME Section XI, IWC-2500
Examination Category:	Table IWC-2500-1, Category C-H
Item Number:	C7.10
Description:	Millstone Power Station Unit 2 (MPS2) 'B' boric acid pump.
Components:	The 'B' boric acid pump stuffing box cover is a casting of type 316 austenitic stainless steel per American Society for Testing and Materials (ASTM) A351 CF-8M.

2. Applicable Code Edition and Addenda

MPS2 is currently in the fourth 10-year inservice inspection (ISI) interval, which started on April 1, 2010, and ends on March 31, 2020. The ASME Section XI, 2004 Edition (No Addenda) applies to the ISI program.

3. Applicable Code Requirement

The ASME Code requirements for this relief request are those associated with Section XI, 2004 Edition, No Addenda, (Reference 8.1) and contained in Article IWB-3142, Acceptance.

4. Background

The 'B' boric acid pump is one of two redundant pumps used for boron injection into the reactor coolant system. The function of the boric acid pumps is for reactivity control, but the pumps are not credited in the Final Safety Analysis Report, Chapter 14 accident analyses. The design and normal operating parameters for the 'B' boric acid pump are provided below.

Design pressure = 150 psig
Design temperature = 250 degrees Fahrenheit
Operating discharge pressure = 112 psig
Operating suction pressure = 4.5 psig
Operating temperature = ambient temperature (110 degrees Fahrenheit)

Although MPS2 was designed and licensed to the GDC as issued on July 11, 1967, DNC has attempted to comply with the intent of the newer General Design criteria to the extent possible, recognizing previous design commitments. MPS2 meets the intent of GDC 26, Reactivity Control System Redundancy and Capability, by employing two independent systems for controlling reactivity changes, including boric acid shim control, of which the boric acid pumps are a part. These systems compensate for long term reactivity changes such as those associated with fuel burnup, variation in the xenon and samarium concentrations, and plant cooldown and heatup. The 'B' boric acid pump provides a redundant means of delivering boric acid to the suction of the charging pumps to control reactivity during normal power operation and for such events as a Technical Specifications required cooldown to cold shutdown.

On February 28, 2017, during a visual (VT-2) examination of the 'B' boric acid system, dry boric acid residue was identified on the pump stuffing box cover. The source of the boric acid could not be identified. This condition was entered into the corrective action program. During the following shift, the boric acid residue was cleaned and the pump was run for two hours in an attempt to determine the leak location and leak rate. No evidence of leakage was observed by the plant equipment operator who was stationed at the pump during the two-hour run.

On March 1, 2017, a follow-up ISI walkdown was performed and dry boric acid residue was found at the same location, but in a smaller quantity. The pump was declared non-functional and corrective action was initiated to identify the source of the leak.

On March 2, 2017, the 'B' boric acid pump was tagged out, but not drained, to support an informational liquid penetrant (LP) examination. The examination found no relevant or recordable indications. Following the LP examination, the 'B' boric acid pump was cleaned and then run for an additional time. After 10 minutes, a small accumulation of boric acid residue appeared as a wet, translucent spot. After 1.5 hours of run time, the wet spot had increased in size to about 1/8 inch in diameter. Although a measurable leak rate could not be determined, growth of the wet spot confirmed the presence of a through-wall leak. The pump was subsequently isolated on March 9, 2017.

Because of limited access and complex surface geometry, direct volumetric examination of the leakage location from the outside surface of the assembled pump was not possible. However, based on an informational LP examination and visual examination of leakage during an extended pump run, DNC concluded the boundary leakage was likely the result of small voids or porosity present in the original stainless steel casting material.

DNC researched the original purchase order for the pump to identify initial testing associated with the boric acid pump. The pump was constructed in accordance with the draft ASME Code for Pumps and Valves for Nuclear Power, dated November

1968, as Class 2, and Combustion Engineering specification 18767-PE-404, Revision 1, dated February 9, 1972. The Combustion Engineering specification refers to the ASME code for testing requirements. Section B of the draft ASME code contains the requirements for Class 2 pumps and valves. Article 23, sub-article 2314 specifies special requirements related to Class 2 components. Normally, this sub-article would require that radiography be performed for a cast product. However, sub-article 2314 identifies that the special requirements do not apply to materials for pumps and valves with inlet piping connections of four inches and less in nominal pipe size unless otherwise noted in the design specification. The inlet piping to the boric acid pump is less than four inches and the design specification did not invoke a radiography requirement for this pump. Initial testing did include an LP examination and a hydrostatic test and the examination and test had satisfactory results.

Following discovery of the through-wall leak, DNC submitted a purchase order to the pump vendor for a new stuffing box cover. Due to the long lead time to fabricate a replacement stuffing box cover, a code repair of the 'B' boric acid pump was not possible prior to the scheduled shutdown date for 2R24. However, based on engineering assessment of the as-found condition, DNC had high confidence that structural integrity of the stuffing box cover would be maintained for the duration of Cycle 24 operation and execution of the plant shutdown and core offload for 2R24. Therefore, on March 29, 2017, DNC requested relief (Reference 9.1) from IWB-3142 of Section XI of the Code to provide continued availability of the 'B' boric acid pump for the remainder of Cycle 24 operation and execution of the plant shutdown and core offload for 2R24. Compliance with the requirements of 10 CFR 50.55a would have resulted in a hardship without a compensating increase in the level of quality or safety. Verbal approval of the relief request was granted by the NRC the same day (ADAMS Accession No. ML17088A719).

The stuffing box cover on the 'B' boric acid pump has since been removed for further characterization of the through-wall flaw. Based on LP examination and hydrostatic testing, DNC has assessed the stuffing box cover as structurally acceptable for continued service. Details of that evaluation are provided in Section 6 below.

5. Reason for Request

The 2004 ASME Section XI code was reviewed for acceptance standards associated with the stuffing box cover leak. Table IWC-3410-1, Acceptance Standards, indicates for pressure retaining components (examination category C-H), the acceptance standard is IWC-3516. IWC-3516 refers to IWB-3522. IWB-3522 refers to IWB-3142 for corrective actions.

Article IWB-3142, Acceptance, specifies that a component with a relevant condition is unacceptable for continued service unless the requirements of IWB-3142.2, 3 or 4 have been satisfied. All three options have been considered. IWB-3142.2 is related to acceptance by performing supplemental examinations. This section is about

sizing of defects for comparison to ASME criteria to allow leaving a flaw in service. This option is not applicable to a through-wall condition. IWB-3142.4 is related to determining acceptance by analytical evaluation. This option is not possible because there is not a code-specified methodology for analyzing the condition. Of the three options available for acceptance of a relevant condition, a repair/replacement per IWB-3142.3 is the only viable option for addressing the current observed condition.

Although MPS2 can operate without boric acid pumps, maintaining the 'B' boric acid pump available provides additional assurance that the boric acid injection function will remain available for reactivity changes, if needed, until a permanent code repair of the stuffing box cover can be performed. Since delivery of the replacement stuffing box cover is not expected until mid-June, 2017, compliance with the requirements of 10 CFR 50.55a would result in a hardship without a compensating increase in the level of quality or safety.

6. Proposed Alternative and Basis for Use

6.1 Proposed Alternative

DNC has assessed the condition of the stuffing box cover as structurally acceptable for continued service. Therefore, in lieu of code repair prior to startup, DNC proposes to keep the pump in service with the identified indications until a replacement part is delivered and a permanent code repair can be performed.

DNC will inspect the affected pump stuffing box cover each shift for leakage until the pump is removed from service for repair. The inspection results will be documented. Should leakage increase, an engineering evaluation will be performed to reassess structural integrity and the impact of the leakage on nearby equipment. If structural integrity cannot be maintained, the pump will be isolated.

6.2 Basis for Use

During 2R24, the 'B' boric acid pump was disassembled to further evaluate the structural integrity of the stuffing box cover (Figure 1). The NDE and hydrostatic test reports are provided in Attachment 2.

Liquid penetrant (LP) examinations were performed on both the inside and outside surfaces of the stuffing box cover. LP examination of the outside surface identified two rounded indications, approximately 1/16 of an inch apart, in the area of the observed leak (Figure 2). LP examination of the inside surface identified three rounded indications; two indications were located near one leak off port (in the area of the observed leakage) (Figure 3), while the third

indication was offset approximately 180 degrees near the opposite leak off port. No recordable indications were identified on the outside of the cover in this area. Table 1 provides the location and size of the indications.

Table 1: B' Boric Acid Pump Stuffing Box Cover LP Indications

Indication	Location	Diameter of bleedout (inches)
1	Outside Surface – East Side	1/32
2	Outside Surface – East Side	1/32
3	Inside Surface – East Side	3/32
4	Inside Surface – East Side	3/16
5	Inside Surface – West Side	3/16

DNC attempted to perform volumetric examination of the stuffing box cover using ultrasonic testing (UT). Although the smallest available transducer was used, the UT did not produce any useful information because the UT transducer was not able to maintain suitable surface contact. DNC considered performing radiography. However, due to the dimensions and geometry of the stuffing box cover, DNC determined that examination of the leakage area using radiography was not practical.

