3.0 LIMITING CONDITIONS FOR OPERATION

6. If specifications 3.7.A.1 through 3.7.A.5 cannot be met, the reactor shall be placed in the cold shutdown condition within 24 hours.

7. DRYWELL-SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE

   a. Drywell pressure shall be maintained ≥ 1.0 psi above the suppression chamber pressure except as specified in 3.7.A.7.b and c.

   b. Within the 26 hour period subsequent to placing the reactor in the run mode following a shutdown, the drywell pressure must be raised to ≥ 1.0 psi above the suppression chamber pressure and maintained in this condition. The differential pressure need not be maintained during the 26 hour period prior to leaving the run mode for a reactor shutdown.

   c. The differential pressure may be decreased to < 1.0 psi for a maximum of 3 hours during required operability testing of the HPCI system pump, the RCIC system pump, and the drywell-pressure suppression chamber vacuum breakers.

   d. If specification 3.7.A.7 cannot be met, an orderly shutdown shall be initiated and the reactor shall be in the hot shutdown condition within 12 hours and the cold shutdown condition within the following 24 hours.

4.0 SURVEILLANCE REQUIREMENTS

7. DRYWELL-SUPPRESSION CHAMBER DIFFERENTIAL PRESSURE

   The differential pressure between the drywell and suppression chamber shall be logged once per shift.

3.0 LIMITING CONDITIONS FOR OPERATION

B. Standby Gas Treatment System

1. Two separate and independent standby gas treatment system circuits shall be operable at all times when secondary containment integrity is required, except as specified in sections 3.7.B.1.(a) and (b).

   a. After one of the standby gas treatment system circuits is made or found to be inoperable for any reason, reactor operation and fuel handling is permissible only during the succeeding seven days, provided that all active components in the other standby gas treatment system shall be demonstrated to be operable within 2 hours and daily thereafter. Within 36 hours following the 7 days, the reactor shall be placed in a condition for which the standby gas treatment system is not required in accordance with Specification 3.7.C.1.(a) through (d).

4.0 SURVEILLANCE REQUIREMENTS

B. Standby Gas Treatment System

1. At least once per month, initiate from the control room 3500 cfm ($\pm$ 10%) flow through both circuits of the standby gas treatment system. In addition:

   a. Within 2 hours from the time that one standby gas treatment system circuit is made or found to be inoperable for any reason and daily thereafter for the next succeeding seven days, initiate from the control room 3500 cfm ($\pm$ 10%) flow through the operable circuit of the standby gas treatment system.

BASES CONTINUED:

system, leak inspections are scheduled during startup periods, when the primary system is at or near rated operating temperature and pressure. The 24-hour period to provide inerting is judged to be sufficient to perform the leak inspection and establish the required oxygen concentration. The primary containment is normally slightly pressurized during periods of reactor operation. Nitrogen used for inerting could leak out of the containment but air could not leak in to increase oxygen concentration. Once the containment is filled with nitrogen to the required concentration, no monitoring of oxygen concentration is necessary. However, at least once a week the oxygen concentration will be determined as added assurance.

Calculations of the forces on the suppression chamber and its support system indicate that the dynamic loads during a postulated design basis loss of coolant accident are dependent on the drywell to suppression chamber differential pressure and the suppression chamber water volume. The specifications require that the conditions assumed in the stress analysis be met after allowing sufficient time to first inert containment and then to establish the differential pressure. Similar provisions are allowed for the purpose of de-inerting.

B. Standby Gas Treatment System and C. Secondary Containment

The secondary containment is designed to minimize any ground level release of radioactive materials which might result from a serious accident. The reactor building provides secondary containment during reactor operation, when the drywell is sealed and in service; the reactor building provides primary containment when the reactor is shutdown and the drywell is open, as during refueling. Because the secondary containment is an integral part of the complete containment system, secondary containment is required at all times that primary containment is required except, however, for initial fuel loading prior to initial power testing.

The standby gas treatment system is designed to filter and exhaust the reactor building atmosphere to the chimney during secondary containment isolation conditions, with a minimum release of radioactive materials from the reactor building to the environs. One standby gas treatment system circuit is designed to automatically start upon containment isolation and to maintain the reactor building pressure at the design negative pressure so that all leakage should be inleakage. Should one circuit fail to start, the redundant alternate standby gas treatment circuit is designed to start automatically. Each of the two circuits has 100% capacity. Only one of the two standby gas treatment system circuits is needed to cleanup the reactor building atmosphere upon containment isolation. If one system is found to be inoperable, there is no immediate threat to the containment system performance. Therefore, reactor operation or refueling operation may continue while repairs are being made. If neither circuit is operable, the plant is placed in a condition that does not require a standby gas treatment system.

