**Omaha Public Power District**
1623 Harney Omaha, Nebraska 68102
402/536-4000



November 4, 1987
LIC-87-744

Mr. Robert D. Martin
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, Tx. 76011

References:
1. Docket No. 50-285
2. Inspection Report 87-27 dated October 23, 1987
3. Licensee Event Report 87-025 dated October 23, 1987

Dear Mr. Martin:

SUBJECT: Instrument Air System at Fort Calhoun Station

On October 29, 1987, members of my staff and the engineering division attended an enforcement conference in your offices in Arlington, Texas. The purpose of the conference was to discuss Omaha Public Power District's (OPPD) activities relative to the instrument air system at the Fort Calhoun Station. The purpose of this letter is to summarize OPPD's corrective actions related to the instrument air system.

The slides utilized for the October 29 presentation are attached to this letter in Enclosure 1. Clarifying information has been added to these slides to assist you in their review.

Enclosure 2 contains information regarding maintenance performed in the water plant in August 1987. (This maintenance was discussed in a telephone conversation October 30, 1987.)

Enclosure 3 contains goals established by management relative to the Instrument Air system at the Fort Calhoun Station. Additionally, dew-point testing measurements have been made by an outside firm. Current measurements indicate that the instrument air dew-point is -60°F.

Specific corrective actions planned and/or taken are itemized in Enclosure 4. As you are aware, a further update (supplement) to Reference 3 is planned.



87-1861





1/1 IE-5

If you have additional questions concerning this matter, do not hesitate to contact us.

Sincerely,

J K Gazzer for

R. L. Andrews
Division Manager
Nuclear Production

RLA/me

cc: LeBoeuf, Lamb, Leiby & MacRae
1333 New Hampshire Ave., NW
Washington, DC 20036

J. A. Calvo, NRC Project Director
A. Bournia, NRC Project Manager
P. H. Harrell, NRC Senior Resident Inspector
T. Reis, NRC Resident Inspector

Enclosure 1

Slides from Presentation of October 29, 1987

# INSTRUMENT AIR SYSTEM OVERVIEW

ALL MAJOR COMPONENTS OF THE INSTRUMENT AIR SYSTEM ARE LOCATED IN THE BASEMENT - OF THE AUXILIARY BUILDING ON THE EAST SIDE, ROOM 19.

- AIR IS SUPPLIED BY THREE IDENTICAL TWO STAGE COMPRESSORS OF WHICH TWO WILL OPERATE AUTOMATICALLY WHILE THE THIRD IS KEPT ON STANDBY AND CAN BE OPERATED MANUALLY IF NECESSARY.

- THE COMPRESSORS ARE CONNECTED TO A DISCHARGE MANIFOLD THAT FEEDS THE INSTRUMENT AND SERVICE AIR SYSTEMS.

- INSTRUMENT AIR FLOWS FIRST THROUGH AN AIR RECEIVER THAT HOLDS A RESERVE SUPPLY OF AIR. FROM THE RECEIVER IT FLOWS THROUGH AN AIR DRIER, FILTERS AND THEN TO THE DISTRIBUTION SYSTEM.

- SYSTEM OPERATION IS NOT REQUIRED TO INITIATE OPERATION OF ENGINEERED SAFEGUARDS EQUIPMENT.

- INSTRUMENT AIR IS NOT REQUIRED FOR OPERATION OF THE REACTOR PROTECTIVE SYSTEM.

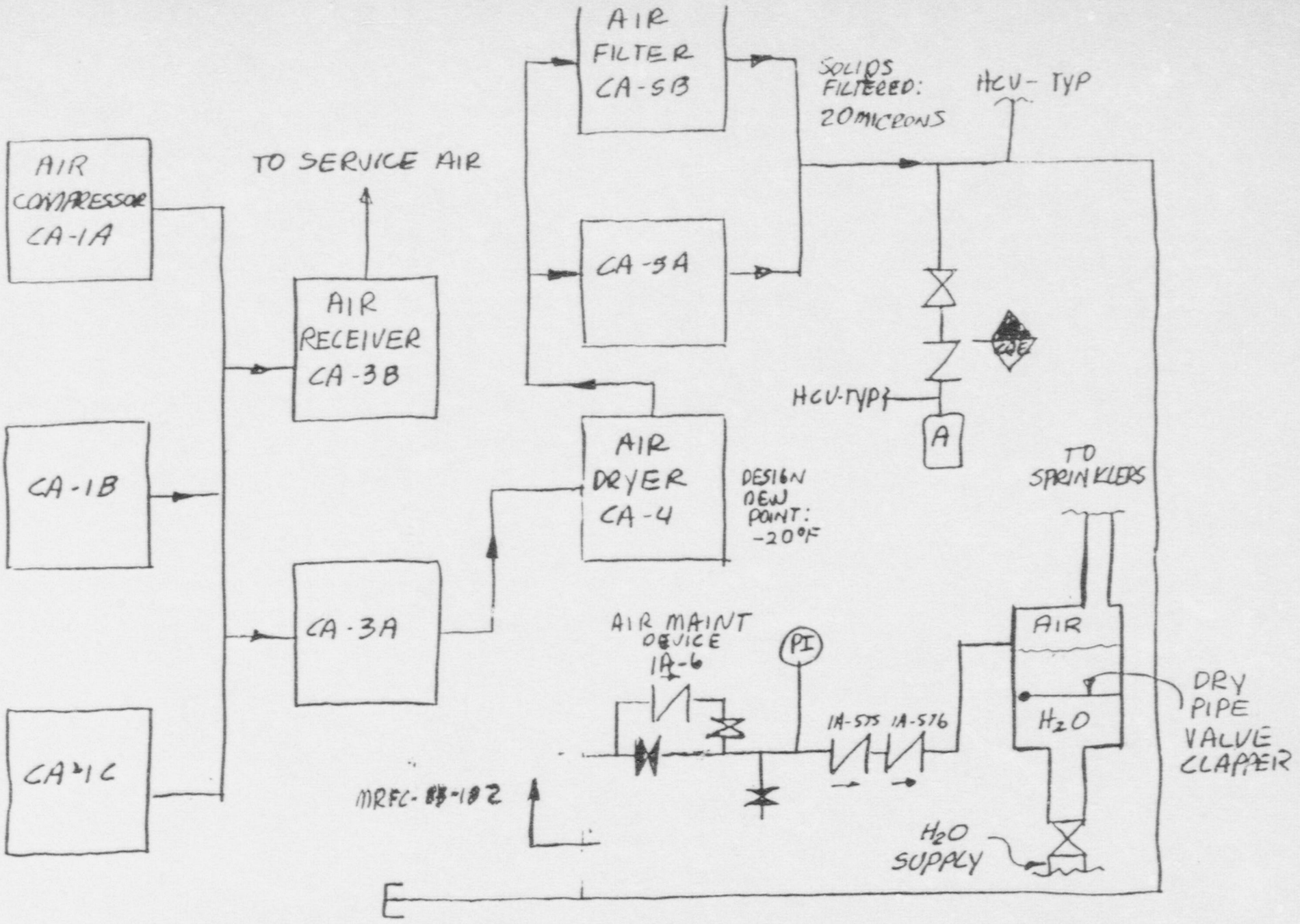
- LOSS OF INSTRUMENT AIR DOES NOT PRESENT A MAJOR HAZARD DURING NORMAL PLANT OPERATION OR MITIGATION OF AN ACCIDENT SITUATION BECAUSE THE SYSTEM IS NOT REQUIRED FOR SAFE SHUTDOWN, EXCEPT FOR NECESSARY AUXILIARY AIR SYSTEMS (ACCUMULATORS).

