VIRGINIA ELECTRIC AND POWER COMPANY
RICHMOND, VIRGINIA 23261

March 28, 2000

United States Nuclear Regulatory Commission
Attention: Document Control Desk
Washington, D. C. 20555

Serial No.: 00-166
NL&OS/GDM: R1
Docket No.: 50-338
License No.: NPF-4

Gentlemen:

VIRGINIA ELECTRIC AND POWER COMPANY
NORTH ANNA POWER STATION UNIT 1
ASME SECTION XI RELIEF REQUESTS NDE-9 AND 15

By letter dated April 8, 1999 (Serial No. 99-169), Virginia Electric and Power Company submitted the Third Ten Year Inservice Inspection (ISI) Program for North Anna Power Station Unit 1, which included Relief Request NDE-9. This relief request was included to address through-wall leakage in the Service Water System as a result of microbiologically-induced corrosion (MIC), since it is anticipated that such through-wall leakage will occur during the third ten year ISI inspection interval. A similar relief request (NDE-32) was previously approved by the NRC for North Anna Units 1 and 2 in a letter dated December 22, 1998, with the condition that the relief request was only valid for the remainder of the second ten year ISI inspection interval. The second inspection interval for Unit 1 expires on April 30, 2000,

In a conference call with the NRC staff on March 22, 2000, several issues were discussed relative to Relief Request NDE-9. The NRC requested that we revise and resubmit the relief request for NRC approval. The relief request has been revised to solely address socket welds and piping, including butt welds, where flaw characterization cannot be conducted volumetrically or mechanically due to geometry or permanent structural interference. Furthermore, the revised relief request is consistent with Code Case N-513, "Evaluation Criteria for Temporary Acceptance of Flaws in Class 3 Piping," with the following exceptions:

- A through-wall leak may be evaluated or repaired within 14 days.

- Repair or replacement of a through-wall leak may be accomplished within 18 months to coincide with a scheduled service water outage if structural integrity is maintained.

- Existing analyses may be used to address socket welds and piping, including butt welds, for any location with a through-wall flaw that cannot be characterized volumetrically by ultrasonics (UT) or radiography (RT), or is inaccessible for such treatment. As requested during the conference call, the basis for postulating a ¾" hole for such flaws is detailed in the relief request.

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Relief Request NDE-9 is provided in Attachment 1.

A second relief request, NDE-15, has also been prepared and is provided as Attachment 2. This relief request is similar to NDE-9 in that it would permit 1) a through-wall leak to be evaluated or repaired within 14 days and 2) repair or replacement of a through-wall leak within 18 months to coincide with a scheduled service water outage, if structural integrity is maintained. However, NDE-15 is only applicable to SW piping that is accessible to flaw characterization (i.e., SW piping not addressed by Relief Request NDE-9.)

As noted above, Relief Request NDE-32, which currently provides similar relief to that noted above, will expire for North Anna Unit 1 at the end of the second ten year ISI inspection interval, i.e., on April 30, 2000. Therefore, NRC approval of Relief Requests NDE-9 and 15 for the third ten year ISI inspection interval is requested prior to that date. Upon expiration of NDE-32 and implementation of NDE-9 and 15, any new through-wall flaws identified in the SW system will be treated in accordance with NDE-9 or 15 as applicable. Previously identified flaws that were assessed in accordance with NDE-32 will not be re-assessed under the new relief requests.

If you have any questions or require additional information, please contact us.

