WOLF CREEK
NUCLEAR OPERATING CORPORATION

Bart D. Withers
President and
Chief Executive Officer

October 31, 1988

WM 88-0288

U. S. Nuclear Regulatory Commission
ATTN: Document Control Desk
Mail Station P1-137
Washington, D. C. 20555

Reference: 1) WM 88-0056 dated February 26, 1988, from B. D. Withers, WCNOC to NRC
2) Letter dated October 19, 1988 from D. V. Pickett, NRC to B. D. Withers, WCNOC

Subject: Additional Information Regarding the Proposed Revisions to the Emergency Ventilation/Exhaust System Technical Specifications

Gentlemen:

The purpose of this letter is to provide the additional information requested by Reference 2 to support the NRC Staff review of the propsoed revisions to the Wolf Creek Generating Station Technical Specifications concerning the Emergency Ventilation/Exhaust System. The proposed Technical Specification revisions were transmitted to the NRC by Reference 1.

The attachment to this letter provides Wolf Creek Nuclear Operating Corporation's response to the Staff questions transmitted by Reference 2. The additional information requested by Mr. Douglas Pickett and Charles Nichols of the NRC Staff during a telephone conference on October 27, 1988 has also been provided.

If you have any questions concerning this matter, please contact me or Mr. O. L. Maynard of my staff.

Very truly yours,

B D Withers

Bart D. Withers
President and
Chief Executive Officer

BDW/jad

Attachment

cc: G. W. Allen (NRC), w/a
B. L. Bartlett (NRC), w/a
D. D. Chamberlain (NRC), w/a
J. Y. Lee (NRC), w/a
R. D. Martin (NRC), w/a
C. R. Nichols (NRC), w/a
D. V. Pickett (NRC), w/a (2)

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STATE OF KANSAS)
) SS
COUNTY OF COFFEY)

Bart D. Withers, of lawful age, being first duly sworn upon oath says that he is President and Chief Executive Officer of Wolf Creek Nuclear Operating Corporation; that he has read the foregoing document and knows the content thereof; that he has executed that same for and on behalf of said Corporation with full power and authority to do so; and that the facts therein stated are true and correct to the best of his knowledge, information and belief.

By B D Withers
Bart D. Withers
President and Chief Executive Officer

SUBSCRIBED and sworn to before me this 31 day of October, 1988.

Marline Heathman
Notary Public

MARLINE HEATHMAN NOTARY PUBLIC STATE OF KANSAS

Expiration Date August 4, 1990

Additional Information Regarding the Proposed Revisions to the Emergency Ventilation/Exhaust System Technical Specifications

Question 1

Justify deleting the maintenance surveillance requirements under technical specifiction 3/4.7.6.c.1. This concerns the pressure differential verification across the filters for the filtration system and pressurization system.

Response

Technical Specifications 3/4.7.6.c.1 and 3/4.9.13.b.1 are intended to verify that the in-place penetration and bypass leakage meet the required acceptance criteria. These specifications were not intended to verify system flow rate requirements at a given pressure drop. System flow rate requirements at a given pressure drop are verified in specifications 3/4.7.6.c.3 and 3/4.9.13.b.3. The current Wolf Creek Generating Station (WCGS) Technical Specifications include the unnecessary and confusing duplication of the system flow pressure drop testing requirements in conjunction with in-place leakage and bypass testing.

The proposed technical specification changes separate unrelated testing requirements into individual paragraphs within the same technical specifications. The proposed changes to Technical Specifications 3/4.7.6.c.1 and 3/4.9.13.b.1 are in accordance with the current revision of the Westinghouse Standard Technical Specifications (NUREG-0452) and meet the requirements of Generic Letter 83-13.

Question 2

Justify deleting the dirty filter pressure differential verification under technical specification 4.9.13.b.1.

Response

See Response to Question 1.

Question 3

Discuss why the exhaust fan flow rate must be changed from 9000 cfm to 6500 cfm in the fuel building.

Response

The emergency exhaust system for the fuel building and auxiliary building is serviced by the same fans (CGG02A and CGG02B). Since a flow reduction is required for the auxiliary building the same flow change must be made for the fuel building flow rates.

Question 4

Justify with the bases that the accident releases are adequately controlled during postulated accident conditions at the new negative pressure levels in the auxiliary building and fuel building.

