

National Aeronautics and
Space Administration (NASA)



**NASA's Historic
Preservation Program:**

**Celebrating and
Managing Significant
Historic Resources**



NASA's historic role in space exploration is unparalleled

it is not an exaggeration to say that the agency has been the most noteworthy group in history that has worked to fulfill people's yearning to understand what is beyond earth's confines.

In the multiple areas of knowledge that enable man to reach into space – aeronautics, science, engineering, technology and other disciplines – NASA has continued to make history every day since its inception in 1959.

As a federal agency, NASA also works to accomplish more earthbound goals – including the protection and celebration of the cultural and historic resources that are physical evidence of its considerable history.

The National Historic Preservation Act (NHPA) provides regulatory guidance to federal agencies to ensure that preservation of the country's history that is found in the built environment – buildings, structures, districts, sites and objects – is fully integrated into every agency's program planning and achievement of mission.

This publication describes how NASA uses the standards and guidance found in Section 110 of the NHPA to accomplish its environmental and historic preservation responsibilities as an integral part of its overall mission while celebrating the historic accomplishments of NASA and protecting the important places where its rich history occurred.



Commemorating NASA's Places that Matter

While NASA carries out its scientific, exploratory and research missions, it is also legally responsible as a federal agency for a broad range of historic properties located around the country. These sites where NASA has operated in the past and continues to carry out its mission matter to the American people because they connect the history of people's lives with the settings where some of the nation's most significant historic accomplishments have taken place.

These places contain cultural resources that range from some of the world's most sophisticated technological structures to archaeological sites that represent the lives of America's first inhabitants.

Every NASA property is an American place that matters – reflecting NASA's fifty astounding years of service to the country and humanity – and those organizations and peoples that used the land and buildings before the agency was founded.

NASA works to identify and protect historic properties and to avoid unnecessary damage to them with advice and guidance from the Advisory Council on Historic Preservation (ACHP) and the National Park Service (NPS).



The NHPA is the Nations' historic preservation legislation that requires every federal agency to evaluate the impact of its actions on historic properties. Under this law, NASA must:

Determine whether an action is a type of activity that could affect historic properties, and

Carry out a consultation process with other designated government agencies, Tribes and the public to ensure that each action is evaluated before implementation and that adverse affects are identified and diminished when possible.

"My Environmental Management Division has developed a sound CRM Program for the Agency. It is important that managers recognize the CRM Program is not just about regulatory compliance as it provides a means to showcase your contributions to our incredible history. NASA now has the information, tools and dedicated team of Center Historic Preservation Officers to support mission success."

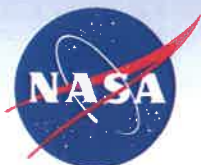
Olga Dominquez
Office of Strategic Infrastructure
NASA Headquarters

NASA's Mission and Historic Preservation

NASA's approach to protecting and preserving its historic properties is integrated into its mission. Each of the NASA's four Mission Directorates – Aeronautics Research, Exploration Systems, Science, and Space Operations – are located at ten NASA Centers and six related facilities that contain various numbers and types of historic properties.

Historic preservation is a component of NASA's environmental management responsibilities that are laid out in the NASA 2006 Strategic Plan that directs the agency to purchase, construct and operate its physical assets consistent with the requirements of the NHPA.

Compliance with the requirements of the NHPA ensures that all known or potential historic properties or cultural resources of significance are treated in accordance with all required cultural resource and environmental regulation. Timely compliance will also avoid or minimize added schedule and cost impacts to NASA missions.



NASA's Scientific and Technical Facilities

NASA's scientific and technological research mission supporting the development and implementation of complex space flight missions is reflected in its property assets. These scientific and technical facilities will likely be seen by future generations as among the nation's most significant historic resources of the late 20th century. Many facilities representing NASA's early history are still in active use but need to be continuously upgraded and modified in order to meet NASA's evolving mission and stay at the forefront of international research.

NASA has participated in the ongoing national conversation regarding the ways in which federal agencies can meet their stewardship obligations under the NHPA and other regulations while helping to preserve the physical evidence of America's scientific heritage. NASA promotes and celebrates its history – both at its visitor centers and through its public affairs and educational programs – which strive share with the public NASA's scientific and technological achievements and tell the story of the heroic accomplishments of those who have traveled beyond earth's confines. NASA is also proactively working to develop more flexible historic preservation compliance procedures that will integrate consideration of its past more effectively into its respective programs. Seeing and experiencing the places where NASA's mission was carried first-hand is certain to enhance the public's understanding of NASA's mission and past accomplishments and promote support and funding for NASA's future activities.

Preservation or Traditional History?

