December 28, 2007

L-MT-07-088
10 CFR 50.90

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Washington, DC 20555

Monticello Nuclear Generating Plant
Docket 50-263
Renewed Facility Operating License No. DPR-22

Response to Request for Additional Information to Revise TS Surveillance Requirement 3.5.1.3 to Correct the Alternate Nitrogen System Pressure (TAC No. MD4095)

On January 30, 2007, (Reference 1, Enclosure 1) the Nuclear Management Company, LLC (NMC) submitted a request to revise the Alternate Nitrogen System supply pressure to the Automatic Depressurization System in Surveillance Requirement 3.5.1.3.b of the Monticello Nuclear Generating Plant Technical Specifications. Additional information was requested by the U.S. Nuclear Regulatory Commission on the basis for this proposed change by email (Reference 3, Enclosure 1). NMC's response to the NRC request is provided as Enclosure 1.

This letter makes no new commitments or changes to any existing commitments. In accordance with 10 CFR 50.91, a copy of this application, with enclosures, is being provided to the designated Minnesota official.

I declare under penalty of perjury that the foregoing is true and correct.
Executed on December 28, 2007.

Timothy J. O'Connor
Site Vice President, Monticello Nuclear Generating Plant
Nuclear Management Company, LLC

Enclosure

cc: Administrator, Region III, USNRC
Project Manager, Monticello, USNRC
Resident Inspector, Monticello, USNRC
Minnesota Department of Commerce

ENCLOSURE 1

Introduction

On January 30, 2007, the Nuclear Management Company, LLC (NMC) submitted a license amendment request (LAR) to revise Surveillance Requirement (SR) 3.5.1.3.b for the Monticello Nuclear Generating Plant (MNGP). This LAR (Reference 1) was to correct an error where the Alternate Nitrogen System (AN2) supply pressure to the Automatic Depressurization System (ADS) was specified as 220 psig rather than 410 psig during the Improved Technical Specification conversion. Administrative controls in accordance with Administrative Letter 98-10 (Reference 2) were imposed. The U.S. Nuclear Regulatory Commission (NRC) requested NMC in Reference 3 to:

> Summarize the calculation, including the assumptions and results, which would justify why 410 psig is the correct number. The submittal should make it clear that 410 psig is a conservative value, in that a supply pressure of 410 psig ensures that the Alternate Nitrogen System can perform its safety function of actuating the SRVs (for the ADS function) during a LOCA by depressurizing the reactor vessel to permit low pressure ECCS injection, and that a supply pressure of 410 psig is adequate for more SRV actuations than is required under worst-case situations.

The ADS is one of several loads supplied by the AN2 System. Overall AN2 System operability, and hence supply to the ADS, is based upon each AN2 subsystem providing sufficient volume to serve its safety and required non-safety related loads.

Alternate Nitrogen System Summary Description

The AN2 System provides an automatic safety-related, long-term, backup pneumatic supply upon a loss of the non-safety related Instrument Nitrogen system distribution. System leakage during normal plant operation is made up for by the Instrument Nitrogen System. The AN2 System consists of an 'A' and 'B' subsystem. A diagram of the AN2 System is provided as Figure 1.

The A AN2 subsystem serves the T-ring seals on four containment purge and vent valves; the actuators and T-ring seals for two containment vacuum relief valves; and safety relief valves (SRVs) A, B, and E. The B AN2 subsystem supplies the T-ring seals for three containment purge and vent valves; the hard piped vent valves; the inboard main steam isolation valves (MSIVs); and SRVs C, F, and H.

In each AN2 subsystem, one SRV is assigned to perform the ADS function, a different SRV performs the low-low set (LLS) function, and another SRV performs the alternate shutdown and manual depressurization functions.

Three SRVs are included in the ADS. Of these three, only two are required to provide sufficient capacity to depressurize the reactor pressure vessel by venting steam to the suppression pool. The ADS valves are required to cycle 5 times over a 10 hour period. AN2 subsystem A supplies ADS SRV A (RV-2-71A). AN2 subsystem B supplies ADS

SRV C (RV-2-71C). An SRV accumulator bank supplies ADS SRV D (RV-2-71D). Therefore, the failure of one AN2 subsystem will only result in one ADS valve becoming inoperable and the system safety function is maintained.