- REACTOR CAN BE TRIPPED AND CONTAINMENT ISOLATED USING ELECTRONIC SIGNALS.

- AIR OPERATED VALVES REQUIRED TO OPERATE DO SO BY SPRING ACTUATION OR BY AUXILIARY AIR SUPPLY (IE ACCUMULATORS) FOLLOWING REMOVAL OF AIR PRESSURE FROM THEIR OPERATORS.

- INSTRUMENT AIR SYSTEM IS NOT SEISMICALLY SUPPORTED EXCEPT FOR NECESSARY AUXILIARY AIR SUPPLY SYSTEMS.

- INSTRUMENT AIR SYSTEM IS <u>NOT</u> SAFETY RELATED, EXCEPT FOR NECESSARY AUXILIARY SYSTEMS.




SIMPLIFIED IA FLOW DIAGRAM

FIRE PROTECTION MODIFICATION
USING INSTRUMENT AIR

DRY PIPE SPRINKLER SYSTEM FOR DIESEL GENERATOR ROOMS (MR-FC-83-182).

- SYSTEM INSTALLED TO REDUCE THE POTENTIAL FOR FREEZING SPRINKLER PIPING WHEN THE DIESEL GENERATORS ARE OPERATED DURING COLD WEATHER.

- SYSTEM UTILIZES A 4-INCH DRY PIPE VALVE THAT FEEDS BOTH D.G. ROOMS VIA COMMON HEADER. ALL SYSTEM PIPING IS PRESSURIZED TO APPROXIMATELY 40 PSI WITH INSTRUMENT AIR. WHEN AIR PRESSURE IN THE SYSTEM IS REDUCED TO A PREDETERMINED POINT, THE DRY PIPE VALVE OPENS ALLOWING THE PIPING SYSTEM TO FILL WITH WATER.

- INSTRUMENT AIR USED FOR SEVERAL REASONS:

  - MINIMIZE ADDITIONAL COMPONENTS THAT REQUIRE PERIODIC MAINTENANCE (ADDING DEDICATED COMPRESSOR WOULD ADD ADDITIONAL MAINTENANCE).

  - PROVIDE A CLEAN, DRY SOURCE OF COMPRESSED AIR, THUS MINIMIZING THE POTENTIAL FOR MOISTURE COLLECTION AND POSSIBLE FREEZING WITHIN THE SYSTEM.

- THE FOLLOWING CHECK MECHANISMS PROVIDE ASSURANCE AGAINST WATER IN THE INSTRUMENT AIR SYSTEM .

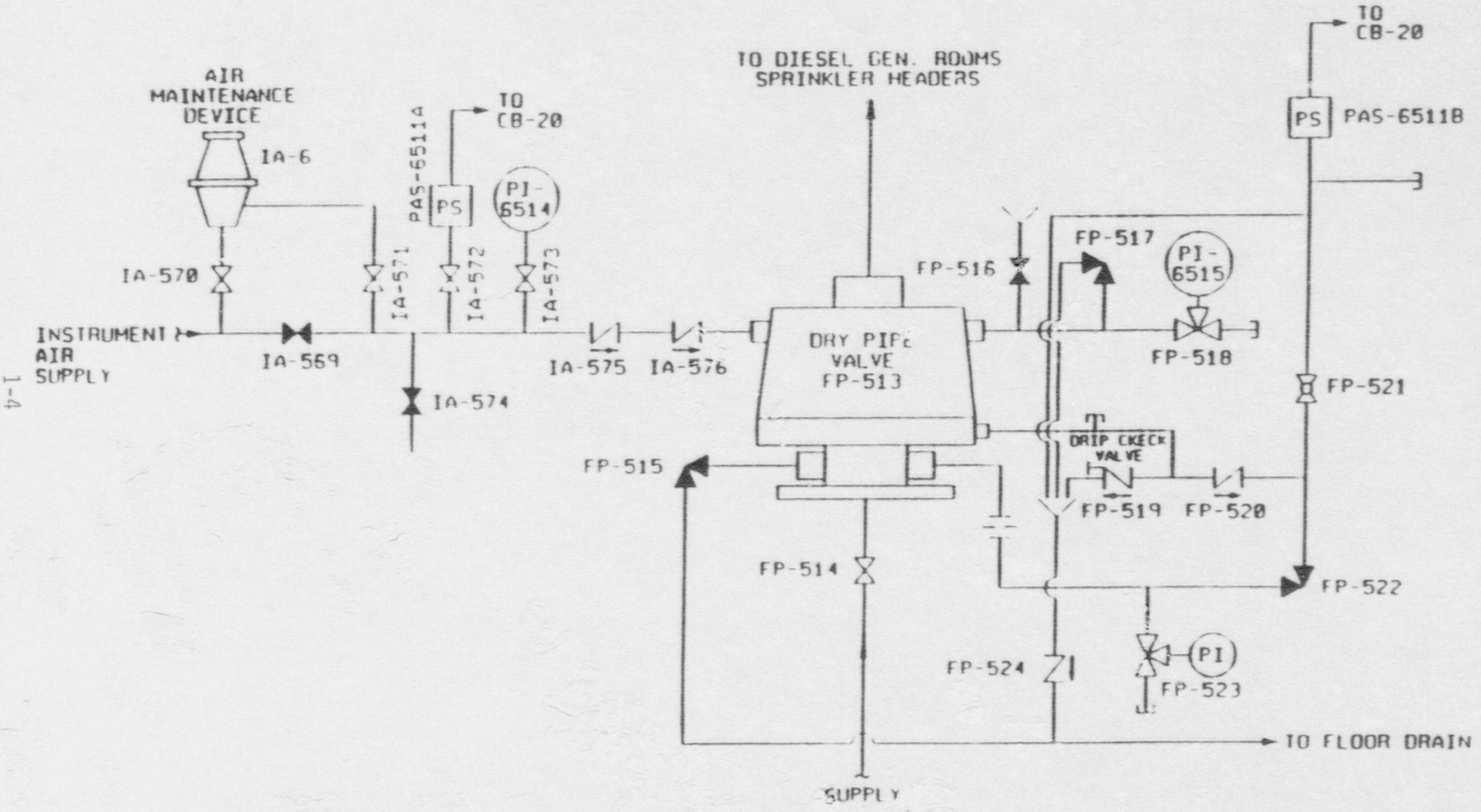
  1) DRY PIPE CLAPPER

  2) CHECK VALVES IA-575 & IA-576

  3) AIR MAINTENANCE DEVICE IA-6

- THE DRY PIPE VALVE, IF THE CLAPPER IS RESET WILL NOT ALLOW WATER UP TO IA-576, THEREFORE, THE ONLY TIME WATER WILL BE AT IA-576 IS DURING SURVEILLANCE TESTING AND AN ACTUAL FIRE CONDITION.

