

3.2. IMPROVEMENT OF ROTARY SPECIMEN RACK DESIGN, J. M. Batch, A. J. Gietzen  
(San Diego, California)

ABSTRACT

A redesign and verification test program has been completed on a new Rotary Specimen Rack ("Lazy Susan") design for the TRIGA Mark III. The purpose of the redesign was to solve a rotation problem which occurred at power levels of about 1 MW and above.

The previous redesign effort on the Mark II-type lazy susan was made in 1967 when the bearing was changed to use stellite balls, spring-type separators and stainless-steel bearing races. An extensive test program at that time showed that the design gave excellent service under all anticipated operating conditions. Fifteen of these units have been installed in the past ten years and have been essentially trouble-free. Although the bearing design for the Mark III was very similar, the component layout was such that irradiation-induced heating with associated thermal expansion resulted in decreased bearing clearance and an increase in the required driving torque.

The solution involved redesign and re-arrangement of the rack drive mechanism. A series of stringent operational proof tests were made under high temperature and temperature differential conditions which proved successful operation of the new design. The severe conditions under which these tests were performed uncovered further difficulties with the bearing and led to a re-evaluation of the bearing design.

A new design was developed in which the spring separators were replaced by similar sized, cylindrical graphite spacers. The entire series of operational and life tests were repeated and the performance was outstanding. Acceptable wear characteristics of the spacers were verified and the bearing was noticeably smoother and quieter than with previous designs.

A Mark III lazy susan of this new design was installed in a TRIGA about one year ago and operated at power levels up to 2 MW with excellent performance. The Mark II design has now been changed to incorporate the new drive and bearing design proven for the Mark III.