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UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555

May 27, 1992

Docket No. 50-219

MEMORANDUM FOR: Alex Dromerick, Project Manager
Project Directorate I-4
Division of Reactor Projects I/II

FROM: John A. Kudrick, Section Chief
Severe Accident and Containment Section
Plant Systems Branch
Division of Systems Technology

SUBJECT: SUMMARY OF MAY 13, 1992 AUDIT WITH GPU NUCLEAR GENERATING STATION (GPUN) TO DISCUSS MATTERS REGARDING THE NITROGEN INERTING SYSTEM AT THE OYSTER CREEK NUCLEAR GENERATING STATION

On Wednesday, May 13, 1992, an audit was held at the Oyster Creek Nuclear Generating Station with the NRC to discuss matters regarding the use of the normal inerting system during post accident conditions. Specifically, the discussion focused on the design features of the normal inerting system and the planned modifications to improve its performance during post LOCA conditions. Enclosure 1 is the list of participants that attended the meeting.

Enclosure 2 is the licensee's agenda and the handouts used during the discussions. The following is a summary of the significant items discussed.

The licensee began the meeting by indicating that the agenda was developed to continue the discussions of the December 6, 1991 meeting. As a result of that meeting, there were a number of outstanding questions concerning the capability of the existing normal inerting system. As a result, GPUN initiated a program to obtain the necessary information. Upon completion of this effort, the current meeting was scheduled.

The discussion began with a brief description of the normal inerting system. The system consists of two distinct portions; valves and piping in the reactor building and the nitrogen valves and components on the outside pad with the cryogenic liquid nitrogen tank. Within the reactor building, containment isolation valves on the 2 inch and eight inch lines and the associated piping to the boundary of the building represent one portion.

The main component of the second portion is the nitrogen tank. It is located outside and about 20 feet from the reactor building wall. The tank is mounted on a concrete pad which is surrounded by a 6 foot concrete protective wall. Within this enclosure are all the necessary valves and instruments necessary

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to operate the system in either the inerting or makeup modes. Of course, the operation of the containment isolation valves and the containment conditions are provided from the control room (CR). Radio communications is established between the CR and an operator loc ted on the nitrogen pad.

GPUN indicated that the existing inspection program is sufficient to assure operatibility of the system for post LOCA operation. The bases of this conclusion are the daily routine walkdowns combined with the verification of functional status of all critical components each time the system is used. It was indicated that the system is normally operated several times a day in the makeup mode. This is the mode that would be used if needed during a post-LOCA event.

The next topic of discussion was the results of a vulnerability study conducted by the GPUN staff. It was found that many of the vulnerabilities that were identified could be eliminated by the use of an alternate nitrogen supply. GPUN indicated that a survey of nitrogen suppliers in the area shows two suppliers that could provide this alternate system within 8 to 10 hours after being notified. The remaining vulnerabilities would be eliminated by modifications GPUN stated they will make in 14R refueling outage (3/93) to the air and electrical supplies to the containment isolation valves and procedure changes to an existing purge flow path in the event of a interfacing system failure during makeup.

The concept is to bring on site a complete system consisting of all components on the outside pad. On one truck would be the nitrogen supply. On the second tank would be all the necessary valves and instrumentation to operate the system. Final discussions with AIRCO, their current nitrogen supplier, are underway to assure this alternate supply if needed during an event.

The necessary hookup features at the plant to allow use of this portable system will be completed by March, 1993. In addition, modifications to the containment isolation valves as part of the hardened vent and SBO efforts address all the GPUN identified system vulnerabilities in an adequate manner and will also be completed by March 1993.

The discussions were halted at this point to allow the staff members to walk down the entire system. Several issues were raised during the tour. The support of the piping in the reactor building was looked at rather closely. As expected, the piping is not seismically designed, but it was found to be adequately supported to conclude that the nitrogen inerting system would remain functional when the modifications planned during the 14R refueling outage is complete.

Another concern was the condition of the buried portion of the 8 inch purge line outside the reactor building. GPUN indicated that the buried pipe length was only of the order of five feet and that small leaks could be easily tolerated without impacting the performance of the system.