Bases Continued:

The acceptable values for local leak rate tests have been specified in terms of standard cubic feet per hour (scf/hr) for purposes of clarity. Following is the list of equivalent values given in terms of an allowable percentage of the allowable operational leak rate (L_{to}).

17.2 scf/hr = 5% L_{to}
@ 41 psig

34.4 scf/hr = 10% L_{to}
@ 41 psig

103.2 scf/hr = 30% L_{to}
@ 41 psig

where L_{to} = .75 L_t (the maximum allowable leak rate) and L_t = 1.2 weight percent of the contained air at the test pressure of 41 psig.

Results of loss of coolant accident analyses indicate that fission products would not be released directly to the environs because of leakage through the main line isolation valves due to holdup in the steam system complex. Although this effect shows that an adequate margin exists with regard to release of fission products, the results of leak tests on the main steam line isolation valves will be closely followed in order to determine the adequacy of these valves to perform their intended function.

Monitoring the nitrogen makeup requirements of the inerting system provides a method of observing ak rate trends and would detect gross leaks in a very short time. This equipment must be periodically removed from service for test and maintenance, but this out-of-service time will be kept to a practical minimum.

Drywell and suppression chamber pressure is continually recorded. Logging the drywell to suppression chamber differential pressure each shift provides a method of observing slow trends. Abrupt reductions would only result from equipment other than the nitrogen recirculation system which is provided to maintain the differential.

EXHIBIT C

Specific Responses to October 4, 1976 Letter from
D L Ziemann to L O Mayer

I. Drywell - Torus Differential Pressure

I.A. Technical Specification Changes

Proposed Technical Specification pertaining to the drywell-torus differential pressure, along with proposed Bases, is included as Exhibits A and B of this submittal.

I.B. Operating Procedures, System Changes and Valve Lineup Changes to Implement Differential Pressure Requirement

This subject is addressed in the April 14, 1976 License Amendment No 18 to DPR-22 which issued the Technical Specification Changes necessary to implement the Monticello nitrogen recirculation equipment. The attached Figure C-1 shows the nitrogen recirculation system identifying the newly added equipment. Containment isolation valves are identified by their unique numbers. The License Amendment acknowledged the addition of a normally open isolation valve, CV-7440. It also acknowledged that three isolation valves, the torus vent bypass valve, CV-2384, and the drywell purge inlet valves, AO-2381 and AO-2377, were changed from normally closed to normally open.

The nitrogen recirculation system removes nitrogen from the torus via CV-2384 and CV-7440 using one of two 100% capacity blowers. The blower will discharge nitrogen through the drywell purge inlet line to the drywell via AO-2381 and AO-2377. Recirculation flow is manually adjusted to maintain the drywell pressure greater than or equal to 1.0 psi above the torus pressure. The system up to the second containment isolation valve in the suction and discharge lines satisfies all design, quality assurance, and testability requirements set forth in 10 CFR 50.

The added isolation valve, CV-7440, receives motive power from instrument air, failing closed on loss of air. The circuitry used is the same as that used throughout the plant on outboard air operated isolation valves. A solenoid valve is energized to open the valve. The solenoid is de-energized by an isolation signal or loss of the instrument bus associated with outboard valves. A detailed discussion of the scheme used can be found in Monticello FSAR Section 7. There is no potential for high energy line break pipe whip or missiles in the vicinity of CV-7440.

I.C. Differential Pressure Instrumentation

The attached Figure C-2 shows the instrumentation available to measure the drywell to torus differential pressure. The pressure sensing lines to the main transmitters are supplied with local indicators PI-3050 and PI-3051 which have a 0 to 100 psig range. The pressure signals used to monitor the 1 psi drywell to torus differential originate at pressure transmitters PT-2994 A and B which have ± ½% accuracy over the 13 to 17 psia range. These signals are displayed in the control room on a dual pen 4" recorder, PR-2994, which also has an accuracy of ± ½% of span. (The drywell pressure pen can be switched to a wide range scale in the event of a drywell pressurization; pressure transmitter PT-7348 provides a 0 to 80 psig input to the recorder.)

The operator maintains the 1 psi differential by maintaining at least one inch separation between pens. The ultimate accuracy in maintaining the 1 psi lies in the ability to read the chart. The chart-reading error is within 1/16 inch which corresponds to 0.06 psi.

