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 April 19, 1992 - May 16, 1992, violations of NRC requirements were identified. In accordance with the "General Statement of Policy and Procedure for NRC Enforcement Actions," 10 CFR Part 2, Appendix C, the violation is listed below:

10 CFR 50 Appendix B Criterion III and the licensee's accepted Quality Assurance Program (Duke Power Company Topical Report Quality Assurance Program, DUKE-1-A) require that measures be established to assure that applicable regulatory requirements and the design basis for structures, systems, and components are correctly translated into specifications, drawings, procedures, and instructions.

Contrary to the above, measures were not effective to assure that applicable regulatory requirements and the design basis for structures, systems, and components were correctly translated into specifications, drawings, procedures, and instructions. This is evidenced by the fact that on March 27, 1992, air was discovered in the Nuclear Service Water System and the design control process failed to recognize this possibility. This directly impacted the ability of the Auxiliary Feedwater System to perform its intended safety function.

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 a copy to the NRC Resident Inspector McGuire Nuclear Plant, 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 or demand for information may be issued as to 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.

Dated at Atlanta, Georgia
this 12 day of June 1992

ENCLOSURE 2

LIST OF ATTENDEES

U. S. Nuclear Regulatory Commission

J. Johnson, Deputy Director, Division of Reactor Projects (DRP), Region II (RII)
E. Merschoff, Deputy Director, Division of Reactor Safety (DRS), RII
A. Herdt, Chief, Reactor Projects Branch 3, DRP, RII
A. Belisle, Chief, Reactor Projects Section 3A, DRP, RII
P. VanDoorn, Senior Resident Inspector, McGuire Facility, RII
T. Reed, Senior Project Manager, Project Directorate II-3, Office of Nuclear Reactor Regulation
G. Jenkins, Director, Enforcement and Investigation Coordination Staff (EICS), RII
B. Uryc, Senior Enforcement Specialist, EICS, RII
*J. Luehman, Enforcement Specialist, Office of Enforcement

*Attended by teleconference

Duke Power Company

T. McMeekin, Vice President, McGuire Nuclear Station (MNS)
P. Herran, Engineering Manager, MNS
T. Curtis, System Engineering Manager, MNS
R. Hall, Mechanical/Nuclear Engineering Manager, MNS
D. Baxter, Operations Support Manager, MNS
G. Gilbert, Safety Assurance Manager, MNS
R. Spittle, Auxiliary Feedwater System Engineer

ENCLOSURE 3

DUKE POWER COMPANY
McGUIRE NUCLEAR STATION

NUCLEAR SERVICE WATER/AUXILIARY FEEDWATER AIR ENTRAINMENT ENFORCEMENT CONFERENCE

JUNE 8, 1992

AGENDA

OPENING REMARKS	Ted McMeekin
DESIGN BASIS	Pete Herran
SYSTEM DESCRIPTION	Pete Herran
PROBLEM DESCRIPTION	Pete Herran
SEQUENCE OF EVENTS	Pete Herran
ROOT CAUSE	Pete Herran
CORRECTIVE ACTION	Pete Herran
SAFETY SIGNIFICANCE	Pete Herran
CLOSING REMARKS	Ted McMeekin

AUXILIARY FEEDWATER SYSTEM
DESIGN BASIS

* ENSURE ADEQUATE HEAT TRANSFER FROM THE REACTOR COOLANT TO THE STEAM GENERATORS IF THE CONDENSATE/ FEEDWATER SYSTEM IS NOT AVAILABLE

* MAINTAIN WATER LEVELS ABOVE THE STEAM GENERATOR TUBES TO LIMIT PRIMARY TO SECONDARY FISSION PRODUCT LEAKAGE

* TWO MOTOR DRIVEN PUMPS (MDP)
  OR
  TURBINE DRIVEN PUMP (TDP)

  REQUIRED TO MEET AUXILIARY FEEDWATER SYSTEM (CA) FLOW REQUIREMENTS.

