UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION II
SAM NUNN ATLANTA FEDERAL CENTER
61 FORSYTH STREET, SW, SUITE 23T85
ATLANTA, GEORGIA 30303-8931

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September 10, 2007

EA-07-219

Duke Power Company LLC
d/b/a Duke Energy Carolinas, LLC
ATTN: Mr. G. R. Peterson
Vice President
McGuire Nuclear Station
12700 Hagers Ferry Road
Huntersville, NC 28078-8985

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INSPECTION REPORT 05000369/2007008 AND 05000370/2007008; PRELIMINARY GREATER THAN GREEN FINDING

Dear Mr. Peterson:

On September 4, 2007, the U.S. Nuclear Regulatory Commission (NRC) completed an inspection at your McGuire Nuclear Station. The inspection was related to your September 2006 discovery of duct tape in the Unit 2 emergency core cooling system (ECCS) sump. This issue had been previously documented in Section 1R20 of NRC Inspection Report 05000369/2006005 and 05000370/2006005, issued on January 30, 2007, and identified as unresolved item (URI) 05000370/2006005-02. The unresolved item was also addressed in NRC Inspection Report 05000369/2007002 and 05000370/2007002. The enclosed report documents the inspection results for that issue, which were discussed on September 4, 2007, with you and members of your staff.

The performance deficiency involves a failure to take adequate corrective actions for an identified nonconforming condition. This nonconforming condition involves the 1996 discovery that the ECCS cold leg injection throttle valves had the potential for clogging during high pressure recirculation because the narrow plug to seat clearances were smaller than the ECCS sump screen openings. Specifically, McGuire Nuclear Station's resolution to this nonconformance was to credit periodic inspections of the ECCS sump to ensure each Units' ECCS sump remained free of foreign material that could clog the respective ECCS cold leg injection throttle valves. The credited periodic ECCS sump inspections were subsequently revealed to be ineffective, by the unrelated September 2006 discovery of a significant amount of aged yellow duct tape inside the Unit 2 ECCS sump around the suction and guard pipe of both ECCS trains.

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PIP M-96-0530, written to document the nonconforming condition discovered in 1996, was found to be an accept-as-is design change. This design change was not processed in accordance with the McGuire design control program that implements 10 CFR 50, Appendix B, Criterion III, Design Control; the resolution did not include an evaluation of this change under 10 CFR 50.59; and the resolution did not include a change to the licensing basis as required by 10 CFR 50.71(e) to update the Updated Final Safety Analysis Report (UFSAR).

This finding was assessed based on the best available information, including influential assumptions, using the applicable Significance Determination Process (SDP) and was preliminarily determined to be a Greater Than Green Finding. Enclosed is a summary of the SDP Phase 3 analysis. It reflects a finding of greater than very low safety significance because, in the event of being in the high pressure ECCS recirculation phase for small break and medium break loss of coolant accidents (LOCAs), there was a lack of reasonable assurance that the Unit 2 ECCS cold leg high and intermediate head injection throttle valves would remain unclogged such that their associated systems would be capable of performing their safety-related function. More specifically, as the yellow duct tape found in Unit 2 was not environmentally qualified for expected sump LOCA conditions, the logical conclusion is that it can be expected to come loose from the guard pipes. In absence of test data or analysis to the contrary, a significant portion of this tape would then be expected to transport from the sump, through both trains of intermediate and high head safety injection pumps, and clog the four intermediate and four high head cold leg injection throttle valves due to their small openings. The finding does not represent a current safety concern because the tape has since been removed and the original nonconforming condition has been corrected with a plant modification.

The finding is also identified as an apparent violation (AV) of 10 CFR 50, Appendix B, Criteria XVI, Corrective Action, for failure to take adequate corrective actions for an identified nonconformance involving the discovery that the ECCS cold leg injection throttle valves have the potential for clogging during high pressure recirculation because the narrow plug to seat clearances were smaller than the ECCS sump screen openings. The details of this AV are discussed in the enclosed inspection report. This apparent violation is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. The current Enforcement Policy is included on the NRC's website at http://www.nrc.gov/reading-rm/adams.html.

