

**Entergy
Operations**

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August 26, 1991

2CAN089107

Mr. Robert D. Martin
Regional Administrator
U. S. Nuclear Regulatory Commission
Region IV
611 Ryan Plaza Drive, Suite 1000
Arlington, TX 76011

Subject: Arkansas Nuclear One - Unit 2
Docket No. 50-368
License No. NPF-6
Request for Temporary Waiver of Compliance

Dear Mr. Martin:

This letter provides the written documentation to follow-up the Arkansas Nuclear One Unit 2 (ANO-2) verbal request at 2245 hours on August 23, 1991 regarding a temporary waiver of compliance from Technical Specification Limiting Condition for Operation (LCO) 3.1.3.1 Action "g". This Specification requires that the unit be placed in at least HOT STANDBY within 6 hours if more than one full length or part length CEA is inoperable or misaligned from any other CEA in its group by more than 19 inches. On August 23, 1991 at 2200 hours, while performing Surveillance Requirement 4.1.3.1.2, which exercises the CEAs to demonstrate that they are movable, the Group 6 CEAs failed to respond to control room demands. I&C Technicians were immediately dispatched to determine the cause of the failure. The failure was due to a defective relay card in the Control Element Drive Mechanism Control System (CEDMCS). The card was replaced and the Action Statement was exited at 0118 hours on August 24, 1991.

The request for the waiver was to allow additional time up to 72 hours to troubleshoot and correct the problem without subjecting the unit to an unnecessary power reduction or possible shutdown. The need for additional time in a situation like this has been previously recognized by Entergy Operations for ANO-2. A Technical Specification change request which would allow 72 hours to correct a problem like that experienced on August 23, 1991 was submitted in Entergy Operations letter of April 9, 1991 (2CAN049102). The ANO Plant Safety Committee (PSC) reviewed and approved that request prior to its submittal. Since the requested waiver was consistent with the proposed Technical Specification change request, ANO considers this similar request to have been previously reviewed and

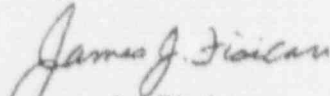
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unapproved by the PSC. The NRC provisionally granted Entergy Operations verbal request for a Temporary Waiver of Compliance at approximately 2325 hours on August 23, 1991. A nonprovisional waiver was granted shortly thereafter.

The attached provides the information required to support the verbal temporary waiver of compliance granted on August 23, 1991.

Your cooperation regarding ANO's verbal request is appreciated. If you have any questions regarding the attached information, please contact my office.

Very truly yours, .



James J. Fisicaro
Director, Licensing

JJF/DEJ/sjf
Attachment

cc: NRC Resident Inspector
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ATTACHMENT
ANO-2TEMPORARY WAIVER OF COMPLIANCE
TECHNICAL SPECIFICATION SECTION 3.1.3.2gDescription of Conditional Requirement for Which Waiver is Required

On August 23, 1991 at 2200 hours, Surveillance Requirement 4.1.3.1.2 was being performed. This surveillance requires each full-length CEA not fully inserted and each part-length CEA which is inserted in the core be demonstrated to be OPERABLE by movement of at least 5 inches in any one direction at least once per 31 days. When attempts were made to move the Group 6 CEAs, in accordance with the surveillance requirement, they would not respond to control room demands. I&C Technicians were immediately dispatched to determine the cause of the malfunction. Troubleshooting by the I&C Technicians included recording electrical current (traces) to the Group 6 Control Element Drive Mechanisms (CEDMs). From these traces, it was determined that there was no current going to the CEDMs as required to move the CEAs. The failure was ultimately traced to a defective relay card in the Control Element Drive Mechanism Control System (CEDMCS). The relay card was replaced, the Group 6 CEAs were exercised and the Action Statement exited at 0118 hours on August 24, 1991.

Technical Specification Limiting Condition for Operation 3.1.3.1 Action "g" requires that with more than one full-length or part-length CEA inoperable or misaligned from any other CEA in its group by more than 19 inches (indicated position), that the unit be in at least HOT STANDBY within 6 hours. Group 6 contains 5 CEAs. The entire group was declared inoperable at 2200 hours on August 23, 1991. Without the temporary waiver of compliance, the unit would have been required to reduce power and ultimately shut down within 6 hours had the problem not been corrected. It is also very possible that an attempt to perform a controlled unit shutdown with the Group 6 CEAs immovable would have resulted in a reactor trip. The Group 6 CEAs are the primary means for controlling Axial Shape Index (ASI) during power maneuvers. A controlled shutdown with these rods incapable of being moved could possibly have lead to a reactor trip due to ASI imbalance.

