



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

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

RELATED TO AMENDMENT NO. 167 TO

FACILITY OPERATING LICENSE NO. NPF-6

ENTERGY OPERATIONS, INC.

ARKANSAS NUCLEAR ONE, UNIT NO. 2

DOCKET NO. 50-368

1.0 INTRODUCTION

By letter dated April 4, 1995, as supplemented by letter dated September 28, 1995, Entergy Operations, Inc. (the licensee) submitted a request for changes to the Arkansas Nuclear One, Unit No. 2 (ANO-2) Technical Specifications (TS). The requested changes would modify TS 3.9.9, Water Level - Reactor Vessel, to permit latching and unlatching of control element assemblies (CEAs) with less than 23 feet of water over the top of the irradiated fuel assemblies in the reactor vessel. The change would improve the operator's visibility of the engaging mechanism and would simplify the latching and unlatching process. The supplemental information submitted by the licensee on September 28, 1995 provided additional technical information related to the latching and unlatching process. It did not change the original no significant hazards consideration determination.

The current TS requires a minimum of 23 feet of water over the top of irradiated fuel assemblies during movement of fuel or CEAs in the reactor vessel while in the refueling mode. CEAs are inserted into selected fuel assemblies in the reactor vessel. The basis for maintaining a minimum water depth of 23 feet is to ensure that there is sufficient water over irradiated fuel so that in the event of damage to fuel pins, the radioactive iodine that would be released from the fuel pins would be absorbed by the water. It is assumed that following a fuel handling accident, 10% of the iodine in the fuel assembly would be released into the water and 23 feet of water above the fuel would remove 99% of the released iodine.

Typically, the licensee utilizes a single closed-circuit viewing camera to verify the CEA latching and unlatching and water level is not a factor. However, in the event of a camera failure, there is a need to lower the water level by approximately three feet to permit the operator to visually verify the engaging slot position and to ascertain that the CEA extensions are disconnected from their CEAs. Revised Standard TS for Combustion Engineering Plants (NUREG-1432) do not specify a minimum water level during CEA latching and unlatching.

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## 2.0 EVALUATION

The process of latching and unlatching CEAs does not involve movement of any of the fuel bearing portions of the fuel assembly. During latching and unlatching, the CEA extension shaft is typically lifted six inches and a load cell is used to ascertain whether the CEA is attached to the extension shaft. During the unlatching process the CEA is unlatched while it is suspended approximately six inches above its bottom-most position in the fuel assembly and a decrease in the load cell reading provides a positive indication that the CEA has detached from the extension shaft. The unlatching and latching associated movements of the CEA, including the six-inch gravity fall to the bottom of the fuel assembly, are all movements that occur during power operation. While moving inside the fuel assembly, the CEA is confined by guide tubes that provide a structural barrier between the CEAs and fuel pins. There is little likelihood that CEA movements during latching and unlatching would damage fuel pins and release fission products.

Although not addressed as the basis for maintaining 23 feet of water above fuel assemblies in the current TS, an assessment was performed to evaluate the radiation consequences of direct shine from reactor internals if the water level were lowered to approximately 20 feet above the active fuel during CEA latching and unlatching. There are no radiological concerns from radiation emanating from the irradiated fuel in the reactor vessel since 20 feet of water would reduce any direct radiation from inside the vessel to well below ambient levels.

The tops of extension shafts will protrude above the surface of the water when the level is lowered to 20 feet. Since the top portions of the extension shafts are not exposed to any appreciable neutron fluence, the portions of the shafts protruding above the water surface will not be a source of radiation due to neutron activation and, therefore, would not normally increase the ambient levels of radiation on the refueling floor. However, there is always the potential that highly radioactive fission products or activated material may be deposited on top portions of the extension shafts. Any radioactive material above or near the water surface would present a hazard to operators during the latching or unlatching sequence. The radiation hazards associated with potential radionuclides on the extension shafts during latching and unlatching are similar to radiation hazards that are commonly encountered during other reactor refueling evolutions and these potential hazards are addressed by site specific radiological procedures and controls rather than by the TS.

## 3.0 TECHNICAL CONCLUSION

The ability to lower the water level to below 23 feet while latching and unlatching CEAs will simplify the task for operators and will likely decrease the overall time spent by operators in a radiation field on the refueling bridge. Latching and unlatching CEAs does not constitute movement of fuel bearing portions of fuel assemblies and this evolution has minimal likelihood to damage fuel pins and release fission products. Any potential for worker exposure from contamination or exposed reactor internals during the latching and unlatching evolution should be readily minimized by the licensee's radiological controls procedures.

#### 4.0 STATE CONSULTATION

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

#### 5.0 ENVIRONMENTAL CONSIDERATION

The 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. The NRC staff has determined that the amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents 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 (60 FR 42604). 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 Commission 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.

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Date: September 28, 1995