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DESCRIPTION:
Ltr requesting change to the Tech Specs for the H. B. Robinson Unit No. 2..........

ENCLOSURES:

ACKNOWLEDGED

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PLANT NAME: H. B. Robinson Unit # 2

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Carolina Power & Light Company

September 13, 1973

File: NG 3514 Serial: NG-73-388

Mr. John F. O'Leary, Director
Directorate of Reactor Licensing
Office of Regulation
U. S. Atomic Energy Commission
Washington, D. C. 20545

50-261

Dear Mr. O'Leary:

H. B. ROBINSON UNIT NO. 2
LICENSE DPR-23
TECHNICAL SPECIFICATION CHANGE REQUEST

Your correspondence of March 27, 1973, informed us of the approval of a change to the Technical Specifications of Operating License No. DPR-23. The approved technical specification required the demonstration of a 99.5% removal efficiency for methyl iodine in a laboratory carbon sample analysis. Subsequent carbon sample analysis of the new carbon installed in the spent fuel exhaust and containment purge exhause systems demonstrated a removal efficiency of only approximately 98%. This necessitated a temporary waiver of this requirement which was effective until July 1, 1973, by authorization of Technical Specification change number 16. Our proposal concerns a change request which would eliminate the problems we have encountered and would also ensure the health and safety of the general public.

We believe that it is important to understand the application of the systems the specification will govern. Our original non-licensed spent fuel handling facility was supplied with an exhaust system with no carbon absorbers.

The analysis of the fuel handling accident assumed the failure of all fuel rods in an assembly. To comply with site boundary dose limitations in the event of a dropped fuel assembly, it became necessary to utilize carbon absorbers in the spent fuel building exhaust system. Ventilation system HVE-15A was installed with subsequent license approval for handling spent fuel in the spent fuel building. The containment purge system was in existence, but also did not have a filter system. The analysis of a fuel handling accident in the containment with the purge system operating necessitated the installation of filters before licensing this operation.

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Having sucessfully complied with the issues of AEC Safety Guide 25 Robinson Unit 2 was granted a license to move spent fuel. The accident applicable to Safety Guide 25 is that of a dropped fuel assembly. The containment purge and spent fuel exhaust systems are not designed to be safeguards exhaust systems that will mitigate the consequences of a Design Basis Accident and are not subject to the extreme conditions and requirements of safeguards exhaust systems utilized elsewhere. This is an important distinction as ambient conditions are significant factors in the efficiency of carbon absorbers. The conditions of humidity and temperature before and after the dropping of a fuel assembly would be relatively the same.

Safety Guide 25 allows a removal efficiency of 90% for inorganic iodine and 70% of organic iodine for carbon absorbers in the accident analysis. With the conservatism available in the other assumptions of Safety Guide 25, it is our position that demonstration of an 85% removal efficiency for organic iodine in the laboratory carbon sample analysis will more than satisfy the Safety Guide requirements. We realize that degradation of the carbon absorber will take place between the time of tests. Available degradation data indicates that adequate margin would exist to ensure that compliance with the Safety Guide is met. We are establishing our own testing program to assure that degradation of the carbon absorber does not exceed that expected.

Referring again to the present Technical Specifications, a condition of a maximum relative humidity of 95% was permitted in the air exhausting through the systems in question. The position taken by the AEC was that a removal efficiency of 98% for methyl iodine at test conditions would result in an efficiency of 70% at a relative humidity of 97%. In view of this we are installing a humidity control system on the exhaust of the spent fuel building. Sizing of this system will be adequate to ensure a maximum relative humidity of 70% in the exhaust air.

Our experience has shown that the relative humidity of the containment atmosphere will not require this humidity control on the containment purge system. Further, the handling of spent fuel in the containment does not require operation of the purge system; therefore, if severe relative humidity existed we would merely not operate the system, in accordance with present Technical Specifications.

In view of these facts, the following changes to the H. B. Robinson Technical Specifications and Basis is requested:

1. Table 4.1.3, Item 16 in Column "Check" replace with:

Check

"Fans functioning at $\geq$ 75% design flow for fan check. DOP and Halon tests on filters to show $\geq$ 99.95% Halon removal and $\geq$ 20% of design flow. Laboratory carbon sample analysis shall demonstrate $\geq$ 85% removal efficiency for radioactive methyl iodine. Laboratory test conditions for carbon sample analysis shall require a face velocity of at least 40 ft/minute, an iodine inlet concentration of at least one Mg/M^3, a temperature of at least 25 degrees C., and a relative humidity as applicable to Technical Specification 3.8.1.i."

2. Paragraph 3.8.1.i., replace with:

"The Spent Fuel Building ventilation system shall be operating when handling irradiated fuel in this area. Prior to and during the time of moving irradiated fuel assemblies in the spent fuel pool, the relative humidity in the exhaust of the spent fuel building shall be less than that for which the impregnated carbon has demonstrated, by lab test, a removal efficiency of $\geq$ 85% for radioactive methyl iodine, and the ventilation system exhaust shall be aligned to discharge through HEPA and impregnated charcoal filters. When in operation during irradiated fuel handling, the exhaust flow of the Containment Purge System shall discharge through HEPA and impregnated charcoal filters, and the relative humidity of the containment atmosphere shall not exceed that for which the impregnated carbon has demonstrated a removal efficiency of $\geq$ 85% for radioactive methyl iodine. When the Containment Purge System is not in operation during irradiated fuel handling, at least one automatic containment isolation valve shall be secured in each line penetrating the containment which provides a direct path from the containment atmosphere to the outside atmosphere."