Response

The negative pressure level limits in the auxiliary building and fuel building are not affected by the proposed technical specification changes. The negative pressure requirement of -0.25 inches W.G. ensures the exfiltration from the buildings does not occur. During accident conditions effluents form these buildings are processed through safety-related filter/adsorber units prior to release via the unit vent.

Question 5

What is the thickness of the charcoal beds for each filter and their assigned iodine removal efficiencies? Verify with bases that at the revised flow rates the system complies with Regulatory Guide (RG) 1.52 Postion 3i (at least .25 sec/2 inch of adsorbent bed).

Response

Each of the filter charcoal beds is composed of multiple charcoal sections each of which is two inches thick. Although these charcoal beds have iodine removal efficiencies of up to 99.9 percent for elemental iodine, a conservative removal efficiency of 90 percent has been assigned for use in accident analyses. The approximate quantity of activated charcoal in each filtration unit is presented in Updated Safety Analysis Report Table 9.4-4.

WCGS continues to comply with Position 3i of Regulatory Guide (R.G.)1.52. For the Emergency Exhaust System the proposed reduction in flow will result in an increase in the "residence time" of effluent in the charcoal bed (0.25 sec/2 in. minimum).

The Control Room Pressurization System was designed to meet the R.G. 1.52 minimum "residence time" at a flow rate of 1000 cfm. Therefore, although the proposed increase in pressurization flow from 500 cfm to 750 cfm will decrease the "residence time" from its current value, any flow rate equal to or less than 1000 cfm ensures a "residence time" of at least 0.25 sec/2 in. in accordance with R.G. 1.52.

Question 6

Provide unfiltered in-leakage flow rates due to the ingress and egress, per SRP 6.4.III.3.d.3, for use in dose calculations.

Response

The control room dose calculations performed for Wolf Creek Generating Station (WCGS) assume no unfiltered in leakage as a result of control room ingress and egress.

As noted in NUREG 0800, Standard Review Plan; Section 6.4.III.3.d.(3), 10 cfm infiltration is normally assumed for conservatism, however, this flow could be reduced or eliminated if assurance that backflow (primarily as a result of ingress and egress) will not occur. The WCGS control room design provides this assurance by utilizing a two-door vestibule configuration.

CONTROL ROOM HABITABILITY

As discussed in Updated Safety Analysis Report (USAR) Section 9.4, Control Building HVAC and 6.4, Habitability Systems, the design basis for the Control Room Emergency Ventilation system is to ensure that the Control Room remains habitable throughout the duration of any of the postulated Design Base Accidents (DBAs) discussed in USAR Chapter 15.

An evaluation of the radiological consequences associated with the Accident Analyses presented in USAR Chapter 15 is provided in Appendix 15A of the USAR. In regards to the radiological consequences associated with the Control Room, only the radiation doses to the Control Room due to a postulated Loss of Coolant Accident (LOCA) are addressed. The reason for addressing only the LOCA condition is that a study of all the radiological consequences in the Control Room, due to the various postulated accidents, resulted in the LOCA as being the limiting case.

The radiological consequences of the postulated LOCA doses in the Control Room are identified in USAR Section 15A.3. A Control Room Ventilation Isolation Signal (CRVIS) starts both trains of the Control Room Pressurization and the Control Room Filtration systems. The USAR indicates that, in determining the dose to the Control Room personnel, the worst case single failure has been ascertained to be the failure of the filtration fan in one of the two filtration system trains. During this condition, a potential pathway exists allowing air from the Control Building to enter the Control Room, bypassing the Control Room filtration filters. In consideration of the above single failure, the accident analysis assumes that operator action will occur in 30 minutes to isolate the train with the failed filtration fan. At the same time, one train of the Control Room pressurization system will also be isolated. After isolation, one Control Room Pressurization fan and one Control Room Filtration fan are assumed to operate for the duration of the accident.

The parameters utilized in the Accident Analysis are presented in USAR Table 15A-1. The filtered intake to the Control Building is assumed to be 1000 cfm prior to operator action and is reduced to 500 cfm after 30 minutes. The filtered and unfiltered flows from the control building are each assumed to be 400 cfm. A revised LOCA dose analysis has been performed. In the revised analysis, the assumed, filtered Control Building intake flow increased to 2000 cfm prior to operator action and 1000 cfm following operator action, and the filtered and unfiltered flow from the Control Building to the Control Room each increased from 400 cfm to 440 cfm. All other assumed parameters remain unchanged. The resultant Control Room thyroid dose to the operators would be less than those presently identified in USAR Table 15.6-8, while the associated Whole-Body and Beta skin dose would increase slightly. However, all Control Room doses remain well below General Design Criteria-19 limits. The Control Room doses are provided in the attached markup to USAR Table 15.6-8.

