

AmerGen

**SPECIFICATION
SP-1302-52-120**

QUALITY

*Final
marker*

SPECIFICATION

FOR

**INSPECTION AND LOCALIZED REPAIR
OF THE TORUS AND VENT SYSTEM COATING**

OYSTER CREEK

PREPARATION *Charles Schilling*

DATE *10-3-02*

ENGINEERING APPROVAL *J. J. [Signature]*

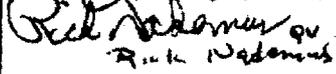
DATE *10-10-02*

QV CONCURRENCE *Paul S. [Signature]*

DATE *10-03-02*

Rev. *2* *3*

TW
8/9/06

 An Exelon/British Energy Company		DOCUMENT NO. SP-1302-52-120	
TITLE Inspection and Localized Repair of Torus and Vent System Coating			
REV	SUMMARY OF CHANGE	APPROVAL	DATE
0	Original Issue		
1	Eliminated the elcometer adhesion tests, putty knife peel test, and the vacuum box tests. Defined scope of de-sludging. Revised scope of visual inspections. Reduced requirements for UT inspections unless required for pit evaluation. Removed chemistry requirements. Refer to AR A2014230 E5 for explanation and justification of changes.		
2	Includes reference to C-1302-187-E310-038 (pit depth acceptance criteria)	 John Clark  T.E. Quintenz  Rick Wadsworth	7/8/2003 7-8-03 7-14-03
3	Incorporate License Renewal Commitments		

Exelon Generation Company, LLC and Amergen Energy Company, LLC
Quality Assurance Topical Report (QATR), NO-AA-10

1.0 SCOPE

This specification provides the requirements for torus water de-sludging, inspection and repair of the interior coating of the Oyster Creek torus shell and vent system located above and below the water line.

in accordance with ASME Section XI Subsection IWE, (CM-1)

The primary purpose of the inspections is to continue to assess the condition of the blistered coating at the invert of the torus. Coating repairs will be made where necessary to protect the torus shell and vent system from corrosion. Inspection of the submerged Core/Containment Spray System Strainers for any blockage is part of this inspection.

in all twenty (20) bays away other refueling outage (CM-1)

2.0 REFERENCES

The following documents are part of this specification, and are applicable to the extent indicated by the specific reference.

The latest revision, edition, or addendum in effect shall apply for those publications which are not specifically identified by date.

- 2.1 ~~Oyster Creek Operational Quality Assurance Plan, 2000-PLN-7200-01~~
- 2.2 10 CFR Part 21 "Reporting of Defects and Noncompliance"
- 2.3 ANSI N45.2.6 "Qualification Inspection Examination and Testing Personnel for Nuclear Power Plants".
- 2.4 MA-AA-716-008 "FOREIGN MATERIAL EXCLUSION PROGRAM"
- 2.5 "Manual of Coating Work for Light Water Nuclear Power Plant Primary Containment and Other Safety Related Facilities," published by American Society of Testing and Materials.
- 2.6 ANSI N5.12-1974, "Protective Coatings (Paints) for Nuclear Industry", published by American National Standard Institute
- 2.7 SGPAI Report # GPU-004-002 Rev. 0, "Analysis of Blistered Torus Coating - Oyster Creek Nuclear Generating Station." prepared by S.G. Pinney & Associates, Inc.

1/2

1/3

1/3

2.16 Station Commitments
2.16.1 CM-1 Action Tracking Item AR 00330592.33,
License (General Aging Management) (Steps 1.0, 3.1.2,
4.2, 4.5, 5.0)
4.3.2

