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March 27, 1984

W3P84-0744

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Director of Nuclear Reactor Regulation
Attention: Mr. G.W. Knighton, Chief
Licensing Branch No. 3
Division of Licensing
Nuclear Regulatory Commission
Washington, D.C. 20555

SUBJECT: Waterford SES Unit No. 3
Docket No. 50-382
Leak Testing of ESF HVAC Ductwork and Housings

Attachment: (1) FSAR Change to Section 6.5.1.4

Dear Sir:

The purpose of this letter is to discuss an FSAR revision regarding the ductwork and housing leak testing performed on the Engineered Safeguards Features atmosphere cleanup systems at Waterford 3. Specifically, this change reflects the fact that testing was performed in accordance with ANSI N509-1980 rather than ANSI N509-1976 as heretofore indicated in the FSAR. This revision neither raises an unreviewed safety question nor requires a change in the relevant draft technical specifications upon which agreement between LP&L and NRC has been reached. LP&L has still chosen to bring this matter formally to your attention as a result of recent discussion on the matter between Mr. Jack Hayes of NRR and Mr. Robert Foley of LP&L. We request that this matter receive your timely attention in light of our rapidly approaching fuel load date.

At the outset it must be emphasized that the issue is only in regard to the ESF atmosphere cleanup system ductwork and housings. The HEPA filters and charcoal adsorbers will be subject to the surveillance requirements of the draft technical specifications as mandated by the NRC. The relevant technical specification surveillance requirements are:

Shield Building Ventilation System (SBVS)	4.6.6.1
Control Room Air Conditioning System (CRACS)	4.7.6
Controlled Ventilation Area System (CVAS)	4.7.7
Fuel Handling Building Ventilation System (FHBS)	4.9.12

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The above tech specs require HEPA and charcoal surveillance in accordance with ANSI N509-1976 and ANSI N510-1975 as endorsed by Regulatory Guide 1.52 Rev. 2 (March 1978).

Leak testing of the ductwork in accordance with ANSI N509-1980 does not raise an unreviewed safety question for the following reasons:

(1) Design, construction and testing of these systems in accordance with ANSI N509-1980 is endorsed by NUREG 0800, Standard Review Plan (SRP) Rev. 2 (July 1981), Section 6.5.1.

(2) The 1976 and 1980 edition both establish leakage criteria based on the limiting of one of the following three general requirements:

- Health Physics
- Air Cleaning Effectiveness
- Ductwork and Housing Quality

The 1976 edition further defines leakage criteria as a function of the following system characteristics:

- Relative location of duct and housing in clean or contaminated areas
- Blow-Through or Draw-Through Unit
- Recirculation or Exhaust Unit

The governing criteria at Waterford 3 for all the above-mentioned ESF atmosphere cleanup systems are the Air Cleaning Effectiveness requirements, and all units are draw-through. An evaluation of the differences in leak testing criteria between the 1976 and 1980 editions as they affect Waterford 3 was therefore done on this basis. A comparison of the total allowable leakage rates, as applicable to the Waterford 3 ESF Systems, in terms of percent of rated flow at internal design pressure for the 1976 and 1980 editions (Section 4.12.1) is given below.

	1976	1980
<u>System</u>	<u>(DW/Housing)</u>	<u>(DW/Housing)</u>
SBVS	0.5/0.02	0.1/0.1
CRACS	0.1/0.02	0.1/0.1
CVAS	0.1/0.02	0.1/0.1
FHBS	0.1/0.02	0.1/0.1

As previously mentioned, the Waterford 3 systems were tested to the criteria of the 1980 edition indicated above. Note also from the above table that the more stringent criteria of Leakage Class I Systems was used in the Waterford 3 tests.

By imposing the 1980 standard, the only area that was changed was testing of the housings (mitigating effect of draw-through systems on housing leakage is discussed in Item 3 below). In fact, use of the later standard imposes much more stringent overall criteria for the SBVS. By lowering the overall acceptable leakage but raising the acceptable housing leakage, the 1980 edition provided increased assurance for the reliability and performance of the ESF systems while simultaneously allowing the use of practical and more accurate methods of determining housing leakage.