In accordance with Inspection Manual Chapter (IMC) 0609, we intend to complete our evaluation using the best available information and issue our final determination of safety significance within 90 days of this letter. The significance determination process encourages an open dialogue between the staff and the licensee; however, the dialogue should not impact the timeliness of the staff's final determination. Before we make a final decision on this matter, we are providing you an opportunity to: (1) present to the NRC your perspectives on the facts and assumptions used by the NRC to arrive at the finding and its significance at a Regulatory Conference or (2) submit your position on the finding to the NRC in writing. If you request a Regulatory Conference, it should be held within approximately 30 days of the receipt of this letter and we encourage you to submit supporting documentation at least 1 week prior to the

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conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. The NRC will also issue a press release to announce the conference. If you decide to submit only a written response, such a submittal should be sent to the NRC within 30 days of the receipt of this letter.

Please contact Mr. Jim Moorman at (404) 562-4647 within 10 business days of the date of your receipt of this letter to notify the NRC of your intentions. If we have not heard from you within 10 days, we will continue with our significance determination and enforcement decisions and you will be advised by separate correspondence of the results of our deliberations on this matter.

Since the NRC has not made a final determination in this matter, a Notice of Violation is not being issued at this time. In addition, please be advised that the number and characterization of the apparent violations may change as a result of further NRC review.

In accordance with 10 CFR 2.390 of the NRC's "Rules of Practice," a copy of this letter and your response (if any) will be available electronically for public inspection in the NRC Public Document Room or from the Publicly Available Records (PARS) component of NRC's document system (ADAMS). ADAMS is accessible from the NRC web site at http://www.nrc.gov/reading-rm/adams.html (the Public Electronic Reading Room).

Sincerely,

/RA/

Charles A. Casto, Director
Division of Reactor Projects

Docket Nos.: 50-369, 50-370
License Nos.: NPF-17, NPF-9

Enclosures:
1. NRC Inspection Report 05000369,370/2007008 w/attachment: Supplemental Information
2. SDP Phase 3 Summary **(OFFICIAL USE ONLY - PROPRIETARY INFORMATION)**

cc w/encl: (See page 4)

conference in an effort to make the conference more efficient and effective. If a Regulatory Conference is held, it will be open for public observation. The NRC will also issue a press release to announce the conference. If you decide to submit only a written response, such a submittal should be sent to the NRC within 30 days of the receipt of this letter.

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Sincerely,

/RA/

Charles A. Casto, Director
Division of Reactor Projects

Docket Nos.: 50-369, 50-370
License Nos.: NPF-17, NPF-9

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cc w/encl: (See page 4)

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SIGNATURE	JHM /RA/	RHB /RA/	SES /RA for/	JHM /RA for/	JHM /RA for/		
NAME	JMoorman	RBernhard	CEvans	JBrady	REul		
DATE	09/07/2007	09/06/2007	09/07/2007	09/07/2007	09/07/2007		
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cc w/encl:
C. J. Thomas
Compliance Manager (MNS)
Duke Power Company LLC
d/b/a Duke Energy Carolinas, LLC
Electronic Mail Distribution

cc w/o encl:
R. L. Gill, Jr., Manager
Nuclear Regulatory Issues
and Industry Affairs
Duke Power Company LLC
d/b/a Duke Energy Carolinas, LLC
526 S. Church Street
Charlotte, NC 28201-0006

Lisa F. Vaughn
Associate General Counsel
and Managing Attorney
Duke Energy Corporation
526 South Church Street-EC07H
Charlotte, NC 28202

Kathyrn B. Nolan
Senior Counsel
Duke Energy Corporation
526 South Church Street-EC 07H
Charlotte, NC 28202

David A. Repka
Winston & Strawn LLP
Electronic Mail Distribution

Beverly Hall, Chief, Radiation
Proctection Section
N. C. Department of Environmental
Health & Natural Resources
Electronic Mail Distribution

County Manager of Mecklenburg County
720 East Fourth Street
Charlotte, NC 28202

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Letter to G. R. Peterson from Charles A. Casto dated September 10, 2007

