



VIRGINIA POLYTECHNIC INSTITUTE AND STATE UNIVERSITY

Blacksburg, Virginia 24061

NUCLEAR ACTIVATION ANALYSIS LABORATORY

August 1, 1980

Mr. J. Wilson
U.S. Nuclear Regulatory Commission
Standardization and Special Projects Branch
Division of Licensing
Washington D.C. 20555

Dear Sir:

The following data is enclosed in response to a request by Mr. Millard Wohl via telephone conversation.

Maximum calculated Argon-41 release rate is 5.5 x 10^-5 Ci/sec.
Volumetric flow rate measured in the stack is 2117 ft^3/min;
conversion to ml/sec:

(2117 ft^3/min) (2.83 x 10^4 ml/ft^3) (1min/60 sec) = 9.99 x 10^5 ml/sec

Calculation of maximum concentration leaving the stack and entering the booster fan.

5.5 x 10^-5 Ci/sec = 5.5 x 10^-11 Ci/ml or 5.5 x 10^-5 uCi/ml
9.99 x 10^5 ml/sec

Booster Fan Dilution Factor

The volumetric flow rate of the booster fan is 12,700 ft^3/min. The booster fan provides the following dilution:

(5.5 x 10^-5 uCi/ml) (2117 ft^3/min / 12,700 ft^3/min) = 9.17 x 10^-6 uCi/ml

Maximum yearly release allowed assuming 4 x 10^-8 uCi/ml released continuously to an unrestricted area:

(4 x 10^-8 uCi/ml) (9.99 x 10^5 ml/sec) (3.15 x 10^7 sec/year) = 1.26 Ci/yr

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Calculation of environmental dispersion factor:

The current Technical Specifications allow us to exhaust up to 315 Ci/yr not to exceed a release rate of 1×10^{-4} Ci/sec. (note also the enclosed safety evaluation done by the Commission)

Therefore we assume a dispersion factor of:

$$\frac{1.26 \text{ Ci/yr}}{315 \text{ Ci/yr}} = \boxed{4 \times 10^{-3}}$$

Calculation of maximum concentration released to an unrestricted area considering the environmental dispersion factor:

$$(9.17 \times 10^{-6} \text{ } \mu\text{Ci/ml}) (4 \times 10^{-3}) = \boxed{3.67 \times 10^{-8} \text{ } \mu\text{Ci/ml}}$$

This assumes we operate the reactor 24 hours a day, 365 days a year. Our actual operating schedule is 8 hours a day, 5 days a week maximum. Therefore averaging this concentration over the year yields: (10CFR 20.106 (a)):

$$(3.67 \times 10^{-8} \text{ } \mu\text{Ci/ml}) \left(\frac{2086 \text{ hr./yr}}{8760 \text{ hr./yr}} \right) = \boxed{8.74 \times 10^{-9} \text{ } \mu\text{Ci/ml}}$$

Sincerely yours,



Alan P. Curtner
Reactor Supervisor

APC/fbl

Enclosure: Safety Evaluation by the Division of Reactor Licensing

cc: Dr. T. F. Parkinson, Director NRL
Dr. A. K. Furr, Deputy Director NRL
Mr. R. D. Mogle, Radiation Safety Officer
Dr. R. H. Miller, Chairman, Reactor Safety Committee