



Merrick & Company provided detailed design, fabrication, systems integration and testing, and installation/ testing support for the 10 meter Small Angle Neutron Scattering Spectrometer (SANS) for the National Institute of Standards and Technology (NIST) in Gaithersburg, MD. The 10m SANS was installed at the Neutron Guide Number 1 (NG1) at the NIST Center for Neutron Research (NCNR). The purpose of the system is to detect small angle neutron scattering of monochromatized neutrons from a broad variety of scientific samples. Scientists of various backgrounds will use the 10m SANS to perform state-of-the-art chemical, physical, and biological research.

Merrick's scope of work was subdivided into 16 subtasks:

- Task 01: Requirements Analysis: Identified overall scope of engineering effort and defined overall project plan.
- Task 02: Cost/Cost-Performance Trade-Off Analysis: Utilizing information gained in Task 01 and existing design, produced a report listing which components may be purchased (ie, off-the-shelf item) or could require custom design.
- Task 03: Technology Conceptual Designs: Make/buy decisions (established in Task 02) were performed under this task.
- Task 04: Computer Aided Design: Design of 10m SANS was completed up to 90% level.
- Task 05: Design Study and Analysis Task: At 90% completion point a Manufacturability Review was held on the design.
- Task 06: High Level Detailed Specification Preparation: Final design was accomplished after Task 05 design study and analysis and after review by NIST at the 90% design level.
- Task 07: Configuration Management and Control: Provided a listing of drawings and status in a format compatible with NIST's Co-Create™ Work-Manager™ document control system.
- Tasks 08-12: Fabrication and Fabrication Supervision: Provided procurement and fabrication oversight for major components of 10M SANS: flight chambers, velocity selector, filter section, detector chamber, and sample environment assembly.
- Task 13: Assembly at NIST: Provided technical assistance to NIST in the installation of the instrument.
- Task 14: Testing of First Article: Provided technical assistance to NIST in performing Sub/Full Assembly Functional Acceptance Tests (FAT).
- Task 15: Testing and Certification of System Safety: Prepared test report documenting results/acceptance of Functional Acceptance Tests.
- Task 16: Final Reporting: Completed outstanding documentation including Final Test Report, O&M Manuals, and Spare Parts List.

