ENCLOSURE 1

NOTICE OF VIOLATION

Duke Power Company
McGuire Units 1 and 2

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

During an NRC inspection conducted on February 17 - March 16, 1991, a violation of NRC requirements was identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C (1990), the violation is listed below:

Technical Specification 3.7.6 requires that two independent Control Room Area Ventilation Systems be OPERABLE in all modes. System operability includes (TS 4.7.6.e.3) the capability to maintain the Control Room in a positive pressure of greater than or equal to 1/8 inch water gauge relative to the outside atmosphere during system operation.

10 CFR 50, Appendix B, Criterion III, Design Control, requires in part that measures be established to assure that applicable regulatory requirements and the design basis as specified in the licensee application for structures, systems, and components are correctly translated into specifications, drawings, procedures, and instructions. Further, design control measures shall provide for verifying the adequacy of design, such as by the performance of design reviews, by the use of alternate or simplified calculational methods, or by the performance of a suitable testing program.

Contrary to the above, design control measures were inadequate, in that, the original design of the control room ventilation system (VC) was such that the system could not meet its function of maintaining at least 1/8 inch water gauge positive pressure in the control room under all assumed accident conditions. Non-safety related chlorine and radiation monitors could have failed the intake dampers closed.

This is a Severity Level IV violation (Supplement I).

Pursuant to the provisions of 10 CFR 2.201, Duke Power Company is hereby required to submit a written statement or explanation to the U.S. Nuclear Regulatory Commission, ATTN: Document Control Desk, Washington, D.C. 20555 with a copy to the Regional Administrator, Region II, and if applicable, a copy to the NRC Resident Inspector, within 30 days of the date of the letter transmitting this Notice of Violation (Notice). This reply should be clearly marked as a "Reply to a Notice of Violation" and should include [for each violation]: (1) the reason for the violation, or, if contested, the basis for disputing the violation, (2) the corrective steps that have been taken and the results achieved, (3) the corrective steps that will be taken to avoid further

violations, and (4) the date when full compliance will be achieved. If an adequate reply is not received within the time specified in this Notice, an order may be issued to show cause why the license should not be modified, suspended, or revoked, or why such other action as may be proper should not be taken. Where good cause is shown, consideration will be given to extending the response time.

FOR THE NUCLEAR REGULATORY COMMISSION

Luis A. Reyes, Director
Division of Reactor Projects

Dated at Atlanta, Georgia
this 26th day of April 1991

ENCLOSURE 2

ENFORCEMENT CONFERENCE SUMMARY

On April 11, 1991, representatives from Duke Power Company (DPC) met with the NRC in the Region II office in Atlanta, Georgia, to discuss issues concerning the design of Catawba and McGuire Control Room Ventilation Systems and the habitability of these control rooms following a design basis accident; and mispositioning of 1SA6 valve affecting the McGuire Unit 1 Turbine Driven Auxiliary Feedwater pump.

Opening remarks were given by Mr. J. L. Milhoan, Deputy Regional Administrator, Region II, and Mr. E. W. Merschoff, Deputy Director, Division of Reactor Projects, Region II.

DPC gave a presentation (Enclosures 4 and 5) on the issues. Mr. M. S. Tuckman, Vice President, Nuclear Operations, provided opening remarks and introduced Duke's presentations.

The Enclosure 4 presentation, given by Mr. D. W. Murdock, Project Manager, McGuire Design Division, covered the system design basis, system description, chronology of issue, corrective action, safety assessment and summary.

The Enclosure 5 presentation, given by Mr. B. H. Hamilton, Operations Superintendent, McGuire Station, covered the explanation of 1SA6 function, brief description of the auxiliary feedwater system, sequence of events, safety significance and lessons learned.

A summary and concluding remarks for each presentation were made by Mr. M. S. Tuckman and Mr. T. C. McMeekin, Vice President of Design Engineering.

The NRC closed the meeting by stating that DPC's presentations enhanced Region II's understanding of the issues and DPC's corrective actions.

