

National Trust Award Application Rocket Engine Test Facility

Background

From August 15, 1957 until July 1, 1995, conducted experimental tests of high-energy propellants, including liquid hydrogen, and rocket engine components that were integral to the United States space program. In the 1980s, the RETF was listed on the National Register of Historic Places and designated a National Historic Landmark by the National Park Service. NASA Glenn and the City of Cleveland explored many options before having to dismantle the facility as part of the adjacent Cleveland Hopkins International Airport expansion in 2003. NASA Glenn worked closely with the Ohio State Historic Preservation Officer to ensure proper historical mitigation before RETF was removed.

NASA Glenn hired Middough Consulting, Inc. to manage the historical documentation of RETF. Middough contracted Hardlines Design Company coordinate and oversee this broad cultural resources management project. Hardlines brought in several subcontractors to assist and worked closely with the NASA Glenn History Office, Facilities Division, Imaging Technology Center, Community and Media Relations Office, former RETF employees, current NASA researchers, and others to carry out this mitigation. The mitigation included Level I Historic American Engineering Record documentation, a documentary video, a peer-reviewed historical manuscript, oral histories, archiving documents, collection of artifacts, a website, and a traveling museum display.

Brief RETF History

The RETF was first conceived in 1952 as a facility to test volatile high-energy propellants and rocket engine designs. Construction cost \$2.5 million and lasted until 1957. RETF was located in a gully in the south end of the laboratory in order to provide a natural barrier for the combusive tests. The facility consisted of a control center on the gully's ridge and a vertical test cell down in the valley. This test cell, which contained a protected control room, exhausted into a large scrubber which served as both a muffler and a filter for toxic combustion byproducts. In the 1980s a second test cell was added adjacent to the original.

Over its almost forty year career, RETF testing contributed significantly to the Apollo program, many unmanned interplanetary missions, and the space shuttle. Of special importance was the improvement of the Pratt & Whitney RL-10 engine for the Centaur rocket and Rocketdyne's F-1 and J-2 engines for the Saturn rockets. The tests of liquid hydrogen and other propellants with high specific impulses helped prove that they were safe and reliable fuels.

In an effort to reduce the cost of launching payloads into space in the early 1990s, the RETF worked with TRW on a Coaxial Pintle Injector Rocket Engine that used liquid oxygen and liquid hydrogen as propellants. Not long afterwards, the City of Cleveland announced plans to expand Cleveland Hopkins International Airport and construct an extended runway that would require demolition of the RETF. NASA decided to forgo upgrading the RETF and began taking steps to document the facility and its history prior to its demolition.

Historic Mitigation

Hardlines, along with Robert Stewart and the NASA Glenn Imaging Technology Center, prepared Level I Historic American Engineering Record (HAER) documentation of the facility. This HAER documentation included detailed photography of the RETF and a set of 12 drawings that provided a detailed record of each building, the site, and the testing process. The written RETF report documented the building construction and type of research and testing that occurred along with how that research fit in with other NASA research facilities.

Hardlines also worked with the History Office to identify and remove artifacts from the facility prior to demolition. Some of these were integrated into a museum display, and the others were offered to xxxxx other groups.

Hardlines enlisted the NASA Glenn Imaging Technology Center (ITC) to create six and twenty minute videos which document the RETF's history. *Fueling Space Exploration* utilizes retiree interviews, archival footage, and photographs to develop the story of the RETF in a digital format. The six-minute video is utilized primarily to provide a brief understanding of the RETF while the twenty-minute video delves into the details of RETF and provides an all-encompassing understanding of the facility and its mission.

Virginia Dawson, of History Enterprises, Inc., was contracted to write a peer-reviewed historic manuscript which details the early development of NASA's rocket research, the need for and construction of the RETF, the role RETF played in the Apollo program, and the expansion of RETF to meet Shuttle era needs. The manuscript was published by NASA and distributed throughout the NASA community as well as federal, state, and local repositories. Dr. Dawson also conducted several interviews as part of her research. History Enterprises, Inc. was also contracted to process the RETF records.

A Flash-based website was created by SiteByMike with the assistance of Hardlines. The website, hosted by the NASA Glenn History Office, included videos of interviews, test footage, and the documentary. It also contained hi-resolution still images, a timeline, history of the facility, and several interactive features.

A traveling museum display, created by Lucarelli Designs & Displays, incorporated several RETF artifacts, a model of the facility, work stations with the website, still images, the HAER drawings, and audio clips from retiree interviews.

NASA Glenn Research Center worked closely with Middough, Hardlines, the city of Cleveland, State Historic Preservation Officer, and the other contractors to ensure successful mitigation of this historic facility.

--Bob Arrighi

February 22, 2006