Alternate Nitrogen System Manifold Pressure Calculation Summary

Using the Ideal Gas law the pressure drop which would occur in the bottles[1] in the Turbine Building nitrogen bottle racks when supplying the respective AN2 subsystem was determined. The required volume to serve the B AN2 subsystem (which also supplies the inboard Main Steam Isolation Valves (MSIVs)) was determined since the volume bounds the demands of the other subsystem.

To determine the required nitrogen bottle pressure, the volume of gas required to operate the equipment served (loads) is added to the volume of nitrogen remaining in a bottle at the minimum bottle pressure.

A pressure switch in each AN2 subsystem isolates the subsystem from its loads when the pressure decreases to 200 psig. An instrument error of 25 percent was applied, resulting in an isolation being assumed to occur at 250 psig. Applying the Ideal Gas Law, the unavailable volume of nitrogen remaining in a bottle at the minimum bottle pressure of 250 psig was determined to be 32.11 scf.

The required nitrogen gas volumes to actuate equipment for the limiting AN2 subsystem, the B AN2 subsystem, were determined to be:

- Volume required to close and seal the four Inboard MSIVs 37.6 scf
- Volume required to cycle the three[2] SRVs five times each (15 cycles) 1.04 scf
- Volume required to seal T-ring seals after the purge and vent valves cycle once 3.93 scf

Total: 42.6 scf

Each AN2 subsystem is supplied from a separate manifold of four nitrogen bottles in the Turbine Building. The same required nitrogen volume was conservatively assumed for both AN2 subsystems.[3] A check valve is installed in each supply manifold between the two bottles furthest downstream. This allows a downstream depleted bottle to be valved-out, replaced with a fully charged[4] bottle, and returned to service without charging the three upsteam bottles concurrently. Once the recharged bottle is placed in

1. A compressibility factor was utilized in the high-pressure Ideal Gas Law calculations.
2. For each AN2 subsystem, one SRV performs the ADS function, another SRV performs the LLS function, and the third SRV performs the alternate shutdown and manual depressurization functions.
3. The B AN2 subsystem includes the MSIVs accounting for approximately 85% of the load.
4. A full nitrogen bottle is pressurized to 2640 psig with a capacity of 298 scf.

service, the remaining three bottles may be valved-out and replaced. Either the three nearly depleted or one fully charged nitrogen bottle is capable of providing the required volume. Since AN2 System is designed for the three upsteam nitrogen bottles in the manifold to maintain operability while the downstream bottle is being replaced, 14.2 scf was assumed to come from each bottle. Combining this volume with the unavailable nitrogen volume remaining in a bottle at the minimum bottle pressure, i.e., 32.11 scf, results in a minimum required volume of 46.3 scf per bottle.

An isentropic expansion (no change in entropy) of the nitrogen as it exits the bottle was assumed.[5] The minimum pressure for subsystem operability is 250 psig. An iterative solution to determine the bottle/manifold initial pressure, prior to the assumed subsystem loads being applied was required. It was determined that for an initial bottle pressure of 410 psig, an isentropic expansion would result in a final pressure of 256 psig. Since 256 psig is greater than the required minimum pressure for system operability of 250 psig, it was determined that 410 psig was an acceptable minimum AN2 subsystem manifold supply pressure.

Conclusion

Since each AN2 subsystem provides sufficient capacity at the minimum manifold pressure of 410 psig to supply all subsystem loads, i.e., meet its design and safety functions for the various equipment served, the AN2 System can perform its safety function of actuating the SRVs (for the ADS function) during a LOCA by depressurizing the reactor vessel to permit low pressure ECCS injection. Each AN2 subsystem provides sufficient volume to cycle the three[6] supplied SRVs five times each (15 cycles), while supplying the other loads on the subsystem, without nitrogen bottle replacement.

REFERENCES

1. NMC letter to NRC, "License Amendment Request to Revise Technical Specification Surveillance Requirement 3.5.1.3 to Correct the Alternate Nitrogen System Pressure," (L-MT-07-014), dated January 30, 2007.

2. U. S. NRC Administrative Letter 98-10, "Dispositioning of Technical Specifications that are Insufficient to Assure Plant Safety," dated December 29, 1998.

3. NRC email dated June 8, 2007, "RE: Monticello: Phone Call to Discuss Alternate Nitrogen System Pressure (TAC MD4292)."