SUBJECT: MCGUIRE NUCLEAR STATION - NRC INSPECTION REPORT 05000369/2007008 AND 05000370/2007008; PRELIMINARY GREATER THAN GREEN FINDING

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L. Slack, RII
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U.S. NUCLEAR REGULATORY COMMISSION

REGION II

Docket Nos:	50-369, 50-370
License Nos:	NPF-9, NPF-17
Report Nos:	05000369/2007008, 05000370/2007008
Licensee:	Duke Energy Corporation
Facility:	McGuire Nuclear Station, Units 1 and 2
Location:	12700 Hagers Ferry Road Huntersville, NC 28078
Dates:	April 30, 2007 through September 4, 2007
Inspectors:	J. Brady, Senior Resident Inspector R. Eul, Resident Inspector
Approved by:	James H. Moorman,III, Chief Reactor Projects Branch 1 Division of Reactor Projects

Enclosure 1

SUMMARY OF FINDINGS

IR05000369/2007008 and 05000370/2007008; 04/30/2007 - 09/04/2007; McGuire Nuclear Station; Other Activities.

The report covered the review and closure of an Unresolved Item for Unit 2. One apparent violation (AV) (potentially greater than Green) was identified. The significance of most findings is indicated by their color (Green, White, Yellow, Red) using IMC 0609, "Significance Determination Process" (SDP). Findings for which the SDP does not apply may be Green or be assigned a severity level after NRC management review. The NRC's program for overseeing the safe operation of commercial nuclear power reactors is described in NUREG-1649, "Reactor Oversight Process," Revision 4, dated December 2006.

A. NRC-Identified and Self-Revealing Findings

Cornerstone: Mitigating Systems

- TBD. The inspectors identified an apparent violation of 10 CFR 50, Appendix B, Criterion XVI, Corrective Action, for the failure to take adequate corrective action for a nonconformance, identified in Problem Investigation Process (PIP) M-96-0530, associated with potential clogging of the Emergency Core Cooling System (ECCS) cold leg injection throttle valves during high pressure recirculation. Specifically, the licensee failed to adequately implement PIP credited inspections of the inside of the ECCS sump, as evidenced by the 2006 discovery of a significant amount of aged yellow duct tape inside the Unit 2 ECCS sump around the suction and guard pipe of both ECCS trains. In addition, the licensee failed to identify and take actions to process a design change per their design control program for the resolution discussed in PIP M-96-0530, to evaluate the resolution/change under 10 CFR 50.59, and to process a licensing basis change under 10 CFR 50.71(e) to revise the UFSAR.

  This finding is greater than minor because, if left uncorrected, the tape could have a detrimental affect on the availability and reliability of both trains of high and intermediate head ECCS pump when called upon during an accident. In particular, the tape had the potential to have detrimental effects on the high pressure recirculation function due to potential clogging of the ECCS throttle valves, which have openings as small as 0.1 inches wide in the radial dimension. The issue was evaluated under IMC 0609, Significance Determination Process, Phase II, and was determined to be a greater than green finding. A Phase III risk assessment was performed by a Region II Senior Reactor Analyst who also found the issue to be potentially greater than green. This finding is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. This finding has a cross-cutting aspect of appropriate correct actions in the area of problem identification and resolution (P.1.d). (Section 4OA5)

Report Details

4. OTHER ACTIVITIES

4OA5 Other Activities

(Closed) URI 05000370/2006005-02, Duct tape in Unit 2 Emergency Core Cooling System (ECCS) Sump

a. Inspection Scope

This issue was unresolved pending NRC review of the documents 1 thru 7, listed in the attachment. The inspectors reviewed the documents to determine whether past evaluations, analysis, and corrective actions for potential clogging concerns associated with the ECCS cold leg injection throttle valves were adequate. The inspectors also reviewed these documents to determine how the duct tape around the unit 2 ECCS suction pipe could have gone undiscovered until September 2006.

b. Findings

Introduction: The inspectors identified an apparent violation (AV) for a failure to take adequate corrective action for a nonconformance associated with potential clogging of the ECCS cold leg injection throttle valves during high pressure recirculation.

