UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC SAFETY AND LICENSING BOARD

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

AFFIDAVIT OF DOYLE HUNNICUTT CLARIFYING
NRC INSPECTION REPORT 83/34-83-18,
REGARDING REACTOR VESSEL MIRROR SHIELD

I, Doyle Hunnicutt, do depose and state:

Q1. Mr. Hunnicutt, please state your name and position with the NRC.

A1. I am Doyle Hunnicutt. I am employed by the U. S. Nuclear Regulatory Commission ("NRC") as Chief, Reactor Project Section B, Reactor Project Branch 2, Region IV, Arlington, Texas. In this position, I review, approve, and perform inspections of nuclear facilities under Region IV jurisdiction. I am responsible for the supervision of the NRC inspectors who inspected the Comanche Peak Steam Electric Station ("CPSES") during July 1983 to the present.

Q2. Have you prepared a statement of professional qualifications?

A2. Yes, a statement of my professional qualifications is attached to my affidavit.

Q3. What are your responsibilities with regard to CPSES?

A3. I am responsible for the direction of inspection personnel. I review and approve the scope of inspection and investigation reports. I participate in direct evaluation of activities related to reactor construction, various testing and verification activities, and various supervisory responsibilities.

Q4. What is the purpose of your affidavit?

A4. My affidavit responds to the Atomic Safety and Licensing Board's ("Board's") inquiry regarding NRC Inspection Report 83-34/83-18 (September 12, 1983). I understand that the Board requested clarification of paragraphs 3 and 4 (pp. 4-5) of this Inspection Report, which discusses the reactor vessel outer wall, reactor vessel mirror shield, and the containment vessel shield wall. The insulation referred to in Inspection Report 83-34/83-18 is "reflective insulation". Over the years this material has been known by a number of names, including "mirror shielding." Although the term "mirror shield" was used in Inspection Report 83-34/83-18, reflective insulation is a more accurate term, and will be used in this affidavit.

Q5. Please briefly describe this insulation.

A5. Reflective insulation (mirror shielding) is manufactured to size and shape specifications for particular locations within a plant such as piping, components, and/or reactor vessels. Reflective insulation consists of several highly polished individual metal sheets that have been formed into the proper shapes. The sheets of

polished metal are separated from each other by air gaps, and are fabricated into an assembly to be attached to the piping, component, or reactor vessel in a manner that assures that the reflective insulation will remain attached during service. Each sheet of the fabricated reflective insulation reflects a percentage of the heat back toward the heat source to reduce heat loss through conduction and convection. Therefore, several sheets of reflective insulation return a very high percentage of the heat back to the source and reduce the loss or transfer of heat from the heat source to an acceptable (specified) value.

The relationship between the reactor vessel, the reflective insulation and the reactor cavity wall is shown on Figure 1 attached. The reactor cavity wall was referred to as the "containment vessel shield wall" in Inspection Report 83-34/83-18.

Although the reactor vessel is insulated by the reflective insulation, there is some heat loss such that a cooling system must be employed. This cooling system is known as the "reactor cavity/ neutron detector well cooling system." The cooling system blows chilled air into the 3-inch gap between the mirror insulation and the reactor cavity wall, to remove the residual heat escaping past the reflective insulation.

Q6. Paragraph 3 of Inspection Report 83-34/83-18 states that Region IV received an allegation that the reactor vessel outer wall had been or was in contact with the containment vessel shield wall. Can you describe the resolution of this allegation by Region IV?

A6. Following the receipt of this allegation, I, together with William Jones, an Engineering Aide with the NRC, inspected the Unit 1 reactor vessel reflective insulation and the reactor cavity wall on August 12 and 19, 1983, to determine whether the allegation was true. We conducted our inspection by visually inspecting the gap (about 3") between the reactor vessel reflective insulation and the inner surface of the reactor cavity wall around the full periphery of the vessel. Our visual inspection consisted of shining the light from a flashlight up into the gap, from the bottom of the vessel, looking for signs of contact. The reactor vessel was at ambient temperature (less than 100°F). We did not see any signs of contact between the reflective insulation and the reactor cavity wall. The Unit 2 reactor vessel reflective insulation was inspected in a similar manner by Mr. Jones, and he also found no evidence of contact.

Q7. Paragraph 4 of the Inspection Report states:

> Apparently the reactor vessel mirror shield did touch the shield wall during hot functional testing (HFT) and a related potential 10 CFR Part 50.55(e) report was transmitted to the NRC Senior Resident Inspection - Construction. The subject of this potential 50.55(e) report was that there was insufficient heat removal capacity in the reactor vessel cavity.

The Inspection Report concludes its discussion on this matter by stating:

> However, the mirror shield did touch the shield wall during the HFT. The occurrence was identified by the licensee and reported to the NRC and corrective action is in progress.

Can you explain these statements, in light of your answer to Question 6, above?

A7. During hot functional testing, temperatures up to 314°F were observed by the Applicants in the annulus between the reactor vessel reflective insulation and the reactor cavity wall. The unanticipated high temperatures were attributed to: 1) restrictions in air flow in the annulus due to construction debris in the annulus and to the reactor vessel insulation support channel; and 2) heat loss from the reactor vessel which was higher than originally anticipated.

The Applicants implemented several corrective actions to address the problem. Construction debris was removed, and the insulation support channel was modified by drilling air passage holes. In addition, Applicants added several insulation seals, modified existing seals, and increased the heat removal capacity of the reactor cavity cooling system. The Staff will require the Applicants to demonstrate by hot testing that these corrective actions are sufficient to reduce the annulus temperature prior to the grant of an operating license.

The statement on page 5 of Inspection Report 83-34/83-18 that "the mirror shielding did touch the shield wall during HFT" was intended to refer to the contact between the reflective insulation and the construction debris, which in turn was in contact with the reactor cavity wall. The removal of this debris took place before the inspection discussed on page 4 above. Consequently, during that inspection we observed no contact between the reactor reflective insulation and the reactor cavity. Nor was there any indication that the construction debris had damaged or crushed the reflective insulation. We concluded that there had been no actual contact between the reactor vessel and the reactor cavity wall.

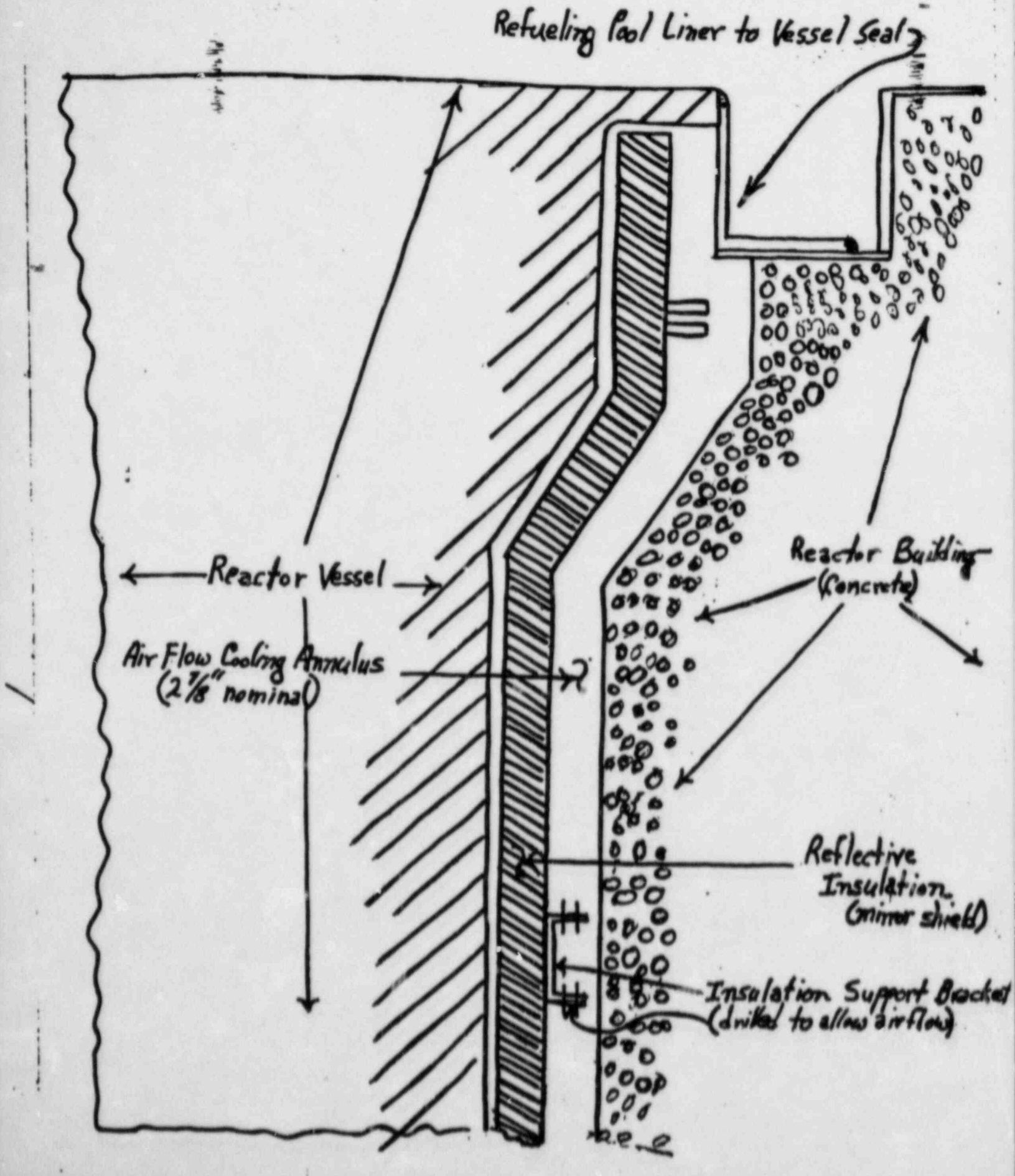
Doyle M. Hunnicutt

Doyle M. Hunnicutt

Subscribed and sworn to before me
this 31st day of May, 1984

Notary Public
Tarrant County, Texas
My commission expires: 7-15-84

FIGURE 1


Refueling Pool Liner to Vessel Seal
Reactor Vessel
Air Flow Cooling Annulus
(2 7/8" nominal)
Reactor Building
(Concrete)
Reflective
Insulation
(mirror shield)
Insulation Support Bracket
(drilled to allow airflow)

