LOUISIANA POWER & LIGHT / 142 DELARONDE STREET
P. O. BOX 6008 • NEW ORLEANS, LOUISIANA 70174 • (504) 366-2345
MIDDLE SOUTH UTILITIES SYSTEM

L. V. MAURIN
Vice President Nuclear Operations

April 13, 1982

W3P82-0483
3-A1.01.04
Q-3-A29.20

Mr. Robert L. Tedesco
Assistant Director for Licensing
Division of Licensing
U. S. Nuclear Regulatory Commission
Washington, D. C. 20555

SUBJECT: Waterford 3 SES
Docket No. 50-382
Effluent Treatment Systems Branch (ETSB) Concerns.

Dear Mr. Tedesco:

In the Waterford - 3 SER, the following statements appear on page 11-21;

(1) The containment purge line does not include either an in-line process monitor or an automatic control feature which would terminate the release upon a high radiation signal. It is our position that an in-line monitor is required for the containment purge line and that isolation of the containment purge on a high radiation signal from either the process monitor or the stack monitor be an automatic control feature and not dependent on operator action.

(2) The applicant has indicated that upon a high radiation signal from the normal exhaust monitor of the fuel handling building the plant operator will be alerted to the fact that additional radiation surveys and sampling are required to determine the source of the radioactive leakage. It is our position that, upon a high radiation signal from the normal fuel handling building exhaust should be automatically isolated and release routed through the fuel handling building ESF filter system.

(3) The spent fuel treatment system does not contain any process monitor which alert the plant operator of the buildup of activity in the spent fuel pool. It is our position that such a monitor is required.

(4) The applicant has indicated that the contents of the regenerative waste tank are pumped to the regnerative waste transfer sump.

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From there the wastes are pumped to the waste collection basin #2 (Unit 1 and 2's metal waste pond). There is no radioactivity monitor on this line. It is our position that since this is an unmonitored release point, a radiation monitor will be required to be installed.

The purpose of this letter is to discuss the analyses conducted, and the design and procedural changes that will be made to address each of these concerns. Since Items (2) and (3) are interrelated they are discussed together below.

(1) In accordance with ETSB's request, a design change shall be made to provide Class IE automatic isolation of the containment purge line upon a high radiation signal from the plant stack radiation monitors. The setpoint will be such as to ensure that 10CFR20 dose limits are not exceeded. This is in addition to the existing containment purge line isolated via four radiation monitors located inside containment and the CIAS based on low pressurizer pressure and high containment pressure.

(2) (3) The only "active" mechanism by which significant activity can exist in the Fuel Handling Building (FHB) atmosphere is via a fuel handling accident (FHA) (See FSAR Subsection 15.7.3.4.). Upon occurrence of an FHA, four Class IE area radiation monitors in the Spent Fuel Pool area will alarm in the control room, automatically isolate normal exhaust, and actuate the FHB emergency filtered exhaust system (See FSAR Subsection 9.4.2.2.2).

The only other way significant activity levels can exist in the FHB atmosphere is via a "passive" leak in a spent fuel rod. This is unlikely for two reasons. The first is due to the fact that reactor coolant system (RCS) specific activity is monitored at least once per 72 hours during power, startup, hot-standby, and hot shutdown in accordance with Technical Specification 4.4.8. If a leak was to exist in a fuel bundle, RCS specific activity levels would rise, denoting a fuel problem. Depending upon the severity of the problem, action following the identification of the problems could include special provisions for problem fuel pins following extraction from the core.

The second reason is as follows. Fuel pin leakage takes the form of fission product gases generated during power operation. The generation of these gases creates an internal pressure within a fuel pin. If a fuel pin contains a defect, there is a potential for the combination of fuel pin internal pressure and high fuel temperature to drive the fission product gases outside the fuel bundle. Following extraction from the reactor core, a problem fuel bundle will no longer be subjected to the power conditions causing the generation of fission product gas and its attendent internal pressure. As such, the fuel pin no longer has any significant driving force for leakage (internal pressure, fuel temperature), of mass available to leak (fission product gas). Therefore, a fuel bundle which has caused a problem in the reactor core is not expected to behave significantly different than a "normal" fuel pin in the spent fuel pool. The existence of such a leak, if one did develop, would be detected by the weekly grab samples of the pool, the weekly health physics surveys of the pool area or by the FHB normal exhaust radiation monitors. Furthermore, the operating procedures have been changed to require the operator to isolate the FHB on an alarm from the normal exhaust.

In order to be responsive to the ETSB's concerns, however, an analysis was performed to determine the consequences of the worst case FHB release that would not be detected by the Class IE area monitors described above.

Two release scenarios were considered; (1) an instantaneous release resulting in a radiation level equal to the monitor setpoint of 1 R/hr (FSAR Table 12.3-3) but which would not cause a trip signal to be generated by the Class IE monitors, and (2) a 30 minute continuous release at a concentration which corresponds to the monitor setpoint. All other assumptions were the same as for a fuel handling accident; i.e., the accident occurs 72 hours after shutdown, radial peaking factor of 1.65, overall pool decontamination factor for iodines of 100, design basis meterological and exposure conditions. No credit was taken in either scenario for operator action to isolate the FHB or activate the ESF filtration system during this period.

For the first release scenario the activity necessary to trip the Class IE monitors was calculated to be equal to the noble gas gap inventory in approximately 12 fuel rods in the core at 100% power. The released radionuclides would produce a dose of 13 rem to the thyroid at the exclusion area boundary. For the second release scenario, the corresponding values are 33 rods and 24 rems. The whole body doses are less than 0.1 rem in both scenarios.

It should be noted that in calculating the activity required to trip the monitors, we considered only activity airborne in the FHB and neglected any contribution to the exposure from radiation by the spent fuel pool. This is conservative because should radiation from the pool impinge on the monitors, a smaller amount of airborne activity would be required to trip the monitors, thus reducing the amount of airborne activity available to be wafted out the FHB exhausts, in turn reducing the resultant offsite dose.

The radiological consequences of the postulated scenarios are therefore an order of magnitude lower than the 10CFR100 dose limit of 300 rem to the thyroid and would require that a large number of fuel rods be damaged. Such an event could realistically occur only during refueling operations. An operator would be aware of an accident of this magnitude during such a closely monitored procedure. Damage to any additional number of rods would, of course, be detected and alarmed by the Class IE area monitors which would then isolate the normal ventilation system and actuate the emergency filtration system.

In conclusion, we feel that the combination of the unlikelyhood of a leakage problem developing, the mechanisms already present for detecting leakage, and the insignificance of the consequences of a leak, justify our design as adequate without the addition of more radiation monitors.

(4) When confirmed primary - secondary leakage exists the Steam Generator Blowdown Treatment System filter flush water and dimineralizer regenerative waste will be directed to the radioactive Waste Management System. This resolution was agreed upon during discussions with ETSB on July 7, 1981, and documented in Amendment 23 (11/81) to the FSAR.

It is requested that you consider the above as a response to ETSB. We would appreciate your review and would be happy to discuss it further if you have any questions.

Very truly yours,

L. V. Maurin

LVM/RMF/lgh

cc: E. L. Blake, W. M. Stevenson, S. Black, J. Hayes (NRC ETSB).