(3) According to both the 1976 and 1980 editions, the bases of the air cleaning effectiveness requirements are to prevent:

- Higher airborne concentration of radioactive materials through loss of purging effect
- Inability to maintain the contaminated space under sufficient negative pressure with subsequent unfiltered releases
- Bypassing of filters on once-through systems

These bases are inherently satisfied at Waterford 3 because all units are draw-through, thereby eliminating potential for filter bypass due to housing leakage or loss of purging due to ductwork leakage. Furthermore, the ability of each system to establish and maintain the appropriate positive or negative pressure is verified during the initial system preoperational test and is reverified during Technical Specification surveillance.

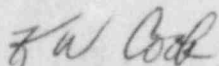
(4) The housing and fans for all the ESF Atmospheric Systems are located in noncontaminated areas.

(5) The Technical Specifications will require that after painting, welding, a chemical release, or fires occur in areas communicating with the ESF Atmospheric Systems, a test of the HEPA and charcoal adsorbers will be required.

(6) All of the ESF HVAC housings have already been leak tested by the vendor to the criteria of the 1976 standard at the factory.

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In summary, by self-imposing the later standard for this aspect of testing, the reliability of the units and the radiological safety of the site personnel and the public have not been decreased. We hope this letter is responsive to any of your staff's concerns regarding the attached FSAR change.



K.W. Cook
Nuclear Support & Licensing Manager

KWC/JH/RMF/pco

Attachment

cc: E.L. Blake, W.M. Stevenson, J.T. Collins, D.M. Crutchfield, J. Wilson,
G.L. Constable, J. Hayes

Charcoal adsorbers are designed and filled with activated charcoal that has been demonstrated to remove more than 99 percent of elemental and organic iodines. Mass of activated charcoal in each air cleaning unit exceeds the basis of a loading of 2.5 mg of iodines per gram of activated charcoal.

ESF air filtration systems are designed and constructed to the recommendations of Regulatory Guide 1.52 with the exceptions delineated in Table 6.5-1.

An analysis to provide delay times up to the depressurization of the controlled ventilation areas by the exhaust fan E-23 following an SIAS shows that depressurization to -0.25 in. w.g. is achieved as shown on Table 6.5-6.

All components of the ESF air filtration systems are designed as seismic Category I. Procurement specifications require and vendors have substantiated through tests, calculations and/or operational data that components will remain operable under safe shutdown earthquake loads.

Dose analyses of postulated accidents are discussed in Chapter 15. Offsite and main control room doses resulting from these accidents are shown to be within the guideline values of 10CFR100 and GDC-19, respectively.

6.5.1.4 Tests and Inspection

Testing and maintenance are considered as primary factors in assuring the reliability and the post accident fission product removal capability of the ESF filter systems. Preoperational and periodic tests will be conducted on all ~~air cleaning systems in accordance with ANSI N 510-1980 to verify that the unit meets the requirements of ANSI Standard N509-1976.~~ Each air cleaning unit is equipped with all necessary sampling and injection ports, instruments and instrument taps to permit the required testing.

Test cannisters containing representative samples of charcoal are located on the adsorber. The samples will be used for the periodic laboratory testing of the adsorber as required by ~~ANSI Standard N510-1980,~~ the Technical Specifications.

6.5.1.5 Instrumentation Requirements

Instrumentation for controlling and monitoring the ESF air filtration systems meets the applicable requirements of standard IEEE-279-1971 and Regulatory Guide 1.52. Each filter train is provided with instrumentation to indicate and alarm pressure drop at the main control room. An arrangement diagram of instrumentation and testing nozzles is provided on Figure 6.5-1. This arrangement is typical for all units except that the main control room and Fuel Handling Building ESF filter trains do not require the demister and its differential pressure taps.

a) Monitoring Instrumentation

Instrumentation provided for sensing and transmitting abnormally high temperatures at the charcoal adsorbers are as follows:

ESF air filtration systems. The preoperational and periodic tests on the HEPA filters and charcoal adsorbers are as required by the plant Technical Specifications. The preoperational in-place leak testing of ductwork and housings is in accordance with the criteria of ANSI N509-1980.