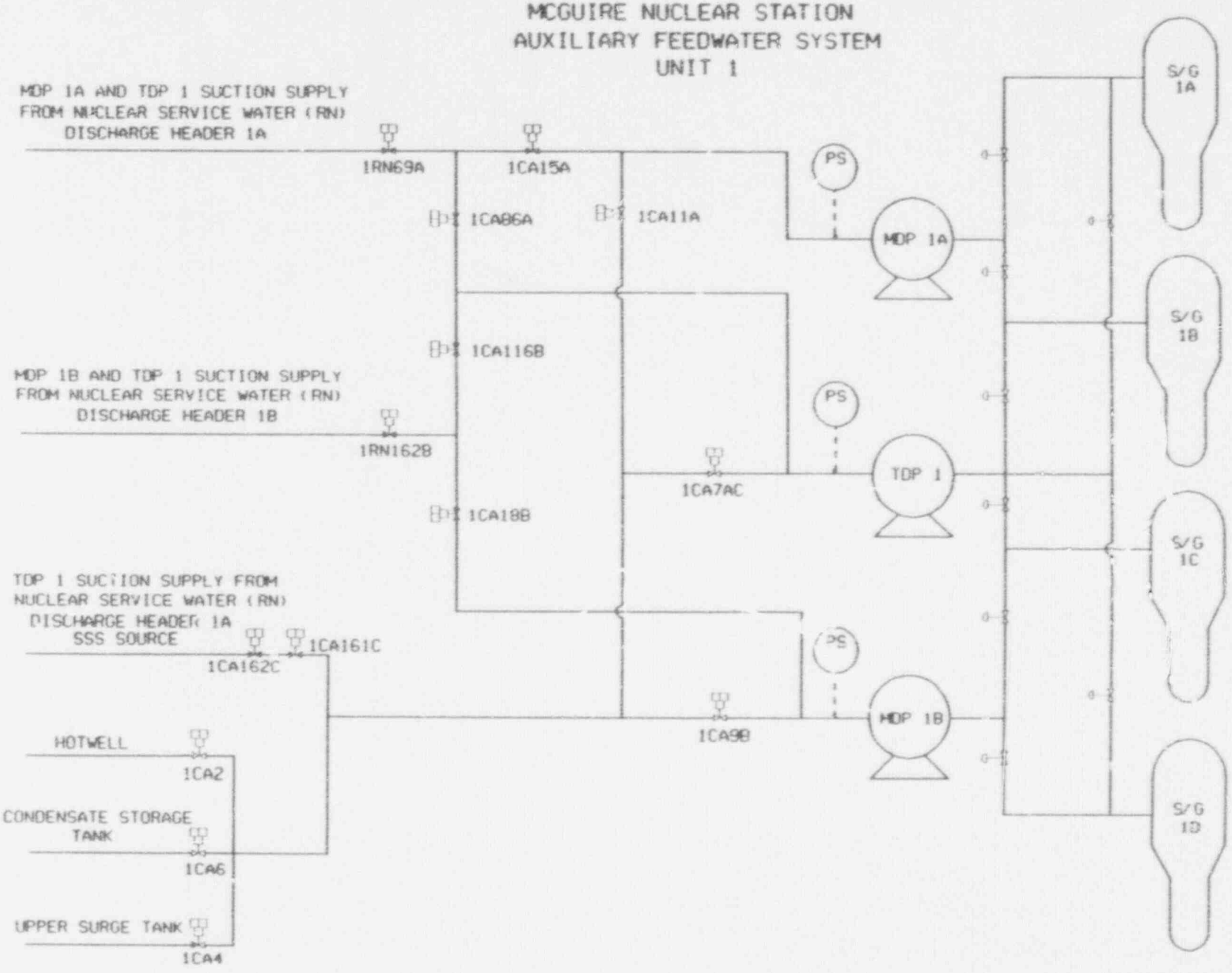
AUXILIARY FEEDWATER SYSTEM DESCRIPTION

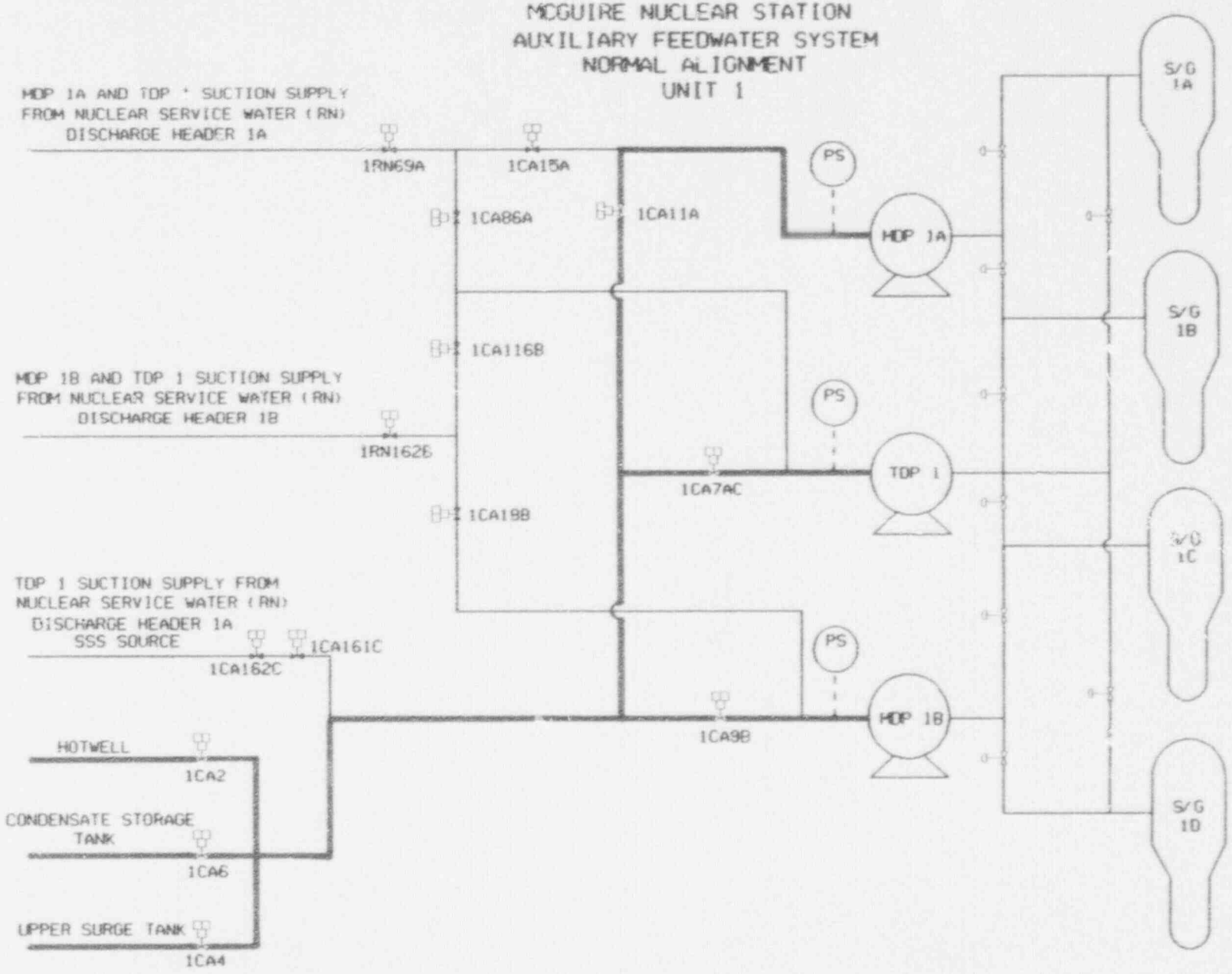
COMPONENT DETAILS

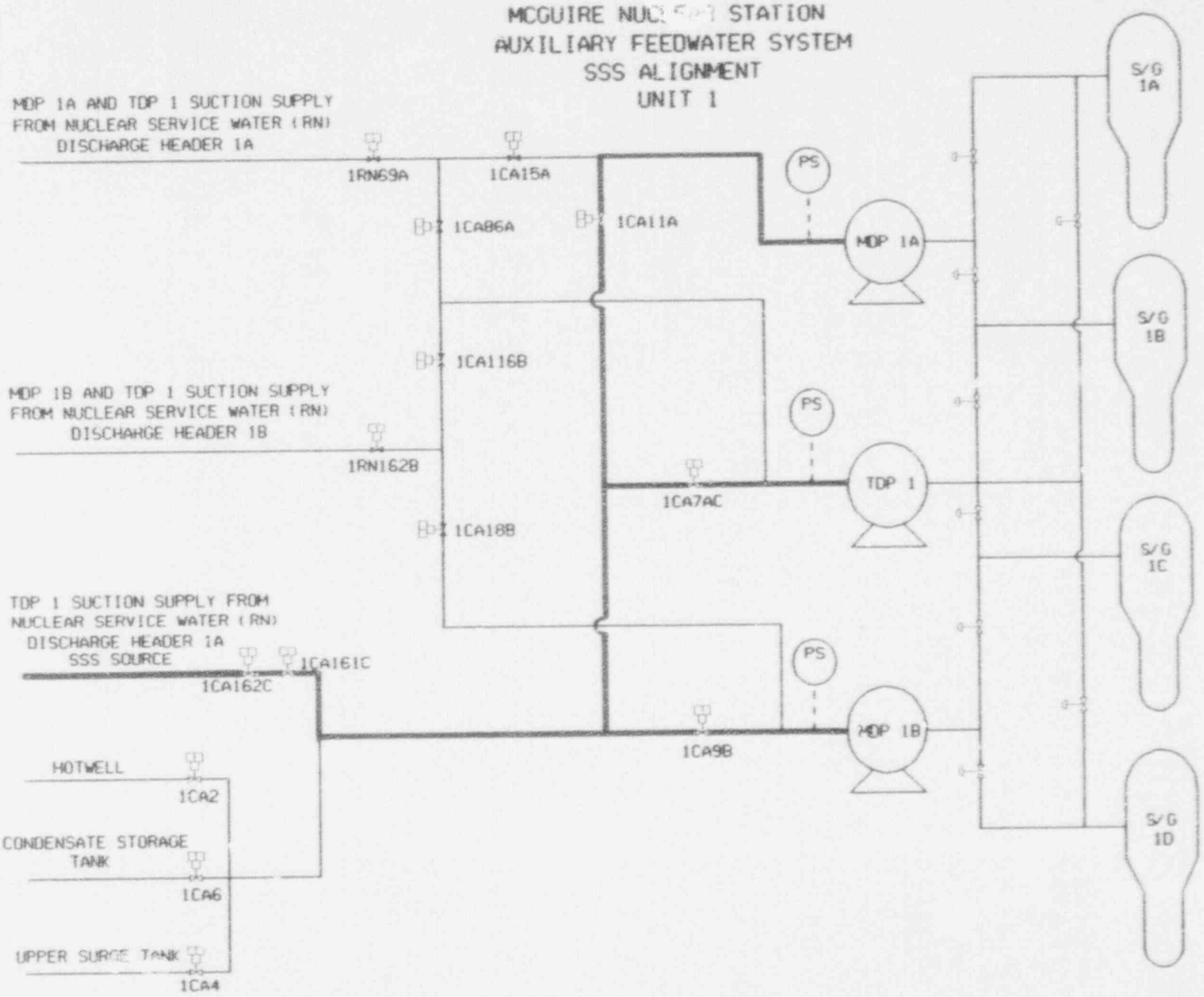
- PUMPS ARE MULTISTAGE, HIGH HEAD, AND HAVE CLOSE CLEARANCES
- VALVES PROVIDE THE REALIGNMENT REQUIRED TO TRANSFER TO THE SAFETY GRADE ASSURED SUPPLY OF FEEDWATER
- PRESSURE SWITCHES SENSE THE LOSS OF NORMAL FEEDWATER WATER SUPPLIES AND INITIATE PUMP SUCTION VALVE REALIGNMENT

