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FROM: Carolina Power & Light Co. Raleigh, N.C. E.E. Utley	DATE OF DOC 5-9-75	DATE REC'D 5-13-75	LTR xxx	TWX	RPT	OTHER
TO: Mr. Benard C. Rusche	ORIG 3-signed	CC	OTHER	SENT AEC PDR xxx SENT LOCAL PDR xx		
CLASS	UNCLASS xxxx	PROP INFO	INPUT	NO CYS REC'D 40	DOCKET NO: 50-261	

DESCRIPTION:

Ltr notarized 5-9-75 .... ltr ref ACRS 6-11-74 ltr furn info requested concerning Facility Operating Licnese No. DPR-23 to permit an increase in the maxium steady - state power level of the H.B. Robinson Unit No. 2 from 2200 MWt to 2300 MWt .....

PLANT NAME: H.B. Robinson #2

ENCLOSURES:

ACKNOWLEDGED

DO NOT REMOVE

FOR ACTION/INFORMATION 5-16-75 JGB

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CP&L
Carolina Power & Light Company

May 9, 1975

File: NG-3514(R)

Serial: NG-75-684

50-261

Mr. Benard C. Rusche, Director
Office of Nuclear Reactor Regulation
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

H. B. ROBINSON UNIT NO. 2
LICENSE DPR-23
RESIDUAL HEAT REMOVAL SUMP DESIGN

Dear Mr. Rusche:

In June, 1974, the Advisory Committee on Reactor Safeguards (ACRS) reviewed the request of Carolina Power & Light Company (CP&L) for an amendment to Facility Operating License No. DPR-23 to permit an increase in the maximum steady-state power level of the H. B. Robinson Unit No. 2 from 2200 MWt to 2300 MWt. As a result of this review, the ACRS requested in their June 11, 1974 letter to the Chairman of the U. S. Atomic Energy Commission, that CP&L and the AEC Regulatory Staff consider possible sources of debris, such as particles of loose insulation in the containment, as well as the possible effect of such debris on the functioning of engineered safeguards systems. In response to the ACRS request, the following information is submitted.

The engineering design, operational modes, and supporting analysis for engineered safeguards systems are completely described in H. B. Robinson Unit 2 Final Safety Analysis Report (FSAR). During a loss of coolant accident (LOCA), the safety injection system provides borated water from either passive accumulators, the refueling water storage tank (RWST), or the containment sump. Since the accumulators and RWST are essentially free of debris, the only path which debris can enter the emergency safeguards system is through the containment sump during the long term recirculation phase following the LOCA.

The containment sump is located on the ground floor level in the annular space formed by the polar crane wall, which also acts as a missile shield for equipment outside the crane wall, and the lined inner wall of the containment structure. Possible sources of debris that can reach the containment sump are pieces of containment liner insulation, pipe lagging, corrosion products, and equipment parts dislodged by missile impact.

5277

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The cylindrical portion of the containment structure's liner is insulated. Containment liner insulation consists of 44 in. x 84 in. x 1-1/4 in. thick, 4 pound/ft^3 density cross-linked foam with an outer covering of 24 gauge stainless steel. Since the liner insulation is designed to resist thermal and mechanical stresses resulting from postulated accidents, the only significant source of liner insulation debris would result from direct impact with whipping pipes or LOCA generated missiles. High pressure piping located between the crane wall and the containment insulated wall is restrained to the crane wall. The spacing of the restraints is less than the radial distance from the outside of the pipe to the containment wall, so that in the event of a pipe rupture, a completely severed pipe cannot strike the containment insulation, regardless of the manner in which it whips.

Protection from dynamic effects or missiles resulting from a LOCA or from a plant equipment failure was considered in the layout design for plant equipment and missile barriers to ensure the availability of engineered safety features. Damage to the containment liner, piping systems, instrumentation, and plant equipment as a result of fluid jets and missiles which might be produced by the action of such jets was also considered in plant design. As a result, debris associated with dynamic effects and missile generation has been minimized. The containment sump itself is located in a missile shielded area and is protected from associated damage.

The safety injection system may operate in the recirculation mode with a water depth of 1.5 feet on the containment floor. This is equivalent to the amount of water in the primary systems plus 60% of the refueling water storage tank, or approximately 215,000 gallons of water at 263°F. There are two sump return lines which lead from the containment sump to the residual heat removal pumps. Each line is located inside of a larger diameter guard pipe. The lines are separated by approximately 18'. The lines are designed to allow for 2 inches differential movement between the containment and pump chamber and are designed as Class I equipment.

Filtration of the water entering the residual heat removal pump suction piping from the containment sump is accomplished as follows:

1. Coarse filtration is accomplished by the screens in the lower portion of the crane wall. These screens have openings of approximately one inch.

2. Floating and submerged debris is excluded from entering the pump suction by the baffles located in the containment sump area.

3. Any debris that penetrates the first two lines of defense (1 and 2 above) is removed by the two screens (1/2" diameter and 7/32" diameter mesh) arranged in series at the pump suction line openings in the containment sump area.

To ensure that slowly settling debris is allowed to settle before reaching the final two screens, the coolant velocity at the inner screen has been limited to approximately 0.2 ft/sec.

The minimum size of debris that will be excluded from entry into the recirculation system will be 7/32" diameter. It is unlikely that debris of this size or smaller will cause clogging of spray nozzles (which are sized to pass debris <1/4") or fuel coolant channels, since the composition of the debris that is able to reach the sump area will have a specific gravity comparable to, or less than, water and will be further reduced in size as it passes through the pumping system.

To ensure that the containment sump continues to be free of debris and corrosion, General Operating GP-1 requires that the containment sump be inspected before each plant heatup from ambient temperature conditions.

In conclusion, debris which enters the engineered safeguards system is minimized and restricted to such a small size that no appreciable operational degradation is encountered. CP&L believes that this information will satisfy the NRC staff and the ACRS with regard to sources of debris and its effect on the function of engineered safeguards systems.

Yours very truly,

E. E. Utley
Vice President
Bulk Power Supply

RGB/jf/pd

cc: Messrs. N. B. Bessac
P. W. Howe
R. E. Jones
J. B. McGirt
D. B. Waters

Sworn to and subscribed before me this 9th day of May, 1975.

Nancy A. Stephens (Yancey)
Notary Public

My Commission expires: June 29, 1976.

NANCY A. STEPHENS NOTARY PUBLIC WAKE COUNTY, N.C.