ENCLOSURE

STAFF EVALUATION
ST. LUCIE PLANT, UNIT NO. 2

Failure of Reactor Coolant Pump Seals Following Station Blackout

We have reviewed the testimony of Frederick George Flugger related to Question B2 of ALAB-537, Failure of Reactor Coolant Pump Seals, provided in the June 22, 1979 submittal to William D. Paton, USNRC, from Norman A. Coll of the law firm of Steel, Hector and Davis (Enclosure 2). The content of this testimony is consistent with the information provided by F. Fehlau, Technical Administrator for Byron, Jackson Pumps, manufacturer of the reactor coolant pumps for the St. Lucie Nuclear Power Plant, Unit 2 at a meeting held on May 16, 1979 between the USNRC, staff and the applicant, Florida Power and Light Company. The testimony of Frederick George Flugger concluded that in the event of a station blackout, which results in a loss of cooling water flow to the cartridge seal assembly of the reactor coolant pump, an appreciable leakage path through the seal assembly to the reactor containment building that could result in a significant loss of primary reactor coolant does not exist. The bases for this conclusion were:

1. All seal components are captured within the seal cartridge assembly and held together by hydraulic and spring forces thereby minimizing the leakage paths.

2. Each of the four seals that comprise the seal assembly is designed to provide sealing against full system pressure.

3. All the components that comprise the seal cartridge assembly, except for the elastomeric U-cups and O-rings, are made of materials that are unaffected by the elevated temperatures resulting from a loss of coolant to the seals.

4. Confined o-rings made of the elastomeric material used on the U-cups and o-rings have been used on flanged joints of a reactor coolant pump hot test loop where they have been subjected to temperatures of 550°F for in excess of 100 hours. The o-rings maintained their sealing capability although hardening and permanent set of the o-rings, as expected, occurred.

Based on our review of the information provided, we agree that the above reasons provide strong basis for acceptance of the conclusion that a significant loss of reactor coolant through the seal cartridge will not occur. However, since no test data on the seal design under expected reactor temperatures and pressures following a station blackout and specifically on the elastomeric seals in the geometry utilized in the seal assembly design is available, it is our recommendation that a confirmatory test on one of the four seal assemblies that comprises the seal cartridge, be performed under expected blackout conditions of temperature, pressure and time to provide the additional verification necessary to determine the adequacy of the reactor coolant pump seal design.

It is our position that the information provided by the applicant in combination with results from the confirmatory test, which show that the loss of coolant through the reactor coolant pump seals during the duration of station blackout is not sufficient to adversely affect natural circulation, provide adequate assurance that the ability to cool the reactor core will be maintained.