Very truly yours,

William R. Matthews
Site Vice President – North Anna

Commitments contained in this correspondence: None.

cc: U.S. Nuclear Regulatory Commission
Region II
Atlanta Federal Center
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Mr. M. J. Morgan
NRC Senior Resident Inspector
North Anna Power Station

Mr. M. Grace
Authorized Nuclear Inspector
North Anna Power Station

Attachment 1

ASME Section XI Relief Request NDE-9

North Anna Power Station Unit 1

Virginia Electric and Power Company
North Anna Power Station Unit 1
Third Ten Year Interval

RELIEF REQUEST NDE-9
Revision 1

I. Identification of Components

	Drawing #
Service Water System	11715-CBB-40D-3 SHT. 1 11715-CBM-78A-3 SHTS. 1 and 4 11715-CBM-78B-3 SHT. 1 11715-CBM-78C-3 SHT. 2 11715-CBM-78G-3 SHTS. 1 and 2

Components within the scope of this Request for Relief include socket welds, and locations within piping including butt welds, where flaw characterization by volumetric or mechanical means is impractical due to geometric or permanent interference constraints, on moderate energy stainless steel piping of the Service Water System (SW). This piping system supplies cooling water from the Service Water Reservoir to safety related equipment and returns the Service Water back to the return headers. Normal operating pressure is 100 PSIG. The design pressure is 150 PSIG and the design temperature is 150°F. This is an ASME, Section XI, Class 3 system.

Attachment 1 provides an identification of each piping segment within the scope of this Request for Relief. The piping segments are identified by their line number designation, which is a unique identifier.

II. Impractical Code Requirements

The Service Water System has experienced through-wall leakage caused by Microbiological Influenced Corrosion (MIC). Chemical treatment of the Service Water System has not been effective in eliminating MIC. The Service Water System is being monitored for MIC.

Identification of additional through-wall leakage is anticipated. Through-wall leakage must be located and evaluated in accordance with the requirements of IWA-5250 of the 1989 Edition for Unit 1. The specific Code requirement for which relief is requested is IWA-5250(a)(3).

"IWA-5250 Corrective Measures

(a) The source of leakage detected during the conduct of a system pressure test shall be located and evaluated by the Owner for corrective measures as follows:

(3) repairs or replacements of components shall be performed in accordance with IWA-4000 or IWA-7000, respectively."

Articles IWA-4000 and IWD-4000 of ASME Section XI Code repair requirements would require removal of the flaw and subsequent weld repair.

III. Basis For Relief

Code repairs for through-wall leaks require the line to be isolated and drained. Taking a train of service water out of service in some instances is a major evolution and requires entering a Technical Specification action statement. The Service Water System is common to both Units. As long as one Unit is in Mode 1, 2, 3, or 4 both trains of service water must be operable. If both Units are in Mode 5 or 6, then one train of Service Water must be operable. The intent of this relief is to permit continued operation with the identified through-wall flaws until repairs are accomplished in a scheduled service water outage.

Based on radiographic examinations and laboratory examinations of removed portions of piping from replacements, North Anna Power Station is experiencing MIC in its stainless steel piping. The MIC-caused flaws originate on the inner diameter of the pipe. Welds and piping with through-wall flaws caused by MIC can typically be shown to have adequate structural integrity to remain in service. This type of through-wall flaw is unpredictable but not normally subject to catastrophic failure.

A 3/4" hole will be postulated for any location with a through-wall flaw that cannot be characterized volumetrically by ultrasonics (UT), radiography (RT), or mechanical techniques. Laboratory examination of cut sections of MIC degraded piping samples indicate that flaws are enveloped within the 3/4" size. The criteria that established a 3/4" diameter hole as the probable largest flaw that would occur because of MIC attack prior to the detection of visible leakage was developed in conjunction with failure analyses performed from about 1992 to 1997 for various pieces of North Anna service water piping which allowed the opportunity to observe the morphology, configuration, and size of numerous pits caused by MIC. During that period, more than 36 sections of piping had been discovered that either exhibited active leakage or evidence of previous leakage. An additional 23 welds had been x-rayed as part of the augmented inspection activity. About 44 of these 59 welds had been evaluated structurally to assess the acceptability of temporary repairs. Of the approximately 59 welds, the materials laboratory had examined about 24 in detail. In general there had been a good correlation between the results from x-ray (on 18 butt welds where x-ray had been possible) and examinations by sectioning the actual flaw locations. There was not as good a correlation between evidence of past leakage and the

location of actual leakage paths on fillet welds. In fact, there had not been (and still has not been) a confirmed case of actual leakage through a fillet weld; though, there had been evidence of leakage near fillet welds. In all cases where any evidence of leakage or corrosive attack of the welds or piping has been confirmed, the causative mechanism has been determined to be MIC. Furthermore, over the last 10 or more years the lab has examined many pieces of piping and other equipment from both Surry and North Anna that have been attacked by MIC. During the last three years visual observations, metallographic cross sections, and X-ray indications of several more MIC attacked welds that were known to be leaking or were suspected of having leaked in the past have been compared.