The single channel of instrumentation available to monitor the drywell-torus differential pressure is independent of the pressure switches used for ECCS initiation signals.

II. Torus Water Level

II.A. Allowable Range of Torus Level

On October 12, 1976 a report was submitted to Mr V Stello (USNRC) by Mr L O Mayer (NSP) entitled, "Monticello Nuclear Generating Plant Supplement to Short Term Program, Plant Unique Torus Support and Attached Piping Analysis". The report concludes that, "...the Short Term Program Criteria is satisfied for all structural components of the torus support structure and the piping systems attached to the torus, for all water levels within the current Technical Specification limits." Therefore, there are no new requirements imposed on torus water level beyond those addressed in the initial plant licensing process and the Technical Specifications.

II.B. Torus Level Instrumentation

The torus level instrumentation available is shown in the attached Figure C-2. This is a single channel system initiated by level transmitter LT-2996. Level indication in the main control room is provided by LI-2996; high and low level alarms in the main control room are initiated by level switches LS-2996 A and B.

Technical Specification 3.7.A.1 requires torus water volume to be a minimum of 68,000 cubic feet and a maximum of 77,970 cubic feet. For the convenience of operators, these volumes are converted to levels about a nominal target level of 70,950 cubic feet. (At this volume, one inch of level is equivalent to approximately 740 cubic feet.) The Technical Specification limits can be expressed as approximately -3.0" to + 10.5" about the nominal level when the 1 psi differential between drywell and torus is established and -4.0" to + 9.5" when the pressures are equalized.

Level indicator LI-2996 has an accuracy of ± 2% across its 4½" display of the range of -15" to + 15". Level switches LS-2996 A and B provide high and low torus level alarms at the levels of -1" and -2 3/4", respectively. (This range is selected to keep the torus level, and therefore the dynamic load resulting from a reactor blowdown, to a minimum.) Both the level indicator and the switches are fed by level transmitter LT-2996. The level transmitter and switches are ± ½% devices over the 30" span. The combined error of the alarm setpoint is therefore ± 0.2". Through the indicator and the alarms, the operator has available continuous monitoring of torus water level.

