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SUBJECT: Provides response to NRC GL 98-04, "Potential for
 Degradation of ECCS & Containment Spray Sys After LOCA
 Because of Const & Protective Coating Deficiencies & Foreign
 Matl in Containment."

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 TITLE: Generic Letter 98-04 - Potential for the Degradation of the Emergency

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May 21, 1999

AEP:NRC:C0599-01

Docket Nos.: 50-315
50-316

U. S. Nuclear Regulatory Commission
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Donald C. Cook Nuclear Plant Units 1 and 2
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

Reference: Letter AEP:NRC:1260GH, "Donald C. Cook Nuclear Power
Plant, Units 1 and 2, ENFORCEMENT ACTIONS 98-150, 98-
151, 98-152 AND 98-186, REPLY TO NOTICE OF VIOLATION
DATED OCTOBER 13, 1998," dated March 19, 1999.

Gentlemen:

In accordance with 10 CFR 50.54(f), Indiana Michigan Power
Company (I&M) hereby provides the response to NRC Generic Letter
98-04. This generic letter requires licensees to provide
information regarding their programs for the control of
protective coatings inside of the containment structure. The
requested information includes procurement of coatings,
qualification testing of coatings, surface preparation and
application of coatings, and surveillance and maintenance
activities associated with coatings. Additionally, the generic
letter requests information about unqualified coatings that may
be located inside the containment structure.

The attachment to this letter provides the required response to
items (1) and (2) of the generic letter.

This letter contains one commitment, which is to enhance plant
procedures that control coatings inside containment. Current
plans are to have these plant procedures developed by October 30,
1999.

In addition to responding to this generic letter, I&M is
currently reviewing recirculation sump operability issues,
including sump blockage caused by accident generated debris. As
noted in the referenced letter, debris generation and transport

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evaluations have been performed, unwanted material has been removed from the containment, and procedures and specifications have been written or revised to better control fibrous materials inside of containment. I&M plans to continue these efforts as part of the Cook Nuclear Plant restart effort.

The required date for submittal of the requested information was November 12, 1998. The Cook Nuclear Plant is currently shutdown and in an extended outage. I&M's delay in providing this response is due to the dedication of engineering and technical support resources to the Cook Nuclear Plant's restart effort. The NRC Project Manager for the Cook Nuclear Plant was informed of this delay.

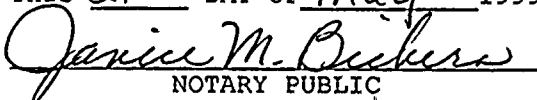
Sincerely,



M. W. Rencheck
Vice President Nuclear Engineering

SWORN TO AND SUBSCRIBED BEFORE ME

THIS 21st DAY OF May 1999


NOTARY PUBLIC

JANICE M. BICKERS
Notary Public, Berrien County, MI
My Commission Expires Feb. 16, 2001

My Commission Expires: 2/16/2001

Attachment

/rgv

c: A. C. Bakken
J. E. Dyer, w/attachment
MDEQ - DW & RPD
NRC Resident Inspector, w/attachment
R. Whale

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JAN 10 1964

bc: T. P. Beilman, w/attachment
J. J. Euto
FOLIO, w/attachment
B. J. Hickie
G. Honma
D. F. Kunsemiller/J. Burford/M. J. Gumns
M. W. Rencheck/S. A. Greenlee/D. J. Garner/
D. H. So/B. C. Mickatavage
J. F. Stang, Jr., - NRC Washington, DC, w/attachment

Attachment to AEP:NRC:C0599-01
RESPONSE TO GENERIC LETTER 98-04

Response to Generic Letter (GL) 98-04 Dated July 14, 1998

On July 14, 1998, the Nuclear Regulatory Commission (NRC) issued GL 98-04 regarding the impact of potential coating debris on the operation of safety related systems, structures, and components (SSC) during a postulated design basis loss of coolant accident (LOCA). Protective coatings are necessary inside containment to control radioactive contamination and to protect surfaces from erosion and corrosion. However, detachment of the coatings from the substrate may result in the emergency core cooling system (ECCS) being unable to satisfy the requirements of 10 CFR 50.46(b)(5), i.e., to provide long-term cooling, and may result in the safety related containment spray system (CTS) being unable to control containment pressure and radioactivity releases following a LOCA. The GL requests information under 10 CFR 50.54(f) to evaluate addressees' programs for ensuring that Service Level 1 protective coatings (coatings whose failure could adversely affect the operation of post-accident fluid systems) inside containment do not detach from their substrate during a design basis LOCA and interfere with the operation of the ECCS and CTS. The specific requests are addressed below.

Generic Letter Item 1 required the following:

- (1) Provide 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 existing coatings.

Response to Item 1

The Cook Nuclear Plant controls to ensure that Service Level 1 protective coatings used inside containment meet regulatory requirements include the elements discussed below. All are administered under the Cook Nuclear Plant's quality assurance program.