DNC performed an informational hydrostatic test of the stuffing box cover. The hydrostatic test was performed at a pressure of 220 psig and held for 10 minutes. Although the test did not result in any measurable leakage, indication of leakage (slight wetting) at two locations was visible through the use of an LP developer. The first location was in the area where the leakage was first observed and the second location was on the opposite side of the cover approximately 180 degrees from the first location. The location where slight wetting was observed on the outside of the stuffing box cover corresponds to the location of the identified indications.

Based on the results of the above inspections, the stuffing box cover pressure boundary leakage is likely due to small casting void defects or porosity that enable a through-wall pathway for leakage. The NDE results (very small rounded indications), the very low leakage at hydrostatic conditions, and the propensity of stainless steel castings to have small amounts of porosity, lead DNC to conclude that porosity is the most likely explanation for what is observed. Alternative explanations have been considered, but determined to be unlikely, as discussed below.

Structural Evaluation

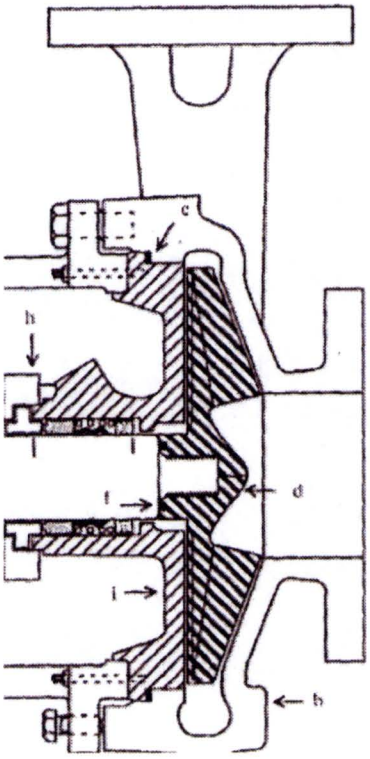
Leak Location and Operating Conditions - The location of the leakage is on the portion of the stuffing box cover that surrounds the pump shaft. At this

location, the stuffing box seal cover pressure cannot be measured but a typical rule for estimating stuffing box pressures is:

$P = (P_{outlet} - P_{inlet}) / 4 + P_{inlet}$

P = stuffing box pressure, psig
P_{outlet} = pump design discharge pressure, psig = 150 psig
P_{inlet} = pump suction pressure, psig = 4.5 psig

The pump design discharge pressure is 150 psig and the suction pressure is 4.5 psig. These values give an estimate for the stuffing box pressure of 41 psig using the above rule. For conservatism, 50 psig is assumed.



Material Performance and Degradation Potential – The figure at right shows the configuration of the boric acid pump. The boric acid pump has been in service since initial plant operation. The cross-hatched area on the left is the stuffing box cover casting, and the impeller is the cross-hatched component on the right. The stuffing box cover is made from cast type 316 austenitic stainless steel per specification ASTM A351 CF-8M, as shown on the vendor drawing. Type 316 stainless steel has excellent general corrosion resistance to the boric acid solution that is the process fluid for this pump. Based on testing done for Electric Power Research Institute (Reference 9.2), the general corrosion rate in the process fluid is too small to measure. The other internal parts of the pump are made from cast or wrought type 316 stainless steel. Type 316 stainless steel, either cast or wrought, is not susceptible to pitting or stress corrosion cracking in this environment. The cast version of 316 stainless steel is not susceptible to thermal aging at the low temperature at which this pump operates. Additionally, mechanical loads due to normal operation, including pump vibration, are low and would not be anticipated to result in service induced flaw growth. With these considerations, it is concluded that there are no active aging degradation mechanisms for this component that would cause initiation and through-wall growth of a planar flaw. The remaining reasonable explanation for the leakage is that there is a leakage pathway via small voids, or porosity, originally present in the cast material. Similar instances of this phenomenon have been documented by other licensees (References 9.3 and 9.4). As discussed below,

such small imperfections do not significantly affect the structural integrity of the component.

The absence of an active degradation mechanism also supports the conclusion that the currently observed leak rate will remain nearly constant for the duration of this requested relief.

Structural Integrity – There is no code-specified methodology for evaluating the structural integrity of this type of component when through-wall leakage is detected. However, the stuffing box cover in the area of concern can be conservatively bounded as a cylindrical section, similar to a cylindrical vessel with localized leakage. The Code of Construction for the pump is the draft ASME Code for Pumps and Valves for Nuclear Plants, 1968. The stuffing box cover material is ASTM A351 CF-8M which has an allowable design stress of 17.5 ksi. The inside diameter of this section is approximately 2.5 inches. Considered as equivalent to a cylindrical vessel, the minimum wall thickness would be calculated per ASME III NC-3324 as:

$t_{min} = P\ R / (S - 0.6\ P)$

The values for the parameters in this formula are:

P = stuffing box pressure, psig = 50 psig
R = radius of the stuffing box = 2.5/2 = 1.25 inches
S = stuffing box allowable stress = 0.8 x 17.5 = 14 ksi
(including a casting quality factor of 0.8)

The result is t_{min} = 0.0045 inch.

The actual wall thickness of this section in the area of the observed leakage is not specified on drawings but is estimated to be approximately 0.250 inch based on the minimum wall thickness required for valves by the construction code. The evaluation result of 0.0045 inch required wall thickness, in comparison to the approximately 0.250 inch estimated actual wall thickness (Figure 4), results in a factor of about 56. This demonstrates that this portion of the pump stuffing box cover is not challenged by the pump stuffing box pressure. Additionally, this portion of the stuffing box cover is not required to withstand any significant mechanical loading. This portion of the casting supports only the mechanical shaft seal. The pump shaft is supported independently of the stuffing box cover and seismic loading from the shaft, impeller, and piping nozzles are transferred through the pump frame adaptor and pump casing to anchorage feet attached to the pump casing. The loads do not pass through this portion of the stuffing box cover. Thus the minimum wall thickness calculation reasonably demonstrates the structural integrity of the pump stuffing box cover in the area of the observed leakage.

Functionality – The above structural integrity evaluation supports the conclusion that the pump is capable of performing its intended function of transferring concentrated boric acid from the boric acid storage tank to the suction of the charging pumps and will retain this capability for the duration of the requested relief. The overall mechanical integrity of the pump will be maintained such that the pump will be able to generate sufficient head for the required flow, and since the pressure boundary is maintained, there would be no significant diversion of boric acid intended for injection into the charging pump suction.

Conclusion

ASME Section XI requires the defect be corrected prior to returning the affected component to service. However, compliance with the requirements of 10 CFR 50.55a would result in a hardship without a compensating increase in the level of quality and safety pursuant to 10 CFR 50.55a(z)(2). The structural integrity of the stuffing box cover cannot be demonstrated in accordance with a code-specified methodology. However, based on LP examination, hydrostatic testing and comparison with typical ASME code design rules, it is concluded that there is reasonable assurance that the structural integrity and functional requirements of the pump will be maintained during the requested period of relief. Delivery of a new stuffing box cover is not expected until mid-June 2017. Therefore, the continued availability of the 'B' boric acid pump is needed to provide defense-in-depth for reactivity control until a permanent code repair of the stuffing box cover can be performed.

7. Duration of Proposed Alternative

This relief is requested to be effective upon approval and until a permanent code repair of the boric acid pump stuffing box cover can be performed during Cycle 25. Delivery of the stuffing box cover is expected in mid-June. A permanent code repair will be performed as soon as practical after receipt of the part, but no later than startup from the next refueling outage.

8. Precedent

Email from R. Guzman to W. Craft – Millstone Power Station Unit 2, Verbal Authorization by the NRR staff - Relief Request No. RR-04-25 (CAC No. MF9497), dated March 29, 2017 (ADAMS Accession No. ML17088A719).

9. References

9.1 Dominion Nuclear Connecticut Inc., Millstone Power Station Unit 2, ASME Section XI Relief Request RR-04-25, dated March 29, 2017 (ADAMS Accession No. ML17090A110).