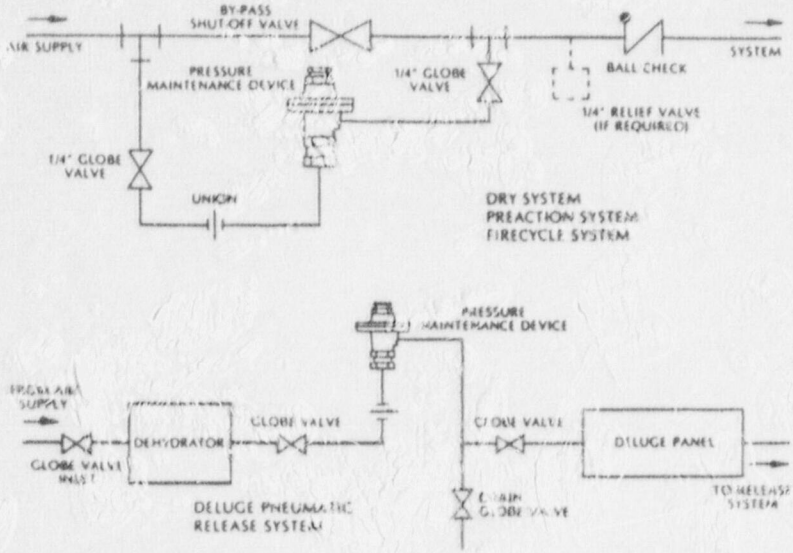
- VENDOR RECOMMENDS USE OF ONLY ONE CHECK VALVE.

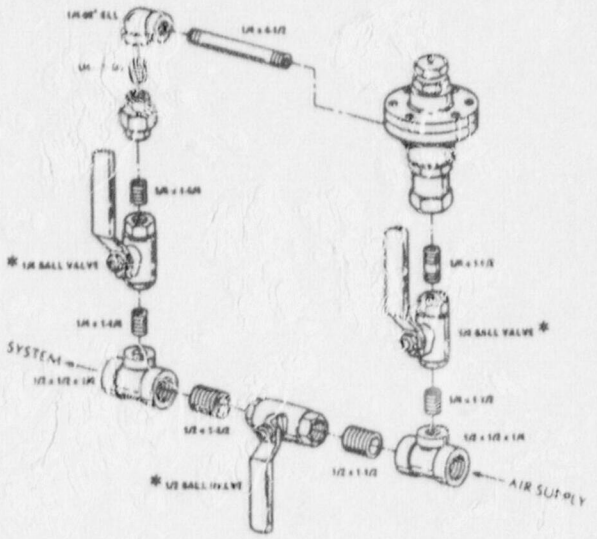



DRY PIPE VALVE

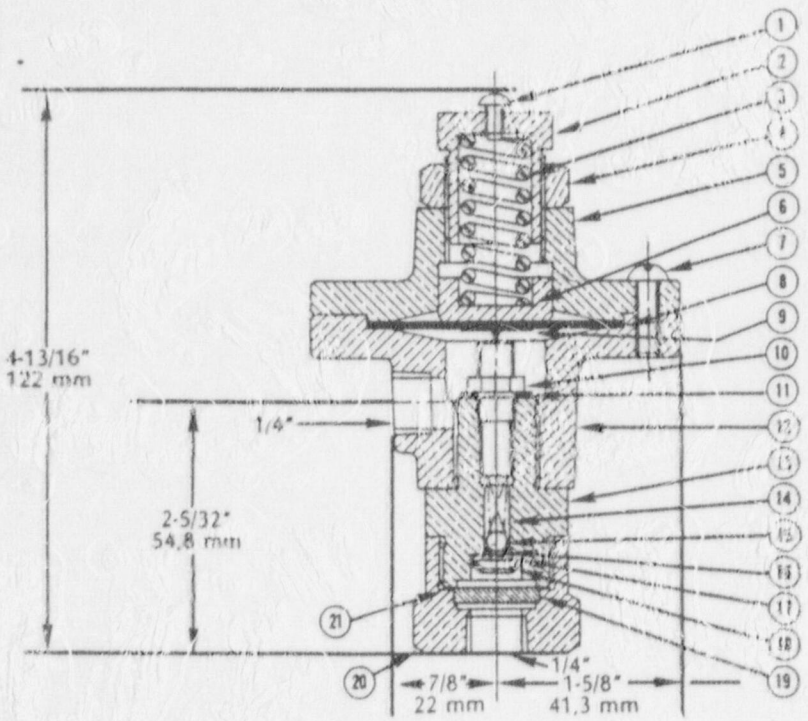
# VIKING TECHNICAL DATA

## AIR PRESSURE MAINTENANCE DEVICE




* "APOLLO" BALL VALVES




IA-6 Air Maintenance Device has backflow prevention device (14, 15)

| ITEM | PART NO. | DESCRIPTION | NO. REQ'D. |
|---|---|---|---|
| 1 | * | Drive Screw #7 x 5/16 Lg. | 1 |
| 2 | 02273A | Adjustment Screw | 1 |
| 3 | 01791A | Spring | 1 |
| 4 | 02275A | Lock Nut | 1 |
| 5 | 02277B | Cover | 1 |
| 6 | 02276A | Spring Retainer | 1 |
| 7 | 04505A | Phillips Round Hd. Sc. #10-24 x 5/8 Lg. | 6 |
| 8 | 01792A | Diaphragm Assembly (8 & 9) | 1 |
| 9 | * | Diaphragm Plate | 1 |
| 10 | 01448A | Schrader Valve Assembly | 1 |
| 11 | 01449A | Seal | 1 |
| 12 | 02273B | Body | 1 |
| 13 | * | Valve Housing | 1 |
| 14 | 02509A | Spring | 1 |
| 15 | 01803A | Ball | 1 |
| 16 | * | O-Ring | 1 |
| 17 | * | Retainer Plate | 1 |
| 18 | * | Retainer | 1 |
| 19 | 02257A | Filter | 1 |
| 20 | 02271B | Filter Cap | 1 |
| 21 | 02181A | Filter Seal | 1 |

