

Washington State University

Nuclear Radiation Center, Pullman, Washington 99164-1300 / 509-335-8641

March 12, 1991

Marvin M. Mendonca
Sr. Project Mgr., Non-Power Reactors
Office of Nuclear Regulatory Regulation
U.S. Nuclear Regulatory Commission
Washington, DC 20555

Dear Mr. Mendonca,

In response to your letter of February 14, 1991, concerning the requested amendment to Section 3.12 of the WSU reactor facility Technical Specifications, the following information is provided:

Historical Information

Attached is a copy of Section 3.12 of the proposed Technical Specifications for the WSU TRIGA reactor facility that was submitted when the facility was relicensed in 1979. Also attached is a copy of the section of the Environmental Impact Appraisal concerning radiation levels that was also submitted during the relicensing process. At the time, there were no Federal requirements relating to ALARA criteria for non-power reactors and I do not believe any have been more recently established. Section 3.12 of the proposed and existing Facility Technical Specifications are really self-imposed limits and criteria to minimize the impact of the operation of the facility on the radiation levels in the vicinity of the facility.

The requirements of Section 3.12(2) were self-imposed criteria that were arbitrarily selected to demonstrate that "fencepost dose" at the closest point of extended occupancy was not significantly increased by the operation of the facility. The specified location was an old student housing complex that has since been torn down and thus the closest housing area is now further away from the facility. Nonetheless, we have continued to monitor the old housing area and to check the exposure in this area with background as required by 3.12(2).

General Response

The facility does not feel that it is appropriate to describe in detail all aspects of the self-imposed environmental monitoring program in writing to the Commission other than already described in the EIR. To do so would turn a voluntary system into a requirement that we could not alter in any way. Thus, we will only describe the system in very general terms and the old and newly proposed ALARA criteria in Section 3.12(2). Information on the calculation of the standard deviation of a set of data is contained in any good textbook on statistics, including "Applied General Statistics" by Croxton, Crowdin and Klein.

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Description of Monitoring System

The radiation levels at the facility, near the facility, on campus and in the Pullman area are monitored on a quarterly basis using commercial TLD-type dosimeters. The exposure measured by the TLD dosimeters at distances of from about 300 to 1200 meters from the facility are averaged to yield a background radiation level in terms of $\mu\text{R}/\text{day}$. A number of TLD dosimeters in the old student housing complex are averaged to determine the exposure rate in $\mu\text{R}/\text{day}$ in this area. The exposure rate at the old housing complex has never exceeded the background exposure rate by more than 5% on a yearly basis over the past ten years. The present Section 3.12(2) limit is 20% increase.

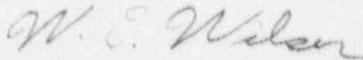
Statistical Analysis of Data

A statistical analysis of six months of typical TLD data yielded a background exposure rate of $165 \mu\text{R}/\text{day}$. The measured standard deviation of this data set was $\pm 16 \mu\text{R}/\text{day}$. The exposure rate at the old student housing complex for the same period of time was $160 \mu\text{R}/\text{day}$. Thus, the old 3.12(2) criteria of 20% yields an allowable difference of $32 \mu\text{R}/\text{day}$ and a two-sigma criteria also yields an allowable difference of $32 \mu\text{R}/\text{day}$. The only difference between the two criteria is that the 20% is an arbitrary limit and the two-sigma limit has a statistical basis as outlined in the amendment request.

Final Comments

Since the old 3.12(2) criteria and the new proposed limit yield equivalent results, the facility is willing to retain the old criteria if the Commission would prefer to retain the existing criteria.

Sincerely,



W.E. Wilson
Associate Director

Enclosure
WEW:crc