1/5/82

UNITED STATES OF AMERICA
NUCLEAR REGULATORY COMMISSION

BEFORE THE ATOMIC LICENSING AND SAFETY BOARD

In the Matter of the Application of Public Service Company of Oklahoma Associated Electric Cooperative, Inc. and Western Farmers Electric Cooperative (Black Fox Station, Units 1 and 2)	)))))))	Docket Nos. STN 50-556 STN 50-557

AFFIDAVIT OF DAVID F. GUYOT

I, David F. Guyot, of lawful age and being first duly sworn, depose and say that:

1. My name is David F. Guyot. I reside at 12833 West 106th Street, Overland Park, Kansas. I am employed by Black & Veatch Consulting Engineers. Black & Veatch is the architect-engineer for Public Service Company of Oklahoma's ("PSO") Black Fox Station. I am the Project Engineer-Structural Systems for the Black Fox Station project. I have been actively involved in the project since 1974 and served as the supervisor of civil-structural engineering activities for this project since 1975. Except for a two-year tour of duty as an officer in the United States Army from mid-1970 to early 1973, I have been employed by Black & Veatch since early 1970.

I received a B.S. degree in Architectural Engineering from the University of Kansas. I am a registered Professional Engineer in the States of Oklahoma and Kansas.

2. I have previously testified in this proceeding with respect to containment design issues, and I am responsible for assuring that the containment design for Black Fox Station adequately accommodates various loads that may result from the occurrence of such events as safety relief valve discharges and loss-of-coolant accidents. My testimony was based on information provided by the General Electric Company ("GE") concerning the appropriate identification and definition of the loads that might be expected from these events. By the time of the hearings in February 1979, GE was in the advance stages of its Mark III Confirmatory Test program for establishing the dynamic load definitions for the Mark III pressure suppression containment. Specifically, GE had issued Revision 2 of design report 22A4365 for its BWR standard plant design. This design report was called the "Interim Containment Loads Report," Revision 2 ("ICLR2"), and it presented the GE recommendations for containment loads which apply to a standard Mark III containment and which relate to the

hydrodynamic influence of the suppression pool. ICLR2 was the basis for establishing the dynamic load definitions for the Black Fox Station ("BFS") Mark III containment design and for demonstrating the adequacy of the preliminary design of the containment structure. The BFS load definitions are set forth in Appendix 3C-Revised of the BFS PSAR.

3. Subsequent to the close of the hearing record, GE issued Revisions 3 and 4 of design report 22A4365 during November 1979 and January 1980, respectively. Revision 3 was classified by GE as an "interim" design report ("ICLR3") because the Mark III Confirmatory Test program was not totally completed. Revision 4 was classified by GE as the "final" containment load report ("CLR4") as this revision incorporated the final results of the GE test program.

4. I and members of my staff reviewed ICLR3 and CLR4 to determine their impact, if any, on the BFS Mark III containment design, and it is the purpose of this Affidavit to provide a summary of that review.

5. The principal change in the information and data presented in ICLR3 as compared to ICLR2 was the revision of the methodology for evaluating the effects of dynamic loads

on submerged structures. These methods are further revised in CLR4 to modify the method of analyzing the effects of the LOCA air bubble. Attachment G of ICLR3/CLR4 includes the revised methodology. The revised methodology in Attachment G was compared with the methods used in the BFS containment design evaluation as documented in Appendix 3C-Revised. The BFS methodology for evaluating components located within the suppression pool is more conservative than those methods presented in ICLR2, which in turn are more conservative than the Attachment G methods. Thus, the results of the methodology set forth in Appendix 3C-Revised conservatively envelops (by factors up to 10) the results using the ICLR3/CLR4 method.

The ICLR3/CLR4 method for evaluating submerged structures is now under review by the NRC Staff as part of the GESSAR docket. Based on presentations by the NRC Staff before the ACRS on September 24 and 25, 1981, and an NRC Staff memorandum of December 1981 (copy attached), I understand the NRC Staff is close to accepting the ICLR3/CLR4 submerged structure methodology, with some limitations on the source strength due to chugging. Although PSO may adopt the NRC Staff's approved version of the ICLR3/CLR4 methodology in the final design of the BFS Mark III containment, the preliminary

design of the containment structure is based on the more conservative methods set forth in Appendix 3C-Revised.

6. With respect to ICLR3, I consider the other changes in the design report as refinements, clarifications, or corrections. In summary, the areas affected include the refinement of the pre-chug under pressure for the chugging event, temporal refinements of the design basis, intermediate and small break accident loading charts, the deletion of the four and six to eight low-set-point SRV loads from the design basis and small break accident loading charts, and the addition of supplemental information on the rate of drywell depressurization during reflood of the reactor pressure vessel. It is my conclusion that these changes have no significant impact on the BFS containment design. This judgment is based on the fact that either (i) the various refinements and clarifications constitute final design details that are amply accommodated by the BFS preliminary containment design, or (ii) the containment design is not affected by the various refinements and clarifications because the design is controlled by a more stringent loading requirement, or (iii) any necessary modifications to components impacted by these changes can be readily accomplished.