In general MIC pitting begins at ID structural discontinuities in piping or equipment such as rough weld root profiles, fillet weld roots, and small pre-existing manufacturing surface discontinuities. Another common place for the pitting process to begin is at the heat-affected zone of stainless steel welds. In addition, the attack tends to begin under a layer of debris or slime bacteria colonies which provides the anaerobic environment the aggressive bacteria require. Once the anaerobic bacteria that are principally responsible for the MIC damage get a toe hold on the piping material, in this case stainless steel, their metabolic byproducts establish an aggressive acidic environment that locally attacks the material. The resulting pit provides even better shelter from the oxygenated environment of the service water system and the bacteria thrive. Ideally, once a pit goes subsurface it will tend to form a rounded, nearly spherical void in the wall of the pipe. The void will grow more or less uniformly in all directions until the OD wall of the pipe is breached, resulting in detectable leakage. Given this idealized scenario the diameter of the void would be approximately equal to the thickness of the pipe.

In reality the pitting which has been seen rarely proceeds in the straightforward fashion described above. In fact the pitting may not proceed along the shortest path across the material thickness but rather on a diagonal path. This is apparently often related to the attack following the heat-affected zone of a weld which generally has degraded corrosion resistance relative to base metal or weld metal. Sometimes the pits will produce voids that actually grow randomly or even predominately axially subsurface for some distance before eventually perforating the wall. This may be related to attack following metallurgical inhomogeneities in the pipe wall or may be related to the pull of gravity for pits, which have started at places other than bottom dead center on the pipe ID. Still, with the various deviations from the ideal growth observed to date, it is clear that the thickness of the pipe wall and the tendency for void growth in the thickness direction pose a significant limit on the likely maximum cross sectional area of a void in the pipe wall or weld.

To date we have not seen any MIC pits that we have sectioned with a dimension greater than about 0.5 inches (approximately twice the wall thickness) in the X or Y planes, where the Z direction represents the thickness of the pipe. From this we conclude that a likely and conservative maximum dimension of a void in a pipe wall or weld caused by MIC in stainless steel piping from 2 to 10 inches in

diameter is 3/4 of an inch (about 2 times the nominal wall thickness of a 10 inch schedule 40 pipe).

While most of the observations to date have been made based on butt welded piping, the fillet welds we have had the opportunity to examine tend to show the same tendencies relative to void morphology and growth caused by MIC. As a result we believe it is appropriate and conservative to use 3/4" as the probable maximum void size in a stainless steel fillet weld subject to MIC attack. The methods used in the structural integrity analysis will be performed using the guidelines from ASME Code Case N-513, "Evaluation Criteria for Temporary Acceptance of Flaws in Class 3 Piping."

System interactions, i.e., consequences of flooding and spray, will be evaluated. Welds and piping with through-wall leakage that could affect plant safety related equipment will be declared inoperable and the appropriate Technical Specification action statement entered.

The use of ASME Code Case N-513 is not allowed by 10 CFR 50.55a rulemaking for socket welds due to the inability to characterize flaws. The same concern exists for butt welds or piping, where identified flaws cannot be characterized. As such, alternative requirements are needed.