Description: While reviewing PIP M-06-4324, the inspectors determined that on September 28, 2006, the licensee found 12 square feet of yellow duct tape wrapped around the ECCS suction and guard pipe in both trains of the emergency core cooling system (ECCS) sump (5 square feet in Train A, 7 square feet in Train B). There appeared to have been more tape installed at one time, however, boric acid in the sump had dissolved what could have been up to 6 additional square feet (2.5' in Train A, 3.5' in Train B) of duct tape. The licensee documented this discovery in PIP M-06-4324 and initiated a significant event investigation team (SEIT). During the investigation the licensee discovered that in the September 2002, Unit 1 outage, a licensee manager had found and removed three or four pieces of duct tape, six to eight inches in length, from a similar location in the Unit 1 ECCS sump. No corrective action document (PIP) was initiated and no extent of condition review performed for Unit 2 at that time.

The inspectors reviewed PIP M-96-0530, which was initiated to conduct an operating experience review of NRC Information Notice 96-27, Potential Clogging of High Pressure Safety Injection Throttle Valves During Recirculation. The PIP problem description identified that “during the recirculation phase of a postulated LOCA, the ECCS throttle valves may have the potential to collect debris and clog, resulting in partial or complete loss of core cooling flow.” The PIP identified a nonconformance, in that the ECCS cold leg injection throttle valve plug to seat clearances were smaller than the ECCS sump screen openings. This nonconformance was contrary to the design and licensing basis for both units in that the ECCS sump screen should have had the smallest size opening in the system so that anything passing through the screen would not clog the ECCS system (UFSAR Section 6.5). The PIP resolution provided an

accept-as-is disposition for this nonconforming design. This accept-as-is disposition credited a combination of design, system configuration, motive force, and administrative controls for assurance that the ECCS throttle valves would not become clogged. With the above combination of PIP corrective actions, the licensee considered this issue resolved. One of the administrative controls credited was a periodic inspection of the sump area inside the sump screen to ensure that the Emergency Sump remained free of debris. This inspection was performed during each refueling outage. Any debris found inside the sump was to be evaluated and removed. In addition, other credited administrative controls included inspections of the reactor building prior to unit startup to remove debris that could impede ECCS return flow and establishment of a foreign material control process for online reactor building entries. No additional corrective action was considered necessary in response to this nonconformance.

The inspectors found that the resolution was inadequate to correct the identified nonconformance for the following reasons:

1. The performance of the inspections inside the sump were inadequate in that they did not find the significant amounts of duct tape on the Unit 2 ECCS sump guard pipe that had the potential to clog the ECCS throttle valves.

2. The resolution was an accept-as-is design change which was not processed in accordance with the licensee's design control program that implements 10 CFR 50, Appendix B, Criterion III.

3. The resolution did not include an evaluation of this change under 10 CFR 50.59.

4. The resolution did not include a change to the licensing basis as required by 10 CFR 50.71(e) to update the UFSAR.

Analysis: The performance deficiency involves a failure to take adequate corrective actions for an identified nonconformance. Specifically, the licensee chose to credit periodic inspections of the ECCS sump to ensure each Units' ECCS sump remained free of foreign material that could clog the respective ECCS cold leg injection throttle valves. The credited periodic ECCS sump inspections were, however, subsequently revealed to be ineffective, by the unrelated September 2006 discovery of a significant amount of aged yellow duct tape inside the Unit 2 ECCS sump around the suction and guard pipe of both ECCS trains. As this tape was not environmentally qualified for expected sump loss of coolant accident (LOCA) conditions, there was a lack of reasonable assurance that the Unit 2 ECCS cold leg high and intermediate head injection throttle valves would remain unclogged during the high pressure recirculation phase of ECCS safety injection for small break and medium break LOCAs.

This issue is greater than minor because, if left uncorrected, the tape could have a detrimental affect on the availability and reliability of both trains of ECCS when called upon during an accident. In particular, the tape had the potential to have detrimental effects on the high pressure recirculation function due to potential clogging of the ECCS throttle valves which have plug to seat openings as small as 0.1 inches wide in the radial

dimension. The issue was evaluated under IMC 0609, Significance Determination Process and was determined to be a potentially greater than green finding by Phase II analysis. A Phase III risk assessment was performed by a Region II Senior Reactor Analyst which also found the issue to be potentially greater than green. This finding has a cross-cutting aspect of appropriate correct actions in the area of problem identification and resolution (P.1.d).

Enforcement: 10 CFR 50 Appendix B Criterion XVI, Corrective Action, states that measures shall be established to assure that conditions adverse to quality, such as deficiencies, deviations, and nonconformances are promptly identified and corrected. In the case of significant conditions adverse to quality, the measures shall assure that the cause of the condition is determined and corrective action taken to preclude repetition. The identification of the condition, cause of the condition, and the corrective action taken shall be documented and reported to appropriate levels of management. This requirement is implemented through the Duke Quality Assurance Program Topical Report and procedure NSD 208, Problem Identification Process. Contrary to the above, from approximately June 3,1996 until September 28, 2006, the licensee failed to adequately correct a significant condition adverse to quality related to the nonconformance identified in PIP M-96-0530 for ECCS injection throttle valve plug to seat clearances being smaller than ECCS sump screen openings. Specifically, the licensee's corrective action failed to adequately implement credited inspections of the inside of the ECCS sump as evidenced by the 2006 discovery of a significant amount of aged yellow duct tape inside the Unit 2 ECCS sump around the suction and guard pipe of both ECCS trains, failed to process the resolution discussed in PIP M-96-0530 as a design change per their design control program, failed to evaluate the resolution/change under 10 CFR 50.59, and failed to process a licensing basis change under 10 CFR 50.71(e) to revise the UFSAR. This finding is identified as an apparent violation, AV 05000370/2007008-01: Failure to Take Adequate Corrective Action For A Nonconformance Associated With ECCS Throttle Valves. It is being considered for escalated enforcement action in accordance with the NRC Enforcement Policy. Accordingly, for administrative purposes, URI 05000370/2006005-02 is considered closed.

4OA6 Meetings, Including Exit

On September 4, 2007, the resident inspectors presented the inspection results to Mr. G. Peterson and other members of his staff. The inspectors confirmed that proprietary information was not provided or examined during the inspection.

SUPPLEMENTAL INFORMATION

KEY POINTS OF CONTACT

Licensee

Ashe, K., Manager, Regulatory Compliance
Brown, S., Manager, Engineering
Crane, K., Regulatory Compliance
Evans, K., Superintendent, Maintenance
Kammer, J., Manager, Safety Assurance
Mooneyhan, S., Radiation Protection Manager
Nolin, J., Manager, Mechanical and Civil Engineering (MCE)
Parker, R., Superintendent, Work Control
Peterson, G., Site Vice President, McGuire Nuclear Station
Repko, R., Station Manager, McGuire Nuclear Station

NRC personnel

J. Moorman, Chief, Reactor Projects Branch 1
J. Stang, Project Manager, NRR

LIST OF ITEMS OPENED, CLOSED, AND DISCUSSED

Opened

05000370/2007008-01	AV	Failure to Take Adequate Corrective Action For A Nonconformance Associated With ECCS Throttle Valves. (Section 4OA5)

Closed

05000370/2006005-02	URI	Duct Tape In Unit 2 ECCS Sump (Section 4OA5)

LIST OF DOCUMENTS REVIEWED

Section 4OA5: Other Activities

1. SEIT report, which was documented in PIP M-06-4364.
2. Westinghouse report dated December 20, 2006, titled McGuire Operability Determination for Duct Tape in Containment Sump.
3. Duke Materials Engineering and Lab Services Report dated October 18, 2006, Titled Characterization of Degraded Duct Tape from MNS ECCS System.
4. Duke Materials Engineering and Lab Services Report dated February 15, 2007, titled Evaluation of New Duct Tape.

5. NRC Information Notice (IN) 96-27 titled Potential Clogging of High Pressure Safety Injection Throttle Valves During Recirculation.
6. PIP M-96-00530, issued to document the licensee's review and evaluation of IN 96-27
7. Licensee document dated 2/21/07 titled, McGuire ECCS Throttle Valve Duct Tape Flow Testing
8. UFSAR Section 6.3 and 6.5