

CATEGORY 1

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FACIL: 50-244 Robert Emmet Ginna Nuclear Plant, Unit 1, Rochester G 05000244
AUTH.NAME AUTHOR AFFILIATION
MECREDY, R.C. Rochester Gas & Electric Corp.
RECIP.NAME RECIPIENT AFFILIATION
VISSING, G.S.

SUBJECT: Forwards response to GL 98-04, "Potential for Degradation of
ECCS & CSS After LOCA Because of Construction & Protective
Coating Deficiencies & Foreign Matl In Containment."

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ROBERT C. MECREDY
Vice President
Nuclear Operations



December 1, 1998

United States Nuclear Regulatory Commission
Document Control Desk
Attention: Guy S. Vissing
Project Directorate I-1
Washington DC 20555

Subject: Response to Generic Letter 98-04, dated July 14, 1998;
SUBJECT: POTENTIAL FOR DEGRADATION OF THE EMERGENCY
CORE COOLING SYSTEM AND THE CONTAINMENT SPRAY SYSTEM
AFTER A LOSS-OF-COOLANT ACCIDENT BECAUSE OF
CONSTRUCTION AND PROTECTIVE COATING DEFICIENCIES AND
FOREIGN MATERIAL IN CONTAINMENT
R. E. Ginna Nuclear Power Plant
Docket No. 50-244

Dear Mr. Vissing:

On July 14, 1998, the Nuclear Regulatory Commission issued the referenced generic letter addressing issues which have generic implications regarding the impact of potential coating debris on the operation of safety related systems, structures, and components (SSC) during a postulated design basis LOCA. Protective coatings are necessary inside containment to control radioactive contamination and to protect surfaces from erosion and corrosion. Detachment of the coatings from the substrate may cause additional debris to be transported to the containment sump, increasing the dp across the sump screen and thus reducing the net positive suction head (NPSH) available to the Residual Heat Removal (RHR) and Containment Spray (CS) pumps. The generic letter requests information under 10 CFR 50.54(f) to evaluate the addressees' programs for ensuring that Service Level 1 protective coatings inside containment do not detach from their substrate during a design basis LOCA and interfere with the operation of the ECCS and the CSS.

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Response to Requested Information

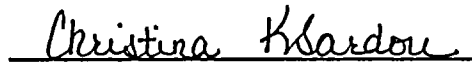
By this letter, Rochester Gas and Electric Corporation is providing the required 120-day response to Generic letter 98-04.

Attachments: (1) Generic Letter 98-04 Requested Information

Very truly yours,


Robert C. Mecredy

Subscribed and sworn to before me
on this 1st day of December, 1998


Notary Public

CHRISTINA K. SARDOU
Notary Public, State of New York
Registration No. 01SA6015061
Genesee County
Commission Expires October 19, 2000

xc: Mr. Guy S. Vissing (Mail Stop 14B2)
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Division of Reactor Projects - I/II
Office of Nuclear Regulatory Regulation
U.S. Nuclear Regulatory Commission
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Attachment 1
Generic Letter 98-04 Requested Information

- (1) *A summary description of the plant-specific program or programs implemented to ensure that Service Level 1 protective coatings used inside the containment are procured, applied, and maintained in compliance with applicable regulatory requirements and the plant-specific licensing basis for the facility. Include a discussion of how the plant-specific program meets the applicable criteria of 10 CFR Part 50, Appendix B, as well as information regarding any applicable standards, plant-specific procedures, or other guidance used for: (a) controlling the procurement of coatings and paints used at the facility, (b) the qualification testing of protective coatings, and (c) surface preparation, application, surveillance, and maintenance activities for protective coatings. Maintenance activities involve reworking degraded coatings, removing degraded coatings to sound coatings, correctly preparing the surfaces, applying new coatings, and verifying the quality of the coatings.*

RESPONSE:

Rochester Gas and Electric Corporation has implemented controls for the procurement, application, and maintenance of Service Level 1 protective coatings used inside the containment in a manner that is consistent with the licensing basis and regulatory requirements applicable to R. E. Ginna Nuclear Power Plant. The requirements of 10 CFR Part 50 Appendix B are implemented through specification of appropriate technical and quality requirements for the Service Level 1 coatings program which includes ongoing maintenance activities.