Preliminary Evaluation of Safety Significance and Consequences of Request

As described in the ANO-2 Safety Analysis Report, the CEAs provide short term reactivity control (long-term reactivity control is accomplished by the use of soluble poison) and insert a large amount of negative reactivity upon a reactor trip signal from the Plant Protective System (PPS). The CEAs are also used to control the power distribution shape of the core.

The Control Element Drive Mechanism Control System (CEDMCS) is made up of the magnetic jack drive devices (Control Element Drive Mechanisms (CEDMs), two motor generator sets, reactor trip switchgear, coil power switch (which controls the sequence in which the CEDM coils energize and deenergize), and the CEDMCS operating console. This console acts as the interface between the operator and the system by directing the control logic for proper sequencing of the CEA coils, which in turn determines the direction of CEA motion.

An electronic or electrical malfunction in the CEDMCS does not affect the ability of the CEAs to trip if required, but may result in a situation where the CEAs cannot be electrically moved. The CEAs, however, remain trippable and capable of performing their primary safety function of shutting down the reactor upon initiation of a reactor trip signal.

A CEA is considered trippable if the CEA was demonstrated operable during the last performance of Surveillance Requirement 4.1.3.1.2 and met the CEA drop time criteria during testing following the last refueling outage. A CEA can be assumed to be trippable until CEA traces indicate otherwise.

The Temporary Waiver of Compliance was requested to allow additional time (up to 72 hours) to troubleshoot and correct the CEDMCS electrical malfunction encountered on August 23, 1991. This additional time was necessary to perform the following:

- 1) Allow sufficient time to evaluate the nature of the failure and to develop a systematic work plan.
- 2) Allow sufficient time to perform troubleshooting activities in a deliberate and systematic manner.
- 3) Allow sufficient time to obtain the necessary part and perform repairs.

Basis for No Significant Hazards Consideration Determination

In accordance with 10 CFR 50.92(c), Entergy Operations has evaluated whether the proposed Temporary Waiver of Compliance (waiver) involves a significant safety hazards consideration. Entergy Operations has concluded that the proposed waiver did not involve a significant hazards consideration because the operation of Arkansas Nuclear One, Unit 2 in accordance with the waiver would not:

- (1) Involve a significant increase in the probability or consequences of an accident previously evaluated.

Allowing 72 hours for diagnosis and repair associated with electronic or electrical malfunctions of the CEDMCS is acceptable, since the primary safety function of these CEAs (reactor trip) remains unaffected. The 72 hour allowance is considered justifiable in order to provide adequate time to effect repairs without undue exposure to any operational requirement to move the affected CEA group.

The waiver did not alter the requirements of CEA position, insertion or alignment limits, and surveillance requirements so that power and peaking distributions used in the safety analysis will remain unaffected. The waiver did not affect the ability of the CEAs to perform their intended safety function when a safety system setting is reached. Therefore, the consequences of accidents related to or dependent upon CEA operation will remain unaffected.

- (2) Create the possibility of a new or different kind of accident from any previously evaluated.

There are no new failure modes or mechanisms associated with the waiver. The waiver did not involve any modification in the operational limits or physical design of the involved systems. The waiver reduced the burden on the control room staff by allowing sufficient time for system repair and prevented the possibility of a reactor trip which would have challenged safety systems.

- (3) Involve a significant reduction in the margin of safety

The waiver did not affect any Technical Specification margin of safety. The waiver allowed appropriate actions commensurate with the significance of the CEDMCS malfunction, while not subjecting the plant to a transient in response to malfunctions that do not affect the capability of the CEAs to perform their primary safety function.

Other Technical Specification limits for reactivity related items, such as shutdown margin and CEA insertion and alignment limits remained in effect and were complied with to ensure that the safety margins were maintained.

Basis for No Environmental Consequences

This request for a Temporary Waiver of Compliance did not have a significant affect, impact or change on the quality of the human environment at ANO. This request, when implemented, does not impact the ANO-2 Operating License or the Environmental Report. Therefore, this request did not significantly involve irreversible environmental consequences.