Upon return to the meeting room, the staff summarized its preliminary findings of this new information. In general, the staff believes that the system can be considered as the post-LOCA system to satisfy the requirements of 50.44. However, the information must be submitted by the licensee before a final determination can be made. The contents of this submittal was also provided by the staff. It was indicated that the following areas should be included in the submittal:

1. A discussion of the entire process to inert the containment. This should identify the specific valves that are opened, closed, or regulated during the process. For each valve, information that is available to show operatibility should be provided. Valve operations to terminate the operation should also be included.

2. A similar discussion should be provided for the makeup mode.

3. If a component or pipe fails during the above operations, a discussion of both the repair procedures and the timeliness should be provided. In particular, address the possibility of extended periods between identification of a failed component and the actual repair. Past repair data should be included to support the discussion.

4. A discussion of the EOP changes that will be made to incorporate this system into the overall plant response. A schedule for implementation should be provided.

5. The operation of the system during a post LOCA event should be addressed. The detail should be similar to the descriptions provided for normal operation. Both loss of off site power and with off site power should be considered. System performance should include nitrogen flow rate up to 50 percent of containment design pressure as well as the effects of ambient temperatures.

6. The specific improvements that are planned to be added by March 1993. These should include the alternate nitrogen supply, accumulators for isolation valves, bypass switches, the combustion turbine, and alternate power supplies. All of these improvements should be considered available in responding to the above areas.

With the above guidance, the staff asked for an estimate of when GPU would submit the information. It was indicated that they expected the submittal to be ready in about two months. The staff indicated that we would make a timely response to this submittal. With these closing statements, the meeting was ended.

/s/

John A. Kudrick, Section Chief
Severe Accident and Containment Section
Plant Systems Branch
Division of Systems Technology

Enclosures:
As stated

cc: See next page

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ENCLOSURE

OYSTER CREEK NUCLEAR GENERATING STATION
MEETING - MAY 14, 1992
ATTENDANCE LIST

NAME	ORGANIZATION
Alexander Dromerick	NRR/PD I-4
Joe Boyle	GPUN/OPS
Paul Crosby	GPUN/Plant Engineering
Jay Silberg	Shaw Pittman Potts & assoc.
Mike Laggart	GPUN/Licensing
Ravi Panicker	GPUN/EP&I
Michael Godknecht	GPUN/Plant Engineering
Steve Ku	GPUN/E&D
David Masiero	GPUN/E&D
Samuel R. Greco	GPUN/E&D
Jack Kudrick	NRC/NRR/SPLB
Tony D'Angelo	NRC/NRR/SPLB
Karla Bristow	NRC/NRR/SPLB
Conrad McCracken	NRC/NRR/SPLB
John Stolz	NRC/NRR/PD I-4
Everett Johnson	GPUN/Plant Engineering
Surendra Tiwari	GPUN/Licensing
James Knubel	GPUN/Licensing
Dave Vito	NRC SRI

Enclosure 2

OYSTER CREEK/NRC
MAY 13, 1992
NITROGEN INERTING SYSTEM (NIS)

I. INTRODUCTION	J. KNUBEL
II. SYSTEM DESCRIPTION	S. KU
III. TESTING AND INSPECTION	M. GODKNECHT
IV. SYSTEM EVALUATION	S. KU

- METHODOLOGY
- RESULTS

V. PLANNED ENHANCEMENTS	D. MASIERO
VI. CONCLUSION	J. KNUBEL

INTRODUCTION

DECEMBER 6, 1991 MEETING:

- DISCUSSED THE DESIGN FEATURES OF THE NITROGEN INERTING SYSTEM (NIS)

- IDENTIFIED PROPOSED MODIFICATIONS WHICH WOULD INCREASE NIS RELIABILITY

  - HARDENED VENT

  - STATION BLACKOUT ALTERNATE AC POWER SOURCE

- AGREED TO A FUTURE MEETING TO FURTHER DISCUSS CAPABILITIES OF NIS AND ASSESS IF FURTHER OR ADDITIONAL ACTIONS ARE APPROPRIATE