ENCLOSURE 3

LIST OF ATTENDEES

U. S. Nuclear Regulatory Commission

J. L. Milhoan, Deputy Regional Administrator, Region II (RII)
G. R. Jenkins, Director, Enforcement and Investigation Coordination Staff (EICS)
E. W. Merschoff, Deputy Director, Division of Reactor Projects (DRP), RII
G. A. Belisle, Chief, Projects Section 3A, DRP, RII
F. Jape, Chief, Test Programs Section, Division of Reactor Safety (DRS), RII
*R. E. Architzel, Section Chief, Plant Systems Branch, Office of Nuclear Reactor Regulation (NRR)
W. Orders, Senior Resident Inspector, Catawba, DRP, RII
P. K. VanDoorn, Senior Resident Inspector, McGuire, DRP, RII
*R. Martin, Senior Project Manager, Projector Directorate II-3, NRR
*J. J. Hayes, Jr., Senior Radiation Specialist, Radiation Protection Branch, NRR
B. Uryc, Senior Enforcement Coordinator, RII
W. H. Miller, Jr., Project Engineer, RII
S. Q. Ninh, Project Engineer, RII
J. G. Luehman, Senior Enforcement Specialist, Office of Enforcement
*J. H. Paval, Reviewer, Plant Systems Branch, NRR

Duke Power Company

M. S. Tuckman, Vice President, Nuclear Operations
T. C. McMeekin, Vice President, Design Engineering
D. W. Murdock, Project Manager, McGuire Design Division
J. W. Hampton, Station Manager, Catawba Station
T. L. McConnell, Station Manager, McGuire Station
B. H. Hamilton, Operations Superintendent, McGuire Station
T. C. Geer, Engineering Supervisor, Design Engineering
R. R. Weidler, Engineering Supervisor, Design Engineering

*Via Telephone

ENCLOSURE 4

AGENDA

- CONTROL ROOM VENTILATION SYSTEM (VC) ISSUE FOR MNS & CNS

  * STATEMENT OF ISSUE
  * SYSTEM DESIGN BASIS
  * SYSTEM DESCRIPTION
  * CHRONOLOGY OF ISSUE
  * CORRECTIVE ACTION
  * SAFETY ASSESSMENT
  * SUMMARY

STATEMENT OF ISSUE

* ALL VC SYSTEM OUTSIDE AIR INTAKES AT BOTH CNS AND MNS CAN AUTOMATICALLY ISOLATE UNDER CERTAIN CONDITIONS RESULTING IN LOSS OF CONTROL ROOM PRESSURIZATION