Specific Response to (1) (a):

Procurement of Service Level 1 coatings used for new applications or repair/replacement activities are 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 in the procurement documents (e.g., specifications prepared in accordance with an approved procedure, and purchase orders). Acceptance activities by I&M personnel are conducted in accordance with procedures that are consistent with ANSI N 45.2, "Quality Assurance Program Requirements for Nuclear Power Plants," requirements (e.g., receipt inspection, source surveillance, etc.). The specification of the required technical and quality requirements, combined with the acceptance activities, provides adequate assurance that the coatings reviewed meet the requirements of the procurement documents.

The following specification is used for the procurement of Service Level 1 coatings.

DCC-CEST-134-QCN, "Procurement, Receipt, Storage and Documentation of Protective Coatings," Revision 7.

Coatings on Vendor Supplied Equipment:

Cook Nuclear Plant units 1 and 2 have a mix of vendor-supplied equipment inside containment that was procured with "acceptable" as well as "indeterminate" and "unacceptable" coatings (as defined in reference 1). Currently, there are no procedures in place to track (e.g., via a coatings log) the amount of indeterminate or unacceptable coatings inside containment. Plant procedures are being developed to control the quantity of indeterminate and unacceptable coatings inside containment. Current plans are to have these plant procedures developed by October 30, 1999.

Specific Response to item (1) (b):

Qualification testing of coatings is performed by the coatings vendor. The requirements for qualification testing of Service Level 1 coatings used for new applications or repair/replacement activities inside containment are contained in specifications and meet the following regulatory guide and industry standards.

Regulatory Guide 1.54, "Quality Assurance Requirements for Protective Coatings Applied to Water-Cooled Nuclear Power Plants," June 1973.

ANSI N101.4, 1972 "Quality Assurance for Protective Coatings Applied to Nuclear Facilities."

ANSI N101. 2, 1972 "Protective Coatings (Paints) for Light Water Nuclear Reactor Containment Facilities," applicable to ice condenser only. .

Specific Response to item (1)(c):

The surface preparation, application, and inspection of Service Level 1 coatings used inside containment are performed in accordance with plant specifications and procedures and are intended to meet the applicable portions of Cook Nuclear Plant's licensing basis. Documentation of completion of these activities is performed per the requirements of the implementing procedures.

A general visual examination of Service Level 1 coatings inside containment is performed during each refueling or an extended outage as part of the protective coatings inspection procedure. When localized areas of degraded coatings are identified, they are evaluated and scheduled for repair in accordance with the protective coatings inspection procedure listed below.

The following specifications and procedures are used to control the application of coatings.

Specifications

DCC-CEST-145-QCN, "Painter Training, Qualification and Certification," Revision 4.

ES-CIVIL-0408-QCN, "Protective Coating System: Requirements for Material Selection, Surface Preparation, Application and Inspection," Revision 0.

Procedures

800000-LTG-7400-01, "Qualification and Certification of Inspection, Test, Examination, Audit and NDE Personnel," Revision 0.

This procedure provides the educational, experience, physical, and certification requirements for inspectors.

227200-STG-5400-08, "Protective Coating Inspection," Revision 0.

This procedure specifies that in-place inspection of coatings be performed during each refueling outage and that the inspection may be performed during other major outages. The procedure requires that an assessment of the coating's condition be performed, a condition report be written for significant defects and deviations, and that an inspection report be prepared.

12CHP5021.CCD.011, "Application of Protective Coatings to Steel Surfaces in Areas Classified as Coating Service Level 1 and for Coating Service Level III Lining Applications," Revision 3.

This procedure provides instructions for surface preparation, prime coating application, finish coating application. It also provides acceptance criteria and a provision for management review.

12CHP5021.CCD.012, "Application of Protective Coatings to Concrete Floor, Wall, Ceiling and Block Wall Surfaces in Areas Classified as Coating Service Level 1," Revision 2.

This procedure provides instructions for surface preparation of concrete floors, concrete walls, ceilings and block walls. The procedure provides instructions for surfacer application, prime coating application, and finish coating application. Acceptance criteria and a provision for management review are also provided.

Generic Letter Item 2 requires the following:

(2) Information demonstrating compliance with either item (i) or (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 DB 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,

- (ii) For plants without the above licensing-basis requirements, information shall be provided to demonstrate compliance with the requirements of 10 CFR 50.46(b)(5), "Long-term cooling" and the functional capability of the safety related CTS as set forth in your licensing basis. If a licensee can demonstrate this compliance without quantifying the amount of unqualified coatings, this is acceptable.
 - (a) If commercial grade coatings are being used at your facility for Service Level 1 applications, and such Quality 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 to Item 2

The Cook Nuclear Plant does not have a licensing basis requirement for tracking the amount of unqualified coatings inside containment. Therefore, I&M is providing the following response to Item 2(ii).