PROFESSIONAL QUALIFICATIONS
OF
DOYLE M. HUNNICUTT

UNITED STATES NUCLEAR REGULATORY COMMISSION

Mr. D. M. Hunnicutt is Chief, Reactor Project Section A, Reactor Project Branch 1, Region IV, U. S. Nuclear Regulatory Commission, Arlington, Texas. Mr. Hunnicutt has held this position in Region IV since July 1983, and in the course of his responsibilities he has reviewed, approved, and performed inspections and investigations of nuclear facilities under Region IV jurisdiction. In this position, he was responsible, from July 1983 to present, for the supervision of the project inspectors who inspect Comanche Peak Steam Electric Station, Units 1 and 2.

Mr. Hunnicutt earned a Bachelor of Arts degree in chemistry from Adams State College, Alamosa, Colorado, in 1952. He earned a Master of Science degree in engineering (Major: Nuclear Engineering) from the University of Washington, Seattle, Washington, in 1965. He is a licensed Professional Engineer in General Engineering in the state of New Jersey. He is a registered Professional Engineer in Nuclear Engineering in the state of California.

DOYLE M. HUNNICUTT

7/83 - present & 6/80 - 2/82	Chief, Reactor Project Section A, Reactor Project Branch 1, Region IV, NRC - Responsible for the supervision of a Project Section assigned inspection duties at various commercial nuclear power reactors. Review and evaluation of data, licensee event reports, and reportable occurrences at the assigned facilities.
2/82 - 7/83	Chief, Engineering Section, Reactor Project Branch 2, Region IV, NRC - Responsible for the supervision of the Engineering Section assigned personnel. Duties included auditing and observing inspectors performing inspections at various licensed commercial nuclear power plants under construction and in operation. Review and evaluation of data, inspection findings, and engineering information for Region IV facilities.
7/76 - 6/80	Chief, Components Section II, VIB:Region IV, NRC - Responsible for supervision of the VIB program related to implementation of the Vendor Inspection Programs of manufacturers of valves; piping and piping assemblies; electrical components; instrumentation; and ASME B&PV Code, Section III Components.
5/74 - 7/76	Chief, Construction and Engineering Support Branch, Region III, NRC/AEC - Responsible for the supervision of nuclear power plants under construction to verify that system design, fabrication, construction and construction testing were performed to meet design and functional requirements.
5/71 - 5/74	Chief, Reactor Startup and Test Branch, Region III, AEC - Responsible for the supervision of the preoperational testing of 10 PWR and BWR power plants to assure that nuclear safety requirements and operating parameters were met.
5/68 - 5/71	Reactor Inspector, Region I, AEC - Conducted construction, preopeoperational testing, power ascension, and operations inspections at various PWR and BWR nuclear power plants.
2/65 - 5/67	Assistant Plant Engineer, General Electric Company Idaho Falls, Idaho - Supervised construction, preoperational testing, power ascension testing, and full power operation of the S5G submarine prototype. Evaluated test data, operating conditions, and equipment performance to assure that nuclear safety conditions were maintained.

1/62 - 2/63	Shift Supervisor, GE, Richland, Washington - Responsible for the supervision of one operating shift at various graphite moderated nuclear reactors. Performed technical functions, including evaluation of proposed design changes, reactivity calculations, and preoperation and review of procedures.
1/60 - 1/62	Power Supervisor, GE, Richland, Washington - Responsible for the supervision of one operating crew in water treatment and water pumping facilities at a dual plutonium production nuclear reactor area. Supervised repairs, modifications, and testing of equipment.
5/57 - 1/60	Laboratory Leader, Radiochemical Laboratory, GE, Richland, Washington - Designed and developed laboratory equipment for use within a laboratory that processed high level radiation (high exposure rate) samples. Performed measurements of neutron fluxes in operating nuclear reactors. Used activation analyses techniques to measure concentrations of specific elements or isotopes in a variety of materials. Calculated results from data and prepared reports related to work and measurements made in the laboratory. Supervised professional personnel and technicians during all phases of sample preparation and measurements.
8/55 - 5/57 and 5/53 - 6/54	Engineering Inspector (QC&QA) at various vendor facilities in the mid-west, GE, Richland, Washington, was employer - Performed applicable QC and QA inspections of nuclear reactor and irradiated fuels processing equipment and materials for use at the various Hanford facilities.
6/54 - 8/55 and 9/52 - 5/53	Chemical Engineer, GE, Richland, Washington - Performed duties as a chemical engineer in fission product research, separations facilities, and uranium recovery.

Professional Society Affiliations

American Nuclear Society (ANS)