9.2 2012 EPRI Technical Report: *Materials Reliability Program: Boric Acid Corrosion Guidebook, Revision 2: Managing Boric Acid Corrosion Issues at PWR Power Stations (MRP-058, Rev 2).*

9.3 NRC letter from J. Quichocho (USNRC) to W. Gideon (CP&L), dated December 12, 2012, "H. B. Robinson Steam Electric Plant, Unit No. 2 – Relief Request-07 from Immediate ASME Code Repair of Refueling Water Storage Tank Drain Valve (Safety Injection-837) for Fifth10-year Inservice Inspection Program Plan (TAC NO. ME9747)." [ADAMS Accession Number ML12325A612]

9.4 NRC Letter from J. B. Martin (USNRC) to C. A. Schrock (WPSC) dated November 5, 1993, related to Notice of Enforcement Discretion associated with Residual Heat Removal Pump Casting Void. (As identified in WPSC letter from C. A. Shrock to USNRC, dated December 6, 1993, "Reportable Occurrence 93-019-00").

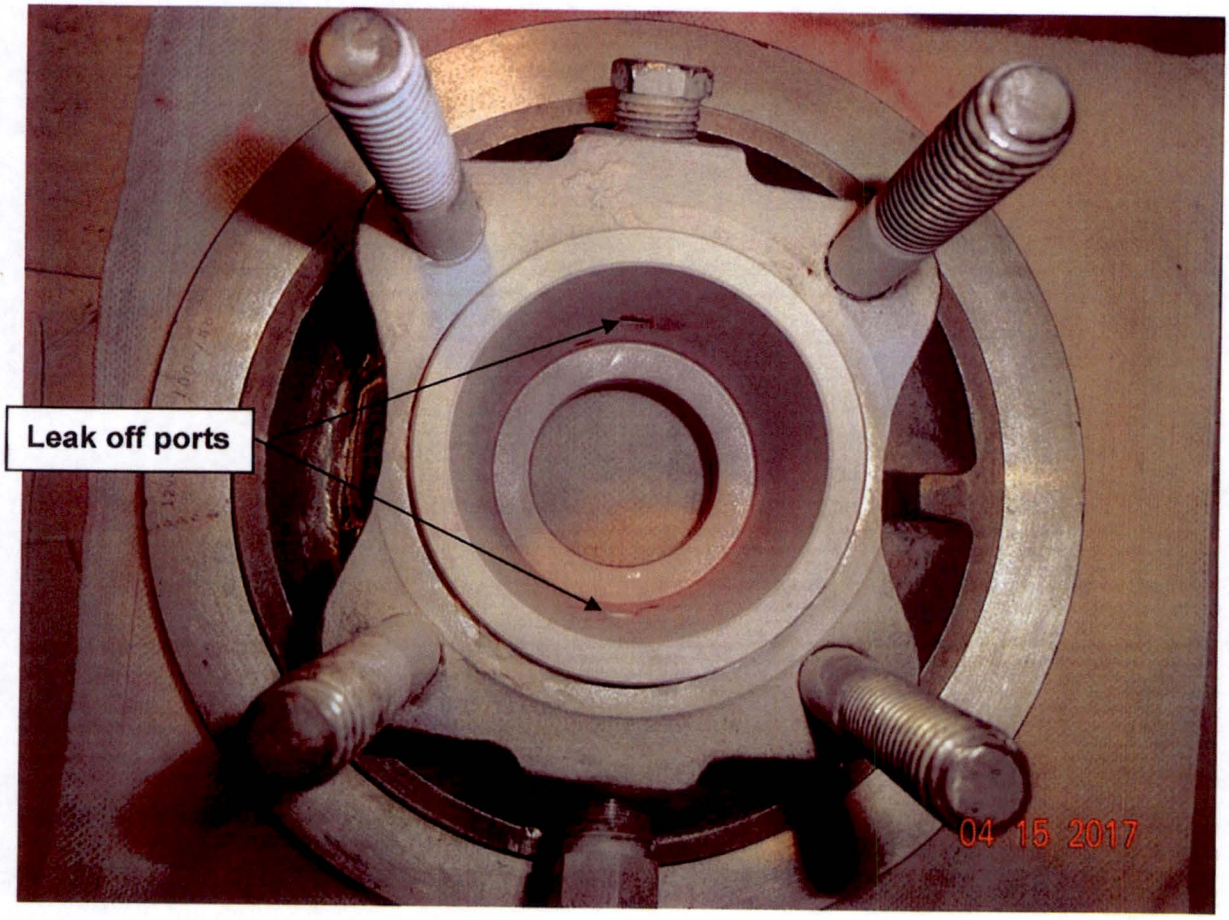


Figure 1

'B' Boric Acid Pump Stuffing Box Cover

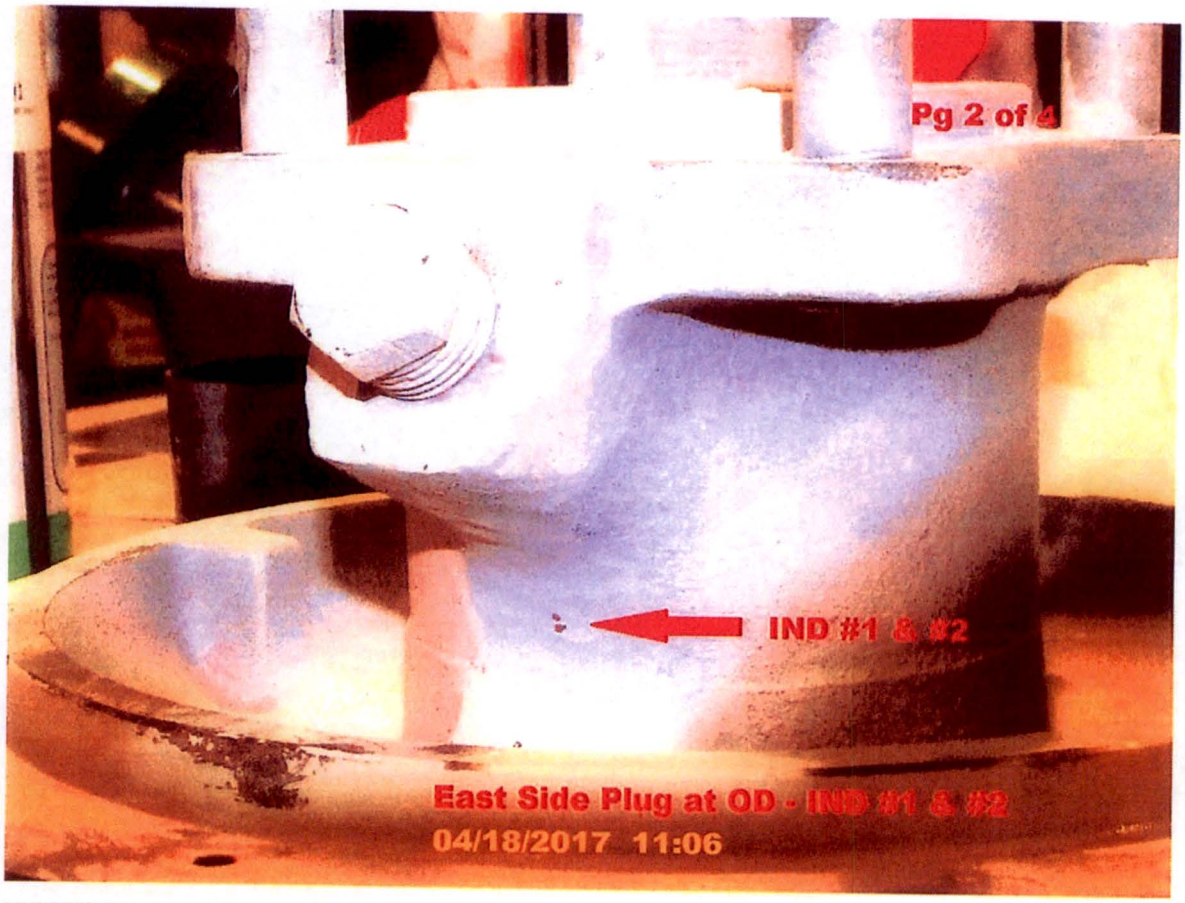


Figure 2

Rounded Indications on Outside Surface of Stuffing Box Cover
(In area where leakage was observed)