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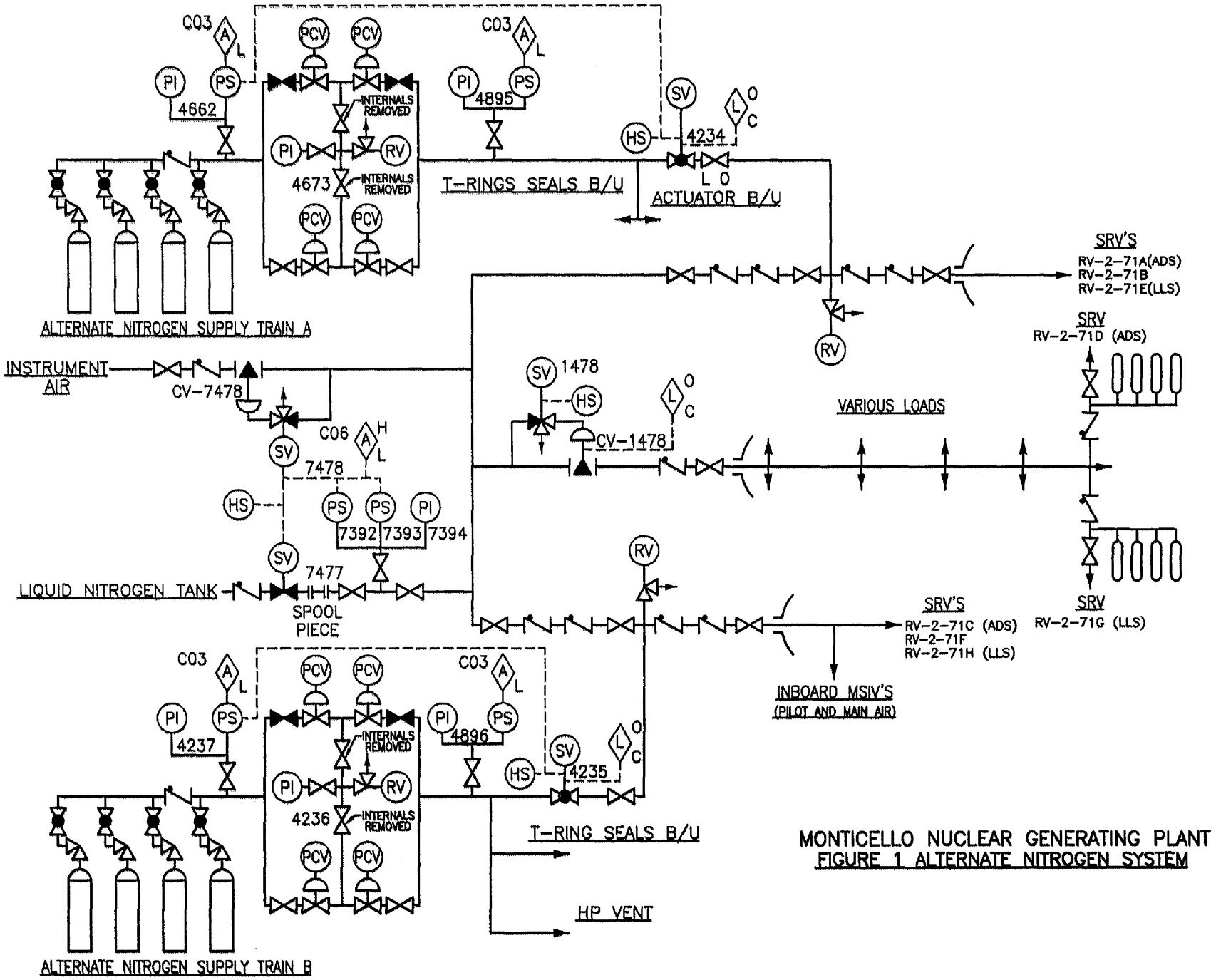
5. Isentropic expansion was assumed because actuation of MSIVs, the largest load, results in rapid bottle depressurization providing little time for heat transfer.
6. For each AN2 subsystem, one SRV performs the ADS function, another SRV performs the LLS function, and the third SRV performs the alternate shutdown and manual depressurization functions.



MONTICELLO NUCLEAR GENERATING PLANT
FIGURE 1 ALTERNATE NITROGEN SYSTEM

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