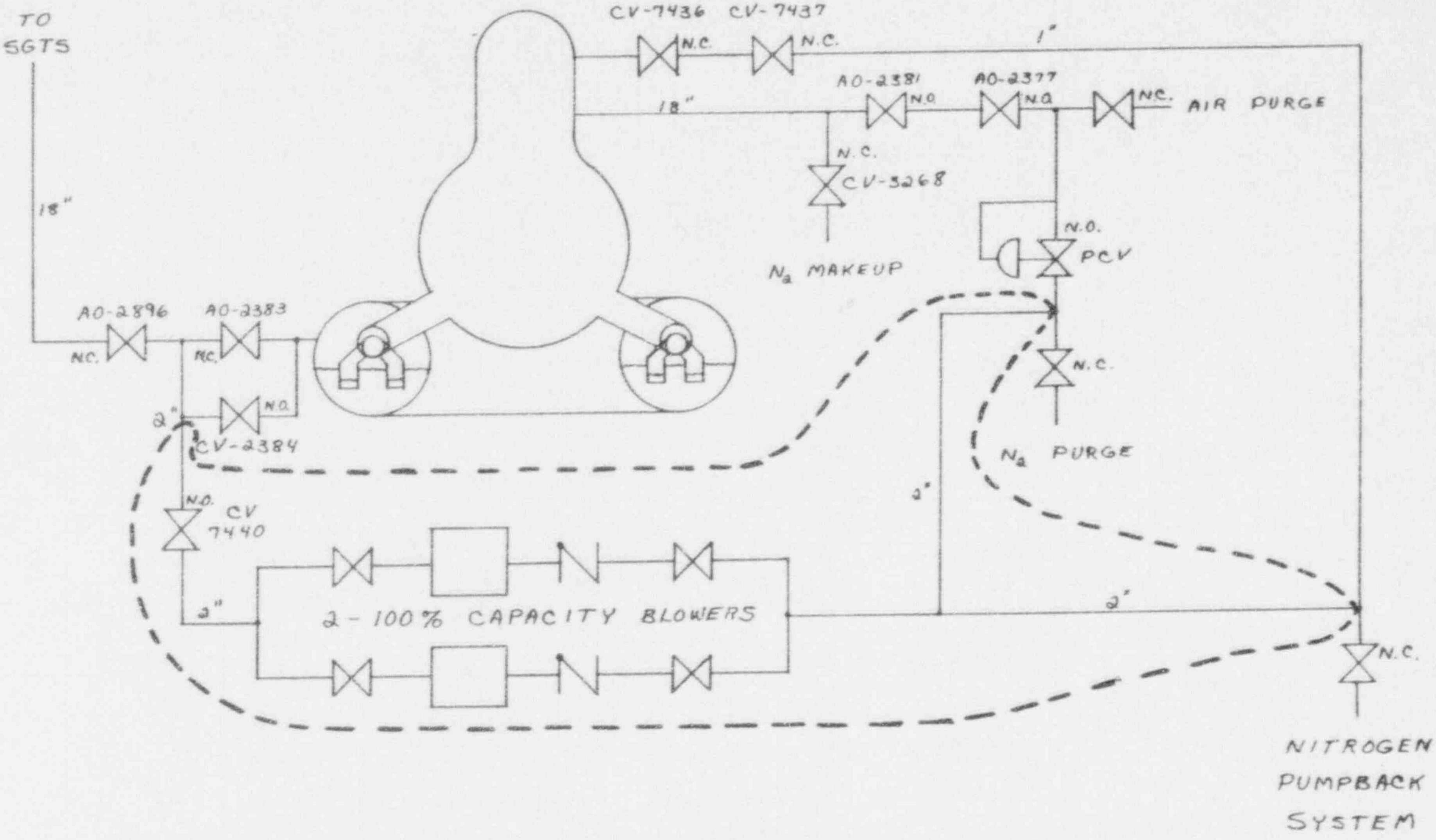

Figure C-1. Nitrogen Recirculation System

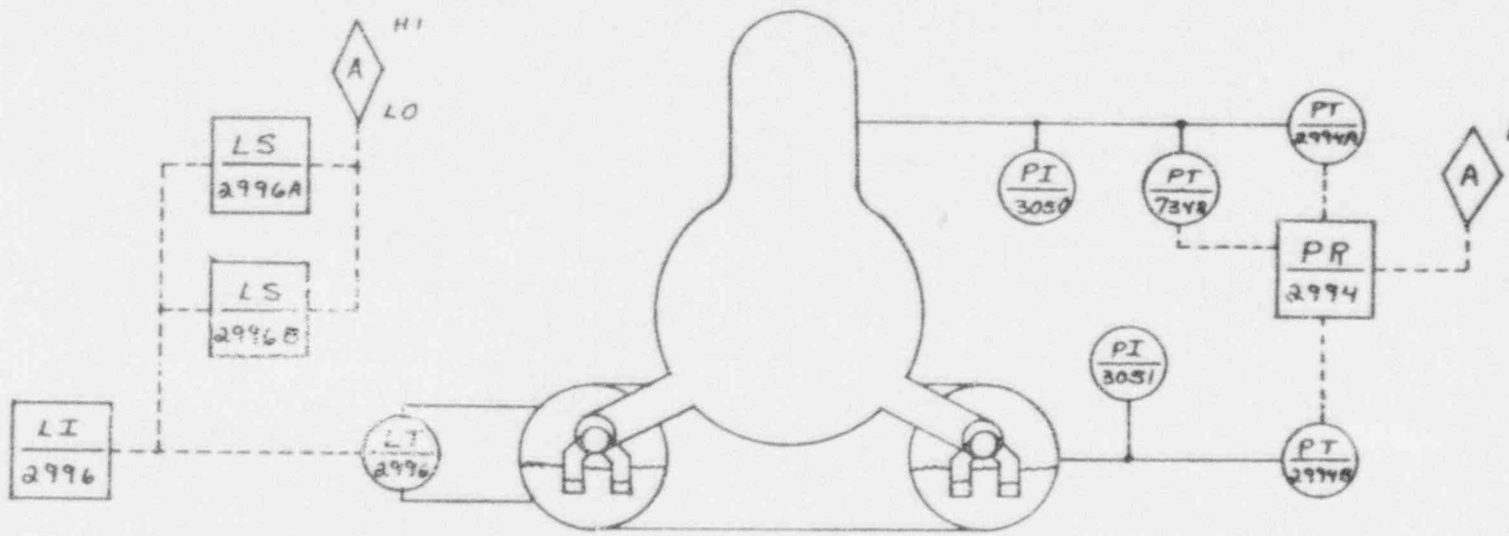

Figure C-2. Primary Containment Instrumentation

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