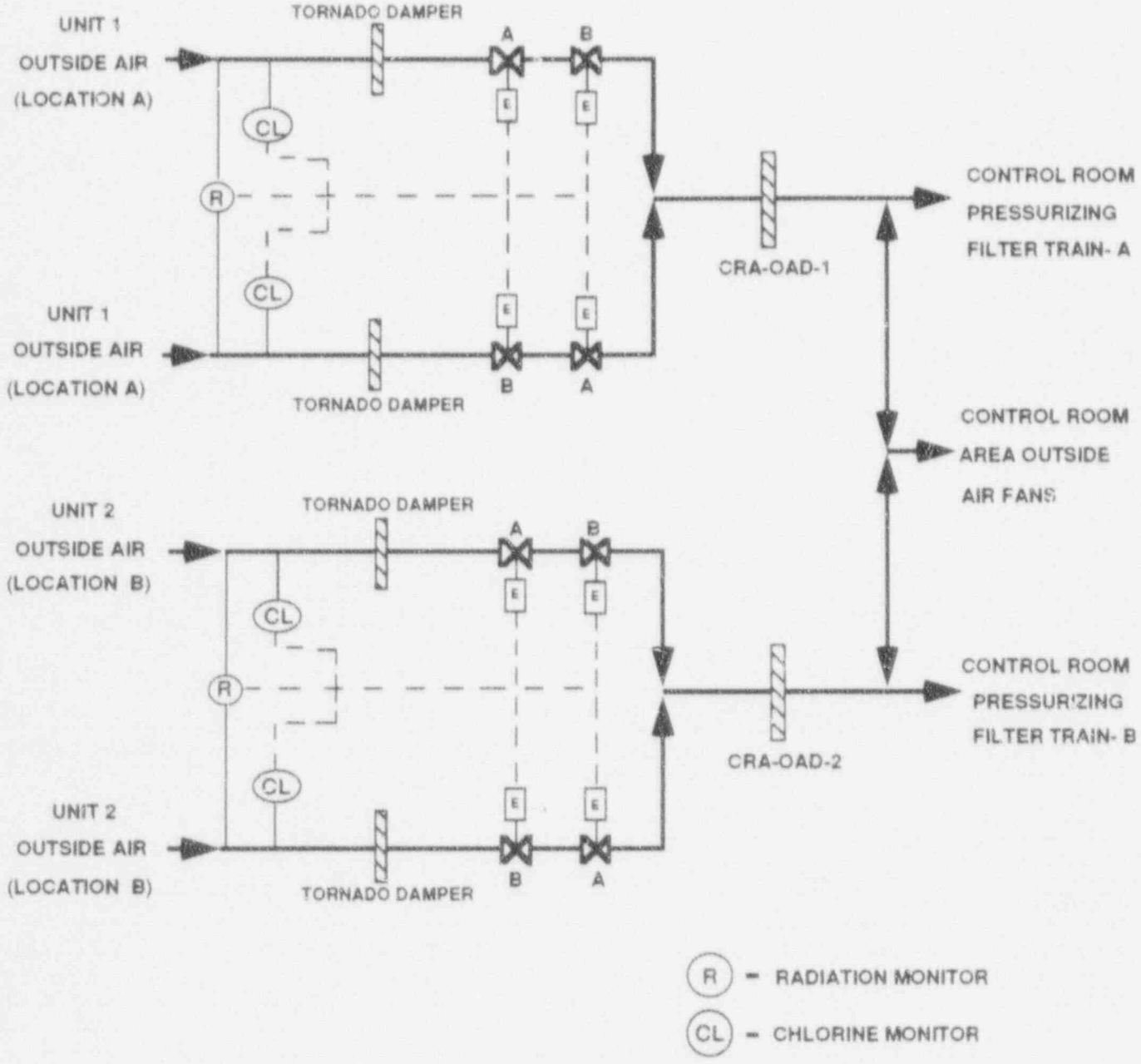
* TIME REQUIREMENTS TO MANUALLY RE-OPEN OUTSIDE AIR INTAKES ARE NOT IN CONFORMANCE WITH ASSUMPTIONS OF CONTROL ROOM DOSE ANALYSIS