- 2.8 ANSI 101.2-1972, "Protective Coating (Paints) for Light Water Nuclear Containment Facilities," published by American National Standard Institute
- 2.9 ANSI N101.4-1972, "Quality Assurance for Protective Coatings Applied to Nuclear Facilities", published by American National Standard Institute
- 2.10 ASTM D-714, 'Standard method of Evaluating Degree of Blistering of Paints"
- 2.11 Underwater Construction Corporation's QA Program Manual "Quality Assurance Manual", Revision 0 Dated December 9, 1996
- 2.12 Under Water Engineering Services (Subsidiary of S. G. Pinney & Associates) 14R Coating & Corrosion Inspection Report of O.C. Torus Immersion Area & Vent Header Report # FER-7101 Rev. 0 dated 3/2/93
- 2.13 ASME Section XI Part IWE 1992 Edition with 1992 Addenda (CM-1)
- 2.14 ~~2000 ADM 7218.01 Corrective Action Process (CAP)~~ LS-AA-125 Corrective Action Program (CAP) Procedure
- 2.15 AmerGen Calculation C-1302-187-E310-038, "Oyster Creek Torus Corrosion Allowable Pit Depth"

3.0 GENERAL REQUIREMENTS

3.1 Contractor Work

- 3.1.1 Perform torus water desludging.
- 3.1.2 Perform inspections and coating repair in accordance with ASME SECTION XI, IWE. (CM-1)
- 3.1.3 Prepare final report to document the inspection and repairs. Still photographs and/or videotape shall be submitted to support written report.

3.2 AmerGen Work

- 3.2.1. Provide station services to support contractor's work.
- 3.2.2 Monitor de-sludging, inspection, and repair of coating defects.
- 3.2.3 Provide ultrasonic thickness equipment, train divers in ultrasonic transducer use, and thickness measurement procedures.

3

3

3.2.4 Perform water analysis.

3.2.5 Provide container and analyze for MIC, microbes.

4.0 DETAILED REQUIREMENTS

4.1 Torus Water Cleanup

Torus water cleanup effort shall include removal of biomass from all bays.

4.1.1 Desludge all twenty (20) torus bays using AmerGen approved procedures prior to inspecting/repairs. The procedure shall include preventive measures in equipment selection and process development to minimize (or eliminate) cracking of existing blisters during desludging operation.

4.1.2 Scope of De-Sludging - The invert area, in all 20 bays shall be de-sludged. The invert is defined as the bottom of the Torus shell up to the location of the ECCS Suction Strainer nozzles. This includes both sides of the shell. In addition, de-sludging shall be performed on areas above the invert where required to provide sufficient visibility to perform general visual coating inspections as defined in Section 4.2.1 of this specification.

4.2 Visual Inspection (CM-1)

4.2.1.4 flaking
4.2.1.5 discoloration
4.2.1.6 other signs of distress

4.2.1 Perform a ^{VT-3 visual examination} ~~general visual inspection~~ of the interior immersion torus shell coating in all 20 bays. The following coating defects shall be recorded:

- 4.2.1.1 delamination / peeling,
- 4.2.1.2 cracking, and/or,
- 4.2.1.3 blistering (report in accordance with Reference 2.10)

4.2.2 Perform ^{a VT-3 visual examination} ~~visual inspection~~ of three existing one square foot test patches, one patch in Bay 6, Quadrant I and two patches in Bay 7, Quadrants 1 and 2 respectively. Test areas are outlined with Brutem 15 coating material and are accompanied by an arrow which points to the reactor. Specific locations of the test patches and details of the previous inspection are given in References 2.7 and 2.12.

4.2.2.1 Divide each test patch into quadrants and measure diameter of each blister that is intersected by dividing lines.

4.2.2.2 Take photographs of each test patch. Photographs shall include overall view of each test area as well as close-ups of the measured blisters. All photographs shall include a ruler.

4.2.3 Perform ^{a VT-3 visual examination} ~~visual inspection~~ of interior of vent system ^{Coating.} (CM-1)

4.2.3.2 The following defects shall be recorded:
4.2.3.2.1 delamination/peeling
4.2.3.2.2 cracking and/or
4.2.3.2.3 blistering (Report in accordance with Reference 2.10)
4.2.3.2.4 flaking
4.2.3.2.5 discoloration
4.2.3.2.6 other signs of distress

4.2.3.1 Examine surfaces for coating defects with particular attention paid to the vent tube and vent header intersection. If required to aid the examination, the accumulated water at these intersections may be pumped and/or sponged out with care taken to avoid excessive friction on the coated surface.