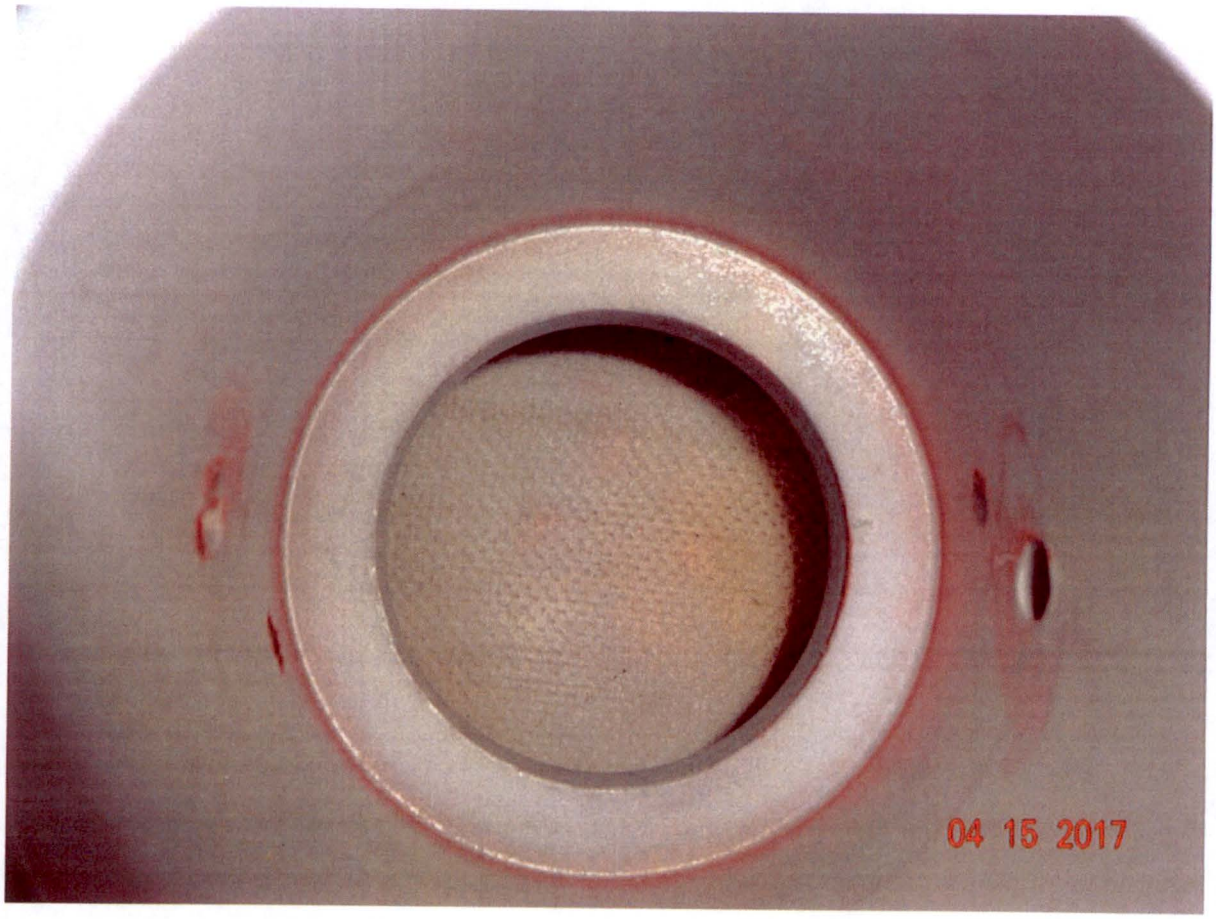


Figure 3

Rounded Indications on Inside Surface of Stuffing Box Cover

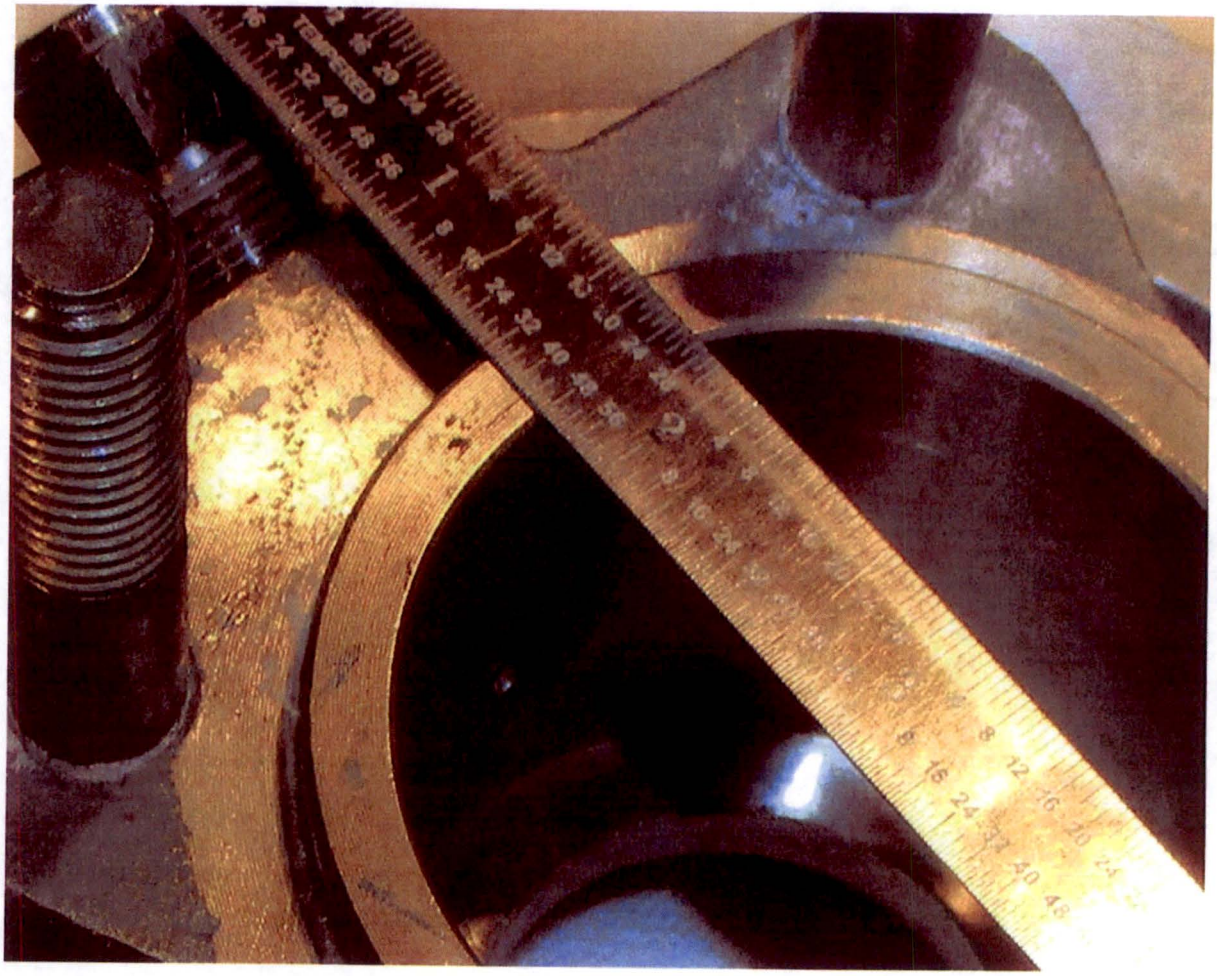


Figure 4

Photo Showing Wall Thickness of Stuffing Box Cover

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Docket No. 50-336

ATTACHMENT 2

NON-DESTRUCTIVE EXAMINATION AND HYDROSTATIC TEST REPORTS

MILLSTONE POWER STATION UNIT 2
DOMINION NUCLEAR CONNECTICUT, INC.

Liquid Penetrant Examination
(Page 1 of 1)

Site/Unit: Millstone	Procedure: ER-AA-NDE-PT-301	Outage No.: 2R24
Summary No.: N/A	Procedure Rev.: 7	Report No.: N/A
Workscope: Eng Information	Work Order No.: 53103060177	Page: 1 of 4
Code: N/A	Cat./Item: N/A	Location: -5' Aux Bdg
Drawing No.: 25203-29163 SH 5	Description: P19B Stuffing Box Cover ID Exam	
System ID: M2P19B		Mat./Thickness: ☐ N/A
Component ID: P19B Stuffing Box Cover		Size/Length: ☐ N/A
Limitations: N/A		
Light Meter Mfg.: Spectroline	Serial No.: MTE-02951	Illumination: >100 fc
Temp. Tool Mfg.: KTA Tator	Serial No.: MTE-01887	Surface Temp.: 72.5 °F
Comparator Block Temp.: Side A N/A °F Side B N/A °F		Resolution: N/A
Lo/Wo Location: C/L of threaded plug / Top edge of Cover	Surface Condition: Machined	

	Cleaner	Penetrant	Remover	Developer
Brand	Magnaflux	Magnaflux	Magnaflux	Magnaflux
Type	SKC-S	SKL-SP2	SKC-S	SKD-S2
Batch No.	15E15K	13J10K	12G04K	13G07K
Time	Evap. 4 min	Dwell 15 min	Evap. 1 min	Develop 10 min
	Time Exam Started:	09:27	Time Exam Completed:	10:10