VC SYSTEM DESIGN BASIS

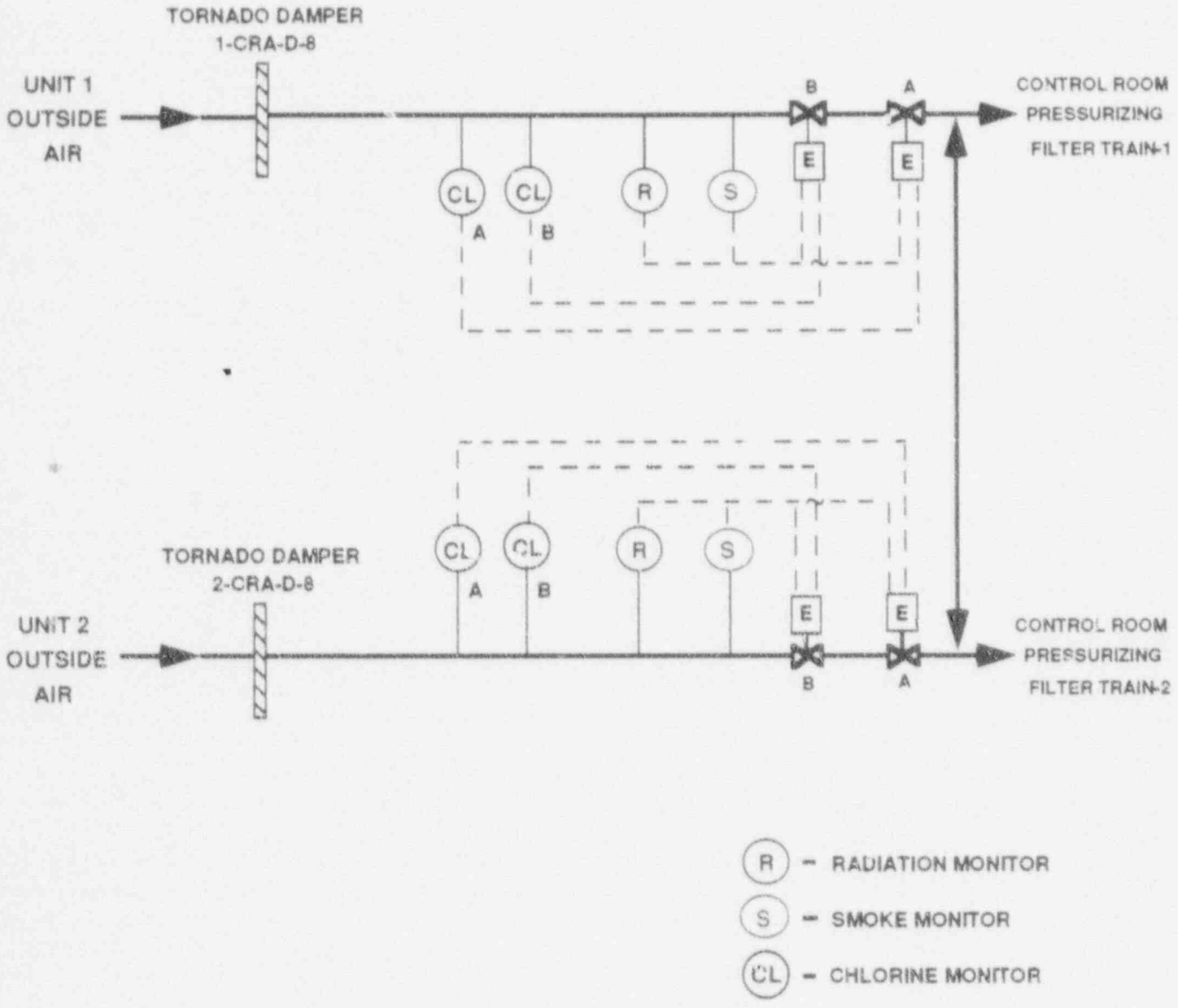
* PROTECTION OF CONTROL ROOM PERSONNEL

* PROVIDE TEMPERATURE AND HUMIDITY CONTROL FOR CONTROL ROOM

McGUIRE NUCLEAR STATION, UNITS 1&2
VC OUTSIDE AIR INTAKES



CATAWBA NUCLEAR STATION , UNITS 1&2
VC OUTSIDE AIR INTAKES



SYSTEM DESCRIPTION

Pressurizing air is provided by two separated sets of outside air intakes. For McGuire, each of these paths branch into two parallel paths at the intake itself.

Non-safety chlorine detectors and radiation monitors are provided at each intake location to isolate that intake should high chlorine or radiation be present. Each intake path is provided with redundant isolation valves.

The Catawba design is very similar. It also has two intake paths but was simplified by eliminating the branching. Catawba has safety related chlorine detectors and non-safety related radiation and smoke detectors capable of isolating their respective intake.

KEY POINTS OF INITIAL DESIGN

* TO MEET ELECTRICAL CRITERIA, NON-SAFETY DETECTORS MUST BE ISOLATED FROM SAFETY CIRCUITS BY AN ACCEPTABLE ISOLATION DEVICE.

* USE OF AN ISOLATION DEVICE CREATES A DEPENDANCE ON NON-SAFETY POWER.

* TO PRESERVE THE ISOLATION FUNCTION , FAILURE MODES WERE SELECTED WHICH WOULD ISOLATE UPON LOSS OF NON-SAFETY POWER

* THE DESIGN INTENTIONALLY RELIED ON OPERATOR ACTION TO RE-OPEN A PREVIOUSLY ISOLATED INTAKE AS RECOGNIZED IN THE SER's.

* ORIGINAL DESIGN WAS REVIEWED AND APPROVED AS PART OF McGUIRE AND CATAWBA INITIAL LICENSING EFFORTS.

McGUIRE NUCLEAR STATION
CHRONOLOGY OF ISSUE

* 10/06/89 - VC/YC DESIGN BASIS DOCUMENT COMPLETED.

  RESULTS: DESIGN BASIS REVIEWED AND DOCUMENTED.

* 10/12/89 - POWER SUPPLY SHORT DURING MAINTENANCE ACTIVITY ISOLATED INTAKES.

