

CAPE CANAVERAL AIR FORCE STATION, LAUNCH COMPLEX
39, SOLID ROCKET BOOSTER DISASSEMBLY &
REFURBISHMENT COMPLEX, SOLID ROCKET BOOSTER PAINT
FACILITY

(Hanger AF Complex, SRB Paint Facility)

(John F. Kennedy Space Center)

Hangar Road

Cape Canaveral

Brevard County

Florida

HAER FL-8-11-S-9

HAER FL-8-11-S-9

PHOTOGRAPHS

WRITTEN HISTORICAL AND DESCRIPTIVE DATA

FIELD RECORDS

HISTORIC AMERICAN ENGINEERING RECORD

SOUTHEAST REGIONAL OFFICE

National Park Service

U.S. Department of the Interior

100 Alabama St. NW

Atlanta, GA 30303

HISTORIC AMERICAN ENGINEERING RECORD

CAPE CANAVERAL AIR FORCE STATION, LAUNCH COMPLEX 39,
SOLID ROCKET BOOSTER DISASSEMBLY & REFURBISHMENT COMPLEX
SOLID ROCKET BOOSTER PAINT BUILDING
(Hangar AF Complex-SRB Paint Building)

HAER No. FL-8-11-S-9

Location: Cape Canaveral Air Force Station, Cape Canaveral,
Brevard County, Florida.

USGS Orsino, Florida, Quadrangle, Universal
Transverse Mercator Coordinates: E 540465.24 N
3151325.46 Zone 17, NAD 1983.

Date of Construction: 1984

Present Owner: National Aeronautics and Space Administration (NASA)

Present Use: Solid Rocket Booster Disassembly & Refurbishment

Significance: The Solid Rocket Booster (SRB) Disassembly & Refurbishment Complex contains the SRB Paint Building and eight other facilities that played an essential role in the reusability of the SRBs in the Space Shuttle Program (SSP). The complex is considered eligible for the NRHP as a historic complex in the context of the SSP (1969-2011) under Criterion A for Space Exploration. The SRB Paint Building has achieved exceptional significance within the past 50 years, so Criterion Consideration G also applies. The complex was originally designed or modified to process SRBs, from pre-launch manufacture and assembly to post-launch recovery, disassembly, cleaning, and refurbishment. The complex maintains a high level of integrity.

Report Prepared by: New South Associates, Stone Mountain, Georgia

Date: October 16, 2012

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PART I. HISTORICAL INFORMATION

A. INTRODUCTION

The SRB Paint Building (66310) lies within the SRB Disassembly and Refurbishment Complex at Hangar AF, which is located on Hangar Road in the Industrial Area of the Cape Canaveral Air Force Station (CCAFS). The complex's boundaries are defined as the edges of the concrete hardscape that surrounds Hangar AF. The complex contains nine contributing resources, including the SRB Paint Building (8BR2006). The remaining eight contributing resources are Hangar AF (8BR2001), the High Pressure Gas Building (8BR2002), the High Pressure Wash Building (8BR2003), the First Wash Building (8BR2004), the SRB Recovery Slip (8BR2005), the Robot Wash Building (8BR2007), the Thrust Vector Control Deservicing Building (8BR2008), and the Multi-Media Blast Facility (8BR2009).

The complex is a significant historic property for its association with the Space Transportation System (STS), commonly known as the "space shuttle." The STS was a unique breakthrough in the history of the U.S. Space Program because it was based on a design that made most of its major components reusable. This model decreased program costs and helped make orbital space flight a routine endeavor. Along with the orbiter spacecraft, the SRBs were two of the space shuttle's primary reusable elements, while the external tank (ET) was not reused. The SRBs' reusability was made possible by a number of facilities at Kennedy Space Center (KSC) and CCAFS, including the SRB Disassembly and Refurbishment Complex. The complex is the first place the SRBs were brought after their recovery from sea, and where they were disassembled,

cleaned, and processed before they were moved to other KSC facilities for buildup and assembly.

B. HISTORICAL CONTEXT

A full historical context for the SRB Disassembly and Refurbishment Complex, as well as a summary of the entire disassembly and refurbishment process, can be found in HAER NO. FL-8-11-S (Hangar AF Complex). A detailed explanation for the portions of that process that occurred in this resource is located in Section III of this document.

C. PHYSICAL HISTORY

1. Date of Construction:

1984

2. Architects/Engineers:

Burns and Roe, Engineers and Constructors, Jacksonville, Florida.