The proposed Technical Specification change increases the Control Building flow to 750 cfm, not the 1000 cfm assumed in the analysis. Therefore, the proposed changes reflected in the attached USAR Tables 15.A-1 and 15.6-8 provide a bounding case.

WOLF CREEK

TABLE 15.6-8

RADIOLOGICAL CONSEQUENCES OF A
LOSS-OF-COOLANT-ACCIDENT

	Doses (rem)
I. Exclusion Area Boundary (0-2 hr)	
a. Containment leakage (0-2 hr)	
Thyroid	65
Whole body	2.2
b. ECCS recirc. leakage (0.47 hr-2 hr)	
Thyroid	20
Whole body	0.061
II. Low Population Zone Outer Boundary (0-30 day)	
a. Containment leakage (0-30 day)	
Thyroid	42
Whole body	0.78
b. ECCS recirc. leakage (0.47 hr-30 day)	
Thyroid	45
Whole body	0.045
III. Control Room (0-30 day)	
a. Containment leakage (0-30 day)	
Thyroid	~~11~~ 9.16
Whole body	~~0.31~~ 0.36
Beta-skin	~~5.5~~ 6.29
b. ECCS recirc. leakage (0.47 hr-30 day)	
Thyroid	~~1.7~~ 1.33
Whole body	~~6.0E-5~~ 5.0E-5
Beta-skin	~~5.3E-4~~ 4.4E-4

Rev. 0

WOLF CREEK

TABLE 15A-1

PARAMETERS USED IN ACCIDENT ANALYSIS

I. General	
1. Core power level, Mwt	3565
2. Full-power operation, days	1000
3. Number of fuel assemblies in the core	193
4. Maximum radial peaking factor	1.65
5. Percentage of failed fuel	1.0
6. Steam generator tube leak, lb/hr	500
II. Sources	
1. Core inventories, Ci	Table 15A-3
2. Gap inventories, Ci	Table 15A-3
3. Primary coolant specific activities, μCi/gm	Table 11.1-5
4. Primary coolant activity, technical specification limit for iodines - I-131 dose equivalent, μCi/gm	1.0
5. Secondary coolant activity technical specification limit for iodines - I-131 dose equivalent, μCi/gm	0.1
III. Activity Release Parameters	
1. Free volume of containment, ft^3	2.5×10^6
2. Containment leak rate	
i. 0-24 hours, % per day	0.2
ii. after 24 hrs, % per day	0.1
IV. Control Room Dose Analysis (for LOCA)	
1. Control building	
i. Mixing volume, cf	150,000
ii. Filtered intake, cfm	
Prior to operator action (0-30 minutes)	~~1000~~ 2000
After operator action (30 minutes - 720 hours)	~~500~~ 1000
iii. Unfiltered inleakage, cfm	300
iv. Filter efficiency (all forms of iodine), %	90

WOLF CREEK

TABLE 15A-1 (Sheet 2)

2.	Control room		
	i.	Volume, cf	100,000
	ii.	Filtered flow from control building, cfm	~~400~~ 440
	iii.	Unfiltered flow from control building, cfm	
		Prior to operator action (0-30 minutes)	~~400~~ 440
		After operator action (30 minutes - 720 hours)	0
	iv.	Filtered recirculation, cfm	~~1600~~ 1560
	v.	Filter efficiency (all forms of iodine), %	90

V. Miscellaneous

1.	Atmospheric dispersion factors, χ/Q sec/m^3		Table 15A-2
2.	Dose conversion factors		
	i.	total body and beta skin, rem-meter^3/Ci-sec	Table 15A-4
	ii.	thyroid, rem/Ci	Table 15A-4
3.	Breathing rates, meter^3/sec		
	i.	control room at all times	3.47×10^{-4}
	ii.	offsite	
		0-8 hrs	3.47×10^{-4}
		8-24 hrs	1.75×10^{-4}
		24-720 hrs	2.32×10^{-4}
4.	Control room occupancy fractions		
	0-24 hrs		1.0
	24-96 hrs		0.6
	96-720 hrs		0.4