*Available in Sub-Assemblies only

**SUB-ASSEMBLIES**

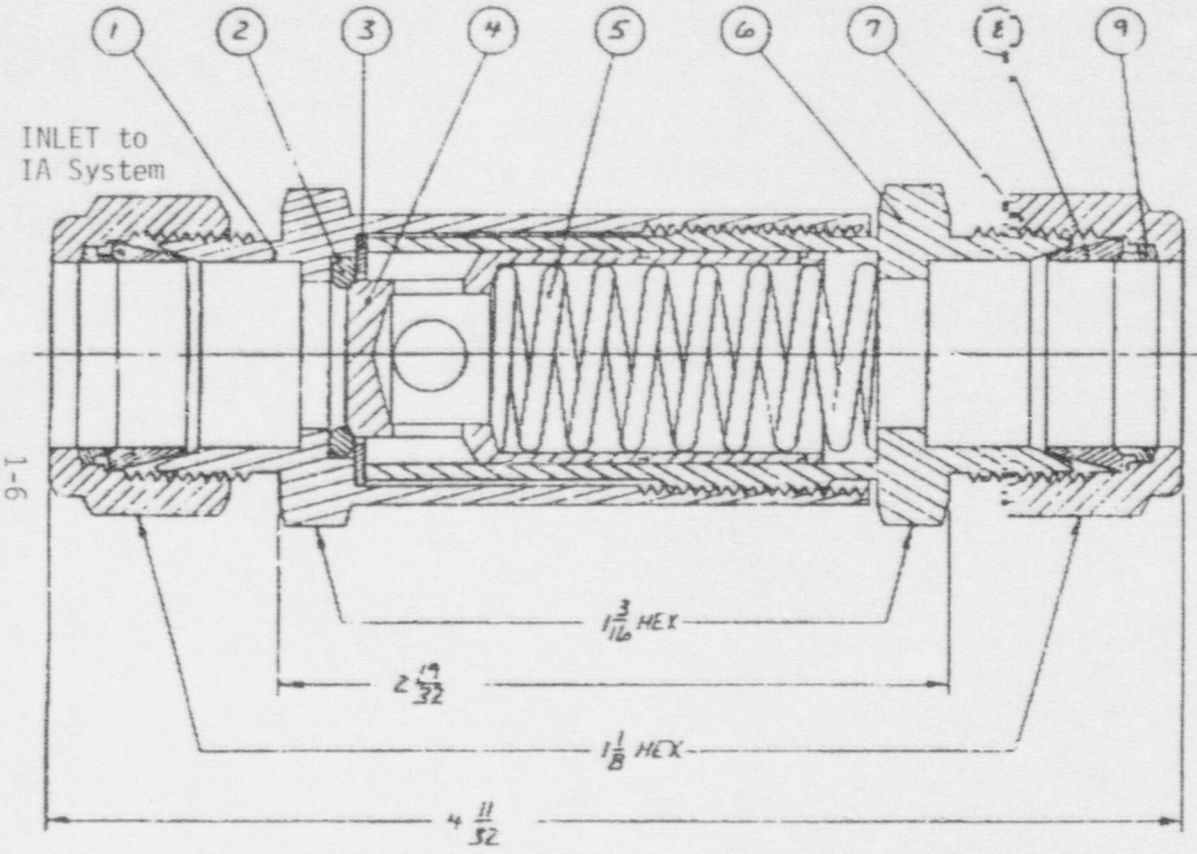
| ITEM | PART NO. | DESCRIPTION | NO. REQ'D. |
|---|---|---|---|
| 10, 11, 13 thru 21 | 02269B | Housing Assembly | 1 |
| 1, 2, 4 | 02272A | Adjustment Screw Ass'by | 1 |
| 8 & 9 | 01792A | Diaphragm Assembly | 1 |
| 19 & 21 | 03007A | Filter Kit | 1 |

## 11. METRIC CONVERSIONS

| | | | |
|---|---|---|---|
| 1/16" | = 1.59 mm | 35 psi | = 241,0 kPa |
| 1/4" | = 6.35 mm | 40 psi | = 276,0 kPa |
| 5 psi | = 34,5 kPa | 45 psi | = 310,0 kPa |
| 10 psi | = 68,9 kPa | 50 psi | = 345,0 kPa |
| 15 psi | = 103,0 kPa | 75 psi | = 517,0 kPa |
| 20 psi | = 138,0 kPa | 100 psi | = 689,0 kPa |
| 25 psi | = 172,0 kPa | 150 psi | = 1034,0 kPa |
| 30 psi | = 207,0 kPa | 175 psi | = 1206,8 kPa |

Part No. 04909-F
Form No. 2114

Printed in U.S.A.




| BILL OF MATERIAL | | | | |
|---|---|---|---|---|
| ITEM | PART NUMBER | PART NAME | MATERIAL | QTY. |
| 1 | SS-12C-P1A | FEMALE BODY | 316 S.S. | 1 |
| 2 | V70-14C-P4 | O-RING | VITON | 1 |
| 3 | SS-14C-P6A | GASKET | 316 S.S. | 1 |
| 4 | SS-14C-P3 | POPPET | 316 S.S. | 1 |
| 5 | 302-14C-P2-1 | SPRING | 302 S.S. | 1 |
| 6 | SS-12C-P5A | MALE BODY | 316 S.S. | 1 |
| 7 | SS-1212-1 | NUT | 316 S.S. | 2 |
| 8 | SS-1213-1 | FRONT FERRULE | 316 S.S. | 2 |
| 9 | SS-1214-1 | BACK FERRULE | 316 S.S | 2 |

NUPRO COMPANY

[illegible] 1986

DESTROY [illegible] DRAWINGS.

NOTES:
1. DO NOT SCALE DRAWING.
2. ALL DIMENSIONS ARE APPROXIMATE.
3. DIMENSIONS TO SWAGELOK NUTS SHOWN FINGERTIGHT.
4. REFER TO CATALOG FOR FLOW, TEMPERATURE AND PRESSURE RATINGS.