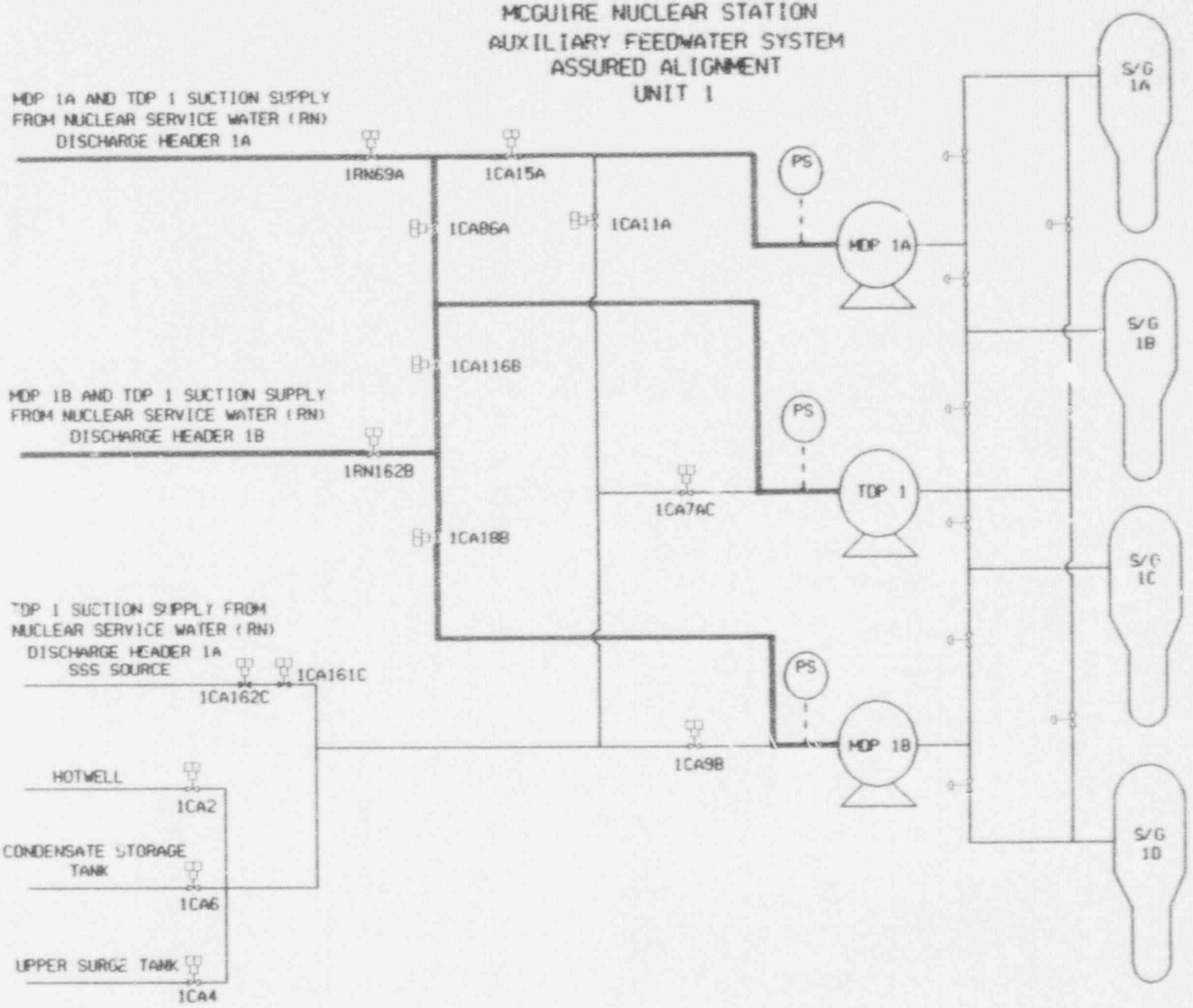
FEEDWATER SUPPLIES

- AUXILIARY FEEDWATER SYSTEM IS REQUIRED ONLY WHEN THE CONDENSATE/FEEDWATER SYSTEM IS NOT AVAILABLE
- CONDENSATE IS THE NORMAL AUXILIARY FEEDWATER SUPPLY AND IS NON-SAFETY
- ALIGNMENT TO SAFETY GRADE ASSURED SUPPLY ONLY OCCURS WHEN NORMAL SUPPLY IS DEPLETED
- NUCLEAR SERVICE WATER (RN) IS THE SAFETY GRADE ASSURED SUPPLY
- SWAPOVER FEATURE SENSES LOSS OF NORMAL CONDENSATE SUPPLY AND PROVIDES REALIGNMENT TO NUCLEAR SERVICE WATER (RN) SUPPLY


MCGUIRE NUCLEAR STATION
AUXILIARY FEEDWATER SYSTEM
UNIT 1
MDP 1A AND TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1A
1RN69A
1CA15A
1CA86A
1CA11A
PS
MDP 1A
S/G 1A
S/G 1B
1CA116B
MDP 1B AND TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1B
1RN162B
1CA7AC
TDP 1
1CA18B
S/G 1C
TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1A SSS SOURCE
1CA162C
1CA161C
1CA98
MDP 1B
HOTWELL
1CA2
CONDENSATE STORAGE TANK
1CA6
S/G 1D
UPPER SURGE TANK
1CA4


MCGUIRE NUCLEAR STATION
AUXILIARY FEEDWATER SYSTEM
NORMAL ALIGNMENT
UNIT 1
MDP 1A AND TDP 1 SUCTION SUPPLY
FROM NUCLEAR SERVICE WATER (RN)
DISCHARGE HEADER 1A
1RN69A
1CA15A
1CA86A
1CA11A
PS
MDP 1A
S/G 1A
S/G 1B
1CA116B
MDP 1B AND TDP 1 SUCTION SUPPLY
FROM NUCLEAR SERVICE WATER (RN)
DISCHARGE HEADER 1B
1RN162B
PS
TDP 1
1CA7AC
1CA19B
S/G 1C
TDP 1 SUCTION SUPPLY FROM
NUCLEAR SERVICE WATER (RN)
DISCHARGE HEADER 1A
SSS SOURCE
1CA161C
1CA162C
PS
MDP 1B
1CA9B
HOTWELL
1CA2
CONDENSATE STORAGE
TANK
1CA6
S/G 1D
UPPER SURGE TANK
1CA4


MCGUIRE NUCLEAR STATION
AUXILIARY FEEDWATER SYSTEM
SSS ALIGNMENT
UNIT 1
MDP 1A AND TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1A
1RN69A
1CA15A
1CA86A
1CA11A
PS
MDP 1A
S/G 1A
S/G 1B
1CA116B
MDP 1B AND TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1B
1RN162B
PS
TDP 1
1CA7AC
1CA18B
S/G 1C
TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1A SSS SOURCE
1CA162C
1CA161C
PS
MDP 1B
1CA9B
HOTWELL
1CA2
CONDENSATE STORAGE TANK
1CA6
UPPER SURGE TANK
1CA4
S/G 1D


MCGUIRE NUCLEAR STATION
AUXILIARY FEEDWATER SYSTEM
ASSURED ALIGNMENT
UNIT 1
MDP 1A AND TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1A
1RN69A
1CA15A
1CA86A
1CA11A
PS
MDP 1A
S/G 1A
S/G 1B
1CA116B
MDP 1B AND TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1B
1RN162B
PS
TDP 1
1CA7AC
1CA188
S/G 1C
TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1A SSS SOURCE
1CA161C
1CA162C
PS
MDP 1B
1CA9B
HOTWELL
1CA2
CONDENSATE STORAGE TANK
1CA6
S/G 1D
UPPER SURGE TANK
1CA4