Burns and Roe was founded in 1932 by Ralph Roe and Allen E. Burns. The company built much of its early reputation in the 1930s and 1940s on the design and engineering of electric power plants. By the 1950s, the company expanded into national defense projects, including radar and missile installations. In 1963, Ralph Roe handed over control of the company to his son, Kenneth, who continued to broaden its work into nuclear power plants, desalination plants, and aerospace projects. The company was a major participant in the planning of NASA's Mercury and Apollo Programs, including Mercury's Ground Support System and

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Apollo's Lunar Module Test Facility and Site Activation Program in Texas and the White Sands Missile Range in New Mexico. Burns and Roe's connections to NASA led to continued design and engineering work in the 1980s, including construction drawings for the SRB Paint Building and the TVC Deservicing Building.¹

3. Builder/Contractor/Supplier:

Unknown

4. Original Plans and Construction:

The SRB Paint Building retains its original appearance.

5. Alterations and Additions:

None

PART II. STRUCTURAL/DESIGN/EQUIPMENT INFORMATION

A. GENERAL STATEMENT:

1. Character:

The SRB Paint Building is a metal workshop-type building containing staging areas and paint cells used for priming and painting SRB frustums, aft skirts, and forward skirts.

¹ Burns and Roe, "History and Legacy," http://www.roe.com/about_legacy.htm, Accessed December 20, 2011.

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2. Condition of fabric:

The SRB Paint Building was regularly maintained throughout its lifespan and does not exhibit any major signs of neglect or deterioration.

B. BUILDING DESCRIPTION:

The SRB Paint Building was added to the Hangar AF Complex in 1984. It was completed to house the application of alodine and paint primer to the SRB frustums, forward skirts, and aft skirts after they had been disassembled and stripped of all paint and TPS.

Exterior

The SRB Paint Building is a one-story metal industrial-type building with a lightly pitched gable roof. There are metal ventilation stacks projecting from the roof. The main portion of the building has a rectangular footprint with a reinforced concrete foundation. Extending out from this main portion are additional rooms and equipment stacks, including a mechanical room, electrical room, and ventilation equipment.

The entire building is clad in corrugated aluminum siding. The north elevation features a pair of metal roll-up doors and a double pedestrian entrance.

The west elevation is the building's most complex, containing the following components: a metal "lean-to" on the north end that covers the building's main pedestrian entrance and electrical equipment; a metal platform holding ventilation equipment and compressed air tanks over the

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projecting electrical room near the middle of the building; and a projecting mechanical room at the south end of the elevation.

The east elevation features a non-original two-story projecting section that contains bathrooms on the ground floor and office space above. As on the west elevation, there is a metal platform structure that supports ventilation equipment.

The south elevation features a single metal roll-up door and a double pedestrian entrance. There is a louvered metal vent over the pedestrian entrance.

Interior

The interior floor plan of the SRB Paint Building is organized according to the workflow as SRB segments go through the paint process. It is roughly divided into four sections: the blast booth/logistics area, the wash area, the spray booths, and the cure area. The blast and spray booth areas stand as separate structures within the overall building. They have their own independent structural systems that are not integrated into the steel framing of the surrounding building.

The walnut blast booth use was discontinued with the construction of the Multi-Media Blast Facility, and due to the fact that walnut blast media presented a fire hazard due to airborne dust particles. It was converted to use as a mechanical buildup room. The blast booth has a polished concrete floor and drywall walls. The roll-up door occupies the south wall of the booth. The booth is lit by

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fluorescent lights embedded in the ceiling and in the walls, as well as by wall-mounted floor lights.

Adjacent to the walnut blast booth is a multi-function area in the southeast corner of the building. This area contains a tool crib, paint lab, and restroom on the ground floor. Above these areas is a metal second-story platform that holds personnel storage lockers. The platform is reached via a metal staircase.

The wash area is an open bay between the walnut blast booth and the spray booths with a concrete floor. There are water/detergent and alodine drains embedded in the floor. A metal roll-up door allows access on the west wall of the wash area.

The cure area on the north end of the building is an open work area with a concrete floor. The ceiling and walls are unfinished and reveal the building's metal structural system. There are two metal roll-up doors on the north wall, and an overhead 15-ton bridge crane that runs over the room from north to south. The room is lit with suspended flood lights.