IA-575 and IA-576

| DRWN BY/DATE | CKD BY/DATE | SCALE | REV | PART NO. | NUPRO COMPANY |
|---|---|---|---|---|---|
| TSH 8-17-83 | CJ 2-11-82 | — | — | SS-12C-1 | 4800 EAST 345th STREET WILLOUGHBY, OHIO 44094 |

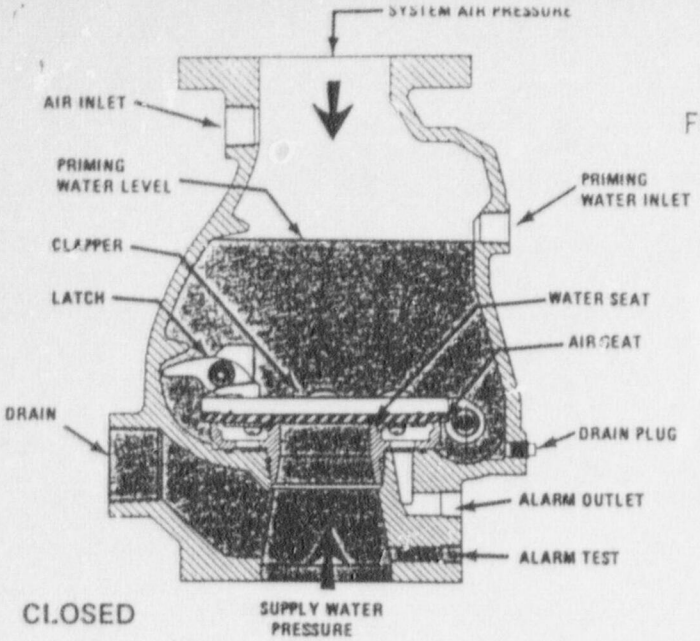



Fig. 1

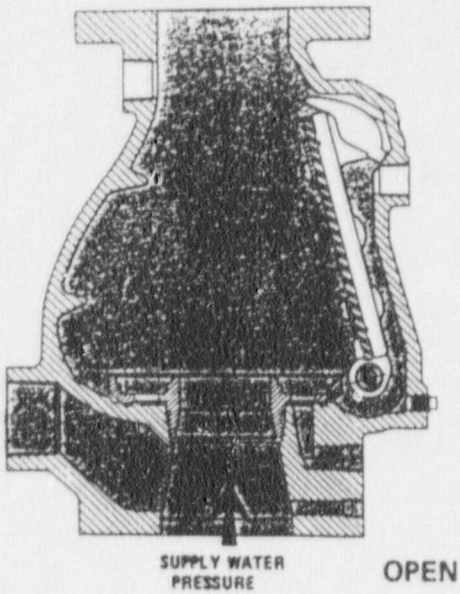



Fig. 2

## OPERATION

The Reliable Model D Dry Pipe Valve in its closed and open positions is shown in Figures 1 and 2. The closed position is maintained as long as the air pressure in the system piping above the Dry Pipe Valve is sufficient to exert a greater force on the top side of the clapper than is exerted on its underside by the pressure of the water supply. Since the area included by the Air Seat is approximately six times that of the Water Seat (The Differential Principle) the air pressure needed to keep the Dry Pipe Valve closed is only a fraction of that of the water supply. Table 1 gives the recommended air pressure for various water supply pressures for both sizes of Model D Dry Pipe Valves.

| Water Pressure in Supply Line | Air Pressure To be Pumped into System | |
|---|---|---|
| Maximum | Not less than | Not more than |
| 20 | 10 | 20 |
| 50 | 15 | 25 |
| 75 | 20 | 30 |
| 100 | 25 | 35 |
| 125 | 30 | 40 |
| 150 | 35 | 45 |
| 175 | 40 | 50 |

Table 1

When one or more Automatic Sprinklers operate due to fire, the air pressure in the system piping above the Dry Pipe Valve is reduced. The pressure of the water supply, now by exerting the greater force, raises and rotates the Clapper to its open position, permitting the water to flow to the operated Sprinkler(s). Water also flows from the Alarm Outlet of the Dry Pipe Valve through a strainer to the Reliable Mechanical Sprinkler Alarm and Electric Alarm Switch to automatically actuate mechanical and electrical alarms.

Reliable Model D Dry Pipe Valve can be reset quickly and easily without the use of special tools.

### QUICK OPENING DEVICES

When an automatic sprinkler operates, the resulting air pressure decay is inversely proportional to the size of the Dry System-the larger the system, the slower the air pressure decays which slows the operation of the Dry Pipe Valve. NFPA Pamphlet No. 13 titled "Installation of Sprinkler Systems" specifies that Quick Opening Devices are required in Dry Systems having capacities of more than 500 gallons.

Reliable's Model B Accelerator is an approved Quick Opening Device that is easily attached to Reliable's Dry Pipe Valves. The accelerator is sensitive to small drops in system pressure and its quick operation allows the system air to pass through to the alarm outlet and the underside of the clapper. Here the air pressure build-up, coupled with the pressure of the water supply, opens the Dry Pipe Valve clapper permitting the water to flow instantly to the operated sprinkler(s).

Reliable's Model B Accelerator is described in greater detail in separate bulletins.

## VALVE DESCRIPTION

1. Rated working pressure 175 psi (12.1 bar)
2. Factory hydrostatic test pressure 350 psi (24.1 bar)
3. End and trim connections — Three valve connection styles are available.

   a. US Standard Flanged Inlet and Outlet

   • Flanges mate with ANSI B 16.1 (125 lb.) Flange

| U.S. FLANGE DIMENSIONS IN INCHES | | | | | |
|---|---|---|---|---|---|
| Valve Size | Bolt Circle Dia. | Bolt Hole Dia. | Flange Outside Dia. | Flange Thickness | No. Bolts |
| 4 | 7½ | 3/4 | 9 | 15/16 | 8 |
| 6 | 9½ | 7/8 | 11 | 1 | 8 |

   • Threaded openings per ANSI B 2.1

   • Reliable's standard trim sets are compatible with US Flanged Valves.

   • Color — Light Gray

   b. US Standard Flanged Inlet and Grooved Outlet (Fig. 3)

   • Inlet flange mates with ANSI B 16.1 (125 lb.) Flange

| U.S. GROOVE DIMENSIONS IN INCHES | | | | |
|---|---|---|---|---|
| Valve Size | Outlet Dia. | Groove Dia. | Groove Width | Outlet Face to Groove |
| 4 | 4.500 | 4.334 | 3/8 | 5/8 |
| 6 | 6.625 | 6.455 | 3/8 | 5/8 |

July 6, 1987, Water in Instrument Air Event

A. Instrument Air System

1. Important to station operation

2. Historically - only minor problems; a few instances of plugged orifices, etc.

B. ST-FP-5 - Includes Test Actuation of Dry Pipe Sprinkler system for DG Rooms

1. Fire protection water supply is screened river water

2. FP header pressure maintained at approximately 125 psig by jockey pump, using service water

3. Dry pipe system normally maintained at approximately 40 psig air pressure from IA system

4. Test actuation initiated by bleeding down the air pressure

5. Following test actuation, dry pipe valve is reset by performing MP-FP-7

C. Sequence of Events - Based on Discussions with Personnel Involved

1. Test initiated per ST-FP-5

2. ST says to reset per applicable steps of MP-FP-7; not clear as to where to begin

3. Closed FP-514, but did not reset clapper

4. Entered reset procedure at point of priming FP-513. Operator thought that FP-513 was like the pre-action deluge valves; self-reset when pressure removed. Actually, one-of-a-kind dry pipe valve requiring manual reset.

