UNITED STATES
NUCLEAR REGULATORY COMMISSION
REGION IV
611 RYAN PLAZA DRIVE, SUITE 400
ARLINGTON, TEXAS 76011-8064

September 22, 2000

MEMORANDUM TO: Tad Marsh, Chief
Events Assessment, Generic communications,
And Non-Power Reactors Branch
Office of Nuclear Reactor Regulation

FROM: Ken Brockman, Director ***Elmo E. Collins for***
Division of Reactor Projects

SUBJECT: POTENTIAL INFORMATION NOTICE - INADEQUATE CONTROLS TO ENSURE RECIRCULATION SUMP AVAILABILITY DURING SHUTDOWN CONDITIONS

This memorandum is to highlight a potential safety concern identified at Comanche Peak Steam Electric Station that may have generic implications. We request that you consider the following information as input for communication with other licensees.

DRAFT INFORMATION NOTICE

Addressees:

All holders of operating licenses for nuclear power reactors except those who have ceased operations and have certified that fuel has been permanently removed from the reactor vessel.

Purpose:

The U.S. Nuclear Regulatory Commission (NRC) is issuing this information notice to remind licensees that they are required to maintain a system that provides emergency core cooling to the core during shutdown conditions in accordance with their plant-specific Technical Specifications. 10 CFR Part 50, Appendix A, General Design Criteria 35, states, in part, that the safety function of this system shall be to transfer heat from the reactor core following any loss of reactor coolant at a rate such that: (1) fuel and clad damage that could interfere with continued effective core cooling is prevented, and (2) clad metal-water reaction is limited to negligible amounts. Licensees may not have adequate controls on containment sumps during outages to ensure that spilled coolant from some credible reactor coolant system (RCS) breaks can be pumped back to the core. Credible RCS breaks can be postulated during heavy load movement inside containment over reactor coolant system components with nonsafety-related, nonsingle-failure proof hoists.

Description of Circumstances:

On October 6, 1999, the Comanche Peak Steam Electric Station was performing a heavy lift evolution to remove the Reactor Coolant Pump (RCP) 1-03 motor from the Unit 1 containment building to replace it with a rebuilt and upgraded model. The motor weighed approximately 40 tons. This evolution was performed using a 45 ton, nonsafety-related, nonsingle-failure proof, electric-driven chain hoist rigged to the polar crane main hook, which was rated at 175 tons. Use of the chain hoist was necessary to raise the motor approximately 80 feet from its base to the 905 foot elevation, since the polar crane main hook was too large to be lowered into the narrow compartment above the motor. As the top of the motor cleared the 872 foot elevation, a failure in the chain hoist allowed the chain to free-spin through the chain blocks and the motor dropped 20 to 30 feet in a matter of seconds. As the chain was free-spinning, one link randomly lodged in the lower chain block, arresting the descent. The motor stopped approximately 8 feet above its base.

The NRC resident inspectors subsequently reviewed the licensee's program for controlling the movement of heavy loads inside containment. The licensee's heavy loads program closely matched guidance contained in NUREG-0612, "Control of Heavy Loads at Nuclear Power Plants." The Comanche Peak Steam Electric Station heavy load program documents stated, in part, that the crane and associated lifting devices used for handling heavy loads in the containment building shall satisfy the single-failure proof guidelines of NUREG-0554, "Single-Failure Proof Cranes for Nuclear Power Plants," or the effects of drops of heavy loads shall be analyzed and shown to satisfy the following criteria: (1) postulated doses from a drop are well within the 10 CFR Part 100 limits, (2) K_{eff} remained larger than 0.95 for postulated drops on or near fuel, (3) damage to the reactor vessel or spent fuel pool will not result in the uncovering of fuel, and (4) damage to redundant equipment will not result in a loss of required safe shutdown functions. The design bases further indicated that the evaluation of heavy loads assumed that such loads were not carried over operating safe shutdown or decay heat removal equipment when the redundant train was not operable.

In Mode 5, Comanche Peak Steam Electric Station Technical Specifications required at least one train of Residual Heat Removal (RHR) to be operable and operating and, depending on whether the loops are filled, the Technical Specifications required either an additional train of RHR operable or a minimum of two steam generators filled to at least the 10 percent level. The NRC resident inspectors noted that licensee procedures appropriately restricted the movement of heavy loads over RCS Loops 1 and 2 when RHR Train A was in operation and over RCS Loops 3 and 4 when RHR Train B was operating. These pre-established safe load paths were adequate to prevent an immediate loss of safety function directly from the postulated load drop. However, the inspectors noted that, if an RCP motor drop was postulated in any of the loop compartments while in Mode 5 and RCS leakage resulted, regardless of what train of RHR was operating, the licensee's abnormal operating procedures relied on operators having the capability to transfer reactor coolant spilled inside containment back to the vessel for core cooling. To successfully transfer coolant from the containment floor back to the reactor vessel, at least one containment sump would need to be available. No procedural requirements had been established to assure at least one containment sump was available to pump coolant back to the core following a loss of coolant event.

S:\DRP\DRPDIR\Information Notice\Recirc. Sump.wpd

RIV:C:DRP/A	D:DRP			
JITapia;df	KEBrockman			
/RA/	***EECollins for***			
9/22/00	9/22/00			

OFFICIAL RECORD COPY T=Telephone E=E-mail F=Fax