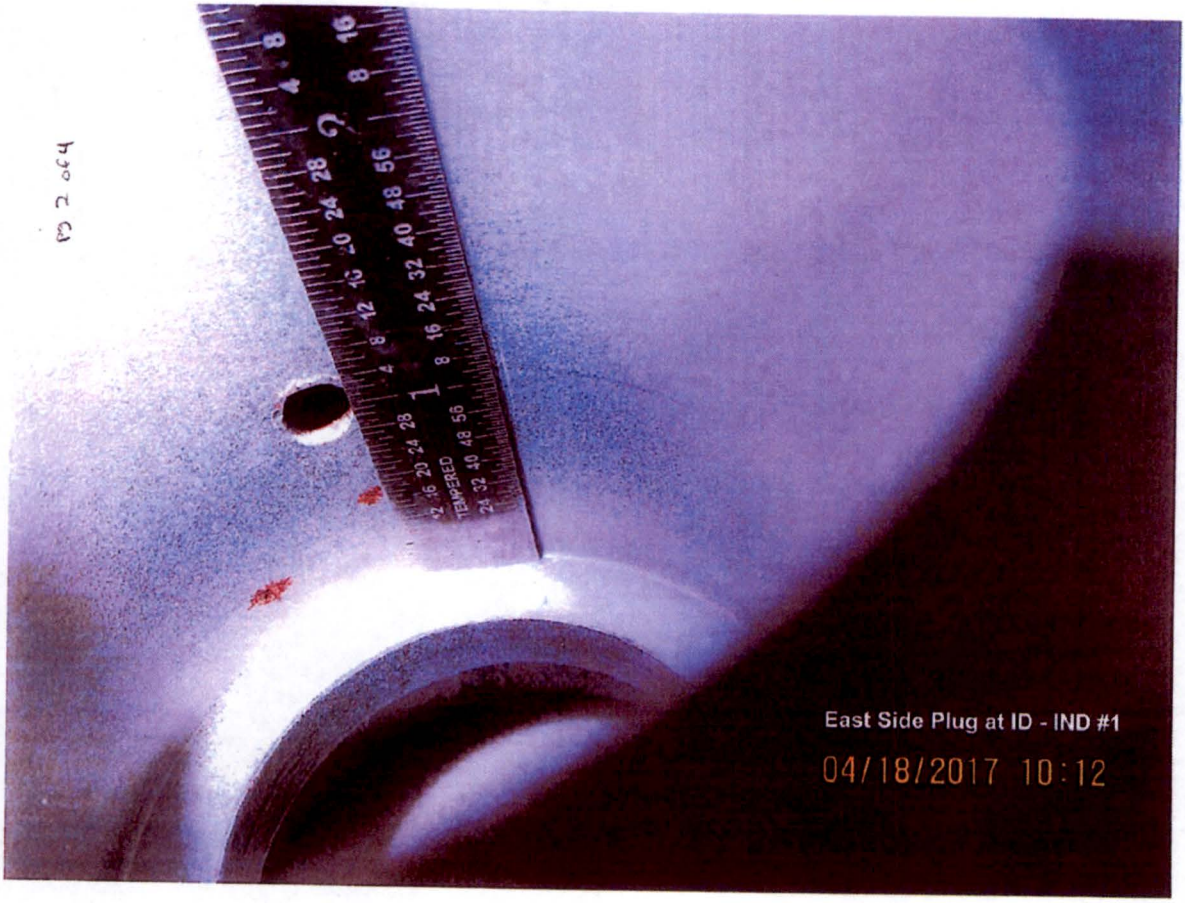
Indication No.	Loc L	Loc W	Diameter	Length	Type R/L	Remarks
1	1/8"cw	2 1/8"	3/32"	N/A	R	East side plug at ID of cover
2	3/8"cw	2 3/8"	3/16"	N/A	R	East side plug at ID of cover
3	1/4"cw	2 1/8"	3/16"	N/A	R	West side plug at ID of cover

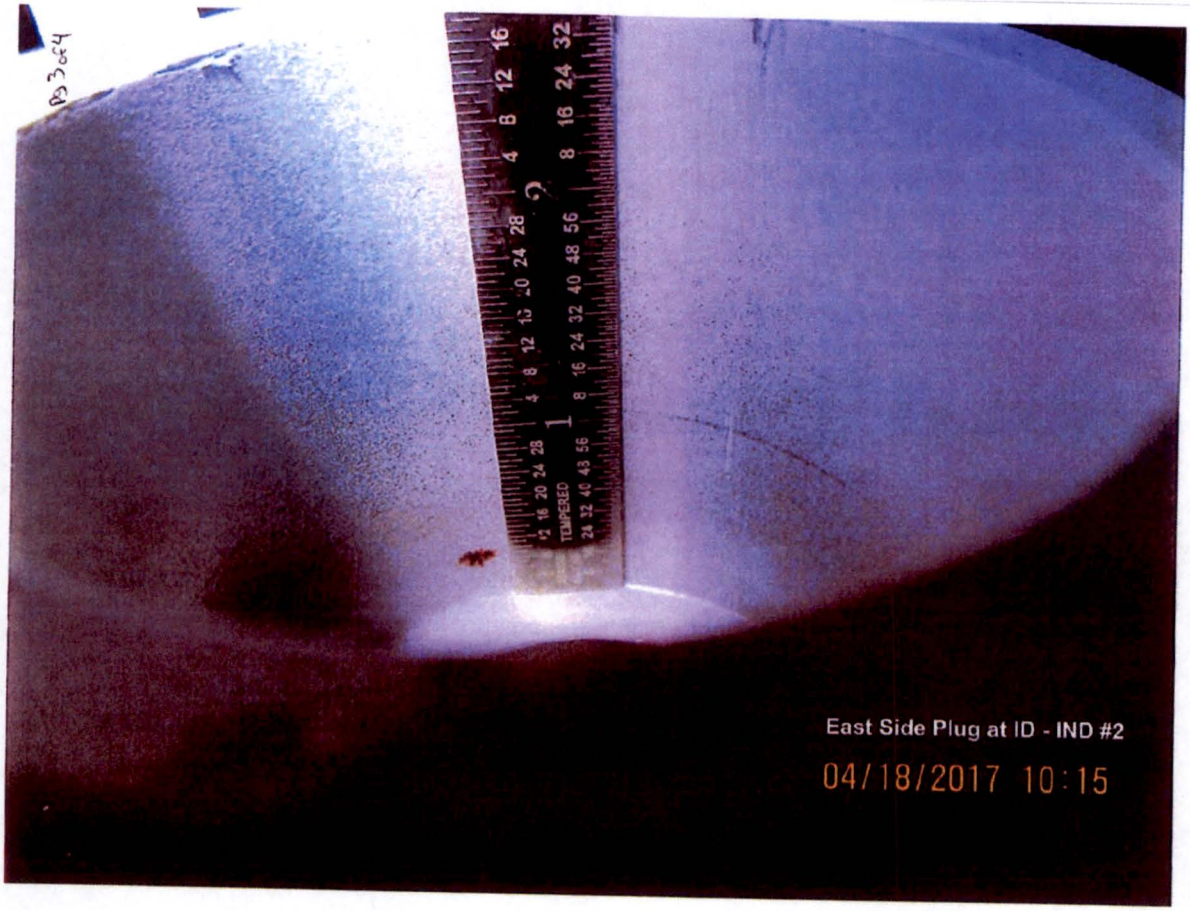
Comments: Examined machined ID of stuffing box cover