PROBLEM DESCRIPTION

PROBLEMS

1. DISCOVERY OF AIR IN SAFE SHUTDOWN SYSTEM (SSS) WATER SUPPLY TO UNIT 1 AUXILIARY FEEDWATER (CA) PUMPS

2. AIR FOUND IN NUCLEAR SERVICE WATER (RN) TRAIN 1A AND 2A SUPPLY TO AUXILIARY FEEDWATER (CA) PUMPS

EFFECTS

- CA PUMP OPERABILITY FROM NORMAL CONDENSATE SUPPLY UNAFFECTED

- CA PUMP OPERABILITY POTENTIALLY AFFECTED FOLLOWING TRANSFER FROM NORMAL SUPPLY

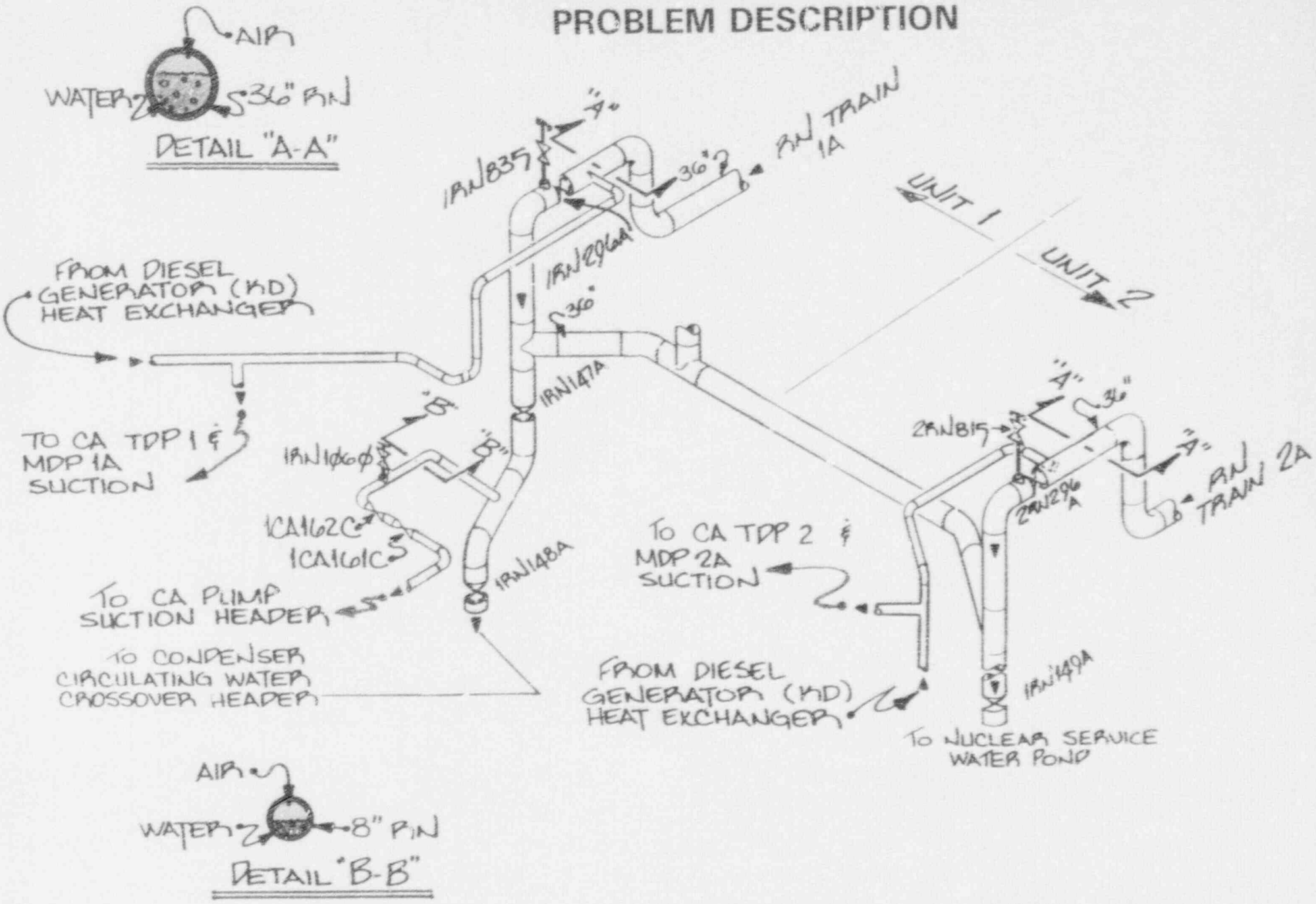
  - AIR IN UNIT 1 SSS SUPPLY POTENTIALLY AFFECTED CA TDP 1 AND MDP 1A AND 1B

  - AIR IN UNIT 1 AND 2 NUCLEAR SERVICE WATER (RN) "A" TRAIN SUPPLIES POTENTIALLY AFFECTED UNIT 1 AND 2 TDP AND MDP A

- COMPLEX ENGINEERING EVALUATION OF POTENTIAL FOR CA PUMP DEGRADATION AS A RESULT OF AIR ENTRAINMENT FROM SSS AND RN SUPPLY FLOWPATHS

- CA PUMPS CONSERVATIVELY DECLARED INOPERABLE

MCGUIRE NUCLEAR STATION
NUCLEAR SERVICE WATER SYSTEM
PROBLEM DESCRIPTION



SEQUENCE OF EVENTS

3/27-4/3 DISCOVERY OF AIR IN NUCLEAR SERVICE WATER SYSTEM

- ENGINEER DISCOVERS AIR IN UNIT 1 SSS SUPPLY ASSURED FEEDWATER SUPPLY
- DISCOVERED DURING INSPECTION OF "STAGNANT OR INFREQUENTLY USED FLOW PATHS" PER GENERIC LETTER 89-13
- LINE VENTED AS IMMEDIATE CORRECTIVE ACTION
- RE-VENTING REVEALS ADDITIONAL AIR
- INFORMAL SEARCH FOR SUPPLY OF AIR BEGUN
- OPERATIONS PREPARES VENTING PROCEDURE (TRAPPED AIR THOUGHT TO BE THE PROBLEM)

4/7-4/9 REALIZATION OF SSS SUPPLY OPERABILITY ISSUE

- REVIEW OF VENTING PROCEDURE REVEALS OPERABILITY CONCERN FOR SSS SUPPLY TO TURBINE DRIVEN AUXILIARY FEEDWATER PUMP
- FORMAL OPERABILITY EVALUATION INITIATED
- PERIODIC VENTING ESTABLISHED AS IMMEDIATE CORRECTIVE ACTION
- OPERABILITY EVALUATION EXPANDS TO OPERABILITY OF AUXILIARY FEEDWATER SYSTEM PROPER
- SSS-SUPPLY ISOLATED AS A PRECAUTION
- SSS DECLARED INOPERABLE

SEQUENCE OF EVENTS (CONT'D)

4/8-4/30 SIMULTANEOUS INVESTIGATIONS OF PROBLEM 1

SYSTEMATIC SEARCH FOR AIR & AIR SUPPLY(S)

- PIPING LAYOUT AND EQUIPMENT REVIEW
- WALKDOWN; SEARCH FOR IN-LEAKAGE; ADDITIONAL VENTING
- EVALUATION OF DISSOLVED AIR RELEASE
- CONCLUSIONS:

  AIR @ HIGH POINTS ON DISCHARGE SIDE

  NO IN-LEAKAGE

  DISSOLVED AIR RELEASE IS SOURCE OF AIR

INVESTIGATION OF SSS SUPPLY EFFECT UPON PAST OPERABILITY OF AUXILIARY FEEDWATER SYSTEM

- HYDRAULIC MODELING OF FLOW PATHS, ASSESSMENT OF POTENTIAL FOR AIR ENTRAINMENT AND TRANSPORT
- EVALUATION OF CA PUMP REQUIREMENTS; PUMP MANUFACTURER/DESIGNER REVIEWS
- REVIEW OF INDUSTRY EXPERIENCE/LITERATURE
- CONCLUSION:

  COMPLEXITIES PREVENT CONCLUSIVE DEMONSTRATION OF PAST OPERABILITY; CA TDP 1A AND MDP 1A AND 1B CONSERVATIVELY DECLARED TO HAVE BEEN INOPERABLE

SEQUENCE OF EVENTS (CONT'D)

4/30-5/5 REALIZATION OF SIGNIFICANCE OF AIR/SINGLE FAILURE INTERACTIONS - PROBLEM 2

- ENGINEERING INITIATES REVIEW OF POTENTIAL VULNERABILITY OF BOTH UNITS' CA TDP & MDP A TO SINGLE FAILURE IN NUCLEAR SERVICE WATER SYSTEM
  - REVERSE FLOW - LOSS OF CONDENSATE/ FEEDWATER + LOSS NORMAL AUXILIARY FEEDWATER SUPPLY + LOSS D/G COOLING FLOW "A"
  - INCREASED PERIODIC VENTING BEGUN AS IMMEDIATE CORRECTIVE ACTION
  - ADDITIONAL INVESTIGATION, TESTING, AND FORMAL OPERABILITY EVALUATION BEGUN
- TURBINE-DRIVEN PUMP (BOTH UNITS) ISOLATED FROM "A" SERVICE WATER LINE AND DECLARED INOPERABLE
  - 72 HOUR LCO ENTERED
  - TD PUMP REMAINS AVAILABLE
  - ACTION PREVENTS SIMULTANEOUS INOPERABILITY OF TD PUMP AND "A" MD PUMP
- CONTINUOUS VENTING AND PROCEDURE CHANGES IMPLEMENTED
  - TD PUMP RESTORED TO OPERABILITY
  - 72 HOUR LCO EXITED

SEQUENCE OF EVENTS (CONT'D)

5/4 UNIT 1 SHUTDOWN FOR S/G OUTAGE

5/20 UNIT 2 TRIPPED; ENTERED PLANNED S/G OUTAGE

ROOT CAUSE

ROOT CAUSE: DESIGN DEFICIENCY - SYSTEM CONFIGURATION AND FUNCTIONAL DESIGN DEFICIENCY

EFFECT OF AIR COMING FROM SOLUTION NOT CONSIDERED IN DESIGNING ASSURED MAKEUP SUCTION TIE-INS

CORRECTIVE ACTION

INITIAL CORRECTIVE ACTIONS

- VENTING AT AFFECTED LOCATIONS
- CONSERVATIVE MEASURE TO CLOSE 1CA161C TO ASSURE UNIT 1 AUXILIARY FEEDWATER OPERABILITY
- TEMPORARY ISOLATION OF "A" SERVICE WATER SUPPLY TO UNIT 1 & 2 TD AUXILIARY FEEDWATER PUMPS

SUBSEQUENT ACTIONS

- INSTALLED CONTINUOUS VENTING SYSTEM AT 1RN835 AND 2RN815 FOR AUXILIARY FEEDWATER OPERABILITY
- PROCEDURE CHANGES TO ASSURE RN SUPPLY DURING REALIGNMENT TO NUCLEAR SERVICE WATER POND

CORRECTIVE ACTION (CONT'D)

PARALLEL ACTIONS (COMPLETE)

- EXTENSIVE ENGINEERING EVALUATION
- VERIFICATION OF NO ADDITIONAL AFFECTS OF AIR IN NUCLEAR SERVICE WATER (RN)
- COMPLETION OF VENTING REVIEW FOR CA & ECCS PUMPS
- VERIFICATION OF NO SIMILAR PROBLEMS AT CATAWBA AND OCONEE
- NOTIFICATION TO INDUSTRY VIA INPO

CORRECTIVE ACTION (CONT'D)

PLANNED ACTIONS

SHORT TERM (COMPLETE BY 6/19/92)

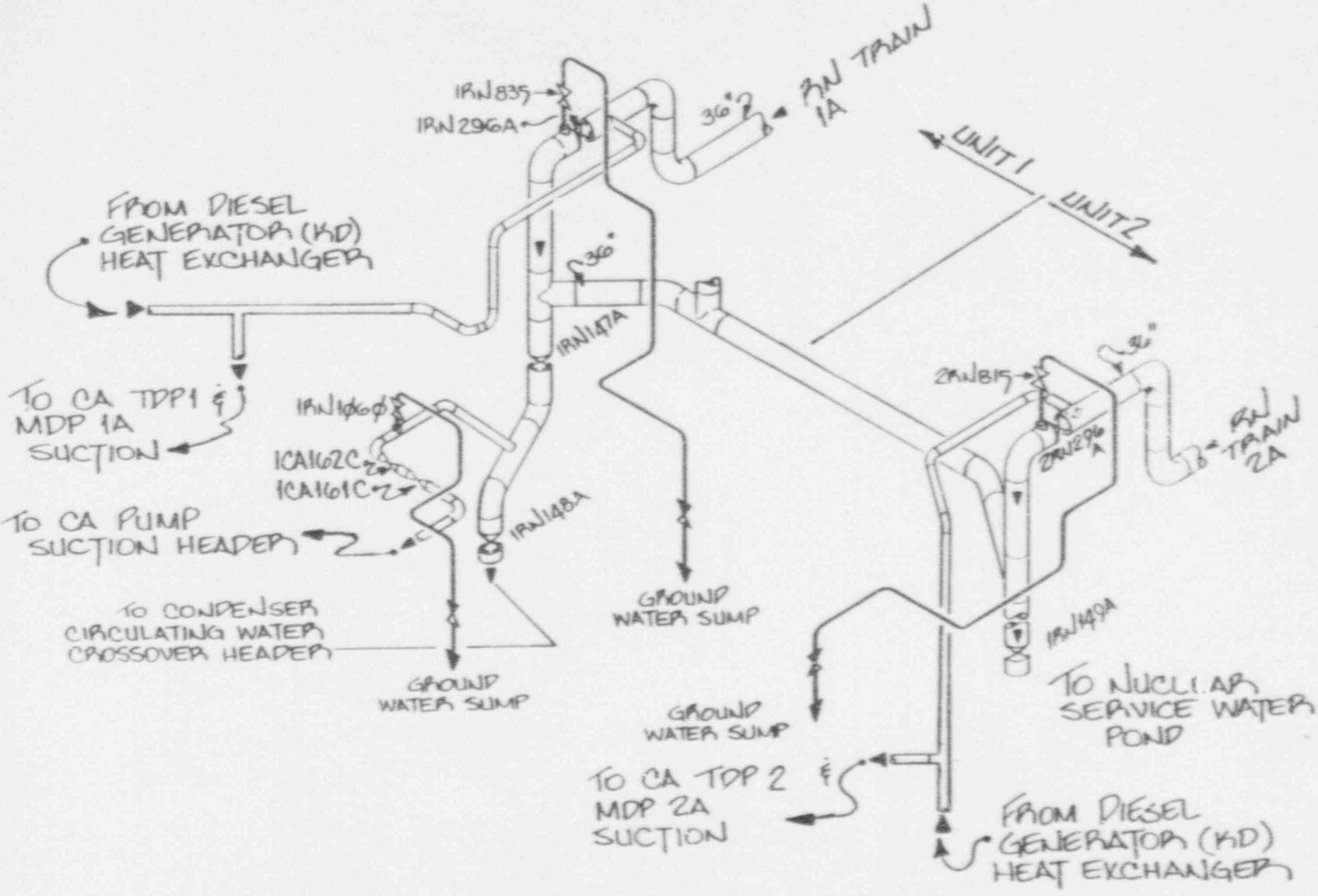
- PERMANENTLY INSTALL CONTINUOUS VENT AT 1RN1060 TO RESTORE SSS OPERABILITY. PROCEDURE CHANGES TO PREVENT AIR INTRODUCTION INTO SSS SUPPLY