5. Opened FP-516 and poured priming water into body of dry pipe valve

6. Closed IA-570; isolated air maintenance device

7. Opened IA-569; noted water blowing out of FP-516

8. Opened FP-514; noted that both air and water pressure gauges on valve were at fire main pressure; know this was abnormal

9. Opened IA-574; stream of water; know at this pint that there may be water in the IA system

10. Isolated system; discussed with shift supervisor; MO written to perform maintenance on check valves and reset dry pipe valve

11. Some component problems over the next hour pointed to water in the IA system; FC-269X, blubbler for DG fuel tank, HCV-485

D. Evaluated Cause of Event

1. check valves IA-575 and IA-576 were prevented from closing fully by foreign matter

2. When FP-514 was opened, water entered the IA system because the clapper in FP-513 was not reset, IA 569 was open and the water pressure was approximately 30 psi greater than the air pressure

3. Procedural inadequacies were a major contributing factor

E. Immediate Actions

1. Performed maintenance on check valves IA-575 and IA-576; restored

2. Reset the dry pipe valve, FP-513

3. Began blowdowns of IA system in the vicinity of FP-513, extending into areas where we discovered water and/or operational problems

4. By the end of the day, we felt that substantially all water had been removed from the system and full operability restored

5. Began an engineering investigation of the problem; scope of blowdowns required, etc.

F. Blowdown Program - Determine Extend of Water Intrusion and Document its Removal

1. Began drawing review Monday, July 6, 1987 PM

2. Walkdowns performed Tuesday, July 7, 1987 to determine possible paths of water, etc.

3. Procedure and data sheets prepared Wednesday, July 8, 1987

4. I&C began detailed blowdowns and component cycling on Thursday, July 9, 1987

G. Phase I - July 1987

1. 515 components blown down; valves cycled and components actuated except where not possible during operation

2. 49 components from 11 risers had water

3. Water confined to lower two levels of the auxiliary building; none in the turbine building or intake structure; did not reach level of IA penetration in containment

H. Phase II - August 1987

1. 11 risers from Phase I blown down completely

2. 4 locations on 4 risers showed mist

I. Phase III - September 1987

1. Planned to blow down the 4 risers showing mist in August

2. Data sheets issued to maintenance but work not completed when DG-2 event of September occurred

J. Air Accumulators

1. Researched P&ID's to determine which CQE in affected areas are equipped with accumulators

2. Drained or blew down accumulators; one had 12.5% water, two others had a small amount; all in lower level of auxiliary building

3. DG exhaust damper accumulators were missed because they are not shown on the P&ID; different type of accumulator application

4. I&C technician who blew down DG headers believed that his actions blew down the accumulators as well; this was later determined to not be the case

K. Procedural Inadequacies - Procedure Changes are Being Prepared to Correct

L. Long Term Actions Planned as a Result of the July 6 Event (Taken from Report to PRC dated August 3, 1987)

1. EEAR FC-87-32 written to reevaluate/remove IA from FP-513

2. Plan developed to disassemble sample of valves and instruments and inspect for adverse effects of moisture intrusion

3. Consider cleaning/system flush during 1988 refueling outage

## DG-2 FAILURE SEQUENCE OF EVENTS

| | |
|---|---|
| SEPTEMBER 22, 1987 | DG-1 started to verify operability prior to commencing DG-2 maintenance |
| SEPTEMBER 23, 1987 | 0906 began ST-ESF-6 on DG-2 to meet Tech. Spec. requirements for monthly full load test |
| | 0911, 5 minutes after startup, commenced loading DG-2 |
| | 0920, 14 minutes after starting, DG-2 shutdown automatically on high cooling temperature |
| | Initiated immediate investigation that included call to EMD |
| | About three hours after trip, the damper to the radiator failing to fully open was thought to be most probable cause |
| | 1610, after confirming damper problem on DG-2, blocked open damper on DG-1 |

COMMENCED DETAILED INVESTIGATION

## CORRECTIVE MEASURES

- Reinitiated Phase I Blowdown/Cycling Program (538 components to date)
- Performed JCO for CQE valves not cycled during any of the three phases (34 valves total)
- Isolated IA from wetted/pressurized tie-ins
- Repaired HCV-871F and HCV-871G
- Commenced walkdown of IA System to verify completeness of Blowdown/Cycling Program
- Initiated Dew Point Sampling Program. Initial results indicate need to replace desiccant
- Reviewed IST Program Stroke Time Results/Increased frequency of testing to monthly
- Commenced development of stroke time monitoring program for valves not included in the IST Program (11/15/87)

## CORRECTIVE MEASURES (Continued)

- Initiated program to verify air operated valve design bases
- Expediting modification to permanently separate IA from Pressurized Wetted Systems
- Complete rewrite of AOP-17 from a technical and human factors perspective
- Will evaluate existing PM Program for IA components and revise as needed to improve confidence on operability
- Continue to investigate methods for determining the presence of remaining water
- Issued MO's to disassemble and inspect two valves known to have been exposed to water (waiting on parts)

# ROOT CAUSE FOR DG-2 FAILURE

THE MOST PROBABLE ROOT CAUSE FOR THE DG-2 EXHAUST RADIATOR DAMPER FAILURE WAS THE PRESENCE OF WATER OR MOISTURE IN THE INSTRUMENT AIR LINES/VALVE ACTUATOR. THE INADEQUACY OF THE BLOWDOWN OF THE IA LINES PERFORMED IN JULY AND AGAIN IN AUGUST IS CONSIDERED A PRIMARY CONTRIBUTOR TO THE EVENTUAL FAILURE OF THE DAMPER.

Long Term Actions

AEOD/IEN Review

OPPD has an established program to require and document the review of industry and NRC informational reports. The AEOD Report and associated information notices were reviewed under this program. Information from the AEOD report and IE Information Notices was factored into the development of corrective actions noted in Enclosure 4.

Walkdown of System

The walkdowns conducted in response to this issue are as noted in Enclosure 4.

