

UNITED STATES OF AMERICA  
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

In the Matter of	)	
	)	
TEXAS UTILITIES ELECTRIC	)	Docket Nos. 50-445
COMPANY, <u>et al.</u>	)	50-446
	)	
(Comanche Peak Steam Electric	)	
Station, Units 1 and 2)	)	

AFFIDAVIT OF SAMUEL D. MACKAY

I, Samuel D. MacKay, do depose and state as follows:

Q1. What is your name and the purpose of your affidavit?

A1. My name is Samuel D. MacKay. The purpose of my affidavit is to provide further explanation of the likelihood of reactor coolant pump (RCP) restart due to operator error when there has not been an inadequate core cooling (ICC) event, as requested by the Licensing Board in its Memorandum of September 18, 1985.

Q2. By whom are you employed and what are your duties?

I am a Principal Nuclear Engineer on the staff of the Nuclear Regulatory Commission. I am responsible for reviewing and evaluating the radiological safety considerations associated with the operation of nuclear powered generating stations. I presently review Emergency Response Guidelines for the operation of Westinghouse Nuclear Power Plants.

Q3. Have you prepared a statement of professional qualifications?

A3. Yes, a copy of my professional qualifications is attached to my affidavit.

Q4. What is the probability of a RCP restart due to operator error?

A4. Based on the Comanche Peak design, an inadvertent start would not be expected to occur as a result of simply operating the pump start switch. The pump start switch is interlocked with a lube oil pressure switch such that a lube oil pump must operate to supply oil at a pressure greater than 600 psig in order to enable the RCP start switch to run an RCP. We have also considered the possibility of an operator error that results in the lube oil pump running when it should have been turned off, and the possibility that the lube oil pressure switch fails in the enabled position. Such an inadvertent start of an RCP would involve either two operator errors (1. not turning off the lube oil pump and 2. operating the RCP start switch), or one operator error simultaneous with a failed oil pressure switch. Since the probability of occurrence of these combinations of events is very small, we consider the inadvertent start of an RCP to be unlikely.

We also considered a deliberate attempt to start an RCP in violation of the emergency operating procedures.

The Applicants have added the following precaution to the procedure for starting an RCP:

"An RCP shall not be started if containment spray has been actuated and transfer to Cold Leg recirculation has been performed. (Not included in FRC-0.1)."

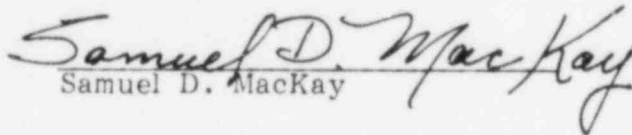
FR-0.1 is the procedure for Inadequate Core Cooling, and the prohibition of RCP start under these conditions is not recommended. Containment spray is necessary to flush paint chips into the containment sump. Recirculation is necessary to deliver some of those chips from the sump to the reactor coolant system. Therefore, we have concluded that the Applicants' proposal is adequate to caution that an RCP not be started when the potential exists for flushing paint chips into the reactor coolant system.

However, even if an operator deliberately initiated the RCP start procedure at the wrong time, it is unlikely that the procedure would be completed and result in an RCP start. This is because (in addition to the precaution discussed above) the RCP start procedure contains the following steps prior to starting the RCP:


- a. Verify oil reservoir alarms clear for RCP to be started.
- b. Ensure seal injection flow is between 6 and 10 gpm.
- c. Verify seal leakoff flow between 0.2 and 5 gpm.
- d. Verify RCP CCW return flows within normal range.
- e. Ensure greater than 200 psid across number 1 seal.
- f. Verify seal water standpipe low level alarm clear.
- g. Start Oil Lift Pump. Verify pressure permissive interlock satisfied (blue light on).

h. After Oil Lift Pump running for at least two minutes, start the associated RCP.

Because of the number of steps involved and the time required to perform them, it is unlikely that such a violation of procedures would occur. To provide additional assurance that an operator error would not occur, a verification process exists at CPSES for the proper use of the Emergency Response Guidelines. This verification is provided by the Assistant Shift Supervisor and the reactor operator while performing the Emergency Response Guidelines. The Assistant Shift Supervisor directs the reactor operators step-by-step with response from these two individuals on completion of each step. This coordinated use of the Emergency Response Guidelines provides a means of continuously monitoring the plant critical safety functions, permits optimal plant recovery and directs systematic operator response to emergency conditions.

  
Samuel D. MacKay

Subscribed and sworn to before me  
this 13<sup>th</sup> day of March, 1986

  
Notary Public

My Commission expires: 7/1/86

SAMUEL D. MACKAY

PROFESSIONAL QUALIFICATIONS

PROCEDURES AND SYSTEMS REVIEW BRANCH

I am a Principal Nuclear Engineer on the staff of the Nuclear Regulatory Commission. I am responsible for reviewing and evaluating the radiological safety considerations associated with the operation of nuclear powered generating stations. I presently review Emergency Response Guidelines for the operation of Westinghouse Nuclear Power Plants.

I received a Bachelor of Science Degree in Physics from Siena College in 1950 and I studied for a Master's Degree in Nuclear Physics at Union University.

I am in my 17th year with the Regulatory staff and have functioned as a Project Manager in an operating reactors branch and a branch that reviews construction permit applications. I have also served as an engineering systems analyst.

Prior to joining the Regulatory staff, I worked for General Electric Company at the Nuclear Energy Division in San Jose, California, from 1965 to 1968 as a field engineer for the startup of nuclear power plants.

From 1959 to 1965 I was associated with Allis Chalmers Company's Elk River Reactor Project. I prepared the startup program for that reactor, supervised many of the operational and startup tests and served as a licensed reactor operation and then shift supervisor. I was subsequently the Operations Supervisor and then the Project Manager.

Prior to Elk River, I was employed by Alco Products Company from 1956 to 1959. I performed critical facility tests for the Army Packaged Power Reactor and later was responsible for evaluating the reactor core performance by conducting tests on the operating reactor.

From 1952 to 1956 I worked at the Knolls Atomic Power Laboratory on various critical assemblies measuring reactivity coefficients and neutron cross sections and performing neutron activation analyses.

This is a total of 33 years experience in nuclear engineering and I am a professional nuclear engineer certified by the state of California.

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NUCLEAR REGULATORY COMMISSION

DOCKETED  
USNRC

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD 86-MR-19 P3:09

In the Matter of )

TEXAS UTILITIES ELECTRIC )  
COMPANY, et al. )

(Comanche Peak Steam Electric )  
Station, Units 1 and 2) )

OFFICE OF SECRETARY  
DOCKETING & SERVICE  
BRANCH

Docket Nos. 50-445  
50-446

CERTIFICATE OF SERVICE

I hereby certify that copies of "NRC STAFF CONCLUDING RESPONSE TO LICENSING BOARD'S SEPTEMBER 18, 1985 MEMORANDUM CONCERNING CONTAINMENT COATINGS" in the above-captioned proceeding have been served on the following by deposit in the United States mail, first class, or, as indicated by an asterisk, through deposit in the Nuclear Regulatory Commission's internal mail system, this 17th day of March, 1986:

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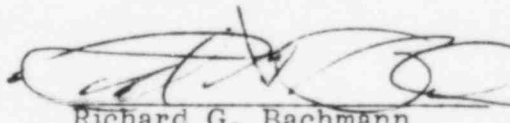
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