GLENN L. MARTIN COMPANY, HAER No. CO-75-G
Titan Missile Test Facilities, Cold Flow Laboratory Building B
Waterton Canyon Road and Colorado Highway 121
Vicinity of Lakewood
Jefferson County
Colorado

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

REDUCED COPIES OF MEASURED DRAWINGS

Historic American Engineering Record
National Park Service
Department of the Interior
Denver, Colorado 80225-0287

HAER
COLO
30-LAKWD.V
26-

HISTORIC AMERICAN ENGINEERING RECORD

GLENN L. MARTIN COMPANY — HAER No. CO-75-G
Titan Missile Test Facilities, Cold Flow Laboratory
Waterton Canyon Road and Colorado Highway 121
Vicinity of Lakewood
Jefferson County
Colorado

Significance: The Titan propulsion system utilized a number of cryogenic gases and highly corrosive chemical compounds that could quickly destroy improperly designed valves, seals, filters, pumps and other parts. The Cold Flow Laboratory enabled engineers to subject critical propulsion system components to rigorous "cold" testing before attaching engines for test firing.

Description: Located on a hillside about a mile northwest of the plant's main Adminstration Building, the Cold Flow Laboratory consists of a blastproof control building, linked by tunnel to a series of enclosed test cells. The control building is a one-story, reinforced concrete structure with an irregular plan, and a flat roof. Set into the hillside below the control building is a large, reinforced-concrete bunker covered by a concrete platform. Near the south end of the platform is a shoebox-shaped, one-story, reinforced-concrete structure containing three, austere, stall-like test cells where individual propulsion system components could be exposed to the effects of cryogenic liquids. Rising from the north end of the slab is a twelve-story, steel-framed tower with a corrugated steel skin. This enclosure contained two additional test cells, each large enough to hold a fully assembled Titan propellant feed system. Elevated pipes conducted propellant fumes from the test cells to earthen revetments where the gases could be safely burned. Supplies of fuel, oxidizer and pressurizing gases for component tests were stored in cylindrical storage tanks mounted on a concrete apron on the east side of the base structure. A gunite-lined ditch channeled spillage from the propellant storage area to a catch basin located across the road.

History: The Cold Flow Laboratory was designed by the Aerojet-General Corporation of Sacramento, California, and was built in 1957 by the George A. Fuller Company, general contractor for the Martin plant. According to Astronautics magazine, the Cold Flow Laboratory was designed to test "everything connected with propulsion but the rocket engine itself. Propellant tankage and plumbing is reproduced in this lab, and real or simulated propellants are run through the setup under flight pressures and conditions. The only difference from the real thing is the lack of an engine at the business end." The Laboratory was expanded in 1961 to accommodate the advanced Titan II missile. The facility remains in use as a Propulsion Laboratory for the Martin-Marietta Astronautics Group.

Sources: "'Cold Flow' Project, Started Last Aug., Virtually Complete," Martin Missile 2 (5 July 1957): 1. "Testing a Titan," Astronautics 4 (August 1959): 28, 92. Other sources include original project blueprints located in the Plant Engineering Department at Martin-Marietta Astronautics Group, Denver, CO. The Company's Photographics Department maintains a large collection of black-and-white and color photographs depicting construction and equipment of the Cold Flow Lab. For a brief description of the 1961 expansion, see "Main

Area Profiles Change with Plant, Titan II Facilities," Martin Mercury 18 (10 March 1961): A.

Historians: John F. Lauber and Jeffrey A. Hess; Hess, Roise and Company, 1994.