4.2.3.3 Document inspection findings through sketches and/or photographs.

4.2.4 Perform a ^{VT-3 visual examination} ~~visual inspection~~ of the vapor region of the torus coating. Inspection shall be made from the torus catwalk utilizing binoculars, where necessary, on a best effort basis. The following defects shall be recorded:

4.2.4.2 cracking and/or
4.2.4.3 blistering (Report in accordance with Reference 2.10)
4.2.4.4 flaking
4.2.4.5 discoloration
4.2.4.6 other signs of distress

4.2.4.1 ~~Characterize coating defects and blistered condition (frequency and size) for Reference 2.10~~ Delamination/peeling

4.2.5 Perform visual examinations of three suction strainers located in Bays 4, 11 and 18 for any sign of blockage. Report any sign of strainer blockage to AmerGen Project Engineer (or designee) within one shift.

4.3 Torus Shell Thickness Measurements

4.3.1 Confirm that the two bare metal areas described below have been coated.

4.2.6 Areas that are suspect shall be accepted by engineering evaluation or corrected by repair or replacement in accordance with ASME Section XI, IWE-3122. Supplemental examinations in accordance with IWE-3200 shall be performed when specified as a result of the engineering evaluations.

4.3.1.1 Area 1 is located in Bay 6--in the transition region between the heavily blistered coating system of Mobil 46 X 16 and Mobil 78 and the non-blistered coating system of Mobil 78. (Reference 2.12)

4.3.1.2.1 Area 2 is located on the Bay 6/7 ring girder in the non-blistered coating system of Mobil 78. (Reference 2.12)

4.3.2 If pitting is present, the following guidance shall be used. (M-1)

Pits shall not exceed 0.040 inches in depth.

~~4.3.2.1~~ Isolated Pits of 0.125" in diameter have an allowed maximum depth of 0.261" anywhere in the shell provided the center to center distance between the subject pit and neighboring isolated pits or areas of pitting corrosion is greater than 20.0 inches. This includes old pits or old areas of pitting corrosion that have been filled and/or re-coated.

~~4.3.2.2~~ Multiple Pits that can be encompassed by a 2-1/2" diameter circle shall be limited to a maximum pit depth of 0.141" provided the center to center distance between the subject pitted area and neighboring isolated pits or areas of pitting corrosion is greater than 20.0 inches. This includes old pits or old areas of pitting corrosion that have been filled and/or recoated.

4.3.2.4 2 Locations that do not meet the requirements specified above shall be characterized based on the size of the area, center to center distance between corroded areas, the maximum pit depth and its location in the Torus based on major structural features. These details shall be sent to Oyster Creek Engineering.

3

4.4 Vent Header Thickness Measurements

4.4.1 AmerGen Project Engineer (or his designee) shall determine the number and locations where remaining wall thickness and/or pit depth measurements will be performed on the vent header. Such determination shall be based upon the results of visual examination of the header (paragraph 4.2.3). The selected areas shall include worst corroded areas.

4.4.2 At least one ultrasonic thickness reading shall be taken in the designated area.

4.4.3 If pitting is present, the depth of the deepest pit shall be measured using a pit gage. The thickness of the metal surrounding the pit shall be determined at three different locations after removing the coating.

4.4.4 Ultrasonic thickness measurements and pit depth readings shall be reported within one shift to AmerGen Project Engineer (or his designee) for disposition.

4.5 Repair of Coating (CM-1)

4.5.1 Vendor shall have capability to repair the torus and vent system coating in the vapor and immersion regions in accordance with References 2.5, 2.6, 2.8, and 2.9. Currently, only approved repair material is UT-15 epoxy developed for EZR Inc. and manufactured by Picco Coatings Co. of Houston, Texas.

and 2.13.

B

4.5.1.1 The types of areas to be repaired are mechanical damage, coating defects exposing substrate, fractured blisters showing signs of corrosion and the testing areas where coating has been removed.