PURPOSE OF MAY 13, 1992 MEETING:

- ADDRESS THE RELIABILITY OF THE NIS TO FUNCTION UNDER ACCIDENT CONDITIONS (BEYOND THE NIS LICENSING BASIS)

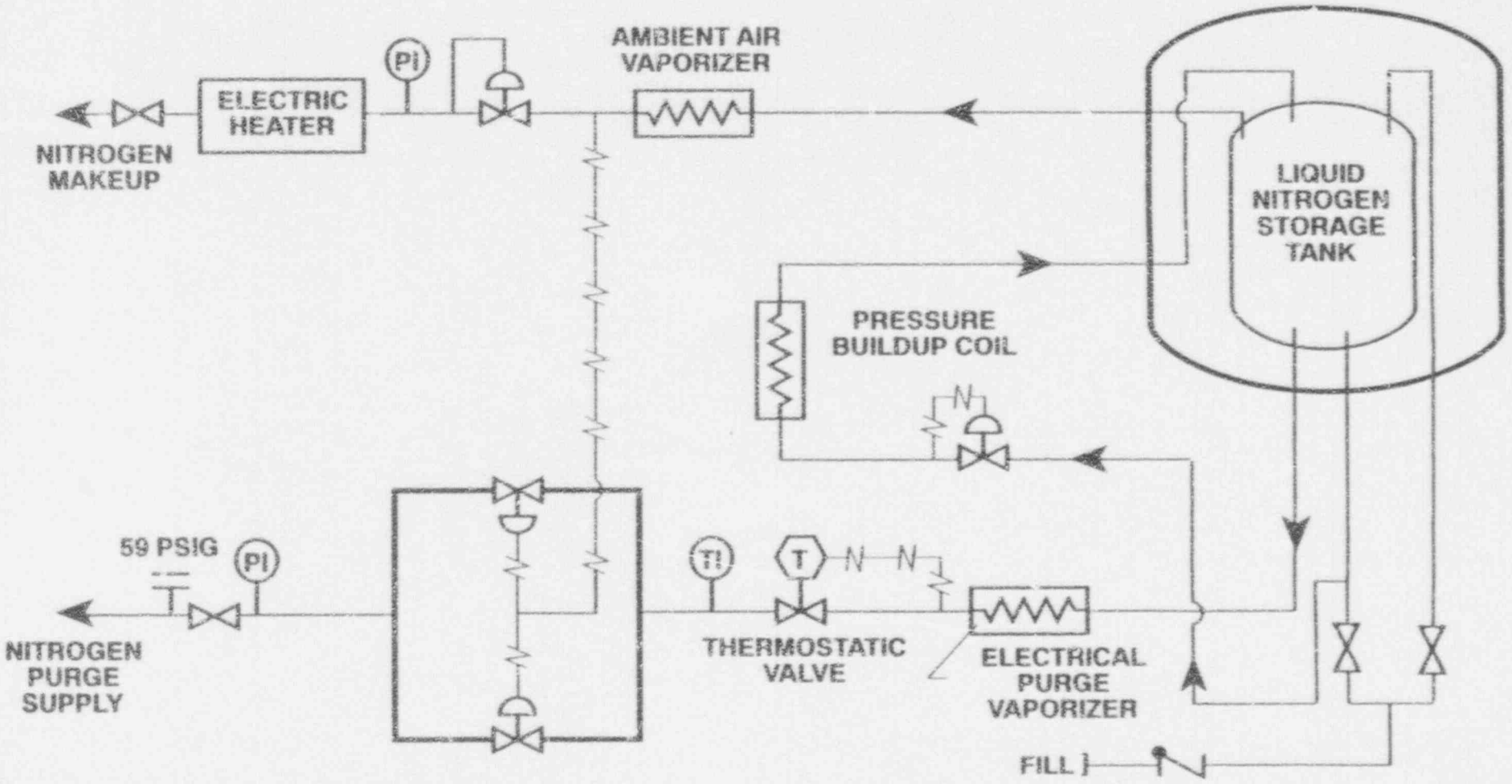
- IDENTIFY SYSTEM ENHANCEMENTS WHICH WOULD UPGRADE THE NIS CAPABILITY TO FUNCTION UNDER ACCIDENT CONDITIONS

