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DAEC Plant Support Center
Operated by Nuclear Management Company, LLC

February 22, 2002
NG-02-0145

Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Attn: Document Control Desk
Mail Station P1-37
Washington, DC 20555-0001

Subject: Duane Arnold Energy Center
Docket No: 50-331
Op. License No: DPR-49
Response to Generic Letter 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions"

References: 1. NG-97-0106, dated January 28, 1997, 120 Day Response to Generic Letter 96-06
2. NG-98-1155, dated June 30, 1998, Response to NRC Request for Additional Information Related to the GL 96-06 Response for the Duane Arnold Energy Center

File: A-101b, A-107a

Generic Letter (GL) 96-06, "Assurance of Equipment Operability and Containment Integrity During Design-Basis Accident Conditions" requested that all licensees evaluate the reliability of plant equipment with respect to operation under conditions created by design basis accidents. References 1 and 2 provided the Duane Arnold Energy Center (DAEC) response.

During their review of the referenced submittals, the Staff requested that the DAEC perform additional reviews of the drywell cooling system to determine if more limiting scenarios could be postulated, for example, a single failure occurring in the associated system or a loss of offsite power. Such scenarios might potentially lead to water hammer or excessive stress in the drywell cooling system that could impair the performance of the containment.

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Nuclear Management Company, LLC (NMC) has performed additional reviews regarding the potential for water hammer in the drywell cooling system. These reviews have shown that the potential for draining or voiding of the drywell cooling system cannot be discounted under accident conditions involving a loss of well water flow along with the isolation of drywell cooling.

The drywell cooling system at the DAEC is supplied coolant flow from the well water system. Normal well water system operating pressures are such that while the well water system is in operation, under either normal or accident conditions, the system pressures at both the inlet and outlet of the containment to the drywell cooling system are sufficiently high to preclude draining of the containment cooling system. However, if well water flow is lost for a sustained period of time, leading to depressurization of the well water piping external to the containment, it may not be possible to avoid draining the piping in the drywell coolers for all conditions and single failures. The assumption has therefore been made that, under certain accident conditions, drywell cooling piping may drain or void. Procedural enhancements have been implemented to address this potential.

Guidance has been added to Abnormal Operating Procedure (AOP) 408, Well Water System Abnormal Operation, to ensure that well water is restored in a controlled, deliberate manner. A Caution has been added which states that if well water has been out of service, water could drain from the drywell cooling loops and well water must be restored in a slow, controlled manner to preclude the potential for a water hammer. Steps have also been added to preclude restoring well water supply to drywell cooling (under conditions susceptible to draining or voiding) until an engineering evaluation of drywell cooling piping integrity has been performed.

Enhancements have been made to Emergency Operating Procedure (EOP) Defeat 4, Drywell Cooler Isolation Defeat. A Caution has been added specifying that if well water is isolated or out of service, water could drain from drywell cooling loops and well water must be restored in a slow, controlled manner to preclude the potential for a water hammer. Guidance was also added to Defeat 4 to preclude restoration of the well water supply to drywell cooling until an engineering evaluation of drywell cooling piping integrity has been performed.

With these procedural enhancements, the potential for water hammer resulting from the draining or voiding of the drywell cooling loops is minimized, thereby providing additional assurance of containment integrity during design basis accident conditions.

This letter is true and accurate to the best of my knowledge and belief.

Nuclear Management Company, LLC

By Gary Van Middlesworth

Gary Van Middlesworth
DAEC Site Vice-President

State of Iowa
(County) of Linn

Signed and sworn to me before on this 22nd day of February, 2002

By Gary Van Middlesworth

Notary Public in and for the State of Iowa

Nancy S. Franck

NANCY S. FRANCK
MY COMMISSION EXPIRES

Commission Expires 9-28-04

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