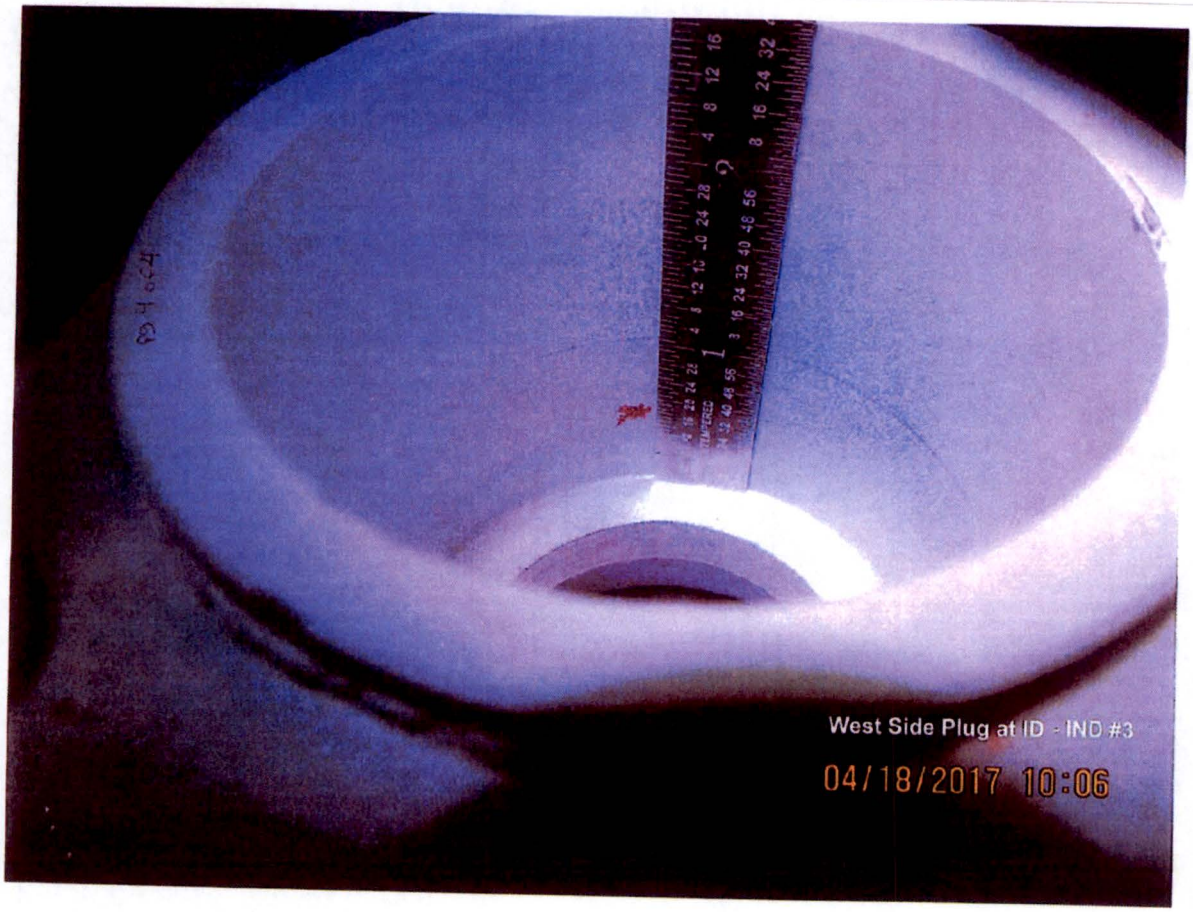
Results: NRI ☐ RI ☐ Eval ☒

Percent of Coverage Obtained >90%: N/A	Reviewed Previous Date: N/A

Examiner	Level	Signature	Date	Reviewer	Signature	Date
[redacted]	II	[redacted]	4/18/17		N/A	
Examiner N/A	Level	Signature	Date	Site Review	Signature	Date
				[redacted]		4/18/17
Other N/A	Level	Signature	Date	ANII Review N/A	Signature	Date


East Side Plug at ID - IND #1
04/18/2017 10:12


East Side Plug at ID - IND #2
04/18/2017 10:15


West Side Plug at ID - IND #3
04/18/2017 10:06

Liquid Penetrant Examination
(Page 1 of 1)

Site/Unit: Millstone	Procedure: ER-AA-NDE-PT-301	Outage No.: 2R24
Summary No.: N/A	Procedure Rev.: 7	Report No.: N/A
Workscope: Eng Information	Work Order No.: 53103060177	Page: 1 of 4
Code: N/A	Cat./Item: N/A	Location: -5' Aux Bdg
Drawing No.: 25203-29163 SH 5	Description: P19B Stuffing Box Cover OD Exam	
System ID: M2P19B		Mat./Thickness: ☐ N/A
Component ID: P19B Stuffing Box Cover		Size/Length: ☐ N/A
Limitations: N/A		
Light Meter Mfg.: Spectroline	Serial No.: MTE-02951	Illumination: >100 fc
Temp. Tool Mfg.: KTA Tator	Serial No.: MTE-01887	Surface Temp.: 72.5 °F
Comparator Block Temp.: Side A N/A °F Side B N/A °F		Resolution: N/A
Lo/Wo Location: C/L of threaded plug / Top edge of Cover	Surface Condition: As cast with ground areas	

	Cleaner	Penetrant	Remover	Developer
Brand	Magnaflux	Magnaflux	Magnaflux	Magnaflux
Type	SKC-S	SKL-SP2	SKC-S	SKD-S2
Batch No.	15E15K	13J10K	12G04K	13G07K
Time	Evap. 3 min	Dwell 15 min	Evap. 1 min	Develop 10 min
	Time Exam Started:	10:25	Time Exam Completed:	11:10

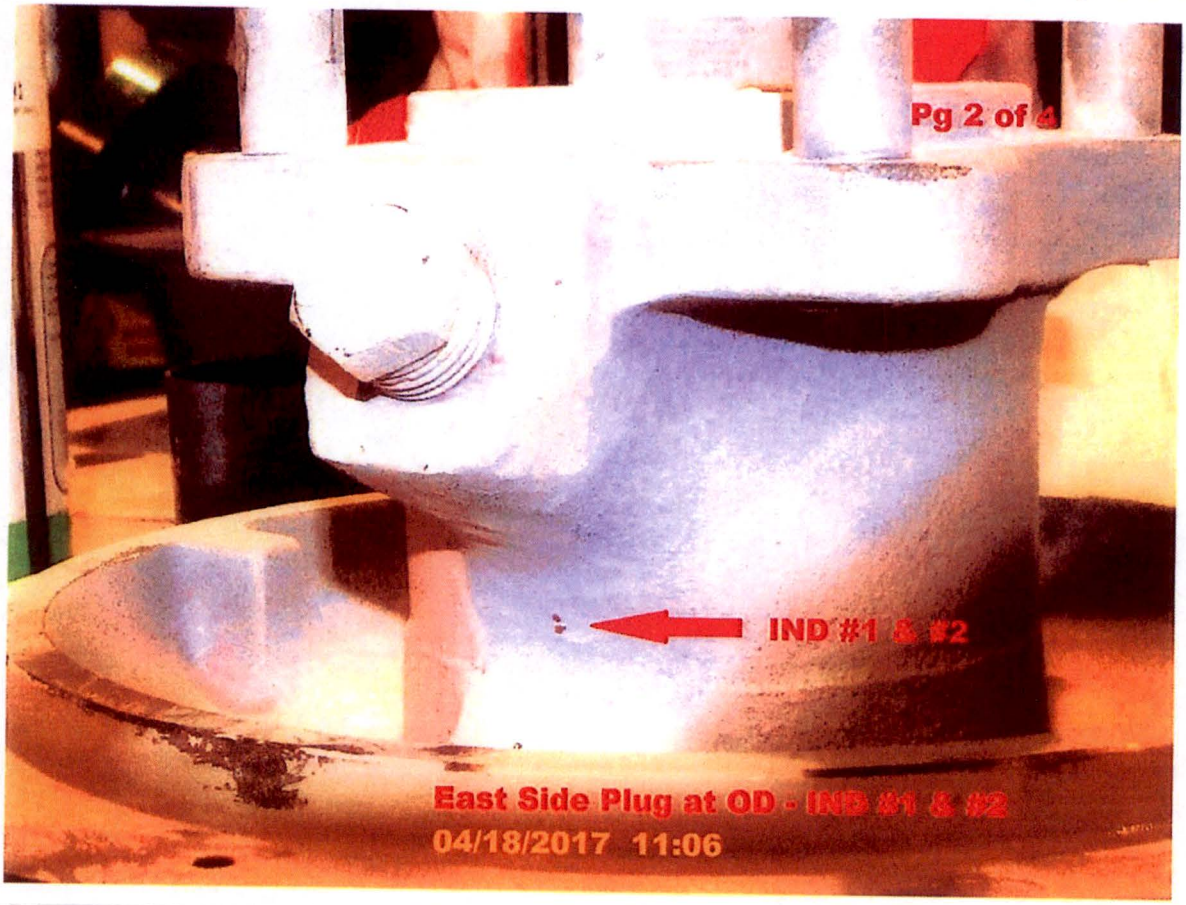
Indication No.	Loc L	Loc W	Diameter	Length	Type R/L	Remarks
1	3/32" ccw	2 5/16"	1/32"	N/A	R	East side plug at OD of cover
2	3/32" ccw	2 3/8"	1/32"	N/A	R	East side plug at OD of cover