  RESULTS: CIRCUITS ACTUATED AS DESIGNED. CONFIRMED ORIGINAL DESIGN INTENT. PLANNED ADDITIONAL FUSING TO FACILITATE MAINTENANCE.

* 03/90 - VC/YC SITA

  RESULTS: RAISED SINGLE FAILURE ISSUE. RE-CONFIRMED ORIGINAL DESIGN INTENT AND PLANNED RELIABILITY UPGRADE OF SENSOR CIRCUITS WITH SEPARATE NON-SAFETY POWER CIRCUITS.

* 02/91 - 50.59 REVIEW FOR FUSE AND POWER SOURCE RELIABILITY UPGRADE.

  RESULTS: DETERMINED THAT TIME AVAILABLE FOR OPERATOR ACTION NOT CONSISTENT WITH ASSUMPTION OF CONTROL ROOM DOSE ANALYSIS.

  REVIEWED CATAWBA AND SIMILAR ISSUE IDENTIFIED.

CORRECTIVE ACTION

* IMMEDIATE CORRECTIVE ACTIONS (MNS)

  - ASSURED CONTROL ROOM PRESSURIZATION BY DELETING AUTOMATIC INTAKE ISOLATION.

  - INSTITUTED MANUAL ACTION TO CLOSE INTAKES IF ISOLATION NEEDED.

* IMMEDIATE CORRECTIVE ACTIONS (CNS)

  - INITIAL REVIEW DETERMINED SYSTEM OPERABLE WITH OPERATOR ACTION TO RE-OPEN INTAKES FROM CONTROL ROOM.

  - FURTHER REVIEW IDENTIFIED ADDITIONAL DIESEL SINGLE FAILURE MECHANISM.

  - ASSURED CONTROL ROOM PRESSURIZATION BY DELETING AUTOMATIC INTAKE ISOLATION (TECH. SPEC. WAIVER OF COMPLIANCE).

  - INSTITUTED MANUAL ACTION TO CLOSE INTAKES IF ISOLATION NEEDED.

* FUTURE CORRECTIVE ACTIONS (MNS & CNS)

  - PLAN TO MAKE CURRENT CHANGES PERMANENT.

SAFETY ASSESSMENT

* REALISTIC ASSUMPTIONS PROVIDE SUBSTANTIAL TIME (HOURS) FOR OPERATOR ACTIONS TO BE TAKEN.

* CONTROL ROOM OPERATORS WERE PROTECTED AND COULD HAVE PERFORMED THEIR DUTIES IN THE EVENT OF AN ACCIDENT.

* DEFENSE IN DEPTH WAS PROVIDED BY THE AVAILABILITY OF SELF-CONTAINED BREATHING EQUIPMENT.

* THE HEALTH AND SAFETY OF THE PUBLIC WAS NOT AFFECTED SINCE VC OPERATION HAS NO IMPACT ON OFFSITE DOSES.

SUMMARY

* MINIMAL SAFETY SIGNIFICANCE

* IDENTIFIED THROUGH ONGOING PROGRAMS

* DUKE PROGRAMS ARE WORKING. (DBD's, SITA, 50.59 REVIEWS AND HVAC TASK FORCE EFFORTS)

ENCLOSURE 5

1SA6 MISPOSITIONING EVENT MANAGEMENT MEETING AGENDA

- EXPLANATION OF 1SA6 FUNCTION
- BRIEF DESCRIPTION OF THE AUXILIARY FEEDWATER SYSTEM
- SEQUENCE OF EVENTS
- SAFETY SIGNIFICANCE
- LESSONS LEARNED