PART III: OPERATIONS AND PROCESS

A. INTRODUCTION

The primary operations at the Hangar AF Complex involved separating all of the SRB segments, removing their electronic and mechanical components and their protective TPS finishes, and preparing them for buildup and assembly at the ARF Manufacturing Building/L6-247. The buildings and structures at the Hangar AF Complex processed the aft

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skirts, forward skirts, frustums, TVC systems, MPSS, ETA ring, and a variety of small metal parts contained in each of the segments. The boosters' four SRMs were separated and cleaned at the Hangar AF Complex and then shipped to their manufacturer for full refurbishment. Typically, the number of people working at the Hangar AF Complex during the space shuttle era was approximately 150 people. It typically took these workers from two to three weeks to fully process the SRB components from the time of their arrival.

B. SRB PAINT BUILDING

The demated SRB segments entered the SRB Paint Building through the roll-up doors on the south or west elevations of the building. From there they were wheeled into the former walnut blast booth in the southwest corner of the building. Although glass beads are used now, until about 2000 this booth used ground walnut shells as a blast medium to strip the exterior of SRB segments down to bare metal.

From the blast booth, the SRB segments were moved into the area labeled "wash area" on the original construction drawings, where they were washed with water and then coated with alodine, an anti-corrosion primer that formed the first layer of protection for the segments.

Once cleaned and coated with alodine, the SRB segments were wheeled into one of the building's two spray booths, labeled on the construction drawings as "spray booth no. 1" and "spray booth no. 2." These booths have square floor plans with concrete floors and drywall walls. They are lit by fluorescent fixtures embedded in the ceiling. Here, the SRB segments receive coats of primer and a top coat of

hypalon paint. These layers serve as the base for the later application of TPS.

Once primed and painted, the SRB segments were removed from the spray booth to the northernmost room of the facility called the 'cure area' where the finish dried and hardened. At that point the SRB segment refurbishment at Hangar AF was complete and they awaited shipment to the SRB ARF Manufacturing Building for further refurbishment and assembly

PART IV. SOURCES OF INFORMATION

A. ENGINEERING DRAWINGS AND PLANS

Burns and Roe. "Solid Rocket Booster Paint Building - Modification to Existing High Pressure Wash Building." Kennedy Space Center, Florida. Construction drawings, 1983.

B. SECONDARY SOURCES

Burns and Roe. "History and Legacy."
http://www.roe.com/about_legacy.htm. Accessed December 20, 2011.

Deming, Joan, and Patricia Slovinac. *NASA-Wide Survey and Evaluation of Historic Facilities in the Context of the U.S. Space Shuttle Program: Roll-Up Report*. Submitted to the National Aeronautics and Space Administration, Environmental Management Branch. Sarasota, Florida: Archaeological Consultants, Inc. February 2008, revised July 2008.

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National Aeronautics and Space Administration (NASA)
NASA Facts: Solid Rocket Boosters. Kennedy Space Center,
Florida. IS-2004-09-014-KSC, Revised 2006.

*NASA Facts: Solid Rocket Boosters and Post-Launch
Processing.* Kennedy Space Center, Florida. FS-2004-07-
012-KSC (Rev. 2006).

United Space Alliance

"Marine Operations, Revision J." (John F. Kennedy Space
Center, n.d.), MO-1.

"Structures Assembly Buildup Operations, Revision J"
(John F. Kennedy Space Center, n.d.).

C. INTERVIEWS

Christy, Howard, RPSF Manager, Personal Communication,
February 24, 2010.

Morales, Art. George C. Marshall Space Flight Center
Office of the Director Shuttle - ARES Transition Office.
Interview with author. September 27, 2011.

Price, David. Hangar AF Facility Manager, United Space
Alliance. Interview with the author. September 27, 2011.

D. LIKELY SOURCES NOT YET INVESTIGATED

Research was conducted at KSC using primary and secondary
sources. Sources that were not investigated that may
contain secondary information include NASA Headquarters and
at the offices of the various architects and contractors
that constructed the buildings of the Hangar AF Complex.

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Additional oral history interviews with other engineers and technicians could also prove useful.

V. PROJECT INFORMATION

NASA determined that the SRB Disassembly & Refurbishment Complex was eligible to the NRHP as a historic district under Criterion A in the area of Space Exploration. The SRB Paint Building was considered a contributing resource to the historic district. This determination was made by NASA's "Shuttle Transition Historic Preservation Working Group" or HPWG, which looked at 335 facilities at thirteen NASA Centers.² As a result of this work, seventy properties were identified as either listed, determined eligible, or were potentially eligible to the National Register. Out of twelve property types identified for NASA's SSP, the SRB Disassembly and Refurbishment Complex was identified as Type 2, which includes Resources Associated with Vehicle Processing Facilities.³ NASA completed this evaluation as the SSP was scheduled for termination in 2011.

