

Davis-Besse Unit 1 Fire Hazard Analysis Report

DAVIS-BESSE NUCLEAR POWER STATION UNIT NO. 1

SECTION 7.0

OIL COLLECTION SYSTEM FOR REACTOR COOLANT PUMPS

7.0 OIL COLLECTION SYSTEM FOR REACTOR COOLANT PUMPS

7.1 Introduction

On September 30, 1983, Toledo Edison submitted a letter (Serial No. 991) to the NRC requesting pursuant to 10CFR50.12(a) and 50.48(c), specific exemption from the 10CFR50 Appendix R, Section III.0 requirement that the Oil Collection System for Reactor Coolant Pumps be capable of collecting lube oil from leakage sites in the Reactor Coolant Pump Lube Oil System (Reference 2.5.C) Toledo Edison stated that the current system is in compliance with Section III.0, except for the ability to collect all oil from both pumps that serve a single Reactor Coolant loop. This exemption request has been approved by the NRC per the Exemption issued August 20, 1984 (Reference 2.5.D).

On November 18, 1997, Toledo Edison submitted a letter (Serial No. 2493) to the NRC requesting an exemption from the 10CFR50, Appendix R, Section III.O requirement that leakage from oil fill lines be collected. The NRC (Log 5205) granted this exemption on January 30, 1998.

The remote oil fill system installed for each of the pumps consists of a stainless steel fill pot and stainless steel tubing and hose. The lines were installed as a means of adding oil to the lower reservoir without going inside the D-rings. This would reduce radiation dose, increase personnel safety and reduce the risk of spilling the oil in the vicinity of the RCP during oil addition. The system is gravity fed and non-pressurized. At the time the system was installed the lines were considered a means to facilitate maintenance and were not designed to meet the oil collection requirements of Appendix R. This was subsequently identified as being incorrect and the condition identified to the NRC as being outside the design basis of the plant (LER 97-004). The exemption was requested because it was felt that while the system did not meet the technical requirements of Appendix R, the collection system was not necessary to meet the underlying purpose of the rule.

7.2 Issued Exemption for RCP Oil Collection System

The following excerpt is from the referenced exemption granted by the NRC.

Section III.0 of Appendix R to 10CFR50 requires, in part, that the Reactor Coolant Pump Lube Oil Collection System be designed to collect lube oil leakage in a closed, vented container that can hold the entire lube oil system inventory. The licensees have requested exemption from this requirement.

The Davis-Besse Nuclear Power Station is designed with two Reactor Coolant loops. Each loop has two Reactor Coolant Pumps (RCP). A High Pressure and Low Pressure Lube Oil System is provided for each RCP motor. The High Pressure System is used only during Startup and Shutdown. The Low Pressure System is used during normal operation. Each RCP motor contains 225 gallons of lube oil.

The licensees have provided one 250-gallon oil collection tank for each loop. This provides sufficient capacity to hold the total lube oil inventory of only one RCP motor in each loop with some margin. Any lube oil overflow will drain to the Containment Sump.

The RCP Motor Lube Oil System does not comply with Section III.0 because the oil collection tank is not sized to contain the entire lube oil system inventory.

Since any lube oil overflow will drain to the Containment Building Sump where there is no other flammable material or hot surfaces which may ignite the oil, the overflow oil will not present an exposure fire hazard to or otherwise endanger safety-related equipment, and since the RCP Motor Lube Oil Collection System is capable of withstanding the Safe Shutdown earthquake, we find the Oil Collection System acceptable.

Based on our evaluation as discussed above, we conclude the existing RCP Motor Lube Oil Collection System provides a level of safety equivalent to the technical requirements of Section III.0 and, therefore, the exemption requested is granted.

7.3 Issued Exemption for the RCP Remote Oil Fill System

The following is from the exemption granted by the NRC.

The staff has determined that the design of the oil filling system and the level of protection provided during oil fill operations provide reasonable assurance that a lube oil fire will not occur. This is contingent on the application of the compensatory measures itemized in the licensee's November 18, 1997, exemption request.

The staff has also determined that, in the event of a worst-case postulated fire due to the absence of a lube oil collection system for the remote lube oil fill lines, the fire would be of limited magnitude and extent. In addition, such a fire would not cause significant damage in the containment building and would not prevent the operators from achieving and maintaining safe shutdown conditions.