- AGREE ON ACTIONS REQUIRED TO BRING THIS ISSUE TO CLOSURE

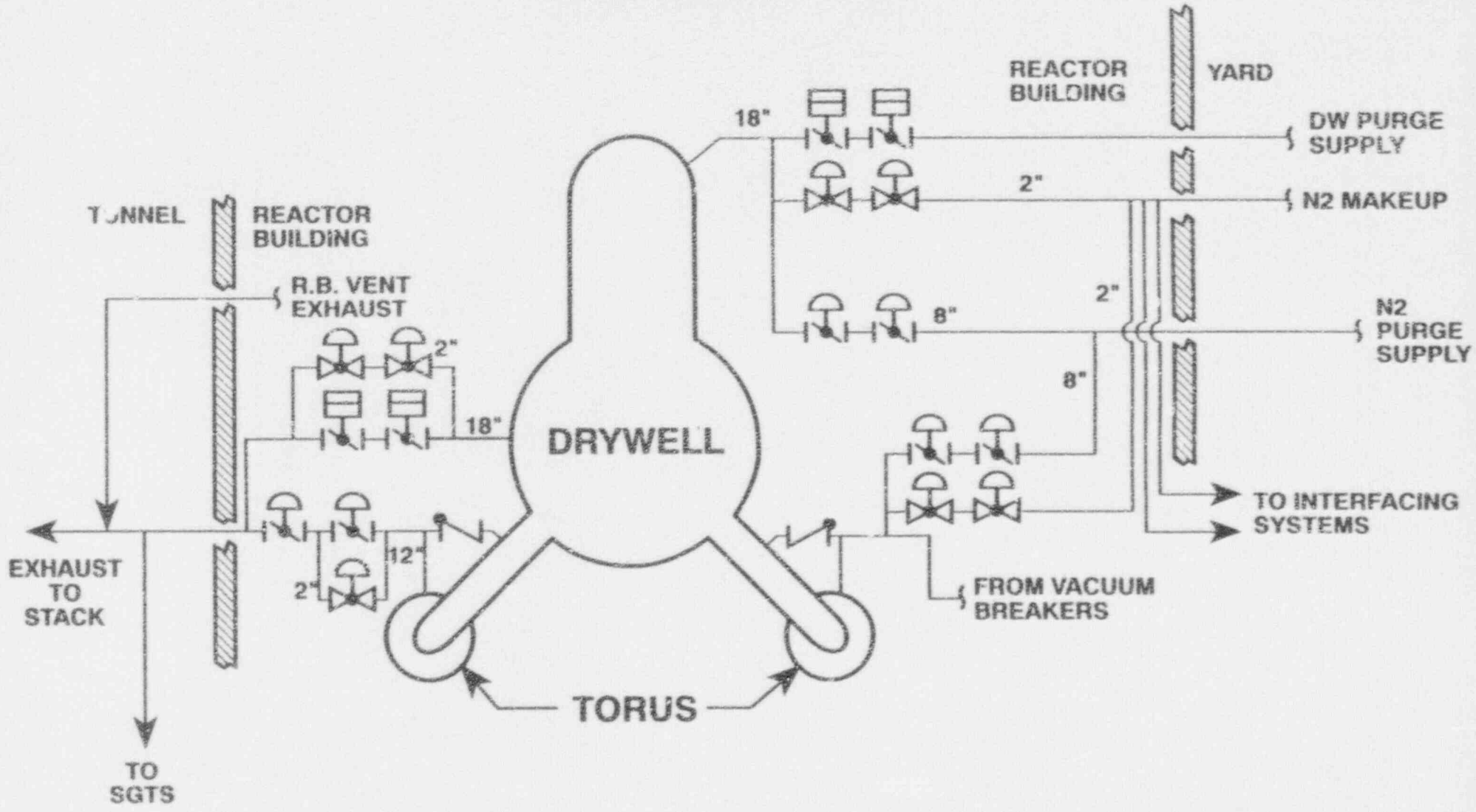
SYSTEM DESCRIPTION:

- NITROGEN SUPPLY SYSTEM
- NITROGEN MAKE-UP SYSTEM
- NITROGEN PURGE SYSTEM

OYSTER CREEK
NITROGEN MAKEUP/PURGE SUPPLY SYSTEM
SIMPLIFIED FLOW DIAGRAM



OYSTER CREEK
CONTAINMENT VENTING AND PURGING
SIMPLIFIED FLOW DIAGRAM



INSPECTIONS

- ROUTINE

  SYSTEM WALKDOWN BY EQUIPMENT OPERATOR - 2/SHIFT

  - INCLUDING TANK LEVEL & PRESSURE

  PLANT WALKDOWN BY SRO

  - INCLUDING THE NITROGEN INERTING SYSTEM

- NON-ROUTINE

  - PERIODIC SYSTEM WALKDOWN BY SYSTEM ENGINEER

  - QUARTERLY INSPECTION OF NITROGEN PAD EQUIPMENT BY AIRCO

TESTING

SURVEILLANCES

CONTAINMENT ISOLATION VALVES

- IN-SERVICE TESTING
  - · STROKE TIME TESTING
  - · FUNCTIONAL TESTING
- APPENDIX J LEAKRATE TESTING

TESTING

SYSTEM OPERATIONAL TESTING

MAKEUP SYSTEM

- TESTED BY ROUTINE DAY-TO-DAY OPERATION OF THE SYSTEM

PURGE SYSTEM

- TESTED BY INERTING THE PRIMARY CONTAINMENT DURING STARTUP FOLLOWING DW ENTRY

TESTING

PREVENTIVE MAINTENANCE

SYSTEM INSTRUMENTATION

- INSTRUMENTS DOWNSTREAM OF NITROGEN PAD
  - CALIBRATED ANNUALLY

- INSTRUMENTS ON NITROGEN PAD
  - INSTRUMENT UPGRADE
  - ON-SITE CALIBRATION PROGRAM BEING ESTABLISHED

TESTING

POST-MAINTENANCE TESTING

- SYSTEM COMPONENTS TESTED AFTER MAINTENANCE

  - ENSURES WORK PERFORMED ADEQUATE TO FIX PROBLEM

SYSTEM EVALUATION:

- METHODOLOGY

- RESULTS

- METHODOLOGY

  - FLOW DIAGRAM
  - PIPING DRAWINGS
  - ELEMENTARY DIAGRAM
  - ELECTRICAL ONE LINE DIAGRAM
  - VENDOR'S MANUAL/EQUIPMENT DRAWINGS
  - SYSTEM WALKDOWN

RESULTS OF SYSTEM/COMPONENT EVALUATION

	VULNERABILITY	REMEDIAL ACTION
1.	FAILURE OF IN-LINE MANUAL VALVE, NITROGEN TANK OR PURGE VAPORIZER OUTSIDE THE REACTOR BUILDING	· TROUBLESHOOT AND REPAIR TO RESTORE SYSTEM OPERATION OR · PROVIDE ALTERNATE NITROGEN SUPPLY
2.	SAFETY VALVES STUCK OPEN OR RUPTURE DISC FAILURE	· PROVIDE ALTERNATE NITROGEN SUPPLY
3.	FAILURE OF INTERFACING SYSTEMS CONNECTED TO NITROGEN MAKEUP SYSTEM	· TROUBLESHOOT AND REPAIR TO RESTORE SYSTEM OPERATION OR · USE EXISTING PURGE FLOW PATH
4.	NITROGEN INERTING SYSTEM INACCESSIBLE	· PROVIDE ALTERNATE NITROGEN SUPPLY