For R. E. Ginna Nuclear Power Plant, Service Level 1¹ coatings are subject to the requirements of Ginna Station Procedure GC-76.11, Painting Application and Inspection. While currently adequate, procedure GC-76.11 is being enhanced by the addition of clarification regarding the use of only Service Level 1 coatings inside Containment. Adequate assurance that the applicable requirements for the procurement, application, inspection, and maintenance are implemented is provided by procedures and programmatic controls, approved under the R. E. Ginna Nuclear Power Plant Quality Assurance program. Rochester Gas and Electric Corporation is also evaluating the guidance provided in EPRI TR-109937 "Guideline on Nuclear Safety-Related Coatings" and, as appropriate, improvements to our existing programs and procedures for Service Level 1 coatings will be implemented following completion of the evaluation. Completion of this evaluation is scheduled for June 8, 1999.

Service Level 1 coatings used for new applications or repair/replacement activities are

Our response applies to Service Level 1 coatings used in primary containment that are procured, applied and maintained by Rochester Gas and Electric Corporation or their contractor

procured from a vendor with a quality assurance program meeting the applicable requirements of 10 CFR Part 50 Appendix B. The applicable technical and quality requirements that the vendor is required to meet are specified by Rochester Gas and Electric Corporation. Acceptance activities are conducted in accordance with procedures that are consistent with ANSI N 45.2 requirements (e.g., receipt inspection, source surveillance, etc.). This specification of required technical and quality requirements combined with appropriate acceptance activities provides adequate assurance that the coatings received meet the requirements of the procurement documents.

The qualification testing of Service Level 1 coatings used for new applications or repair/replacement activities inside containment meets the applicable requirements contained in the standards and regulatory commitments referenced. Ginna Station's Service Level 1 coatings are procured from the Carboline Company. The Carboline Company was last assessed by a Quality Control Procurement Audit in April, 1997. In the Spring of 1999, Ginna Station Quality Control Engineers will participate in the next Quality Control Audit of the Carboline Company

The surface preparation, application and surveillance during installation of Service Level 1 coatings used for new applications or repair/replacement activities inside containment also meet the applicable portions of the standards and regulatory commitments referenced. Documentation of completion of these activities is performed consistent with the applicable requirements.

Rochester Gas and Electric Corporation periodically conducts visual inspections inside containment. General conditions, including coating conditions, are observed during the VT-2 leakage examination of Class I components and piping prior to startup after each refueling outage and during the VT-2 leakage examination of Class II and III piping, supports, and attachments every period. General walkdowns by Operations, Performance Monitoring, Systems Engineering, Radiation Protection, and Maintenance personnel, as well as crane inspections prior to refueling outages, ensure a general awareness of conditions by a variety of observers. If a localized area of degraded coating is identified, that area is evaluated and scheduled for repair or replacement, as necessary. These observations, and the resulting repair/replacement activities, assure that the amount of Service Level 1 coatings which may be susceptible to detachment from the substrate during a LOCA event is minimized. As previously noted, Rochester Gas and Electric Corporation is evaluating the guidance contained in the EPRI coatings guideline.

Prior to Ginna Station's 1999 Refueling Outage, Rochester Gas and Electric Corporation's Laboratory and Inspection Services personnel will have developed the criteria for the ASME Section XI IWE and IWL program. This criteria will then be used to perform the general visual baseline examination (i.e. loose/missing parts, corrosion, erosion, etc.) of the containment during the 1999 Refueling Outage.