OVERHEAD #1

SEQUENCE OF EVENTS

- 02/12/90 1SA6 DISASSEMBLED AND INSPECTED FOR FREEDOM OF MOVEMENT
- 05/16/90 MODE 3, > 900 LBS STEAM PRESSURE REACHED. AUXILIARY FEEDWATER PUMP NUMBER ONE DISCHARGE PRESSURE VERIFICATION TEST WAS PERFORMED
- 05/17/90 MAINTENANCE FUNCTIONAL VERIFICATION OF WORK PERFORMED ON 1SA6 WAS PERFORMED SATISFACTORILY
- 07/12/90 AUXILIARY FEEDWATER PUMP NUMBER ONE DISCHARGE PRESSURE VERIFICATION TEST WAS PERFORMED
- 10/09/90 SEMI ANNUAL LOCKED VALVE LINE UP VERIFICATION PERFORMED
- 10/11/90 AUXILIARY FEEDWATER PUMP NUMBER ONE DISCHARGE PRESSURE VERIFICATION TEST WAS PERFORMED
- 01/10/91 AUXILIARY FEEDWATER PUMP NUMBER ONE DISCHARGE PRESSURE VERIFICATION TEST WAS PERFORMED
- 03/11/91 WITH THE TURBINE DRIVEN AUXILIARY FEEDWATER PUMP DECLARED INOPERABLE IN PREPARATION FOR MAINTENANCE ON 1SA49, 1SA6 WAS FOUND MISPOSITIONED
- 03/14/91 AUXILIARY FEEDWATER PUMP NUMBER ONE DISCHARGE PRESSURE VERIFICATION TEST WAS PERFORMED WITH 1SA6 INTENTIONALLY CLOSED
- 03/25/91 AUXILIARY FEEDWATER PUMP NUMBER ONE DISCHARGE PRESSURE VERIFICATION TEST WAS PERFORMED WHILE POSITIONING 1SA6 TO OBTAIN A DELTA P ≈ 150 PSID

SAFETY SIGNIFICANCE

- AUXILIARY FEEDWATER SYSTEM DESIGN INFORMATION
  - AN ASSURED SOURCE OF FEEDWATER TO THE S/Gs FOR DECAY HEAT REMOVAL
  - 2 100% CAPACITY MOTOR DRIVEN PUMPS
  - 1 200% CAPACITY TURBINE DRIVEN PUMP
  - DESIGNED WITH A LARGE DEGREE OF REDUNDANCY AND DIVERSITY TO ENSURE ITS CAPABILITY TO FUNCTION

- MAIN STEAM TO AUXILIARY EQUIPMENT DESIGN INFORMATION
  - B & C S/Gs SUPPLY STEAM TO THE AFWPT; EITHER SOURCE PROVIDES 100% CAPACITY
  - 6" LINE TAPPED OFF UPSTREAM OF THE MSIVs
  - REDUNDANCY FOR SM OR CF BREAK

- TECHNICAL SPECIFICATION REQUIREMENTS
  - 3 INDEPENDENT PUMPS AND ASSOCIATED FLOW PATHS REQUIRED IN MODES 1, 2 AND 3 WHEN STEAM PRESSURE IS GREATER THAN 900 PSIG
  - MNS TECH SPEC INTERPRETATION CONSERVATIVELY REQUIRES BOTH STEAM SUPPLIES TO THE AFWPT TO BE OPERABLE. THIS ACCOUNTS FOR SINGLE FAILURE CRITERIA
  - TECH SPEC WORDING "CAPABLE OF BEING POWERED FROM AN OPERABLE STEAM SUPPLY SYSTEM."

