UNITED STATES
NUCLEAR REGULATORY COMMISSION
WASHINGTON, D.C. 20555-0001

SAFETY EVALUATION BY THE OFFICE OF NUCLEAR REACTOR REGULATION

SUPPORTING AMENDMENT NO. 17 TO

AMENDED FACILITY OPERATING LICENSE NO. R-106

OREGON STATE UNIVERSITY

DOCKET NO. 50-243

## 1.0 INTRODUCTION

By letter dated July 27, 1998, as supplemented on September 30, 1998, Oregon State University (OSU or the licensee) submitted a request for amendment of the Technical Specifications (TSs), Appendix A, to Amended Facility Operating License No. R-106 for the OSU TRIGA Research Reactor (OSTR). The requested amendment would clarify the quantity and type of material in experiments that could be released in the unlikely event of an experiment failure.

## 2.0 EVALUATION

The licensee has requested amendment of TS 3.8 e. concerning limitations on experiments. TS 3.8 e. and the bases of the TS currently read:

e. Where the possibility exists that the failure of an experiment (except fueled experiments) under (1) normal operating conditions of the experiment or reactor, (2) credible accident conditions in the reactor, or (3) possible accident conditions in the experiment, could release radioactive gases or aerosols to the reactor bay or the unrestricted area, the quantity and type of material in the experiment shall be limited such that the airborne concentration of radioactivity in the reactor bay and the unrestricted area will not exceed the applicable regulatory concentration limits in 10 CFR Part 20, assuming 100% of the gases or aerosols escape from the experiment.

Bases

e. This specification is intended to reduce the likelihood that airborne radioactivity in excess of the limits in Appendix B of 10 CFR Part 20 will be released to the reactor bay and unrestricted area surrounding the OSTR.

The licensee has proposed that the TS and bases be amended to read:

e. Where the possibility exists that the failure of an experiment (except fueled experiments) under (1) normal operating conditions of the experiment or reactor, (2) credible accident conditions in the reactor, or (3) possible accident conditions in the experiment could release radioactive gases or aerosols to the reactor bay or the unrestricted area, the quantity and type of material in the experiment shall be limited such that the airborne radioactivity in the reactor bay or the unrestricted area will not result in exceeding the applicable dose limits in 10 CFR 20, assuming 100% of the gases or aerosols escape from the experiment.

Bases

e. This specification is intended to meet the purpose of 10 CFR 20 by reducing the likelihood that released airborne radioactivity to the reactor bay or unrestricted area surrounding the OSTR will result in exceeding the total dose limits to an individual as specified in 10 CFR 20.

The licensee has proposed clarifying the TS by basing the TS on dose instead of concentrations of radioactive material. The purpose of this TS is to limit doses to members of the public and the OSTR staff to 10 CFR Part 20 limits in the unlikely event that an experiment were to fail and release airborne radioactive material into the reactor confinement and subsequently to the environment. Doses to members of the reactor staff and members of the public from accidents at research reactors are limited to the doses given in 10 CFR Part 20 because 10 CFR Part 100 is not applicable to research reactors.

The current TS is based on radioactivity concentrations. For occupational exposures, the annual limit on intake (ALI) is the annual intake that would result in either a committed effective dose equivalent of 5 rem (stochastic ALI) or a committed dose equivalent of 50 rem to an organ or tissue (non-stochastic ALI). The derived air concentration values in Table 1 of Appendix B to 10 CFR Part 20 are based on dividing the ALI by 2000 working hours per year and is intended to control chronic occupational exposures. For non-occupational exposure (members of the public), the effluent concentrations given in Table 2 of Appendix B to 10 CFR Part 20 are equivalent to the radionuclide concentration, which, if inhaled continually over the course of a year, would produce a total effective dose equivalent of 0.05 rem. The licensee's proposed wording would be based on dose limits directly.

The licensee is concerned that the TS as currently written could be interpreted to limit releases to the instantaneous concentration of airborne radioactive material in the reactor confinement and unrestricted areas. This interpretation would ignore the time integral aspects of the concentration limits given in 10 CFR Part 20, as discussed above. For a particular experiment failure event, it is possible to exceed the concentration limits in 10 CFR Part 20, while the resulting dose would be a small fraction of the dose limits.

The NRC staff notes that the proposed wording of the TS is more encompassing because a TS based on dose would also include consideration of radiation shine from a cloud of radioactive material. This proposed change to the TSs is acceptable to the staff because the dose to members of the reactor staff and members of the public from the accidental failure of experiments will be within the limits given in 10 CFR Part 20 and because the proposed wording clarifies the TS.

## 3.0 ENVIRONMENTAL CONSIDERATION

This amendment involves changes in the installation or use of a facility component located within the restricted area as defined in 10 CFR Part 20 or changes in inspection and surveillance requirements. The staff has determined that this amendment involves no significant increase in the amounts, and no significant change in the types, of any effluents that may be released off site, and no significant increase in individual or cumulative occupational radiation exposure. Accordingly, this amendment meets the eligibility criteria for categorical exclusion set forth in 10 CFR 51.22(c)(9). Pursuant to 10 CFR 51.22(b), no environmental impact statement or environmental assessment need be prepared in connection with the issuance of this amendment.

## 4.0 CONCLUSION

The staff has concluded, on the basis of the considerations discussed above, that (1) because the amendment does not involve a significant increase in the probability or consequences of accidents previously evaluated, or create the possibility of a new or different kind of accident from any accident previously evaluated, and does not involve a significant reduction in a margin of safety, the amendment does not involve a significant hazards consideration; (2) there is reasonable assurance that the health and safety of the public will not be endangered by the proposed activities; and (3) such activities will be conducted in compliance with the Commission's regulations and the issuance of this amendment will not be inimical to the common defense and security or the health and safety of the public.

Principal Contributor: A. Adams, Jr.

Date: