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50-413	Catawba Nuclear Station, Unit 1, Duke Power Co.	05000413
50-414	Catawba Nuclear Station, Unit 2, Duke Power Co.	05000414

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SUBJECT: Forwards response to GL 89-10, Suppl 5 re inaccuracy of MOV diagnostic equipment.

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TITLE: Response to Generic Ltr 89-10, "Safety-Related MOV Testing & Surveillance"

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DUKE POWER

September 27, 1993

U.S. Nuclear Regulatory Commission
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Washington, D.C. 20555

Subject: Catawba Nuclear Station Units 1 & 2
Docket Nos. 50-413, 414
McGuire Nuclear Station Units 1 & 2
Docket Nos. 50-369, 370
Oconee Nuclear Station Units 1, 2, 3
Docket Nos. 50-269, 270, 287
Response to Generic Letter 89-10, Supplement 5
Inaccuracy of Motor-Operated Valve Diagnostic
Equipment

Gentlemen:

On June 28, 1993, the NRC issued Generic Letter (GL) 89-10, Supplement 5 to request information that will enable them to verify whether the licensee is evaluating new information on the accuracy of MOV diagnostic equipment. The NRC staff has recently become aware of new information on the accuracy of MOV diagnostic equipment. This new information raises a generic concern regarding the reliability of the data provided by MOV diagnostic equipment.

The main objective of the Duke Power MOV program is to provide a high degree of assurance that all safety-related MOVs are capable of performing their design function. Duke expeditiously evaluated and has taken or is taking actions on any information concerning the accuracy of MOV diagnostic equipment. Accordingly, the attachments to this letter provide the required information for Catawba, McGuire and Oconee Nuclear Stations.

I declare under penalty of perjury that these statements are true and correct to the best of my knowledge.

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Should you have any questions or require any additional information regarding this submittal, please contact A.D. Jones-Young at (704) 382-3154.

Very truly yours,

A handwritten signature in cursive script, appearing to read "M. S. Tuckman".

M. S. Tuckman
Senior Vice President
Nuclear Generation

adj-y/gl8910-5
Attachment

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xc: W/Attachment

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ATTACHMENT

**CATAWBA, McGUIRE AND OCONEE NUCLEAR STATION
RESPONSE TO GENERIC LETTER 89-10, SUPPLEMENT 5**

The following is Duke Power's response to Generic Letter 89-10, Supplement 5.

QUESTION 1

1. Within 90 days of receipt of this letter, all licensees are required to notify the NRC staff of the diagnostic equipment used to confirm the proper size, or to establish settings, for MOVs within the scope of GL 89-10.

Listed below is the MOV diagnostic test equipment currently in use at each Duke Power Nuclear Station.

Oconee Nuclear Station

Equipment Used	Application	Descriptions	Typical Measured Parameters
VOTES	Primary diagnostic equipment for practically all rising stem valves. The system is used in accordance with all vendor supplied techniques	Thrust setup calculations assume a 10% equipment uncertainty. If torque effects, COF, transitions or extrapolations are encountered in the field, adjustments to the thrust setup windows and the assumed uncertainties are made.	Stem(yoke) thrust, spring pack displacement, motor current, switch actuation.
MOVATS	Used on several unique applications which are inaccessible by VOTES.	Equipment uncertainty is calculated using MOVATS models with thrust setup windows adjusted accordingly.	Spring pack displacement, switch actuation, motor current.

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Oconee Nuclear Station(continued)

Equipment Used	Application	Description	Typical Measured Parameters
Torque Bench	Future testing for Butterfly valves and actuator testing following maintenance.		

McGuire Nuclear Station

Equipment Used	Application	Description	Typical Measured Parameters
VOTES	Primary diagnostic equipment for practically all rising stem valves. The system is used in accordance with all vendor supplied techniques.	Thrust setup calculations assume a 10% equipment uncertainty. If torque effects, COF, transitions or extrapolations are encountered in the field, adjustments to the thrust setup windows and the assumed uncertainties are made.	Stem(yoke) thrust, spring pack displacement, motor current, switch actuation.
Force Transducers	Primary force measurement device used for practically all Kerotest valves	Direct in-line load cell measures stem thrust directly. Can be used with any data acquisition system(MOVATS 2151 scope and Votes computers are currently used).	Stem thrust, spring pack displacement, motor current, switch actuation.
Torque Bench	Recertification of Rotork actuators. Torque Switch Setup for Butterfly Actuators.	Torque is measured at each torque switch setting to verify torque output. Stall torque is measured.	Torque, spring pack displacement, motor current.

Catawba Nuclear Station

Equipment Used	Application	Description	Typical Measured Parameters
VOTES	Primary diagnostic equipment for practically all rising stem valves. The system is used in accordance with all vendor supplied techniques.	Direct in-line load cell measures stem thrust directly. Can be used with any data acquisition system(MOVATS 2151 scope and Votes computers are currently used).	Stem(yoke) thrust, spring pack displacement, motor current, switch actuation.
Force Transducers	Primary force measurement device used for practically all Kerotest valves	Direct in-line load cell measures stem thrust directly. Can be used with any data acquisition system(MOVATS 2151 scope and Votes computers are currently used).	Stem thrust, spring pack displacement, motor current, switch actuation.
Teledyne Smart Stems	Used primarily where higher accuracy requirements are necessary and on new valves.	Currently the gages are calibrated checked against a VOTES calibrator for indication of failure only. Data is acquired on the VOTES equipment.	Stem thrust and torque, spring pack displacement, motor current, switch actuation.

Catawba Nuclear Station(continued)

Equipment Used	Application	Description	Typical Measured Parameters
Torque Bench	Recertification of Rotork actuators. Torque Switch Setup for Butterfly Actuators.	Torque is measured at each torque switch setting to verify torque output. Stall torque is measured.	Torque, spring pack displacement, motor current.

Riverbend Test Loop*

Equipment Used	Application	Description	Typical Measured Parameters
Teledyne Smart Stems	Used primarily where higher accuracy requirements are necessary like the test loop.	Stems are recalibrated by Teledyne Engineering Services(TES). Data is acquired on general purpose data acquisition equipment. Other sensors are general purpose calibrated sensors.	Stem thrust and torque, spring pack displacement, switch actuation accelerometer, stem displacement.

* The Riverbend Steam Station flow loop is a high pressure cold water piping system for testing valves dynamically. A boiler feed pump provides pressures up to 2500 PSI and flows up to 1000 GPM. Valves can be tested in this loop to determine their functionality at full flow and pressure. This is a requirement of GL 89-10 to functionally test all safety-related MOVs when practicable. Since testing at the nuclear sites is difficult and expensive, Duke test valves at Riverbend prior to installation and when new designs are evaluated.

Riverbend Test Loop(continued)

Equipment Used	Application	Description	Typical Measured Parameters
Strain Gages	Used and Calibrated against standards before and after testing. Strain gages were used in recent Butterfly Valve testing at Utah State University.	None	Stem thrust and torque, spring pack displacement, switch actuation accelerometer, stem displacement.

** "Other Vendor MOV Diagnostic Equipment Used" refers to MOVs tested at other flow loop facilities other than Duke's Riverbend Steam Station. We have tested Butterfly valves at the Utah Water Research Laboratory with strain gages installed to measure torque. Other testing with Smart Stems have been performed at Wyle Labs on EPRI projects which Duke receives data from. Data obtained during testing at other facilities is generally taken with unique experimental test equipment.

****Other Vendor MOV Diagnostic Equipment Used**

Equipment Used	Application	Description	Typical Measured Parameters
Teledyne Smart Stems	Used primarily where higher accuracy requirements are necessary like the test loop.	Stems are recalibrated by TES. Data is acquired on general purpose data acquisition equipment. Other sensors are general purpose calibrated sensors.	Stem thrust and torque, spring pack displacement, switch actuation accelerometer, stem displacement.
Strain Gages	Used and Calibrated against standards before and after testing. Strain gages were used in recent butterfly valve testing at Utah State University.	None	Stem thrust and torque, spring pack displacement, switch actuation accelerometer, stem displacement.

QUESTION 2

2. Within 90 days of receipt of this letter, licensees are required to report whether they have taken actions or plan to take actions (including schedule and summary of actions taken or planned) to address the information on the accuracy of MOV diagnostic equipment.

Duke has evaluated the following generic communications for applicability and taken appropriate actions in accordance with vendor supplied guidelines. In cases where complicated issues related to statistical analysis is required, plant personnel

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have attended training seminars and symposiums to address the issues. Duke's Corporate personnel have been involved with Idaho National Engineering Laboratories (INEL) validation testing and other MOV industry testing groups to ensure that MOV diagnostic equipment provides the high degree of confidence that MOVs will operate as designed.

Vendor Information Letters/Notices:

Vendor: Liberty Technology

1. "Effect of Placing C-Clamp or U-Clamp in Stem Transition Region", dated May 19, 1989, CSB-005.
2. "Effects of Non-Linear Yoke Strain on the Accuracy of VOTES Diagnostic Equipment".
3. "Issues that Impact Votes Torque or Thrust Readings (torque corrections on threaded stems and material properties).

The following vendor information letter is presently being evaluated by Duke and corrective actions have been recommended. The recommended actions will be implemented by the end of 1995:

4. "Proximity Probe Type Calibrators with a possible 3% Shift in Sensitivity", dated May 6, 1993, CSB-030.

Vendor: Westinghouse

1. "Inaccuracies in Westinghouse MOVATS Bart System and Stem Strain Ring".
2. "Inaccuracies in Westinghouse MOVATS 2151/3000 MOV Diagnostic Test Systems (Open vs Close Issues)" and it's supplement entitled "Clarification of Initial Notification".

Vendor: ITI Movats

1. "MOV Spring Pack Open Calibration Methodology Inaccuracies" and "INEL Validation Testing Results".
2. "92-01 - Packmate Issues, 92-02 - 3500 Strain Card Accuracy Changes, and 92-03 - SSR Conversion Factors".

NUMARC

1. "Industry Guidance in Responding to MOV Diagnostic Validation Testing".

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Information Notices(IN):

1. IN 91-61, "Preliminary Results of Validation Testing of MOV Diagnostic Equipment", dated September 30, 1991.
2. IN 92-23, "Results of Validation Testing of MOV Diagnostic Equipment", dated March 27, 1992.
3. IN 93-01, ""Accuracy of MOV Diagnostic Equipment Manufactured by Liberty Technology(material properties and torque effects on threaded stems)", dated January 4, 1993.

Duke will continue to expeditiously evaluate and take action on any new information on MOV diagnostic equipment inaccuracies.