# LESSONS LEARNED FROM ENGINEERING PERSPECTIVE

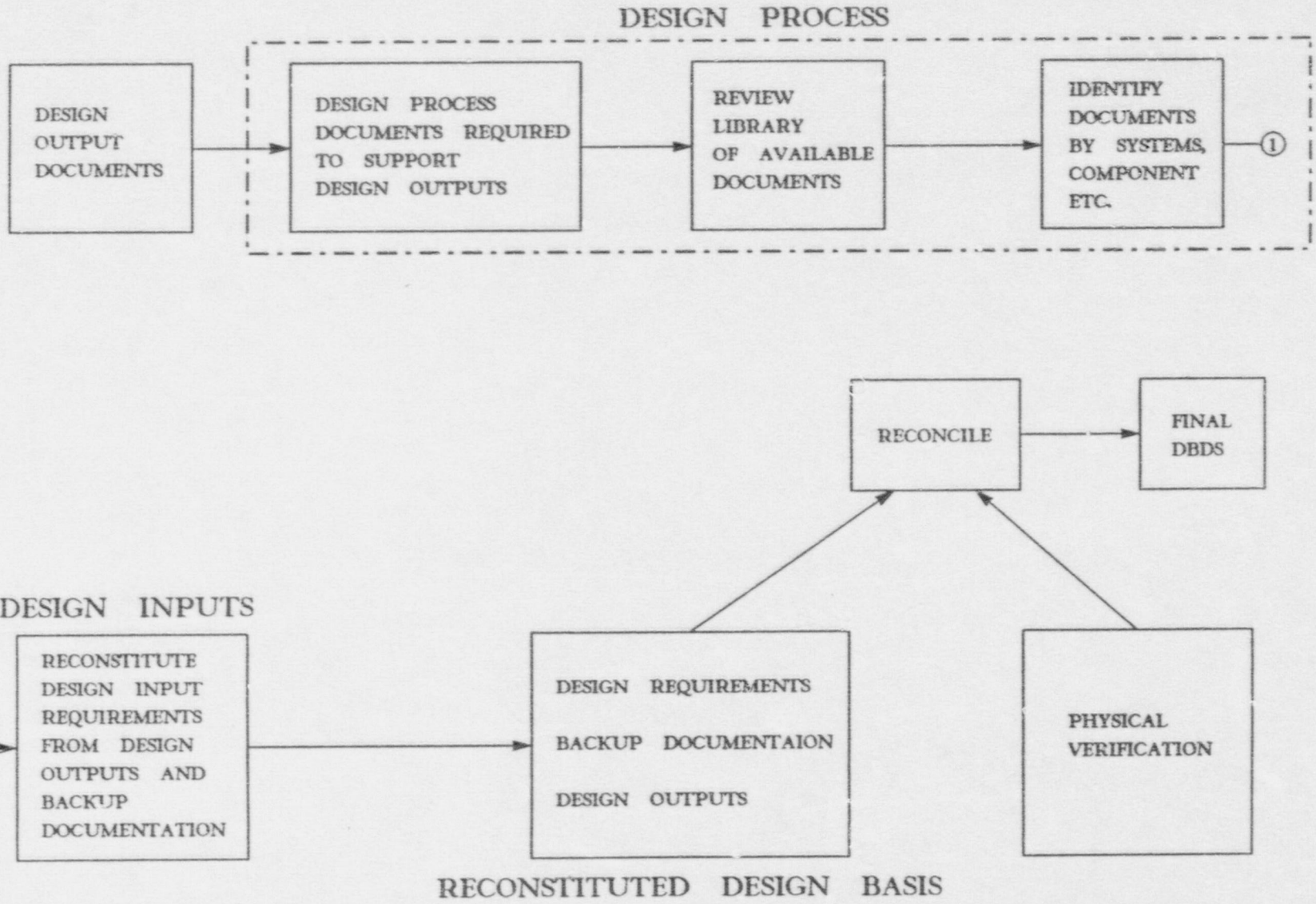
- EMPHASIZED THE NEED FOR PROPER CONFIGURATION CONTROL AND RECONSTITUTION OF DESIGN BASIS.

- NEED TO ENSURE PROPER DOCUMENTATION OF ALL DESIGN CHANGES TO ALLOW INDEPENDENT EVALUATION AT A LATER DATE.

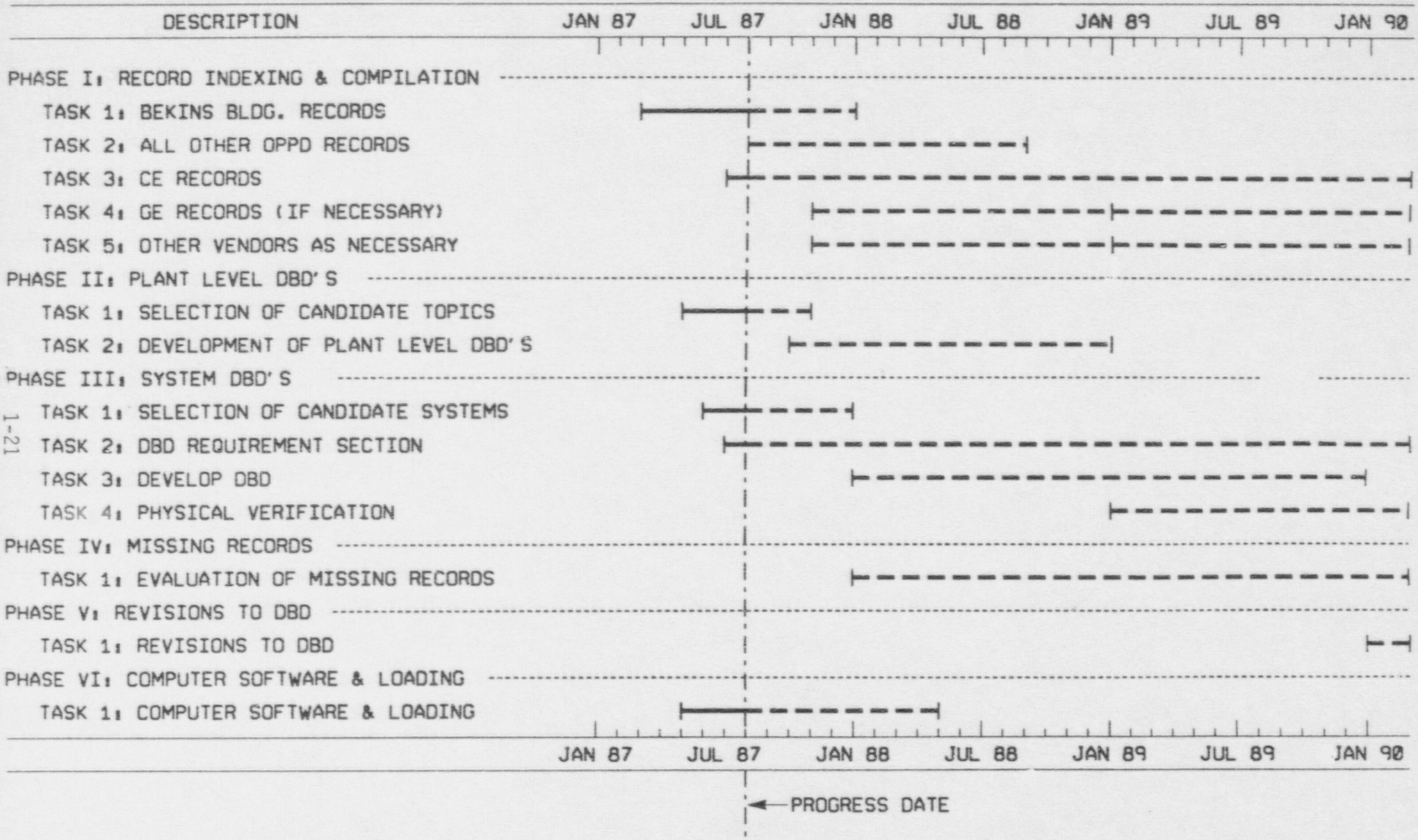
# DESIGN BASIS DOCUMENT

## TABLE OF CONTENTS

# DESIGN BASIS RECONSTITUTION



# FORT CALHOUN STATION DESIGN BASIS



# DESIGN BASIS VERIFICATION

ACTIVITIES UNDER CONSIDERATION

- PROCEDURE REVIEW - REVIEW NORMAL, EMERGENCY AND ABNORMAL OPERATING PROCEDURES TO VERIFY THAT THESE PROCEDURES ARE WRITTEN IN ACCORDANCE WITH THE DESIGN BASIS.