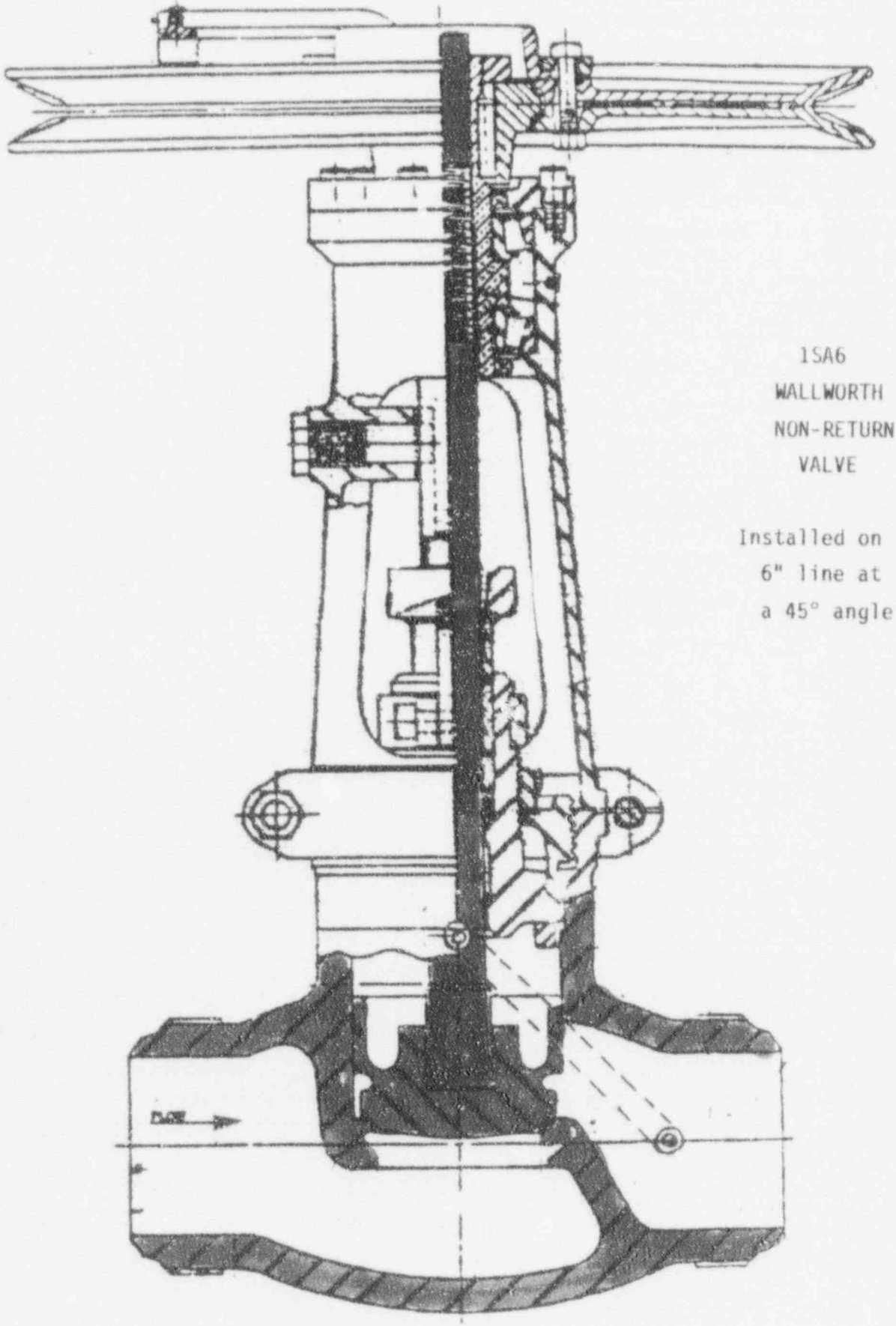
- CONCLUSIONS
  - OF THE 2 STEAM SUPPLIES; 1 WAS NEVER AFFECTED, THE OTHER WAS PARTIALLY RESTRICTED
  - PERIODIC TESTING ON 5/16/90, 7/12/90, 10/11/90 AND 1/10/91 VERIFIED THE RESTRICTED STEAM SUPPLY OPERABLE
  - AT NO TIME WAS THE AUXILIARY FEEDWATER SYSTEM'S OPERABILITY AFFECTED BY THE POSITION 1SA6.

LESSONS LEARNED

- McGUIRE'S "BLOCK TAG OUT" PROCESS, AS IMPLEMENTED DURING OUTAGES, RELIES UPON FUNCTIONAL VERIFICATION TO ENSURE ALL VALVES MANIPULATED WITHIN THE TAG OUT BOUNDARY ARE PROPERLY POSITIONED FOLLOWING THE OUTAGE. WE RECOGNIZE THIS AS A WEAKNESS.

- GUIDANCE PROVIDED TO THE NON LICENSED OPERATORS FOR VERIFICATION OF LOCKED VALVE POSITION IS NOT CLEARLY UNDERSTOOD.

- OJT FOR DETERMINING VALVE POSITION DOES NOT INCLUDE SOME TYPE OF VALVES INSTALLED IN THE PLANT. AN EXAMPLE OF THIS IS THE WALLWORTH NON-RETURN VALVE SUCH AS 1SA6.



1SA6
WALLWORTH
NON-RETURN
VALVE

Installed on
6" line at
a 45° angle

SIMPLIFIED FLOW DIAGRAM OF McGUIRE'S AUXILIARY FEEDWATER SYSTEM