Reason

Change No. 15 to the Technical Specifications requires that after July 1, 1973, both DOP tests on HEPA filters and Halon tests on charcoal filters be conducted at 100% of design flow. The proposed deletion of full-flow requirements for DOP and Halon testing will facilitate the performance of field inplace tests and will not compromise the quality of the data produced. The purpose of inplace DOP tests is to locate holes in filter media, bypass leakage, improperly seated gaskets, etc. and is not intended to qualify the efficiency of the filter media. Testing at reduced flow does accomplish the intended purpose of the inplace test, and in fact, is more sensitive for this purpose than full flow testing. This position is supported in DRNL-NSIC-65.

With regard to Halon inplace testing, the adequacy of reduced flow testing is not as well recognized and accepted as in the case of DOP testing. The purpose of Halon inplace testing on carbon filters is to locate bypass air leakage around gaskets, through void spaces in carbon cells, etc. and is not intended to determine the quality of carbon for iodine trapping.

To perform the test, Halon is introduced upstream of the carbon filter and measurements made upstream and downstream of the carbon filter for Halon concentrations. The presence of air bypass leakage is indicated by premature appearance of Halon downstream of the carbon filter. To increase the holdup time of Halon by the carbon and prevent rapid gross penetration through the carbon, and thus allow time to determine bypass leakage, it is considered permissible to reduce system air flow. Halon test procedures were developed at the Savannah River Laboratory (SRL) and reported in DP-1082. In order to perform adequate tests at SRL both moisture content and system air flow are reduced during Halon testing. This position of the adequacy of testing at reduced flow is also supported in the AACC Tentative Standard CS-8T.

It is our opinion, based upon the overall technical consideration, that DOP and Halon testing at $\geq$ 20% of design flow will produce the required data to insure that the HEPA and carbon filter systems are sufficiently free of air leakage pathways to comply with the values as stated in the Technical Specifications.

Change No. 16 to the Technical Specifications (Table 4.1-3, Item 16) indicates that laboratory carbon sample analysis shall demonstrate $\geq$ 98% radioactive methyl iodide removal at a face velocity of 40 ft/min. and $\geq$ one mg/M^3 inlet iodine concentration with $\geq$ 70% relative humidity. After July 1, 1973, laboratory carbon sample analysis shall demonstrate $\geq$ 99.5% radioactive methyl iodide removal at the same test conditions.

It is believed that the value of $\geq$ 99.5% for methyl iodide efficiency is excessively restrictive from a technical standpoint. Little, if any, published technical data under comparable test conditions, demonstrate an efficiency of 99.5%. The attached graph illustrates the variations in methyl iodide efficiency as reported for a number of carbons by several investigators. A laboratory test of the impregnated carbon used in the Containment Vessel Purge and Fuel Handling Building Ventilation Systems (MSA85851) under the test conditions as stated above indicated an efficiency of 98.71%. Based upon literature data, it is considered doubtful that properly performed lab tests on any impregnated carbon would produce an efficiency $\geq$ 99.5% under the stated conditions.

It has been reported (ORNL-TM-2860) that impregnated carbons suffer a loss of methyl iodide efficiency upon exposure to air flow. The Containment Vessel Purge and Fuel Handling Building ventilation systems are used several months per year; this exposure to air flow will reduce the methyl iodide somewhat; consequently, it would be impossible to demonstrate an efficiency of 99.5% for the exposed carbon sample. Compliance with the value contained in Change 16 would necessitate replacing the carbon filter after several months' usage. The iodine efficiency of the exposed carbon filters would be unchanged and the methyl iodide efficiency only slightly reduced but still much in excess of the 70% efficiency value utilized in the safety analysis.

The changing of the acceptance criteria for laboratory carbon sample analysis does not represent any decrease in safety margins discussed in the safety analysis of a fuel-handling accident. Credit was taken in the safety analysis for removal of 70% of the organic iodine as per Safety Guide 25. In the safety evaluation for Change No. 16 to the Robinson Technical Specifications and Basis, it was stated that a removal efficiency of 98% of the organic iodine at 70% relative humidity would result in an efficiency of 70% at 97% relative humidity. An additional Specification prohibited fuel handling with a relative humidity $\geq$ 95%. Rather than degrading the expected carbon efficiency (as related to the efficiency determined at 70% relative humidity) to compensate for an unanticipated high relative humidity, it would be technically preferable to demonstrate, by laboratory test, that the methyl iodide efficiency of the carbon would be adequate under the maximum relative humidity expected in the effluent air from the fuel handling building or containment volume.

The requirement of the proposed Technical Specification 3.8.1.i dictates a methyl iodide removal efficiency of $\geq$ 85% be demonstrated by lab test under the relative humidity to be maintained in the exhaust of the spent fuel handling building. This will give more safety margin than was available under the maximum stress conditions permitted by the previous specifications. At the same time, it will permit the operating plant the flexibility of controlling relative humidity or replacing the impregnated carbon.

In conclusion, we believe that the specification requested herein will in no way endanger the health and safety of the general public.

Yours very truly,

E. E. Utley
Vice-President
Bulk Power Supply

SB:DBW:mvp

cc: Messrs. C. D. Barham
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