



Merrick & Company designed a Tritium Management System (TMS) for Building 870 at DOE's Sandia National Laboratory. The TMS was part of the Neutron Generator Facility (NGF), which was a non-nuclear consolidation project to transfer the production of neutron generators from the Pinellas Plant in Largo, Florida, and switch tubes from the EG&G facility in Salem, Massachusetts, to SNL in Albuquerque, New Mexico.

The TMS provided tritium removal from process gases generated in the production areas, maintenance areas, and analytical areas of Building 870. The building required extensive renovations and additions to provide a separate room for the TMS. The room was located within the tritium boundary to provide confinement for all the systems and equipment that potentially handled, or may be exposed to, tritium.

The TMS was a tritium-removal system that used the catalytic conversion of all hydrogen isotopes in the process gases to water, and all organic materials to water and carbon dioxide. The neutron generator components were subjected to a series of cleaning and degreasing operations, some of which included halogens in the cleaning/degreasing fluids. Then the components were dried, but trace quantities of these compounds could still be released into the effluent gases. The product water from oxidation was absorbed on molecular sieve dryers. Once the tritium content was below accepted standards, the remaining gaseous effluent was discharged to the stack. Process gases requiring treatment consisted primarily of purge gases, vacuum pump effluent, and analytical instrument effluent.

The Tritium Management Instrumentation and Control System (TMICS) provided automatic control and data acquisition of the TMS. Upon the loss of a utility, a component, or a subassembly, the TMS and TMICS were designed to fail safe. The system was designed with redundancy for optimal reliability.

The TMICS consisted of a programmable logic controller (PLC), a personal computer with color monitor, a printer/plotter, transducers, controllers, annunciator panels, and necessary software. The TMICS software also provided the capability for data trending, data archival, and report generation functions.