IV. Alternate Provisions

Code repairs in accordance with IWA-5250(a)(3) will be performed to the above identified welds and piping in the Service Water System within 14 days; or as an alternative, the provisions of ASME Code Case N-513 will apply except as modified below:

a) Because the flaw characterization cannot be made the assessment for structural integrity will be made by assuming a conservative ¾" diameter hole. The analysis will be performed using the evaluation guidelines of ASME Code Case N-513. Identification of a structurally inadequate weld or piping location will result in the associated piping being declared inoperable and the appropriate Technical Specification action statement to be taken.

b) Flaws will be replaced within 18 months from the time of discovery to coincide with an appropriate service water header outage.

The proposed alternative stated above will ensure that the overall level of plant quality and safety will not be compromised.

V. References:

1. USAS B31.1 Power Piping 1967 Edition

2. EPRI Report NP-6301-D, "Ductile Fracture Handbook"

3. Nuclear Regulatory Commission Generic Letter 90-05 "Guidance for Performing Temporary Non-Code Repair of ASME Code Class 1, 2, and 3 Piping"

4. ASME Code Case N-513, "Evaluation Criteria for Temporary Acceptance of Flaws in Class 3 Piping"

Attachment:

1. Drawing/Line Number Designations

ATTACHMENT 1

RELIEF REQUEST NDE-9
REVISION 1

List of drawings containing the Service Water System and the associated line number designations for pipe class 153A and 163.

DRAWING 11715-CBB-040D-3, SHEET 1

3/4"-WS-F82-163-Q3
3/4"-WS-F83-163-Q3
1-1/4"-WS-G37-153A-Q3
1-1/4"-WS-G40-153A-Q3
4"-WS-F99-163-Q3
4"-WS-G01-163-Q3

DRAWING 11715-CBM-078A-3, SHEET 1

1/2"-WS-F61-163-Q3
3/4"-WS-F66-163-Q3
3/4"-WS-F67-163-Q3
3/4"-WS-F68-163-Q3
3/4"-WS-F69-163-Q3
3/4"-WS-F78-163-Q3
3/4"-WS-F79-163-Q3
3/4"-WS-F80-163-Q3
3/4"-WS-F81-163-Q3
3/4"-WS-G30-163-Q3
3/4"-WS-G31-163-Q3
3/4"-WS-G36-163-Q3
3/4"-WS-339-163-Q3
2"-WS-D72-163-Q3
4"-WS-F62-163-Q3
4"-WS-F63-163-Q3
4"-WS-F64-163-Q3
4"-WS-F65-163-Q3
4"-WS-G35-163-Q3
8"-WS-94-163-Q3

DRAWING 11715-CBM-078A-3, SHEET 4

3/4"-WS-G32-163-Q3
3/4"-WS-G33-163-Q3
4"-WS-46-163-Q3
4"-WS-47-163-Q3
4"-WS-56-163-Q3
4"-WS-57-163-Q3
8"-WS-113-163-Q3
8"-WS-114-163-Q3
8"-WS-115-163-Q3
8"-WS-116-163-Q3

DRAWING 11715-CBM-078B-3, SHEET 1

1"-WS-G03-163-Q3
1"-WS-G04-163-Q3
1"-WS-G05-163-Q3
1"-WS-G06-163-Q3
1"-WS-347-163-Q3
1"-WS-349-163-Q3
1"-WS-351-163-Q3
1"-WS-353-163-Q3
1-1/2"-WS-346-163-Q3
1-1/2"-WS-347-163-Q3
1-1/2"-WS-348-163-Q3
1-1/2"-WS-349-163-Q3
1-1/2"-WS-350-163-Q3
1-1/2"-WS-351-163-Q3
1-1/2"-WS-352-163-Q3
1-1/2"-WS-353-163-Q3