  RESPONSIBILITY-TECH SERVICES

- FUNCTIONALITY CHECK - VERIFY THE ABILITY OF SAFETY SYSTEMS AND REQUIRED SUPPORT SYSTEMS TO PERFORM THEIR INTENDED FUNCTIONS IN NORMAL AND POST ACCIDENT MODES.

  RESPONSIBILITY-GSE/PROJECT TEAM

- LIMITED SCOPE SSFI'S (AUDITS) - VERIFY ADEQUACY OF MAINTENANCE, IN-SERVICE INSPECTION, AND TRAINING ACTIVITIES.

  RESPONSIBILITY-QA/RA

- SAFETY EVALUATIONS - REVIEW MODIFICATION PACKAGES TO CONFIRM ADEQUACY OF SAFETY EVALUATIONS.

  RESPONSIBILITY-GSE/PROJECT TEAM

# DESIGN BASIS VERIFICATION

(CONT'D)

ACTIVITIES COMPLETED

- VERIFICATION AND RECREATION OF SEISMIC DESIGN BASIS
  - 79-02 AND 79-14 EFFORT
  - TECHNICAL RESOLUTION OF A-46 (NOT COMPLETED)
- 10CFR50.49-DESIGN BASIS FOR ELECTRICAL EQUIPMENT REQUIRED FOR POST ACCIDENT OPERATION WAS RECREATED AND VERIFIED PER 10CFR50.49.
- DOCUMENT UPDATING EFFORT

| | |
|---|---|
| MODIFICATION PACKAGES UPDATED | 1,053 |
| MAINTENANCE ORDERS REVIEWED | 30,400 |
| DRAWINGS UPDATED | 2,363 |
| NEW DRAWINGS CREATED | 265 |
| P&ID WALKDOWNS | DONE 3 TIMES |

- CHAMPS DATA BASE (20,400 PIECES OF EQUIPMENT)
- OTHER

## IMPROVEMENTS IN DOCUMENTATION PROCESS

- IMPLEMENTATION OF SSOMI COMMITMENTS
  - IMPROVEMENT IN SAFETY EVALUATION PROCESS
  - IMPROVEMENTS IN DOCUMENTATION OF ENGINEERING JUDGMENT AND EVALUATION
  - TRAINING

## Summary - O&M Perspective

## Closing Remarks

The commitments and comments on these topics are included in the Enclosure 4 to this letter.

Enclosure 2

In a telephone conversation of October 30, 1987, OPPD was asked to include information in this letter regarding a maintenance order which dealt with an instrument air-wetted system connection in the water plant.

On August 25, 1987, Maintenance Order #874116 was written. The maintenance order was written because it was believed that water was entering the instrument air system via DW-CV-86 in the water plant. Action taken was to ensure that the connection to the air system was isolated (by using a caution tag) at the isolation valve on the instrument air line. On October 1, 1987, this caution tag was replaced with a Danger - Do Not Operate tag to further ensure isolation. Since the valve is tagged closed, no current concern of further water ingress is warranted.

On November 4, 1987, valve DW-CV-86 was disconnected from the air system. Action is underway to determine the reason for the water ingress.

Enclosure 3

Management has established the following goals relative to the Instrument Air System at Fort Calhoun Station.

1. The instrument air system will be installed and maintained at or above the USAR standard.

2. Modifications to plant systems will take into consideration the potential for introducing common mode failures. This will include those introduced through a combination of operator errors, procedural errors and equipment failures.

3. Events at Fort Calhoun Station will be evaluated promptly for safety significance and reportability and will be promptly communicated within OPPD and to the NRC.

4. The design basis of the instrument air system will reflect the proper safety considerations and will be analyzed in its installed configuration to assure it is not detrimental to plant operation.

5. The safety conscience of OPPD personnel will be broadened.

6. Components and systems that are relied upon to perform safety functions are included in ongoing test programs.

7. Procedures shall be clear and concise to preclude the possibility of an operator error.

Implementation of these desired conditions will provide added assurance of the continued safe operation of the Fort Calhoun Station.

Enclosure 4

Commitments Made Concerning the
Instrument Air System

The following summary of commitments made includes actions generated internal to OPPD as a result of the July 6, 1987 event, actions committed to via telephone after the September diesel generator failure, actions committed to in LER-87-025, and commitments made as a result of the October 29, 1987 enforcement conference. Clarifying details are provided where necessary.

1. OPPD will retain a consultant to assist us in our instrument air system corrective action plan.

2. OPPD will change the operating incident report system to place more emphasis on trending and tracking.

3. Procedures will be upgraded in accordance with the procedure writer's guide.

4. Pre-job briefings will be held prior to performing any surveillance test which has a frequency of quarterly or greater.

5. New desiccant has been installed in the air dryer.

6. Submit a supplement to LER-87-025 by December 15, 1987.

7. Preventive Maintenance Program is being upgraded.

8. OPPD has identified pressurized connections between the instrument air system and other potentially wetted systems and has isolated these connections.

9. Perform walkdowns of instrument air to determine if other connections exist which did not appear on drawings.

10. Blowdowns of instrument air system devices in the auxiliary building below elevation 1025 were repeated.

11. Quarterly testing of ISI valves increased to monthly until determined that the quarterly schedule may be resumed.

12. Stroke testing will be performed on a sample of CQE valves not in the ISI Program.

13. A justification for continued operation for CQE valves which cannot be stroked during plant operation has been finalized.

14. Initiated program to verify air operated valve design bases.

15. The ISI valves which cannot be cycled during power operation will be cycled during the next scheduled or forced cold shutdown in excess of 48 hours.

16. Initiated a procedure change to MP-FP-7 to ensure check valves are inspected and are operable when the deluge valve is reset to ensure water does not enter the plant air system. (Plant air is separate from the instrument air system).

17. Expedite a modification to permanently remove the tie between the fire protection and plant air system.

18. Revise AOP-17 to address system operation and rewrite it in accordance with the procedure writer's guide.

19. Implement a dew point testing program.

20. Ensure operability of the air dryer.

21. Disassemble and inspect two non-CQE valves to determine if degradation occurred.

22. Ensure findings of the ongoing investigations are reviewed by the Plant Review Committee.