



UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION
RELATED TO AMENDMENT NO. 227 TO FACILITY OPERATING LICENSE NO. DPR-49

IES UTILITIES INC.

CENTRAL IOWA POWER COOPERATIVE

CORN BELT POWER COOPERATIVE

DUANE ARNOLD ENERGY CENTER

DOCKET NO. 50-331

1.0 INTRODUCTION

By letter dated October 15, 1998, Alliant Utilities, Inc. (IES Utilities, Inc.) the licensee for the Duane Arnold Energy Center (DAEC), proposed a change to the DAEC technical specifications (TS) that would revise Section 3.6.1.3, "Primary Containment Isolation Valves," Condition E and add a TS for the Control Building/Standby Gas Treatment (CB/SBGT) instrument air system. The licensee responded to NRC staff questions in a letter dated December 21, 1998.

2.0 BACKGROUND

The DAEC TS are improved TS (ITS) based on the Improved Standard Technical Specifications (ISTS) of NUREG-1433, "Standard Technical Specifications, General Electric Plant, BWR 4." In the licensee's October 15, 1998, letter to the NRC, the licensee stated that during the conversion of the DAEC TS to the ITS, the licensee decided to treat the CB/SBGT instrument air system as a support system outside the TS. This requires that if this system were to become inoperable, the inoperability of systems supported by the CB/SBGT instrument air system would be treated according to the definition of OPERABILITY in the TS. This means that if the CB/SBGT instrument air system became inoperable, the supported systems would also have to be considered inoperable, and their allowed outage times and required actions would have to be complied with. After implementation of the ITS, the licensee determined that this approach "imposes a hardship on plant operations" by not allowing sufficient time to perform necessary maintenance on the CB/SBGT instrument air system. The licensee did not anticipate this at the time the original decision was made.

The CB/SBGT instrument air system is described in the Section 9.3.1.2.1 of the DAEC Updated Final Safety Analysis Report (UFSAR). The CB/SBGT instrument air system is a safety-related backup system to the normal instrument air system. The system is comprised of two separate Seismic Class I trains. Each train consists of a compressor, air receiver, and associated piping and valves. The UFSAR states that the trains are not normally cross-tied. The safety-related

9906160241 990609
PDR ADUCK 05000331
P PDR

compressors can be cooled with either well water (a nonsafety-related system) or the emergency service water system. The licensee's December 21, 1998, response to an NRC staff question included information concerning the TS that are affected by the CB/SBGT instrument air system, as shown in the table attached to this safety evaluation (SE).

The licensee proposes to add limiting condition for operation (LCO) 3.7.9, "Control Building/Standby Gas Treatment System (CB/SBGT) Instrument Air System" with accompanying applicability, required actions, and surveillance requirements for the CB/SBGT instrument air system. The licensee may then rely on the provisions of LCO 3.0.6 which allows the licensee to follow the requirements of the TS for the CB/SBGT instrument air system and not the requirements of the LCOs for the supported systems listed in the table in the attachment.

The effect of this is to allow the licensee more time to deal with inoperability of the CB/SBGT instrument air system. The licensee proposes an allowed outage time of 7 days for the CB/SBGT instrument air system. Without this provision, the licensee must meet the requirements of TS 3.6.1.3.E.1 that the flow penetration path be isolated within 24 hours when a purge valve cannot satisfy its leakage limits. The DAEC purge valves utilize resilient seals that require pressurized air to make a leak-tight seal. Since this flow path can only be isolated by the other purge valve in the flow path, which also has a resilient seal and is therefore subject to a single failure (loss of the corresponding train of the CB/SBGT instrument air system), the licensee would be required to shut down.

The licensee also proposes to revise LCO 3.6.1.3, "Primary Containment Isolation Valves" to make the provisions of the iSTS more consistent with DAEC's design. The iSTS require that with one isolation valve in a flow path inoperable, that the affected penetration is isolated by "use of at least one closed and de-activated automatic valve, closed manual valve or blind flange." With this accomplished, operation may continue indefinitely provided the penetration is verified to be isolated every 31 days and the operable purge valve is leak-tested once every 92 days. The licensee proposes to modify this requirement for the DAEC TS. If a purge valve with a resilient seal is not within its leakage limits for reasons other than loss of the CB/SBGT instrument air system, the licensee proposes to allow operation to continue with the purge flow path isolated by only one purge valve for no more than 72 hours.

The licensee has, therefore, proposed two different allowed outage times for the containment purge valves, depending on the reason that purge valve leakage limits cannot be met. This is discussed further in the Section 3.0 of this SE.

The NRC staff considers this proposed change to the TS to be plant specific and not necessarily applicable to other boiling water reactors. The basis for the NRC staff's approval as provided in the Section 3.0 of this SE is plant-specific for DAEC.

3.0 EVALUATION

The licensee proposes to the addition of a limiting condition for operation (LCO) 3.7.9, "Control Building/ Standby Gas Treatment System (CB/SBGT) Instrument Air System" with accompanying applicability, required actions, and surveillance requirements for the CB/SBGT instrument air system. The licensee may then rely on the provisions of LCO 3.0.6 which allows

the licensee to follow the requirements of the TS for the CB/SBGT instrument air system rather than the required actions of the LCOs for the supported systems listed in the attachment. The licensee has proposed an allowed outage time of 7 days to restore the CB/SBGT instrument air system to OPERABLE status. If the system cannot be restored to OPERABLE status within this time, the reactor is required to be in MODE 3 within 12 hours and MODE 4 within 36 hours. The 7-day allowed outage time is consistent with the allowed outage time for several important safety related support systems, including the diesel generators and the Residual Heat Removal Service Water System. Inoperability of a train of either of these systems would also make a train of the CB/SBGT instrument air system inoperable.