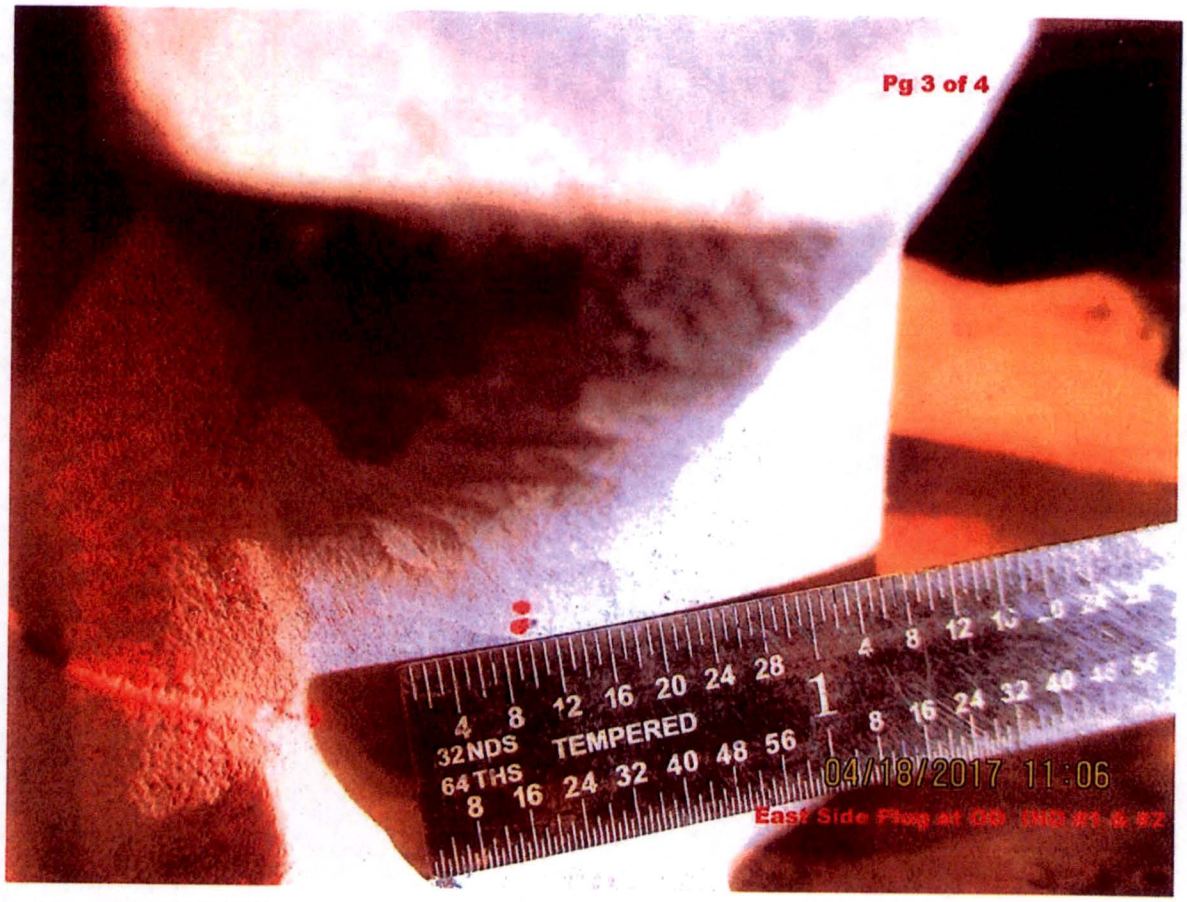
Comments: Examined at areas of ID indications

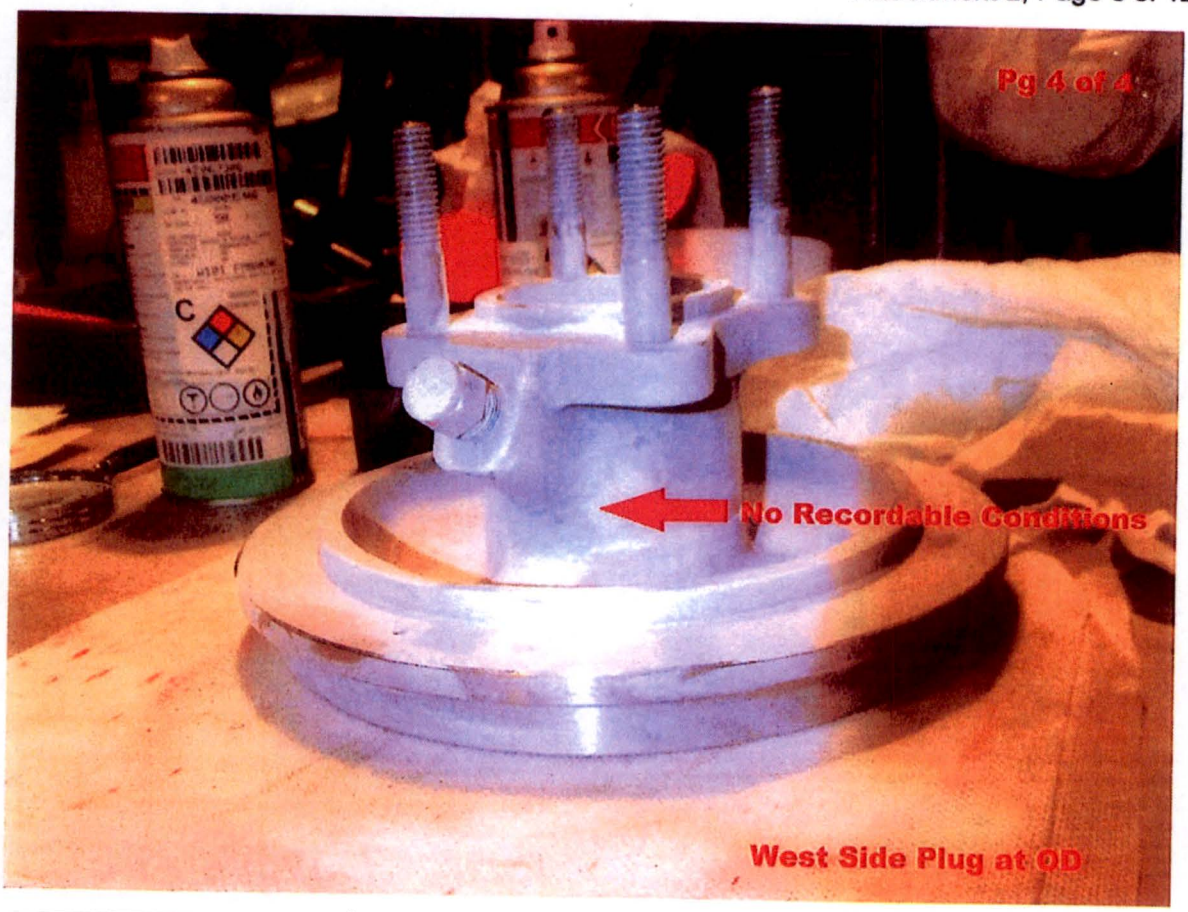
Results: NRI ☐ RI ☐ Eval ☒

Percent of Coverage Obtained >90%: N/A | Reviewed Previous Date: N/A

Examiner [redacted]	Level II	Signature [redacted]	Date 4/18/17	Reviewer	Signature N/A	Date
Examiner N/A	Level	Signature	Date	Site Review [redacted]	Signature	Date 4/18/17
Other N/A	Level	Signature	Date	ANII Review N/A	Signature	Date


Pg 2 of 4
IND #1 & #2
East Side Plug at OD - IND #1 & #2
04/18/2017 11:06


Pg 3 of 4
32NDS
64THS
TEMPERED
04/18/2017 11:06
East Side Plug at OD (ID) #1 & #2


Pg 4 of 4
No Recordable Conditions
West Side Plug at OD

Attachment 1
Pressure Test Parameter Worksheet
(Sheet 6 of 6)

Type of Test: Hydrostatic	Normal Fluid: water
Component: P19B	Pipe Class/Line Designation: 2/Stuffing seal
Applicable Codes: Informational	

Step	Parameters
1.3	Inspection Requires VT–2 qualified examiner? (circle one) YES (NO)
1.4	Design pressure 150 PSI
1.5	Hydrostatic Test Pressure (HTP) 225
1.6	Pressure gauge range limits; Min (337.5) Max (900)
1.7	Hydro map completed & attached? (In–plant hydro only) N/A
1.8	Test Medium and Source DI Water
1.9	In–plant supports adequate for loading N/A
	Additional in–plant support WO or Tagout #'s N/A
1.9.3	Test hold time (Insulated 4 hours, Non–insulated 10 minutes, or other) 10 Min
1.10	Vertical distance between lowest portion of hydrostatic test boundary and test pressure gauge (negative if gauge is higher than lowest point; positive if gauge is lower than lowest point) (ΔL_1) = (feet) 0
	Vertical distance between highest portion of hydrostatic test boundary and test pressure gauge (negative if gauge is higher than highest point; positive if gauge is lower than highest point) (ΔL_2) = (feet) 0
1.11.a	Max Pressure limit= 1.06 x HTP + (Δ L_1 x 0.4335) = 225 or Design document * See Att. Eng. memo
1.11.b	Min Pressure limit= HTP + (Δ L_2 x 0.4335) = 187.5 or Design document
	If Min Pressure is greater than Max Pressure, Min Pressure = 0.94 x Max Pressure N/A
1.12	Vertical distance, relief valve to lowest point in test boundary Δ L_3 = (feet) N/A (negative if relief valve is *above* low point of test boundary; positive if relief valve is *below* low point of test boundary)
	Relief valve setting = 1.06 x HTP + (Δ L_3 x 0.4335) = N/A or Design document Hand Pump
1.14	Relief valve gagging device or modification required. N/A
	Gagging device or modification within test boundaries. N/A
	Separate WO's N/A
Worksheet Prepared By: [redacted]	Date: 4/20/17

