Upgrading and Refurbishing of Secondary Cooling System and Air Monitor

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ABSTRACT

The USGS TRIGA Mk I has been in operation over 36 years and during that time there have been a number of systems that have needed some degree of overhauling or replacement. Financial constraints have pressed us to primarily use upgrading and refurbishment instead of replacement. Two such systems that will be addressed in this presentation are the secondary cooling system and the continuous air monitor.

The secondary cooling system was facing several problems: 1) worn and corroded secondary pump, 2) corroded secondary water tank, and 3) significant corrosion and worn bearings on the evaporative cooling tower. These concerns were addressed by: 1) replacing the secondary pump and motor ($4560), 2) cleaning, patching, and coating the secondary tank ($4760), and 3) refurbishing the cooling tower with a thorough cleaning, regalvanizing, coating, and replacement of the fill, fan bearings, and belts ($14,830). This work was performed under the authorization of 10 CFR 50.59. Total cost of the work was $24,150.

The continuous air monitor (CAM) was a circa-1968, single channel beta/gamma monitor with a fixed filter. In its early years of operation the moving vane air pump was replaced with a positive displacement (Roots-type) blower that was much more reliable. Over a couple of decades the electronics of the instrument became increasingly unstable and replacement parts could no longer be purchased. Specifications were engineered for replacement electronics and a custom replacement package was assembled. The new electronics not only duplicated the functions of the original system but also provided reduced maintenance, improved reliability, and a new scaler function. This work was performed under the authorization of 10 CFR 50.59. The new electronics package cost $1,875.