As shown in the table of systems supported by the CB/SBGT instrument air system, several of the supported systems have allowed outage times that are shorter than the 7 days requested by the licensee for the CB/SBGT instrument air system. Air is supplied to these systems by the plant instrument air system, which is non-safety-related. However, during a design basis accident, the plant air system is assumed to be unavailable. The NRC staff considers the risk increase due to extending the allowed outage time to be acceptably low since, if a train of the CB/SBGT instrument air system became inoperable, the supported systems would be supplied with air from the other train of the CB/SBGT instrument air system. The supported systems would be vulnerable to failure of the remaining train of the CB/SBGT instrument air system. However, such a failure is outside the DAEC design basis. In addition, there is a high probability that the other train of CB/SBGT instrument air system would be operable since, as specified in the Bases for LCO 3.0.6, a cross division check to identify a loss of safety function is required when entering LCO 3.0.6. Thus, the probability is acceptably low that a total loss of the CB/SBGT instrument air system would occur at the same time as a design basis accident.

The licensee also proposes to revise LCO 3.6.1.3, "Primary Containment Isolation Valves," to address a purge valve that does not meet its leakage limits for a reason other than inoperability of the CB/SBGT instrument air system. LCO 3.6.1.3 requires that if one or more containment isolation valves do not meet within leakage limits, the affected flow path must be isolated by at least one closed and deactivated automatic valve, a closed manual valve or a blind flange. In the case of the purge valves at DAEC, no valves besides the other purge valve can be used to isolate the flow path. The licensee proposes to add a requirement (3.6.1.3.E.2) which requires that leakage from an inoperable purge valve with a resilient seal (for a reason other than loss of the CB/SBGT instrument air system) must be restored within 72 hours to within its leakage limit when the flow path is isolated by the remaining purge valve with a resilient seal. If this cannot be done within the allowed outage time, a shutdown would be required to meet LCO 3.0.3. The NRC staff finds this acceptable since one purge valve remains closed and operable.

The licensee has proposed an allowed outage time for the purge valves (72 hours) which is conservatively less than that proposed for the CB/SBGT instrument air system (7 days). The NRC staff finds this acceptable.

The current TS require that a leakage rate test in accordance with surveillance requirement (SR) 3.6.1.4 be performed every 92 days on the operable purge valve with a resilient seal if that valve is closed to isolate the flow path. This requirement would be replaced by 3.6.1.3.E.2.

According to the table in the attachment, in addition to the purge valves, two other systems have

allowed outage times less than 7 days. These are the containment isolation valves for the well water system (which require air for closure) and the reactor building-torus vacuum breakers (which require air to close a containment isolation valve). If a train of the CB/SBGT instrument air system is inoperable for 7 days, both these systems will be vulnerable to a single failure for a 7-day period rather than the 72 hours provided for in their LCOs because the licensee may invoke LCO 3.0.6. The NRC staff finds this acceptable for the well water isolation valves since, as described in Section 9.2.1 of the UFSAR, the well water system would not be exposed to the reactor coolant system or containment atmosphere during a LOCA. The primary safety function of the reactor building-torus vacuum breakers (vacuum relief) is fulfilled when the valves are in the open position. Thus, they could still fulfill their safety function even with a loss of air supply. The secondary safety function of containment isolation would still be performed by the check valve in the line.

The NRC staff finds the licensee's proposed changes to the DAEC TS to be acceptable. The changes will provide the licensee with increased flexibility to maintain equipment without shutting down the reactor while maintaining an acceptable level of safety to the public as described above.

4.0 STATE CONSULTATION

In accordance with the Commission's regulations, the Iowa State official was notified of the proposed issuance of the amendment. The State official had no comments.

5.0 ENVIRONMENTAL CONSIDERATIONS

This amendment changes a requirement with respect to installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes a surveillance requirement. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluent that may be released offsite, and that there is no significant increase in individual or cumulative occupational radiation exposure. The Commission has previously issued a proposed finding that the amendment involves no significant hazards consideration and there has been no public comment on such finding (64FR9193). Accordingly, the amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of the amendment.

6.0 CONCLUSION

The NRC staff has concluded, based on the considerations discussed above, that: (1) there is reasonable assurance that the health and safety of the public will not be endangered by operation in the proposed manner, (2) such activities will be conducted in compliance with the Commission's regulations, and (3) the issuance of the amendment will not be inimical to the common defense and security or to the health and safety of the public.

Principal Contributor: Richard Lobel, SPLB

Date: June 9, 1999

TECHNICAL SPECIFICATIONS AFFECTED BY INOPERABILITY OF THE CB/SBGT
INSTRUMENT AIR SYSTEM

| SYSTEMS SUPPORTED BY CB/SBGT INSTRUMENT AIR SYSTEM | TECHNICAL SPECIFICATION | ALLOWED OUTAGE TIME |
|--|----------------------------|---------------------|
| Well Water Isolation Valves | 3.6.1.3 Condition C | 72 hours |
| Purge Valve T-ring Seals | 3.6.1.3 Condition E | 24 hours |
| Reactor Building-Torus Vacuum Breakers | 3.6.1.6 Condition A | 72 hours |
| Standby Gas Treatment System | 3.6.4.3 Condition A | 7 days |
| Standby Filter Unit System | 3.7.4 Condition A | 7 days |
| Control Building Chiller System | 3.7.5 Condition A | 30 days |

ATTACHMENT