ATTACHMENT 1

RELIEF REQUEST NDE-9
REVISION 1

DRAWING 11715-CBM-078C-3, SHEET 2

3/8"-WS-C01-163-Q3
3/8"-WS-382-163-Q3
3/8"-WS-383-163-Q3
3/8"-WS-397-163-Q3
3/8"-WS-398-163-Q3
3/8"-WS-399-163-Q3
3/4"-WS-A47-163-Q3
3/4"-WS-A48-163-Q3
3/4"-WS-A49-163-Q3
3/4"-WS-A50-163-Q3
3/4"-WS-C01-163-Q3
3/4"-WS-C06-163-Q3
3/4"-WS-79-163-Q3
3/4"-WS-83-163-Q3
3/4"-WS-378-163-Q3
3/4"-WS-379-163-Q3
3/4"-WS-380-163-Q3
3/4"-WS-381-163-Q3
1"-WS-77-163-Q3
1"-WS-78-163-Q3
1"-WS-81-163-Q3
1"-WS-82-163-Q3
1"-WS-85-163-Q3
1"-WS-86-163-Q3
1"-WS-88-163-Q3
1"-WS-89-163-Q3
1"-WS-90-163-Q3
1"-WS-92-163-Q3
2"-WS-80-163-Q3
2"-WS-84-163-Q3
2"-WS-376-163-Q3
2"-WS-377-163-Q3
3"-WS-73-163-Q3
3"-WS-74-163-Q3
3"-WS-75-163-Q3
3"-WS-76-163-Q3
4"-WS-46-163-Q3
4"-WS-47-163-Q3
4"-WS-56-163-Q3
4"-WS-57-163-Q3

DRAWING 11715-CBM-078G-3, SHEET 1

3/4"-WS-C66-153A-Q3
3/4"-WS-C67-153A-Q3
3/4"-WS-C68-153A-Q3
3/4"-WS-C69-153A-Q3
3/4"-WS-C70-153A-Q3
3/4"-WS-C71-153A-Q3
3/4"-WS-C72-153A-Q3
3/4"-WS-C73-153A-Q3
3/4"-WS-C74-153A-Q3
3/4"-WS-C75-153A-Q3
3/4"-WS-C76-153A-Q3
3/4"-WS-C77-153A-Q3
3/4"-WS-D39-153A-Q3
3/4"-WS-D41-153A-Q3
3/4"-WS-D43-153A-Q3
3/4"-WS-D54-163-Q3
3/4"-WS-D55-163-Q3
3/4"-WS-D56-163-Q3
3/4"-WS-D60-163-Q3
2"-WS-C79-153A-Q3
2"-WS-C80-153A-Q3
2"-WS-C81-153A-Q3
2"-WS-C82-153A-Q3
2"-WS-C83-153A-Q3
2"-WS-C84-153A-Q3
2"-WS-C85-153A-Q3
2"-WS-C86-153A-Q3
2"-WS-C87-153A-Q3
2"-WS-C88-153A-Q3
2"-WS-C89-153A-Q3
2"-WS-D46-153A-Q3
2"-WS-50-163-Q3
2"-WS-51-163-Q3
2"-WS-52-163-Q3
2"-WS-53-163-Q3
2"-WS-54-163-Q3
2"-WS-55-163-Q3
2"-WS-60-163-Q3

ATTACHMENT 1

RELIEF REQUEST NDE-9
REVISION 1

DRAWING 11715-CBM-078G-3, SHEET 1

3/4"-WS-D61-163-Q3
3/4"-WS-D62-163-Q3
3/4"-WS-D67-163-Q3
3/4"-WS-D68-163-Q3
3/4"-WS-D69-163-Q3
3/4"-WS-D70-163-Q3
1"-WS-D30-153A-Q3
1"-WS-D31-153A-Q3
1"-WS-D50-153A-Q3
2"-WS-C78-153A-Q3
2"-WS-61-163-Q3
2"-WS-62-163-Q3
2"-WS-63-163-Q3
2"-WS-64-163-Q3
2"-WS-65-163-Q3
3"-WS-73-163-Q3
3"-WS-74-163-Q3
3"-WS-75-163-Q3
3"-WS-76-163-Q3