Level of Use
Reference

STOP THINK ACT REVIEW

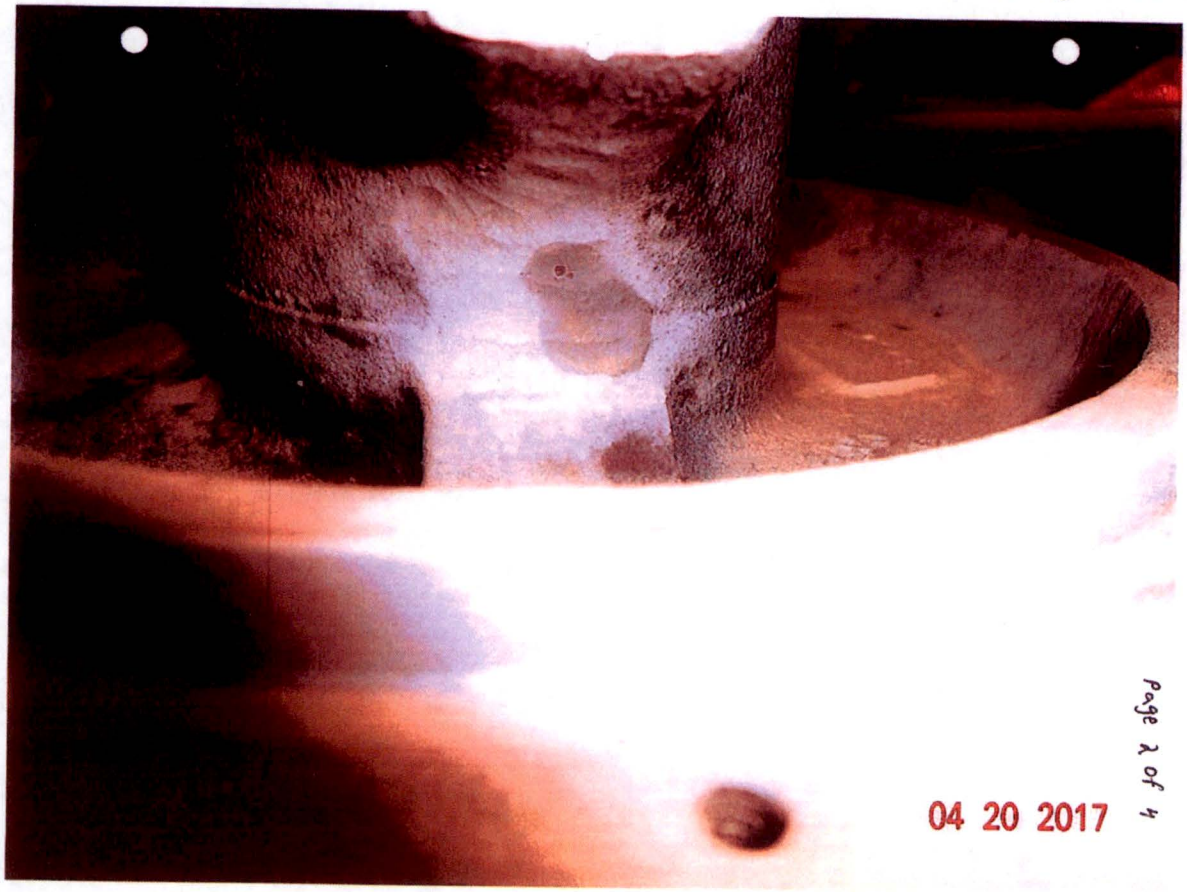
Page 1 of 4

Attachment 2
Hydrostatic Test Data Sheet
(Sheet 1 of 1)

SECTION A: Responsible Engineer to Complete		
☐ ASME–XI Shop Test	☒ Non–ASME–XI Shop Test	☐ Non–ASME–XI In–Plant Test
☒ Component	☐ Piping	
Hydrostatic test boundary (Attach sketch if applicable): Pump seal / stuffing box Informational Hydro		
Test Medium: DI water	Test pressures: Min: (187.5) Max: (225)	
Medium source: Jug		
Test pressure nominal: 225	Pressure gauge calculated range: Min: (337.5) Max: (900)	
Test hold time: 10 min		
Relief valve location: N/A	Relief valve setting: N/A	
SECTION B: Examiner to Complete (VT–2 certified if "YES" in 1.3, Attachment 1)		
Test start; Time: 2228	Pressure: 225 PSI	Temperature: 75.2
Test stop; Time: 2248	Pressure: 225 PSI	Temperature: 75.5
Test gauge; ID: MTE-00108	Range: 0-500	Cal due date: 9/2/17
Resolution Card SN: DOM-2016-0385		Character Height: .158"
Visual aids used: Flashlight		
Comments: 2 small leaks / wet spots Identified, leaks were identified by spraying PT developer, see Attached Photos		
Test equipment operator: [redacted]		
Examiner Name (print): [redacted]		Level: II
Examiner signature: [redacted]		Date: 4/20/17
PART C: Responsible Engineer to Complete		
Disposition: Informational Hydro		
Name (print):		
Signature:		Date:
PART D: ANII Review (If ASME piping or component)		
Name (print): N/A		
Signature:		Date:

Level of Use Reference

STOP THINK ACT REVIEW


04 20 2017
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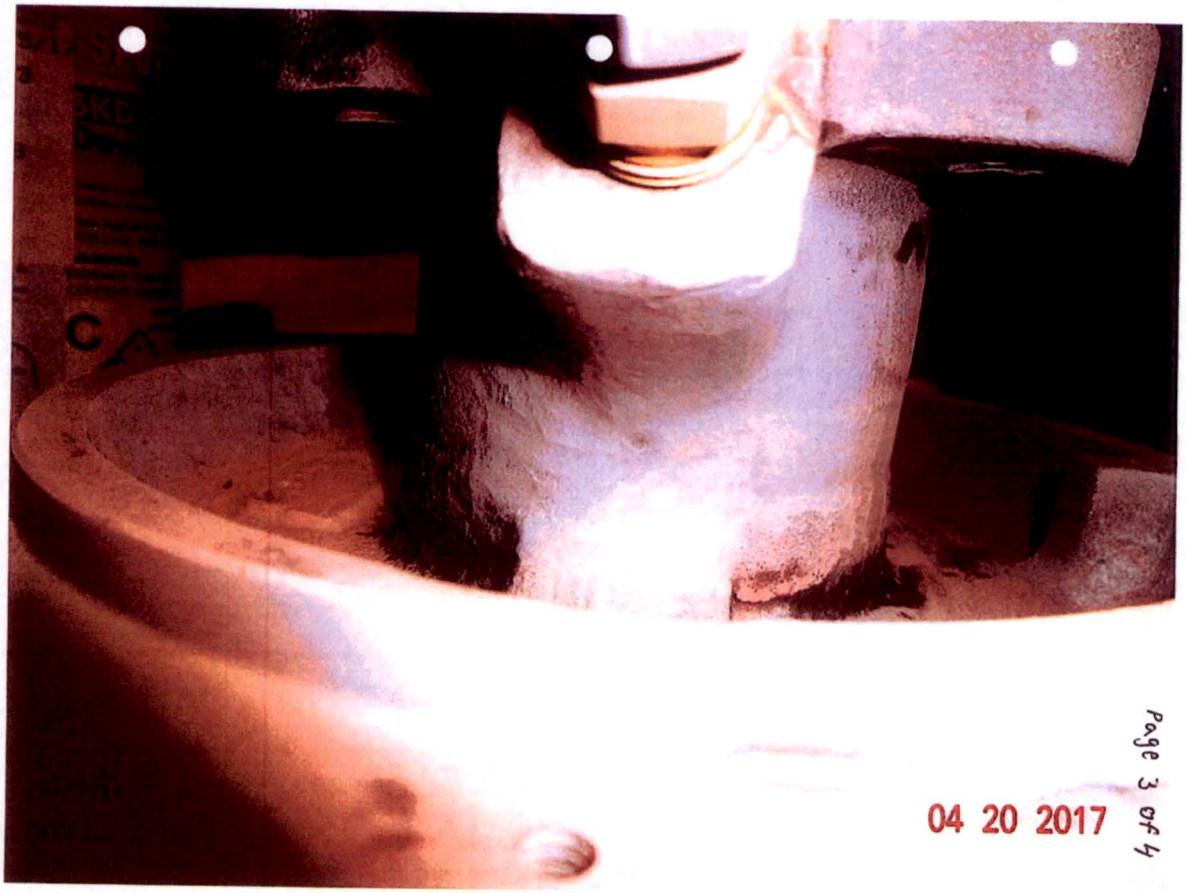

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