4.5.1.2 The size of the repair area shall not exceed one (1) square foot unless directed by AmerGen.

4.5.1.3 Coating material to be applied for repair of the Oyster Creek torus shell and vent system shall be qualified in accordance with References 2.8 and 2.9.

4.6 Microbial Sample

4.6.1 Two samples of the microbial mass shall be collected from the torus in containers provided by AmerGen.

4.7 Cleanliness

4.7.1 The Contractor shall minimize contamination of the torus water. Any chemical spills shall be cleaned up to the satisfaction of AmerGen.

4.7.2 All materials brought into the torus must have prior approval of AmerGen Plant Chemistry Department and be controlled under Reference 2.4.

4.7.3 All materials brought into the torus by Contractor must be removed by the Contractor.

5.0 QUALITY ASSURANCE (CM-1)

5.1 The work is "Q" Quality and shall be performed in accordance with Reference 2.1.

5.2 Inspection records and personnel and procedure qualifications shall be retained as required by Reference 2.1 and 2.13.

5.3 The contractor shall have a QA Program that meets the requirements of References 2.1 through 2.3, 2.5, 2.6, 2.8, and 2.9. This program shall be reviewed and approved by AmerGen in accordance with Reference 2.1 prior to any initiation of work.

5.4 Coating inspector qualifications shall be certified in accordance with References 2.3, and 2.11, and certification shall be approved by AmerGen prior to any initiation of work.

5.5 Reference 2.2 applies to the work conducted under the Contractor's QA program. The resolution of ~~MOCs~~ ^{non-conformances} shall be performed and satisfy the requirements of the Oyster Creek ~~QA Plan~~ ^{QA Plan} (Reference 2.1 and 2.14).

6.0 INFORMATION TO BE SUBMITTED

6.1 Documents to be supplied within 30 days after award of contract.

6.1.1 Coating work/testing/inspection procedures.

13

3

Quality Assurance Topical Report

- 6.1.1.1 Procedures to be supplied include adhesion testing, peel testing, vacuum box testing, coating removal for ultrasonic testing, and coating repair.
- 6.1.2 Qualifications and Certifications for the Inspectors.
- 6.1.3 Contractor's QA Manual/Program.
- 6.2 Document to be supplied within 30 days after completion of project.
 - 6.2.1 Draft final report for AmerGen review and comment. AmerGen review cycle will take two weeks.
- 6.3 Document to be supplied within 60 days after completion of project.
 - 6.3.1 Final Inspection Report
 - 6.3.1.1 Inspection report shall include maps showing locations of defects, all test results and photographs showing coating condition. The documentation of repairs will meet the intent of Reference 2.9.
 - 6.3.2 Video Tape
 - 6.3.2.1 The videotape shall document condition of coating in the immersion zone and in vent header.
 - 6.3.2.2 The videotape shall show results of visual inspection of coating condition in the test patches.
 - 6.3.2.3 The video shall show those areas not vacuumed during the de-sludging.
 - 6.3.2.4 The video shall show the detail conditions of the suction strainers.
 - 6.3.2.5 The video tape shall show any new special interest areas uncovered during inspection.

TABLE OF CONTENTS

<u>ARTICLE</u>		<u>PAGE</u>
1.0	SCOPE	3
2.0	REFERENCES	3
3.0	GENERAL REQUIREMENTS	4
3.1	Contractor Work	4
3.2	AmerGen Work	4
4.0	DETAILED REQUIREMENTS	5
4.1	Torus Water Cleanup	5
4.2	Visual Inspection	5
4.3	Torus Shell Thickness Measurements	6
4.4	Vent Header Thickness Measurements	7
4.5	Repair of Coating	8
4.6	Microbial Sample	8
4.7	Cleanliness	8
5.0	QUALITY ASSURANCE	9
6.0	INFORMATION TO BE SUBMITTED	9
6.1	Documents to be supplied within 30 days after award of contract	9
6.2	Document to be supplied within 30 days after completion of project	10
6.3	Document to be supplied within 60 days after completion of project	10