DRAWING 11715-CBM-078G-3, SHEET 2

3/4"-WS-D33-153A-Q3
3/4"-WS-D35-153A-Q3
3/4"-WS-D37-153A-Q3
3/4"-WS-D51-163-Q3
3/4"-WS-D52-163-Q3
3/4"-WS-D53-163-Q3
3/4"-WS-D57-163-Q3
3/4"-WS-D58-163-Q3
3/4"-WS-D59-163-Q3
3/4"-WS-D63-163-Q3
3/4"-WS-D65-163-Q3
3/4"-WS-D66-163-Q3
3/4"-WS-D71-153A-Q3
1"-WS-D47-153A-Q3
1"-WS-D48-153A-Q3
1"-WS-D49-153A-Q3
2"-WS-D46-153A-Q3
3"-WS-73-163-Q3
3"-WS-74-163-Q3
3"-WS-75-163-Q3
3"-WS-76-163-Q3

Attachment 2

ASME Section XI Relief Request NDE-15

North Anna Power Station Unit 1

Virginia Electric and Power Company
North Anna Power Station Unit 1
Third Ten Year Interval

RELIEF REQUEST NDE-15
Revision 0

I. Identification of Components

	Drawing #
Service Water System	11715-CBB-40D-3 SHT. 1 11715-CBM-78A-3 SHTS. 1 and 4 11715-CBM-78B-3 SHT. 1 11715-CBM-78C-3 SHT. 2 11715-CBM-78G-3 SHTS. 1 and 2

Pressure retaining piping, fittings, and associated welds on moderate energy stainless steel piping of the Service Water System (SW). This piping system provides cooling water from the Service Water Reservoir to safety related equipment and returns the Service Water back to the return headers. Normal operating pressure is 100 PSIG. The design pressure is 150 PSIG and the design temperature is 150°F. This is an ASME, Section XI, Class 3 system.

Attachment 1 provides an identification of each piping segment within the scope of this Request for Relief. The piping segments are identified by their line number designation, which is a unique identifier.

II. Impractical Code Requirements

The Service Water System has experienced through-wall leakage caused by Microbiological Influenced Corrosion (MIC). Chemical treatment of the Service Water System has not been effective in eliminating MIC. The Service Water System is being monitored for MIC.

Identification of additional through-wall leakage is anticipated. Through-wall leakage must be located and evaluated in accordance with the requirements of IWA-5250 of the 1989 Edition for Unit 1. The specific Code requirement for which relief is requested is IWA-5250(a)(3).

"IWA-5250 Corrective Measures

(b) The source of leakage detected during the conduct of a system pressure test shall be located and evaluated by the Owner for corrective measures as follows:

(3) repairs or replacements of components shall be performed in accordance with IWA-4000 or IWA-7000, respectively."

Articles IWA-4000 and IWD-4000 of ASME Section XI Code repair requirements would require removal of the flaw and subsequent weld repair.

Alternatively, the use of ASME Code Case, N-513, "Evaluation Criteria for Temporary Acceptance of Flaws in Class 3 Piping," is authorized except for certain restrictions by 10 CFR 50.55a rulemaking. However, the Code Case requires a Code repair or replacement not exceeding the time to the next scheduled outage. Additionally, the Code case provides no timeframe for completion of the evaluation of the flaw.

III. Basis for Relief

Code repairs for through-wall leaks require the line to be isolated and drained. Taking a train of service water out of service in some instances is a major evolution and requires entering a Technical Specification action statement. The Service Water System is common to both Units. As long as one Unit is in Mode 1, 2, 3, or 4 both trains of service water must be operable. If both Units are in Mode 5 or 6, then one train of service water must be operable.

Historically, the timeframe from detection of the flaw to completion of the flaw evaluation process for the components in the affected system has been within 14 days of detection otherwise the component has been repaired or replaced. The timeframe for this process will be continued and is appropriate for the damage mechanism as approved previously by the NRC for NDE-32 (2nd interval corresponding relief request) in letter dated December 22, 1998 (TAC NOS. MA1222 and MA1223).

IV. Alternate Provisions

Code repairs in accordance with IWA-5250(a)(3) will be performed to the above identified welds and piping in the Service Water System within 14 days; or as an alternative, the provisions of ASME Code Case N-513 will apply except as modified below:

Flaws will be replaced within 18 months from the time of discovery to coincide with an appropriate service water header outage.