(2) Information demonstrating compliance with item (i) or item (ii):

- (i) For plants with licensing-basis requirements for tracking the amount of unqualified coatings inside the containment and for assessing the impact of potential coating debris on the operation of safety-related SSCs during a postulated design basis LOCA, the following information shall be provided to demonstrate compliance:**
- (a) The date and findings of the last assessment of coatings, and the planned date of the next assessment of coatings.**
 - (b) The limit for the amount of unqualified protective coatings allowed in the containment and how this limit is determined. Discuss any conservatism in the method used to determine this limit.**
 - (c) If a commercial-grade dedication program is being used at your facility for dedicating commercial-grade coatings for Service Level 1 applications inside the containment, discuss how the program adequately qualifies such a coating for Service Level 1 service. Identify which standards or other guidance are currently being used to dedicate containment coatings at your facility; or,**

RESPONSE:

Rochester Gas and Electric Corporation does not have a licensing basis requirement for tracking the amount of unqualified coatings used inside containment at R. E. Ginna Nuclear Power Plant.

- (ii) For plants without the above licensing-basis requirements, information shall be provided to demonstrate compliance with the requirements of 10CFR50.46(b)(5), "Long-term cooling" and the functional capability of the safety-related CSS as set forth in your licensing basis. If a licensee can demonstrate this compliance without quantifying the amount of unqualified coatings, this is acceptable.**

RESPONSE:

The following description and referenced materials describe the licensing basis for R. E. Ginna Nuclear Power Plant relative to conformance with 10 C.F.R. 50.46(b)(5), "Long-term cooling," specifically with regard to R. E. Ginna Nuclear Power Plant's ability to provide extended decay heat removal including related assumptions for debris that could block containment emergency sump screens.

In the construction of R. E. Ginna Nuclear Power Plant contemporary standards were specified to ensure that protective coatings applied would perform their functions under environmental conditions experienced during operation and the design-basis accident and to

do so without hazard of interfering with other nuclear components.

One standard specified was SP-5485 dated January 18, 1968, entitled Technical Specification, Painting of Structures and Equipment, Robert Emmett Ginna Nuclear Power Plant Unit No. 1, which includes techniques for preparation of surfaces to be painted, sampling, thickness measurement and control, and a detailed paint schedule including components and paint materials for plant structures and equipment. Also, SP-5339 dated March 31, 1967, entitled Technical specification for Painting the Interior Surface of the Containment Vessel Dome for the Robert Emmett Ginna Nuclear Power Plant Unit No.1, gives the specifications for the preparation, application, material, and paint sampling for the interior of the containment dome.

The painting of the containment structure and components inside the containment was governed by Westinghouse process specification PWR 597755, dated February 20, 1968. This specification covered the application of paint systems to equipment and structures in containments which use additive spray systems for fission product removal and/or containment cooling.

Regulatory Guide 1.54 and related ANSI Standard N101.4 were published after construction of the Ginna plant and thus were not available to be applied. However, the previously referenced process specifications demonstrate that care was taken in the selection and application of protective coatings for the Ginna plant.

The investigation of materials compatibility in the post-accident design-basis environment included an evaluation of protective coatings for use in the containment. The results of the protective coatings evaluation showed that several inorganic zincs, modified phenolics, and epoxy coatings are resistant to an environment of high temperature (320°F maximum test temperature) and alkaline sodium borate. Long-term tests included exposure to spray solution at 150°F to 175°F for 60 days, after initially being subjected to the design-basis accident cycle. The protective coatings, which were found resistant to the test conditions (that is, exhibited no significant loss of adhesion to the substrate not formation of deterioration products), comprise virtually all of the protective coatings used in the Ginna containment. Hence, the protective coatings will not add deleterious products to the core cooling solution. Essentially all carbon steel surfaces are coated with Carbozinc-11 (inorganic zinc primer) and Phenoline 305 (modified phenolic top coat). Phenoline 305 protective coating is also used on concrete surfaces.

Several test panels of the types of protective coatings used at Ginna Station were exposed for two design-basis accident cycles and showed no deterioration or loss of adhesion with the substrate.

In the safety evaluation of the SEP Topic VI-1, Organic Materials and Post-Accident Chemistry dated February 19, 1982, plant design was reviewed with respect to the effect of paints and coatings under accident conditions. Phenolic based paints are among the most

radiation resistant, remaining serviceable after radiation dosage in excess of 10^9 rad. For a severe Design Basis Accident (DBA), 10^8 rad would be a conservative dose estimate. Most paint areas are calculated to receive less than 10^7 rad.

