

National Aeronautics and Space Administration

LYNDON B. JOHNSON SPACE CENTER
WHITE SANDS TEST FACILITY



GSE DEMONSTRATION AND PROCEDURE DEVELOPMENT

SUMMARY

The White Sands Test Facility (WSTF) can design, fabricate and test ground support equipment (GSE), which can be used in concert with the conduct of potentially hazardous testing. GSE can also be designed and fabricated to support pre-launch, launch, and de-servicing operations to meet customer specified requirements.

EXPERIENCE

Often GSE is developed and must be tested in conjunction with propulsion systems. WSTF has experience designing, fabricating, and testing GSE to support many programs. Recent examples include both vendor- and WSTF-designed GSE for the Air Force's Minuteman III Propulsion System Rocket Engine (PSRE) Qualification Testing, newly developed GSE and procedures for ongoing Shuttle processing, refurbished and modified GSE for Shuttle Processing, and development and checkout of GSE for loading hypergolic propellants at a remote launch facility for the DOD. WSTF also develops procedures using supplied GSE or GSE developed at WSTF to meet customer-specified test requirements. Procedures have been developed to reduce turnaround time and costs based on customer test requirements. Experience has included high pressure gas systems, hypergolic rocket propellant systems, decontamination and cleaning systems, and cryogenic systems.

FACILITY CAPABILITIES

Shop areas ranging from class 100 clean-rooms to industrial work areas support the design and fabrication of GSE. Test and verification of the GSE is highly dependent on customer requirements, but can include servicing and test of high-fidelity test articles in flight-like environments. Test facilities consist of permanent test cells that can simulate space environments or ambient conditions, and provide remote or local test operations. Services provided to the test cells include propellants and gases, electric power, instrumentation, data acquisition, area and test cell warning systems, fire extinguishing equipment, and closed-circuit television. Test-specific instrumentation such as infrared and high-speed cameras and high-speed data acquisition can be added. Temperature conditioning of test fluid or test article is available as well as helium and nitrogen saturation of propellants.

TEST MEDIA

Testing is commonly conducted in the following media:

- Gaseous oxygen and hydrogen
- Cryogenics (liquid oxygen, nitrogen, and hydrogen)
- Hydrazines and nitrogen tetroxide
- Liquid and gaseous oxygen in conjunction with hydrocarbon based fuels
- Inert gases, including helium and nitrogen

Other fluid media are possible with equipment reconfiguration

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