The following description and referenced material describe the licensing basis for the plant relative to conformance with 10 CFR 50.46(b)(5), "Long Term Cooling." Specifically, it addresses the operation of the ECCS, the function of the sump, and the regulatory basis for assuming a maximum sump blockage of 50%.

The Cook Nuclear Plant is currently evaluating the adequacy of the sump inventory for the ECCS and CTS systems as part of the restart efforts. This effort, although related to the generic letter concerns, does not impact this response. Thus, this submittal does not address either the ECCS or CTS system issues and resolutions. Any actions required as a result of the ECCS/CTS evaluations will be addressed as a part of the restart effort.

The operation of the ECCS following a LOCA is divided into 2 phases: 1) the injection phase in which any reactivity increase attending the accident is terminated, initial cooling of the core is accomplished, and the coolant lost from the primary system is replenished; and 2) the recirculation phase in which long term core cooling is provided during the accident recovery period. The potential impact of the degradation of protective coatings used inside containment would occur only during the recirculation

phase when the water required by the ECCS and the CTS is obtained from the recirculation sump.

The sump design provides sufficient flow area over the trash curb ahead of the sump and adequate net positive suction head for the residual heat removal (RHR) and CTS pumps to operate in the recirculation mode. Water flowing into the sump passes through the coarse and fine screens and downwards under the crane wall. The flow is then turned upwards and enters the twin recirculation pipes connecting the sump to the RHR and CTS. The adjacent containment sump is also equipped with coarse and fine screens at its entrance. The containment and the recirculation sumps are connected via an 8-inch pipe near the bottom of the sumps.

The recirculation sump is protected at the entry by coarse and fine screens supported within a substantial frame. The coarse screen (grating) is installed in front of the sump to prevent large materials from passing and the fine (1/4-inch mesh) screen is intended to stop material capable of plugging the 3/8-inch containment spray nozzles. Additionally, the containment sump entrance is also protected with a coarse screen and 1/4 inch wire mesh in a similar manner. For the recirculation sump, the screens act as flow straighteners and mitigate vortex formation by equalizing local velocity differences. Additionally, the sump is designed with a relatively large flow area, allowing low water velocities, such that build-up of debris against the screens is minimized. The low velocities make it unlikely that air bubbles enter into the pump suction area of the sump.

As noted in the NRCs Safety Evaluation Report (SER) dated July 2, 1982 the containment recirculation sump design meets the intent of the applicable sections of Regulatory Guides 1.68, 1.79, and 1.82, Revision 0. In conformance with Regulatory Guide 1.82, Revision 0 position C.7, 50% of the effective sump area was considered to be blocked by LOCA generated debris. At the time that the plant was licensed, no distinction was drawn between the various potential sources of post-LOCA debris; these systems were intended to function with debris from any source partially obstructing the sumps and 50% blockage was considered to be a conservative estimate of potential sump blockage. The analyses and model testing results submitted as part of the licensing basis for the plant demonstrate that, even with 50% of effective sump area blockage, the ECCS and CTS will continue to provide sufficient cooling flow to fulfill the long-term cooling functions required to conform with 10 CFR 50.46(b)(5).

The containment recirculation sump design was model-tested at the Alden Research Laboratories in the late 1970s to evaluate air entrainment and vortexing concerns. These tests determined that the modifications, as prescribed by a 1978 Alden study, would be effective in assuring acceptable sump performance. Additionally, empirical data for determining the head loss at the sump entrance were obtained for sump blockages up to 50% of the screen area.

These test results and NRC requests for supplementary information were submitted to the NRC via references 2 and 3. The NRC reviewed the test results and the supplementary information and issued a SER dated July 2, 1982. The SER states in part, "Based on the applicant's implementation of the sump modifications as recommended by the September 1978 and December 1979 reports and acceptable results reported in the April 28, 1982 submittal, we find these tests meet the intent of applicable portions of Regulatory Guide 1.68, 1.79, and 1.82, and are therefore acceptable."

The plant's licensing basis, as accepted by the NRC, as described in the SER provides the regulatory and safety basis for the ECCS and CTS systems. Our coatings are not treated as a separate debris source in the previously described licensing basis. Additionally, the sump screen 50% blockage assumption does not differentiate between the sources for the LOCA generated debris.

Specific Response to Item (2)(ii)(a):

The plant does not use commercial grade coatings inside containment for Service Level 1 applications.

References:

1. EPRI TR-109937, "Guideline on Nuclear Safety-Related Coatings," dated April 1998.
2. Letter AEP:NRC:0112, J. Tillinghast to H. R. Denton, dated December 20, 1978.
3. Letter AEP:NRC:0355A, "CONTAINMENT RECIRCULATION SUMP TEST," dated April 28, 1982.