- DEVELOP SERVICE WATER SYSTEM VENTING PROCEDURE

LONG TERM (BEFORE EOC-8)

- PERMANENTLY INSTALL CONTINUOUS VENTS AT 1RN835 AND 2RN815

MCGUIRE NUCLEAR STATION
NUCLEAR SERVICE WATER SYSTEM
CORRECTIVE ACTION



SAFETY SIGNIFICANCE

ABILITY TO MEET CA SYSTEM DESIGN BASIS AFFECTED

CA PUMP OPERABILITY WITH NORMAL CONDENSATE SUPPLY UNAFFECTED

CONCLUSIVE DEMONSTRATION OF CA PUMP OPERABILITY COULD NOT BE MADE - CONSERVATIVE INOPERABLE CALL

IF AUXILIARY FEEDWATER SYSTEM IS UNAVAILABLE THERE ARE TWO METHODS OF COOLING:

1) RESTORATION OF CONDENSATE/ FEEDWATER SYSTEM

2) PRIMARY FEED AND BLEED

CLOSING REMARKS

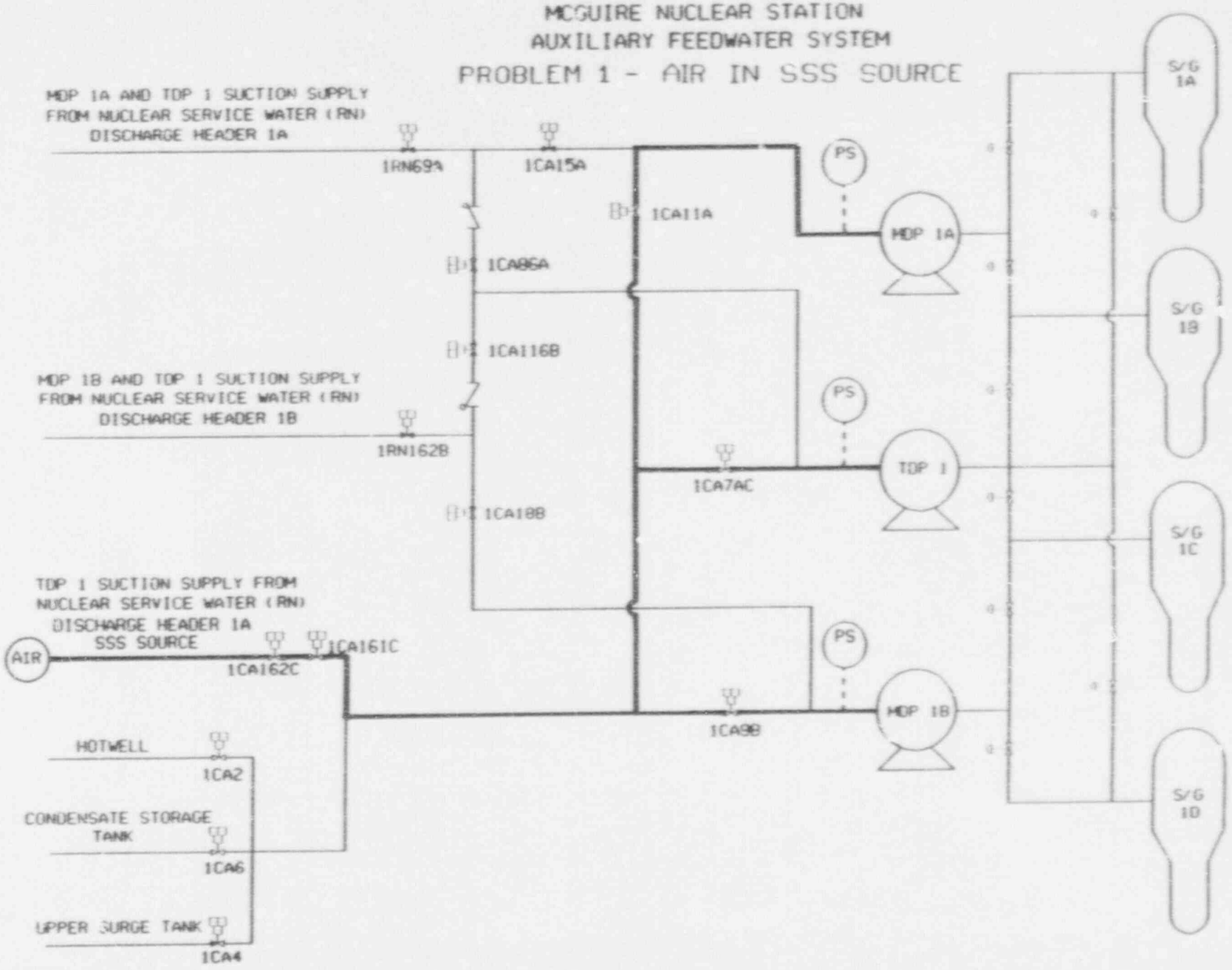
PROBLEM DISCOVERED BY DUKE ENGINEERS

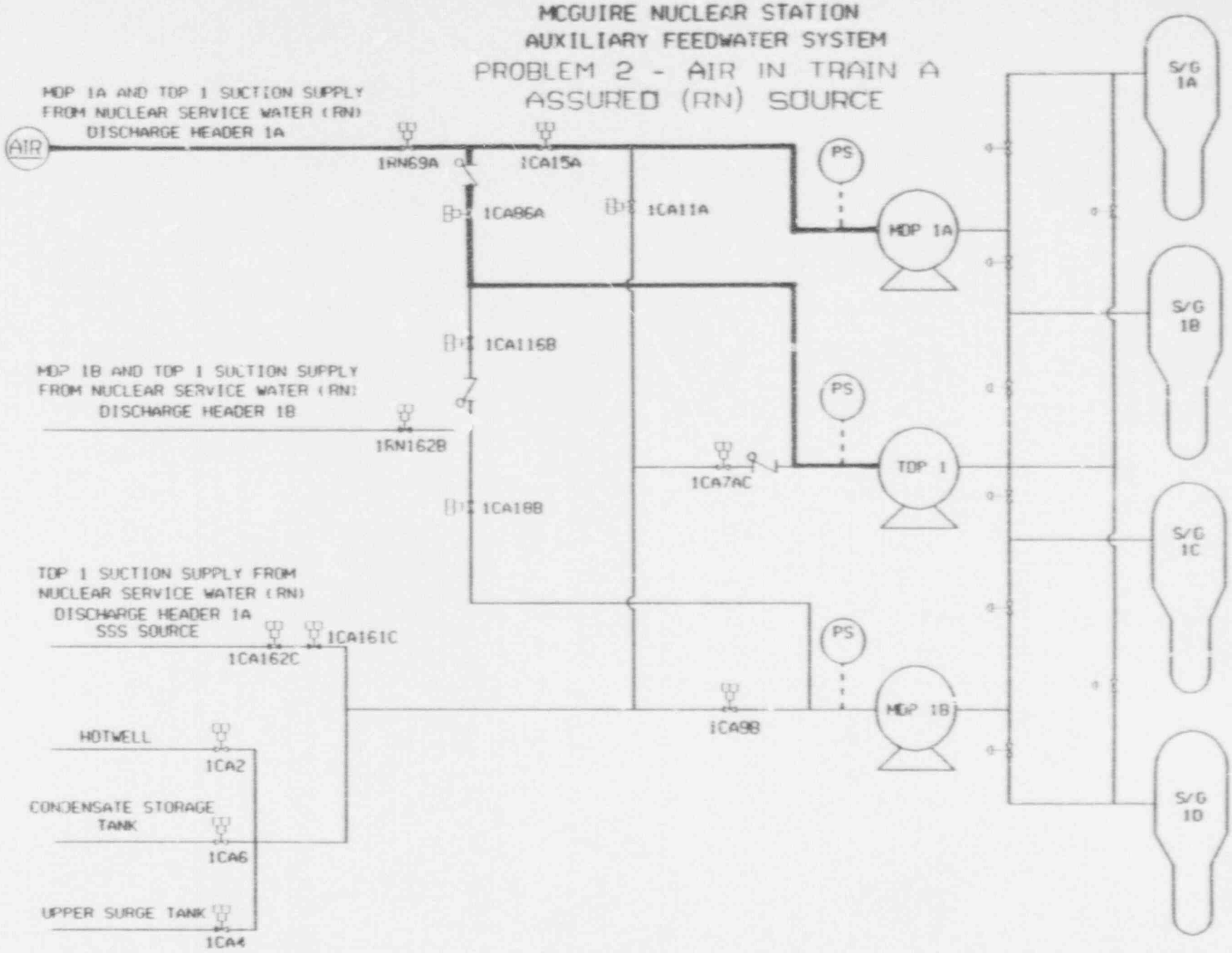
EXTENSIVE INVESTIGATION:

- ROOT CAUSE OF PROBLEM IDENTIFIED
- CONSERVATIVE EVALUATION OF COMPLEX OPERABILITY IMPLICATIONS
- REVIEWS FOR SIMILAR PROBLEMS COMPLETE
- PREVIOUSLY UNRECOGNIZED IN INDUSTRY NOTIFICATION MADE VIA INPO
- RN SITA SCHEDULED FOR 1992

OPERABILITY RESTORATION:

- COMPLETE FOR SAFETY GRADE ASSURED SUPPLIES