A Programmatic Agreement (PA) was developed to document the identified eligible resources and streamline the Section 106 consultation process. Per Section V.A of the PA between NASA, the Advisory Council on Historic Preservation (ACHP), and the Florida State Historic Preservation Officer (SHPO), dated May 2009, and the Statement of Work provided to New South Associates by KSC/InoMedic Health Applications (IHA), as part of the Task Order Contract, dated August 2011, the documentation package for the SRB Disassembly &

² Deming and Slovinac, *Evaluation of Historic Facilities, Space Shuttle Program*, 5.11.

³ Deming and Slovinac, *Evaluation of Historic Facilities, Space Shuttle Program*, 5.11.

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Refurbishment Complex includes the following items: a written narrative; a series of photographs showing both exterior and interior views using large format negatives; and a selection of existing drawings, which were photographed with large format negatives. This HAER documentation fulfills the recordation requirements of the PA for the historic district.

New South Associates, under contract with IHA, a subcontractor to NASA, conducted the HAER documentation and historic research for this project in September and October 2011. Therefore, NASA is completing HAER documentation of the complex and other KSC properties to record these as they appear and as they existed during the SSP. David Diener served as the project photographer. Julie Coco served as Principal Investigator, while David L. Price served as Project Historian.

In order to complete the project, New South Associates personnel were allowed full access to the facility, under the supervision of Barbara Naylor, KSC Historic Preservation Officer, and Nancy English, Cultural Resources Specialist. Photographs were taken of each building's interior, exterior, and context. David Price conducted a limited number of oral interviews and otherwise compiled the historic documentation required for the project. The following people were interviewed for this project: David Price, Hangar AF Facility Manager, United Space Alliance; Art Morales, George C. Marshall Space Flight Center, Office of the Director Shuttle - ARES Transition Office; and Dave Pappalardo, United Space Alliance, TVC Technician. Elaine Liston, KSC Archivist, provided a wealth of information from her office in the KSC Headquarters Building.