V. Reference

1. ASME Code Case N-513, "Evaluation Criteria for Temporary Acceptance of Flaws in Class 3 Piping"

Attachment:

1. Drawing/Line Number Designations

ATTACHMENT 1

RELIEF REQUEST NDE-15
REVISION 0

List of drawings containing the Service Water System and the associated line number designations for pipe class 153A and 163.

DRAWING 11715-CBB-040D-3, SHEET 1

3/4"-WS-F82-163-Q3
3/4"-WS-F83-163-Q3
1-1/4"-WS-G37-153A-Q3
1-1/4"-WS-G40-153A-Q3
4"-WS-F99-163-Q3
4"-WS-G01-163-Q3

DRAWING 11715-CBM-078A-3, SHEET 1

1/2"-WS-F61-163-Q3
3/4"-WS-F66-163-Q3
3/4"-WS-F67-163-Q3
3/4"-WS-F68-163-Q3
3/4"-WS-F69-163-Q3
3/4"-WS-F78-163-Q3
3/4"-WS-F79-163-Q3
3/4"-WS-F80-163-Q3
3/4"-WS-F81-163-Q3
3/4"-WS-G30-163-Q3
3/4"-WS-G31-163-Q3
3/4"-WS-G36-163-Q3
3/4"-WS-339-163-Q3
2"-WS-D72-163-Q3
4"-WS-F62-163-Q3
4"-WS-F63-163-Q3
4"-WS-F64-163-Q3
4"-WS-F65-163-Q3
4"-WS-G35-163-Q3
8"-WS-94-163-Q3

DRAWING 11715-CBM-078A-3, SHEET 4

3/4"-WS-G32-163-Q3
3/4"-WS-G33-163-Q3
4"-WS-46-163-Q3
4"-WS-47-163-Q3
4"-WS-56-163-Q3
4"-WS-57-163-Q3
8"-WS-113-163-Q3
8"-WS-114-163-Q3
8"-WS-115-163-Q3
8"-WS-116-163-Q3

DRAWING 11715-CBM-078B-3, SHEET 1

1"-WS-G03-163-Q3
1"-WS-G04-163-Q3
1"-WS-G05-163-Q3
1"-WS-G06-163-Q3
1"-WS-347-163-Q3
1"-WS-349-163-Q3
1"-WS-351-163-Q3
1"-WS-353-163-Q3
1-1/2"-WS-346-163-Q3
1-1/2"-WS-347-163-Q3
1-1/2"-WS-348-163-Q3
1-1/2"-WS-349-163-Q3
1-1/2"-WS-350-163-Q3
1-1/2"-WS-351-163-Q3
1-1/2"-WS-352-163-Q3
1-1/2"-WS-353-163-Q3

ATTACHMENT 1

RELIEF REQUEST NDE-15
REVISION 0

DRAWING 11715-CBM-078C-3, SHEET 2

3/8"-WS-C01-163-Q3
3/8"-WS-382-163-Q3
3/8"-WS-383-163-Q3
3/8"-WS-397-163-Q3
3/8"-WS-398-163-Q3
3/8"-WS-399-163-Q3
3/4"-WS-A47-163-Q3
3/4"-WS-A48-163-Q3
3/4"-WS-A49-163-Q3
3/4"-WS-A50-163-Q3
3/4"-WS-C01-163-Q3
3/4"-WS-C06-163-Q3
3/4"-WS-79-163-Q3
3/4"-WS-83-163-Q3
3/4"-WS-378-163-Q3
3/4"-WS-379-163-Q3
3/4"-WS-380-163-Q3
3/4"-WS-381-163-Q3
1"-WS-77-163-Q3
1"-WS-78-163-Q3
1"-WS-81-163-Q3
1"-WS-82-163-Q3
1"-WS-85-163-Q3
1"-WS-86-163-Q3
1"-WS-88-163-Q3
1"-WS-89-163-Q3
1"-WS-90-163-Q3
1"-WS-92-163-Q3
2"-WS-80-163-Q3
2"-WS-84-163-Q3
2"-WS-376-163-Q3
2"-WS-377-163-Q3
3"-WS-73-163-Q3
3"-WS-74-163-Q3
3"-WS-75-163-Q3
3"-WS-76-163-Q3
4"-WS-46-163-Q3
4"-WS-47-163-Q3
4"-WS-56-163-Q3
4"-WS-57-163-Q3