7. The principal change incorporated in CLR4 was the introduction by GE of reduced safety-relief valve ("SRV") bubble pressure based on the new in-plant SRV test data resulting from tests conducted at Caorso, Italy. In general, the Caorso test data indicates that the SRV bubble pressures in Table A.4.4 of CLR4 (same as Table A.4.4 in Appendix 3C-Revised) are 20 to 35 per cent larger than the reduced bubble pressure predicted using the Caorso data base and presented in Table A.4.5 of CLR4. These reduced peak bubble pressures are currently under review by the NRC Staff. If the NRC Staff accepts these reduced pressures, PSO may use this data in the final design of the BFS containment. However, for purposes of preliminary containment design, the larger and more conservative pressures, which the NRC Staff finds acceptable, have been used for BFS.

In addition to the reduced bubble pressures, the in-plant SRV tests at Caorso indicate that other SRV-related conditions need to be evaluated, including the initial clearing of water in the SRV discharge line and quencher, leaking SRV's, SRV actuations with a pressurized drywell and wetwell, and the steam condensation which follows the air

clearing of the SRV discharge line. Utilizing test data obtained at Caorso, GE has evaluated the effects of these related conditions against the ICLR2 load definition. The results of this evaluation were used to determine the amount of SRV bubble pressure reduction presented in Table A.4.5 of CLR4. GE did find that the SRV steam condensation load effect was enveloped by all of the SRV load cases except the single-valve, first-actuation case. If the single-valve, first-actuation SRV case is design controlling, GE recommends that the effects of SRV steam condensation be added to the results of the current SRV single-valve, first-actuation effects. However, for BFS the preliminary containment design was based on the single-valve, subsequent-actuation case rather than the single-valve, first-actuation case. The former case is more conservative than the single-valve, first-actuation case, and it completely envelops the test results from Caorso. Therefore, the adequacy of containment design for BFS is not affected by the Caorso test data.

8. With respect to CLR4, I consider the other changes in the design report as refinements, clarifications, or corrections. In summary, the areas affected include

temporal refinements of the design basis, intermediate and small break accident loading charts, refinements in the rate of drywell depressurization during reactor reflood, and clarifications of thermal transients due to the LOCA events. It is my conclusion that these changes will not have any significant impact on Black Fox Station design for the same reasons explained in Paragraph 6.

9. During mid-1980, GE, on the GESSAR docket, filed GESSAR II in support of their application for "final design approval" for their BWR standard plant. As part of the GESSAR application, GE has filed Appendix 3B which reflects the containment load definition recommendations presented in CLR4. As part of this submittal, the NRC Staff has initiated a review of the generic Mark III containment load definition program. As a result of their final design approval review, the NRC Staff has questioned three matters regarding Mark III LOCA load definition. The NRC Staff has not completed its review, nor published its position in any formal fashion. However, the NRC Staff has identified the issues in the attached memorandum. Each of these issues is discussed below for its applicability and potential impact on the BFS containment design.

10. The peak pool swell velocity of 40 ft/sec has been established for the BFS containment design. It is my understanding (based on attendance at a meeting between GE and the NRC Staff and a September 24 and 25, 1981, ACRS subcommittee meeting) that the NRC Staff is requesting a revision to this load specification to cover uncertainties in the GE pressure suppression test facility data and scaling models. The attached memorandum indicates that 50 ft/sec is an acceptable bounding parameter, although 60 ft/sec was used at the Grand Gulf facility to avoid licensing delays.

It is my judgment that a revision to 50 ft/sec of the pool swell velocity specification would not significantly impact the BFS containment design. I base this conclusion on the fact that this change is a final design detail that can be accommodated because:

(1) The structures and components above the suppression pool which would be affected by such a change are not yet released for fabrication. As such, there is ample opportunity to include the effects of any such change in their design, and

(2) Any changes to the Black Fox Station structures and components which may be required are judged to be limited to adjustment of member or component sizes, adjustment to spacing between supporting elements, or increasing capacity of support members by the addition of stiffening and/or reinforcements. Each of these modifications is possible as part of the final BFS design.

11. Potential revisions of the froth impact loads similarly involve final design detail, and as such they can be accommodated as discussed in Paragraph 10. The potential revision of the submerged structures load specification is reported (in the attached memorandum) to relate to the source strength definition of the chugging load. As previously stated in Paragraph 5, the BFS Appendix 3C-Revised methodology results in submerged structures loads which are up to a factor of 10 times the effects of the methodology under review by the Staff, and therefore are not a concern for purposes of preliminary containment design.

12. In conclusion, it is my opinion that neither ICLR3, nor CLR4, nor the matters referred to in the attached

memorandum of the NRC Staff have any significant effect on the preliminary Mark III containment design of BFS.

Executed at Washington, D. C.
January 5, 1982

David F. Guyot

District of Columbia: SS

Subscribed and sworn to before me this 5th day of January, 1982.

Phyllis D. Macy
Notary Public in and for
the District of Columbia.

My commission expires 1-1-87.