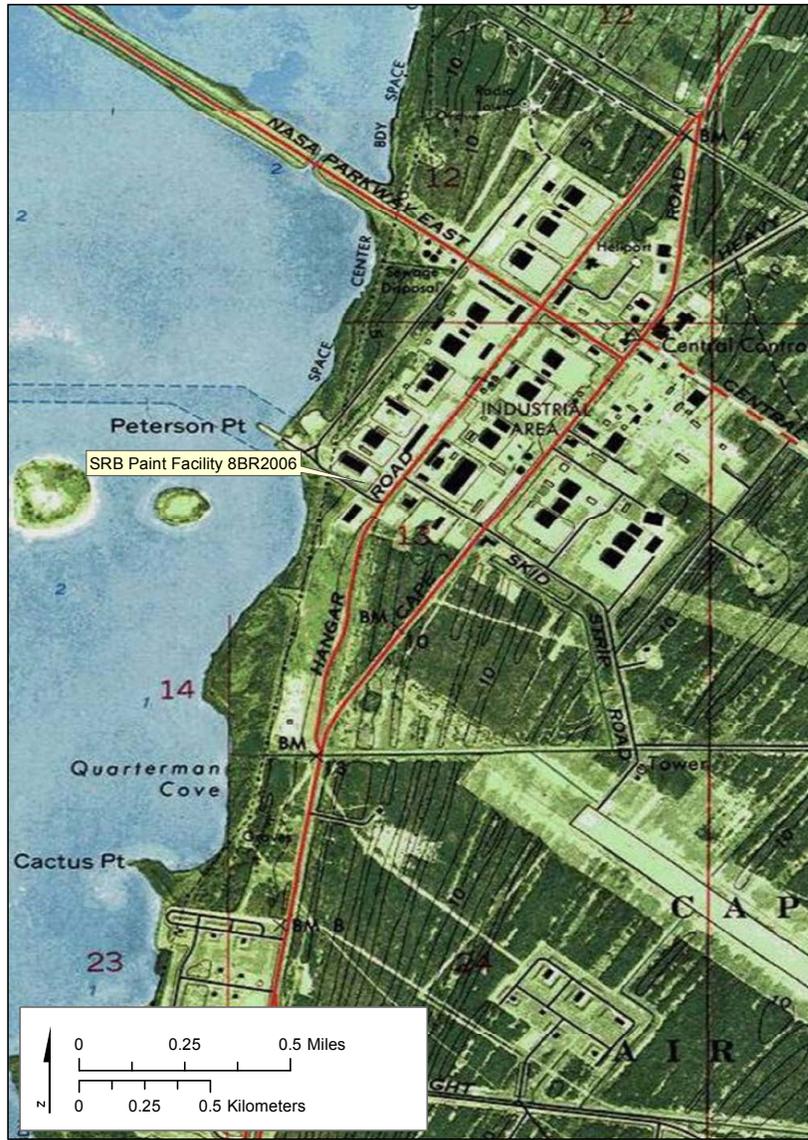
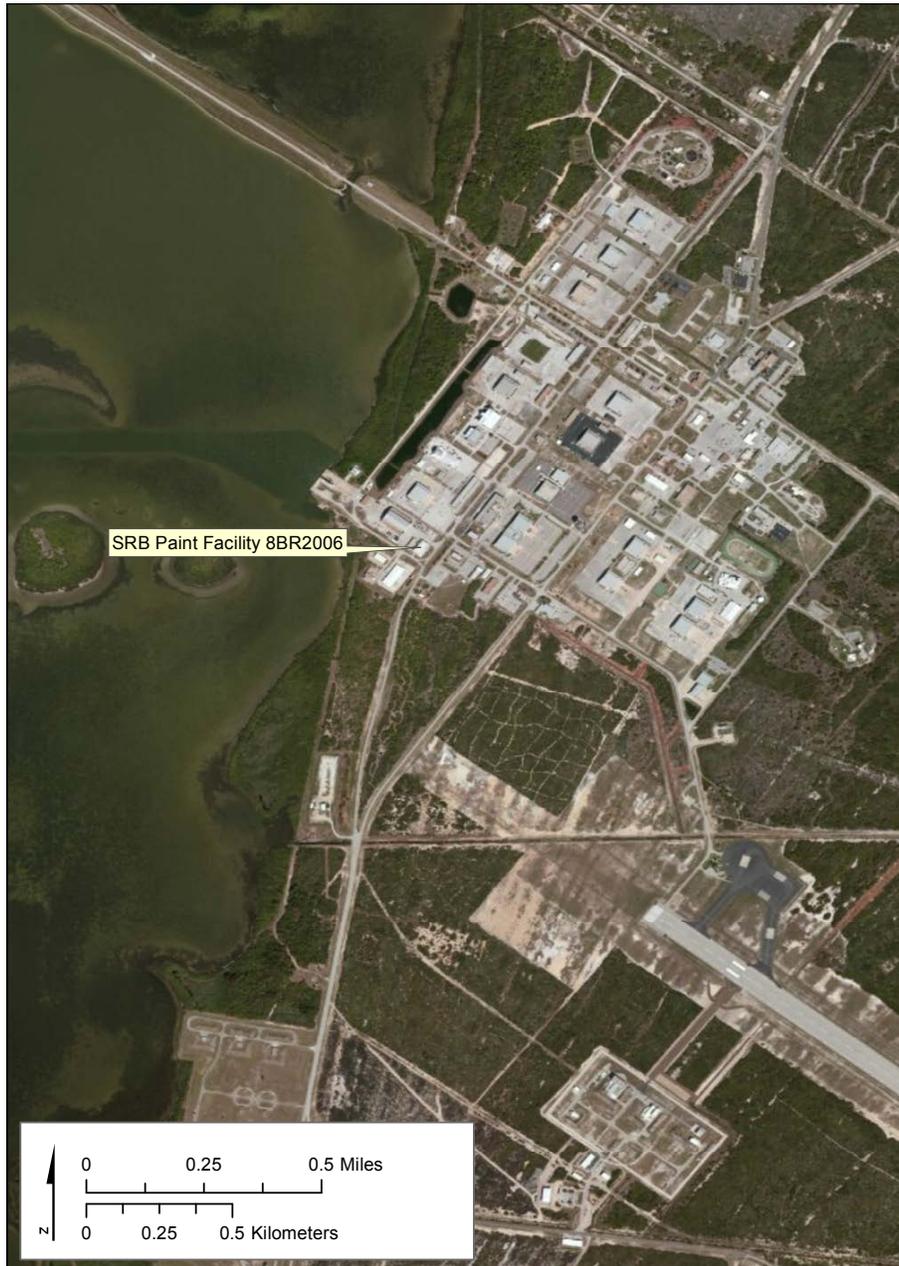


Figure 1. USGS Map Showing the Location of the SRB Paint Building.

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Source: ESRI Resource Data, Imagery Layer

Figure 2. Aerial Photograph Showing the Location of the SRB Paint Building.

