

TECHNICAL EVALUATION REPORT
H. B. ROBINSON STEAM ELECTRIC PLANT, UNIT 2
SEISMIC QUALIFICATION OF AUXILIARY FEEDWATER SYSTEM

1. INTRODUCTION

Since the accident at Three Mile Island, considerable attention has been focused on the capability of nuclear power plants to reliably remove decay heat. The NRC has recently undertaken Multiplant Action Plan C-14 "Seismic Qualification of AFW Systems" [Ref. 1], which is the subject of this evaluation.

To implement the first phase of Action Plan C-14, the NRC issued Generic Letter No. 81-14 "Seismic Qualification of AFW Systems" [Ref. 2], dated February 10, 1981, to all operating PWR licensees. This letter requested each licensee (1) to conduct a walk-down of non-seismically qualified portions of the AFW system and identify deficiencies amenable to simple actions to improve seismic resistance, and (2) to provide design information regarding the seismic capability of the AFW system to facilitate NRC backfit decisions.

The licensee of H. B. Robinson Steam Electric Plant, Unit 2 responded with a letter dated December 31, 1981 [Ref. 3]. The licensee's response was found not to be complete and a Request for Additional Information (RAI) was issued by the NRC, dated July 21, 1982 [Ref. 4]. The licensee provided a supplemental response in a letter dated August 20, 1982 [Ref. 5].

This report provides a technical evaluation of the information provided in the licensee's responses to the Generic Letter, and includes a recommendation regarding the need for additional analysis and/or upgrading modifications of this plant's AFW system.

2. EVALUATION

Information provided in licensee's responses included:

- o Specification of the overall seismic capability of the AFW system.
- o Description of methodologies and acceptance criteria for seismic design of the AFW system, which is determined to be seismically qualified to the SSE level by the licensee.
- o Description of the AFW system boundary.
- o Status of compliance with seismic related NRC Bulletins and Information Notices.
- o Additionally, schematic sketch of the AFW system.

We have reviewed the licensee's responses, and a point-by-point evaluation of licensee's responses against Generic Letter's requirements is provided below.

(1) Seismic Capability of AFW System

The AFW system has been designed, constructed, and maintained to withstand an SSE utilizing methods and acceptance criteria consistent with that applicable to other safety-related systems in the plant. All areas of the AFW system, i.e., pumps/motors, piping, valves/actuators, power supplies, water source, initiation/control systems, and structures supporting and housing the AFW system, are seismically qualified to the SSE level.

The licensee provided a description of the methodologies and acceptance criteria used for seismic qualification of the AFW system, and referred to the applicable sections of the FSAR. The description includes seismic analysis methods, seismic input, load combinations, allowable stresses, qualification testing, and engineering evaluations performed.

The condensate storage tank is the primary water supply and it is seismic Class I. Switchover to a secondary water supply, therefore, is not involved. Additionally, the licensee indicated that there are a non-seismic Class I backup water supply, the well water system, and a seismic Class I backup water supply, the service water system. The licensee indicated that the procedure which would be followed to enable a transfer, if required, from the primary to the secondary water sources is outlined in the plant emergency instructions EI-5 and EI-6.

Additional information regarding the seismic capability of any alternate decay heat removal system is not required because the AFW system currently is fully seismically qualified for the SSE.

Regarding the AFW system boundary, the licensee's responses indicated that, due to a restriction in the number of node points that could be modeled in one computer run utilizing the codes in existence at the time of the original analysis, specific guidelines for modeling of the branch line connections to the AFW system did not exist. During licensee's IE Bulletin 79-14 analysis, the additional effects of branch line loading were reviewed on a case-by-case basis and were judged to be insignificant. However, the licensee's responses did not clarify whether (a) the branch lines have been seismically analyzed and qualified up to a point of three orthogonal restraints in order to assure the structural integrity of the branch lines, and (b) all branch lines have a second valve normally closed or capable of automatic closure when safety function is required. Therefore, it is not clear to us whether the AFW system boundary fully conforms to the definitions given in the Generic Letter 81-14.

The licensee stated that the AFW system was included within the scope of the seismic related NRC Bulletins 79-02, 79-04, 79-07, 79-14, 80-11. The licensee is currently evaluating the

adequacy of anchorage and support of safety related electrical equipment as described in IE Information Notice 80-21. As part of this analysis the adequacy of the seismic qualification of electrical cables and motor control centers will be assessed. The licensee stated that the evaluation is scheduled to be completed by the end of 1982.

(2) Walk-Down of Non-Seismically Qualified Portions of AFW System

A walk-down is not required because no lack of seismic qualification of the AFW system is indicated.

(3) Additional Information

The licensee provided a schematic sketch of the AFW system including the water source(s), heat sinks, suction and discharge piping, major mechanical equipment, and structures housing and supporting the AFW system items.

3. CONSLUSIONS

The information contained in licensee's responses to Generic Letter 81-14 is complete except that it did not clarify whether the AFW system boundary fully conforms to the definitions specified in Generic Letter 81-14.

Based on the submitted information, we conclude that the AFW system is fully seismically qualified and is able to provide the safety related function following an SSE assuming that the AFW system boundary currently fully conforms to the boundary definitions specified in GL 81-14. Therefore, we recommend that no further action be initiated regarding upgrading of the AFW system of this plant under NRC Multiplant Action Plan C-14.

REFERENCES

1. D. G. Eisenhut, U. S. Nuclear Regulatory Commission, memorandum to H. R. Denton, "Multiplant Action Plan C-14; Seismic Qualification of Auxiliary Feedwater Systems," February 20, 1981.
2. U. S. Nuclear Regulatory Commission, Generic Letter No. 81-14 to all operating pressurized water reactor licensees, "Seismic Qualification of Auxiliary Feedwater Systems," February 10, 1981.
3. S. R. Zimmerman, Carolina Power & Light Company, letter to D. G. Eisenhut of U. S. Nuclear Regulatory Commission, December 31, 1981.
4. U. S. Nuclear Regulatory Commission, letter to Carolina Power & Light Company, "Request for Additional Information on Seismic Qualification of the Auxiliary Feedwater System, H. B. Robinson Steam Electric Plant, Unit 2," July 21, 1982.
5. S. R. Zimmerman, Carolina Power & Light Company, letter to S. A. Varga of U. S. Nuclear Regulatory Commission, August 20, 1982.