- COMPLETE FOR UNIT 1 SSS SUPPLY BY 6/19/92


MCGUIRE NUCLEAR STATION
AUXILIARY FEEDWATER SYSTEM
PROBLEM 1 - AIR IN SSS SOURCE
MDP 1A AND TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1A
1RN69A
1CA15A
1CA11A
1CA86A
1CA116B
MDP 1B AND TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1B
1RN162B
1CA7AC
1CA18B
TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1A SSS SOURCE
AIR
1CA162C
1CA161C
1CA9B
HOTWELL
1CA2
CONDENSATE STORAGE TANK
1CA6
UPPER SURGE TANK
1CA4
PS
MDP 1A
TDP 1
MDP 1B
S/G 1A
S/G 1B
S/G 1C
S/G 1D


MCGUIRE NUCLEAR STATION
AUXILIARY FEEDWATER SYSTEM
PROBLEM 2 - AIR IN TRAIN A
ASSURED (RN) SOURCE
MDP 1A AND TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1A
AIR
1RN69A
1CA15A
1CA86A
1CA11A
PS
MDP 1A
S/G 1A
S/G 1B
1CA116B
MDP 1B AND TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1B
1RN162B
1CA7AC
TDP 1
1CA188
S/G 1C
TDP 1 SUCTION SUPPLY FROM NUCLEAR SERVICE WATER (RN) DISCHARGE HEADER 1A SSS SOURCE
1CA161C
1CA162C
1CA98
MDP 1B
HOTWELL
1CA2
CONDENSATE STORAGE TANK
1CA6
S/G 1D
UPPER SURGE TANK
1CA4