RESULTS OF SYSTEM/COMPONENT EVALUATION

	VULNERABILITY	REMEDIAL ACTION
5.	LOSS OF INSTRUMENT AIR	· PROVIDE ALTERNATE AIR SUPPLY FOR 8" PURGE VALVES
6.	ONE AIR OPERATED CIV FAILS CLOSED	· TROUBLESHOOT AND REPAIR TO RESTORE SYSTEM OPERATION OR · USE EXISTING ALTERNATE FLOW PATHS
7.	LOSS OF ELECTRICAL POWER TO PURGE VAPORIZER	· PROVIDE ALTERNATE NITROGEN SUPPLY
8.	ALL NITROGEN CIVs FAIL CLOSED IN THE EVENT OF FAILURE OF CIP-3	· TROUBLESHOOT AND REPAIR TO RESTORE SYSTEM OPERATION OR · PROVIDE ALTERNATE POWER SOURCE FOR NITROGEN CIVs

OYSTER CREEK
PLANT IMPROVEMENTS
FOR CONTAINMENT VENTING/PURGING

PLANT MODIFICATIONS TO INCREASE VENTING/PURGING RELIABILITY:

- HARDENED VENT

  INCLUDED IN THIS MODIFICATION:

  - NITROGEN PURGE ISOLATION VALVES TO BE PROVIDED WITH AIR ACCUMULATORS

    ACCUMULATOR SIZING BASIS:

    - SIX OPEN/CLOSE VALVE CYCLES
    - ALLOWABLE ACCUMULATOR SYSTEM LEAKAGE FOR 24 HOURS

  - INSTALLATION OF BYPASS SWITCH IN CONTROL ROOM TO PERMIT OPERATION OF PURGE AND VENT CONTAINMENT ISOLATION VALVES WITH A CONTAINMENT ISOLATION SIGNAL PRESENT.
  - DESIGN WILL PERMIT PURGING AND VENTING OF CONTAINMENT VIA REDUNDANT HARD PIPE FLOW PATHS. SOFT VENT PATHS WILL ALSO BE AVAILABLE.

OYSTER CREEK
PLANT IMPROVEMENTS
FOR CONTAINMENT VENTING/PURGING

- ALTERNATE NITROGEN FILL CONNECTION

  - ALTERNATE 2" FILL CONNECTION WILL BE PROVIDED NEAR THE HARD VENT VALVE STATION.

  - A SURVEY OF NITROGEN SUPPLIERS IN THE REGION INDICATE THAT THERE ARE AT LEAST TWO SUPPLIERS THAT ARE CAPABLE OF PROVIDING NITROGEN WITHIN 8-10 HOURS.