DRAWING 11715-CBM-078G-3, SHEET 1

3/4"-WS-C66-153A-Q3
3/4"-WS-C67-153A-Q3
3/4"-WS-C68-153A-Q3
3/4"-WS-C69-153A-Q3
3/4"-WS-C70-153A-Q3
3/4"-WS-C71-153A-Q3
3/4"-WS-C72-153A-Q3
3/4"-WS-C73-153A-Q3
3/4"-WS-C74-153A-Q3
3/4"-WS-C75-153A-Q3
3/4"-WS-C76-153A-Q3
3/4"-WS-C77-153A-Q3
3/4"-WS-D39-153A-Q3
3/4"-WS-D41-153A-Q3
3/4"-WS-D43-153A-Q3
3/4"-WS-D54-163-Q3
3/4"-WS-D55-163-Q3
3/4"-WS-D56-163-Q3
3/4"-WS-D60-163-Q3
3/4"-WS-D61-163-Q3
3/4"-WS-D62-163-Q3
3/4"-WS-D67-163-Q3
3/4"-WS-D68-163-Q3
2"-WS-C79-153A-Q3
2"-WS-C80-153A-Q3
2"-WS-C81-153A-Q3
2"-WS-C82-153A-Q3
2"-WS-C83-153A-Q3
2"-WS-C84-153A-Q3
2"-WS-C85-153A-Q3
2"-WS-C86-153A-Q3
2"-WS-C87-153A-Q3
2"-WS-C88-153A-Q3
2"-WS-C89-153A-Q3
2"-WS-D46-153A-Q3
2"-WS-50-163-Q3
2"-WS-51-163-Q3
2"-WS-52-163-Q3
2"-WS-53-163-Q3
2"-WS-54-163-Q3
2"-WS-55-163-Q3
2"-WS-60-163-Q3
2"-WS-61-163-Q3
2"-WS-62-163-Q3
2"-WS-63-163-Q3
2"-WS-64-163-Q3

ATTACHMENT 1

RELIEF REQUEST NDE-15
REVISION 0

DRAWING 11715-CBM-078G-3, SHEET 1

3/4"-WS-D69-163-Q3
3/4"-WS-D70-163-Q3
1"-WS-D30-153A-Q3
1"-WS-D31-153A-Q3
1"-WS-D50-153A-Q3
2"-WS-C78-153A-Q3
2"-WS-65-163-Q3
3"-WS-73-163-Q3
3"-WS-74-163-Q3
3"-WS-75-163-Q3
3"-WS-76-163-Q3

DRAWING 11715-CBM-078G-3, SHEET 2

3/4"-WS-D33-153A-Q3
3/4"-WS-D35-153A-Q3
3/4"-WS-D37-153A-Q3
3/4"-WS-D51-163-Q3
3/4"-WS-D52-163-Q3
3/4"-WS-D53-163-Q3
3/4"-WS-D57-163-Q3
3/4"-WS-D58-163-Q3
3/4"-WS-D59-163-Q3
3/4"-WS-D63-163-Q3
3/4"-WS-D65-163-Q3
3/4"-WS-D66-163-Q3
3/4"-WS-D71-153A-Q3
1"-WS-D47-153A-Q3
1"-WS-D48-153A-Q3
1"-WS-D49-153A-Q3
2"-WS-D46-153A-Q3
3"-WS-73-163-Q3
3"-WS-74-163-Q3
3"-WS-75-163-Q3
3"-WS-76-163-Q3