



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

SAFETY EVALUATION BY THE  
OFFICE OF NUCLEAR REACTOR REGULATION  
SUPPORTING AMENDMENT NO. 35 TO  
FACILITY OPERATING LICENSE NO. R-67  
GA TECHNOLOGIES, INC.  
DOCKET NO. 50-163

I. Introduction

In a letter from GA Technologies, Inc. (GA), dated January 28, 1986, GA requested a change in the Technical Specifications of Operating License No. R-67 for their TRIGA Mark F non-power reactor. This change relates to the use of fueled in-core thermionic direct conversion experimental devices. The requested change would increase the authorized irradiation time of such devices from a maximum of 10,000 hours to a maximum of 20,000 hours. A similar change had been previously reviewed and approved in the Technical Specifications for a similar GA TRIGA reactor, Docket No. 50-227, which has been decommissioned.

II. Background

GA initially designed and remains the sole vendor for the TRIGA family of non-power research reactors. In addition, they have installed several such reactors and operated them in their facilities under Nuclear Regulatory Commission operating licenses. One of these, a Mark III, was devoted primarily to tests of thermionic direct conversion devices for the production of electricity for specialized purposes. That Mark III was operated under Operating License No. R-100, Docket No. 50-227, from approximately 1966 to 1973, when it was decommissioned. In recent years, the continued development of these direct conversion devices has been resumed, using a very similar Mark F reactor, which has been in operation since the early 1960s. During the years of experimentation on the direct conversion devices, there have been no significant malfunctions or deviations from their predicted operations that raised unreviewed safety questions.

### III. Requested Change and Evaluation

The specific change requested by the licensee is to section 10.2.6(d) of the Technical Specifications, as follows:

The irradiation time for any one device shall not exceed 20,000 hours.

The current section 10.2.6(d) limits the maximum irradiation time to 10,000 hours. In justifying this request, the licensee pointed out that other Technical Specification limitations on the operation and monitoring of the thermionic devices would remain in effect, and referred to the License Conditions of the previous Mark III license R-100. The staff has reviewed the safety analyses and the related safety evaluations for that facility. Among other considerations, the safety report (GA 9622, December, 1970) analyzes potential accidents that might involve the thermionic devices. In the licensee's analyses related to the duration of irradiation and the consequent inventory of fission products in such a device, it was assumed that operation would be for 20,000 hours. None of the assumed accident scenarios would have lead to radiological exposures in unrestricted areas that exceeded 10 CFR 20 values. On the basis of the staff's safety evaluation for the Mark III reactor it was found that operation for 20,000 hours was acceptable, and that reactor's license authorized such operation. The staff's review for the current amendment request indicates that all relevant operating conditions of the Mark F and Mark III reactors and the thermionic devices are sufficiently similar so that we reaffirm the previous conclusion that operation of the devices for 20,000 hours does not present an unacceptable risk to the health and safety of the public.

### IV. Environmental Considerations

This amendment involves changes in the installation or use of facility components located within the restricted area, as defined in 10 CFR Part 20, and changes in inspection and surveillance requirements. The staff has determined that: (1) the amendment involves no significant hazards consideration (as discussed below), (2) there is no significant change in the types or significant increase in the amounts of any effluents that may be released offsite, and (3) there is 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.

V. Conclusion

The staff has concluded, based on 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; or involve a significant reduction in a margin of safety, this amendment involves no 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 the health and safety of the public.

Dated: February 20, 1986

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