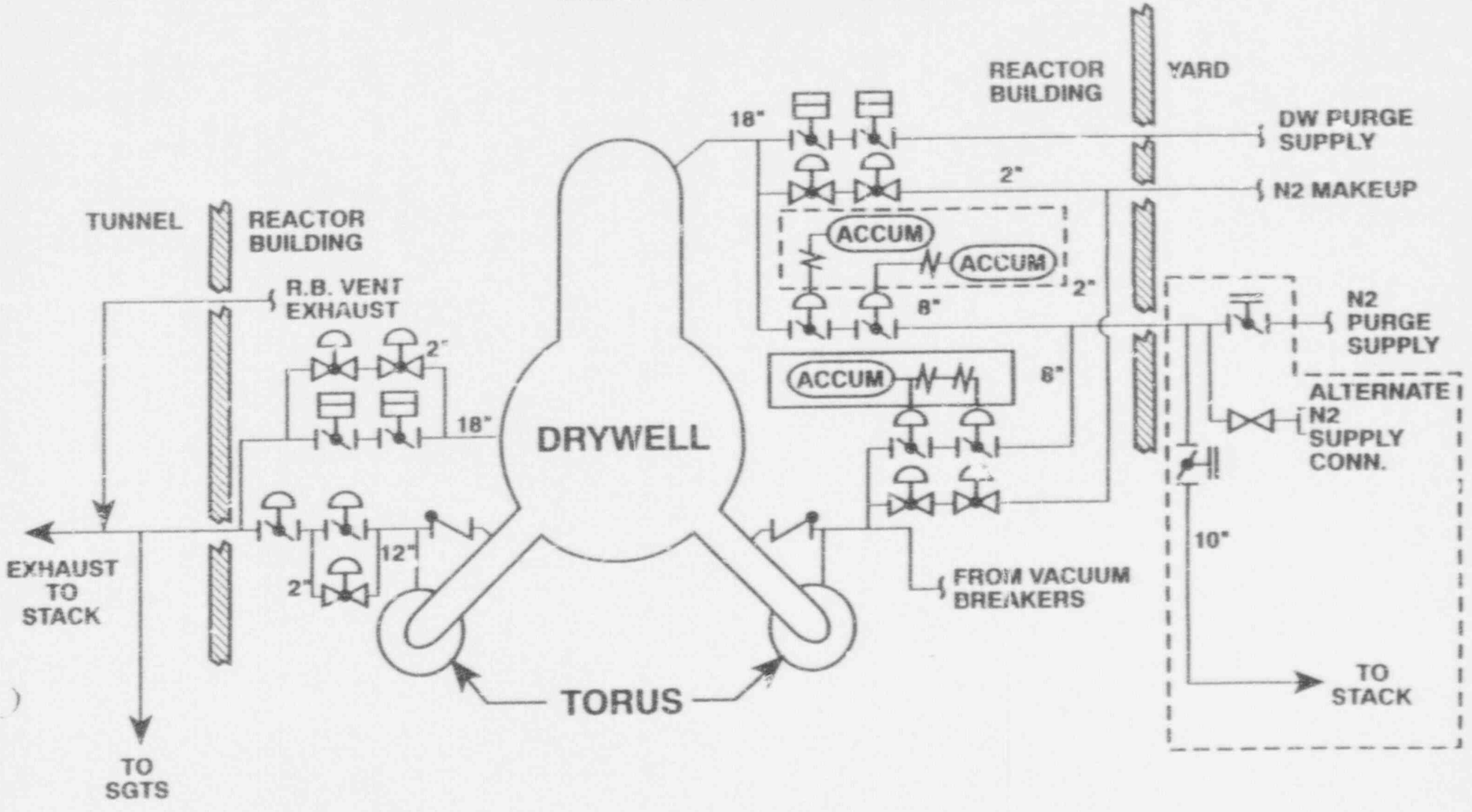
- STATION BLACKOUT

  OYSTER CREEK IS INSTALLING AN ALTERNATE AC (AAC) POWER SOURCE AS REQUIRED BY 10 CFR 50.63. POWER WILL BE SUPPLIED FROM EXISTING COMBUSTION TURBINES LOCATED ON THE ADJACENT FORKED RIVER SITE.

  - AAC WILL SUPPLY POWER TO SYSTEMS/COMPONENTS NECESSARY TO BRING THE PLANT TO AND MAINTAIN A SAFE SHUTDOWN CONDITION.

  - COMBUSTION TURBINES WILL SUPPLY SUFFICIENT POWER TO OPERATE SYSTEMS AND COMPONENTS NECESSARY TO RESPOND TO ACCIDENTS OUTSIDE THE SCOPE OF A POSTULATED SBO.

OYSTER CREEK
CONTAINMENT VENTING AND PURGING
SIMPLIFIED FLOW DIAGRAM



CONCLUSIONS:

- GPU NUCLEAR MEETS THE REQUIREMENTS OF 50.44 AS SET FORTH IN OUR MAY 31, 1991 LETTER

- GPU NUCLEAR HAS CONDUCTED A THROUGH EVALUATION AND IDENTIFIED VULNERABILITIES OF THE NIS

- THE NIS IS CURRENTLY A RELIABLE SYSTEM AND CAN FUNCTION UNDER CERTAIN ACCIDENT CONDITIONS

- PLANNED ENHANCEMENTS WILL INCREASE SYSTEM RELIABILITY AND CAPABILITY

- GPU NUCLEAR BELIEVES OUR COMPLIANCE LETTER OF MAY 31, 1991 AND OUR PLANNED ENHANCEMENTS TO THE NIS SHOULD BRING THIS LONG STANDING ISSUE TO CLOSURE