On the basis of the above information, the NRC found, in SEP Topic VI-1, that there is reasonable assurance that the radiation, thermal, and chemical resistance of the organic coatings used in the plant is sufficiently high that deterioration under DBA conditions would not interfere with the operation of engineered safety features. Qualification tests demonstrated that the types of organic coating materials used in the containment will maintain their integrity and remain in serviceable conditions after exposure to the severe environmental conditions of a DBA.

Although RG&E is not committed to Regulatory Guide 1.82, an evaluation relative to the criteria of Revision 1 of that guide was performed to support the 1996 Ginna Station Steam Generator Replacement Project. The results of that assessment were submitted to the NRC in our response to Generic Letter 97-04, dated October 7, 1997. That modification replaced sections of reflective metallic insulation with fiberglass blanket. In that analysis, significant conservatisms were included, including assumptions for the amount of insulation debris generated, the transport of insulation debris to the sump "B" area, and RHR pump flowrates.

Thus, although RG&E does not specifically track the amount of unqualified coatings used inside containment, we have concluded that our specification to use only qualified coatings in containment, coupled with the conservatism used in determination of sump screen plugging due to insulation debris transport, provide reasonable assurance that small quantities of unqualified coatings that may exist within containment would not inhibit the functional capability of the safety related RHR and CS pumps.

The following information shall be provided:

- (a) If commercial-grade coatings are being used at your facility for Service Level 1 applications, and such coatings are not dedicated or controlled under your Appendix B Quality Assurance Program, provide the regulatory and safety basis for not controlling these coatings in accordance with such a program. Additionally, explain why the facility's licensing basis does not require such a program.

RESPONSE:

Rochester Gas and Electric Corporation does not currently employ commercial grade dedication for Service Level 1 coatings used inside containment at R. E. Ginna Nuclear Power Plant.

References:

- (1) NRC Generic Letter 98-04: Potential for Degradation of the Emergency Core Cooling System and the Containment Spray System After a Loss-of-Coolant Accident Because of Construction and Protective Coating Deficiencies and Foreign Material in Containment
- (2) EPRI TR-109937: Guidelines on the Elements of a Nuclear Safety-Related Coatings Program, dated April 1998
- (3) Correspondence LeBoeuf, Lamb, Leiby & MacRae, Attorneys, to J. O'Leary, AEC, "Amendment No. 1 to the Application to Convert Provisional Operating License to Full-Term Operating License". December 20, 1973.
- (4) Correspondence D. Crutchfield, NRC, to J. Maier, RG&E, "SEP Topic VI-1, Organic Materials and Post-Accident Chemistry R. E. Ginna". February 19, 1982.
- (5) Process Specification PS 597755, APPLICATION OF PROTECTIVE COATINGS TO REACTOR CONTAINMENT AND SYSTEMS COMPONENTS IN THE REACTOR CONTAINMENT. Westinghouse Electric Corporation, Power Systems. Rev E. May 4, 1973.
- (6) SP-5485, Technical Specification, Painting of Structures and Equipment, Robert Emmet Ginna Nuclear Power Plant Unit No. 1. January 18, 1968.
- (7) SP-5339, Technical Specification for Painting the Interior Surface of the Containment Vessel Dome for the Robert Emmet Ginna Nuclear Power Plant - Unit No. 1. March 31, 1967.
- (8) Ginna Station Procedure GC-76.11, Painting Application and Inspection. Rev. 01, September 5, 1997.
- (9) Ginna Station Procedure GC-76.7, Installation and Inspection of Piping Supports. Rev. 00, December 4, 1997.
- (10) Ginna Station Technical Specification ME-121, Fabrication and Installation of Seismic Category I Pipe Supports. Rev. 6, January 27, 1993.
- (11) Ginna Station Technical Specification CE-125, Technical Requirements for Furnishing and Erecting Structural Steel. Rev 11. January 17, 1997.