Historic preservation plays an increasingly important role in the shaping of our collective memories. It offers a range of approaches which help maintain and manage historic properties: preservation, restoration, adaptive re-use, reconstruction, and replication. Many communities, organizations and individuals are choosing to preserve and make use of significant historic buildings, sites and structures as a way to better understand and cherish their heritage, rather than rely on traditional narrative (written) history alone. The chance to experience the past through a direct encounter with its authentic, physical remains draws people to historic sites. NASA has chosen to respect and protect its tangible cultural heritage by partnering with traditional historians and museums, providing avenues for them to obtain information about NASA's history, and by interpreting the agency's history for the public at its visitor centers and on the world wide web. This "traditional" approach to saving historical knowledge is incorporated into the agency's multiple historic preservation initiatives as is illustrated in this publication.



"You can't make it; you can't buy it; and when it's gone, it's gone forever."

Chief of the Miccosukee Indians,
referring to the Florida Everglades



What is “Historic?”

For all NASA-sponsored projects or actions, any property listed in or eligible for listing in the NRHP is considered historic. There is no distinction between listed and eligible properties in the Section 106 compliance process.

Section 106 of the NHPA establishes a consultation process that NASA must follow before taking or approving actions that have the potential to affect historic properties. Consultation is required for all historic properties, above-ground or archaeological, that are listed in or eligible for the NRHP. The NHPA has established eligibility criteria used to determine if a property is significant and can therefore be officially considered “historic.” Historic properties include buildings, structures, sites, districts and objects and are found both above and below the ground; therefore both archaeologists and architectural historians take part of identifying them.

But Section 106 also requires agencies to take into consider the possible presence of historic properties that have not been identified and evaluated in the past that may be impacted by agency actions. When previously unidentified and unevaluated potential historic properties are found, NASA evaluates the eligibility of each property as part of a formal “Determination of Eligibility” (DOE). DOEs are used not only to determine if properties are individually eligible for inclusion in the National Register, but also to determine if individual resources contribute to historic districts.

The standards used for evaluating properties in DOEs are found in National Register Bulletin 15: How to Apply the National Register Criteria for Evaluation. If a property is found to be eligible, the effects of the action on the property must be assessed and consulting parties must be notified. In turn, if the property is found to be ineligible, appropriate documentation must be provided to the SHPO/THPO and the consulting parties must be notified.

It is essential to emphasize that, for purposes of Section 106 compliance there is no distinction between listed and eligible properties in the review process. Properties are not presumed to have greater significance simply because they are listed in the National Register.



Sections 106 & 110 of the NHPA

On a day-to-day operational basis, the two most relevant parts of the NHPA are Sections 106 and 110. Section 110 focuses on guidelines and policies concerning the identification, recognition, use, and management of historic properties while Section 106 primarily addresses the review of individual projects.

Section 106 is a 4-step review and consultation process that considers the effects of agency actions on historic properties. The 4 steps include :

Section 110 ensures that historic preservation is fully integrated into NASA's ongoing programs and missions. It directs NASA and all federal agencies to locate, inventory, and nominate their historic properties to the NRHP and guides agencies to protect their historic properties and to utilize them in their mission to the maximum extent feasible.

Section 110 also requires documentation of properties adversely affected by federal undertakings, requires that a trained Federal Preservation Officer assist the agency with implementing its historic preservation program, and that the agency include the costs of preservation activities as eligible project expenditures.

Finally, Section 110 assures that NASA does not inadvertently transfer, sell, demolish, substantially alter, or neglect historic properties under its jurisdiction.

Sections 106 and 110 of the National Historic Preservation Act (NHPA, PL 89-665, as amended through 1992 (16 USC 470)) detail processes that should be followed in the management of archaeological and historic properties at NASA's centers.

Initiating the process



Identifying historic properties



Assessing adverse effects



Resolving adverse effects

Section 106 is a consultation process which seeks to accommodate historic preservation concerns with the needs of agency projects and is designed to identify potential conflicts between the two and to help resolve such conflicts in the public interest

Section 110 is the proactive part of the NHPA directing agencies to develop comprehensive, practical preservation programs



Section 110 of the NHPA and NASA

Using Section 110 as its guidance, NASA has taken responsibility for the preservation of historic properties under its control and carries out its mission in accordance with the broader purposes of the NHPA. NASA works especially hard to minimize harm to NHLs, seeks to find new uses for historic properties which no longer serve a function in the agency's mission, and considers historic properties early in agency planning.

To assure that historic properties are given due consideration under Section 110, NASA has established a historic preservation program which today extends to all of its Centers and operates as a mission-integrated program that identifies and protects the agency's wide variety of historic properties.

This publication illustrates the many ways in which NASA Headquarters and Centers work together to ensure that historic properties are maintained and managed with emphasis on assigning new uses for historic properties through creative "adaptive reuse" to protect NASA's irreplaceable historic places and properties. Examples are also provided which illustrate how NASA has developed methods to help identify and evaluate its historic properties more effectively and processes it has instituted to promote successful communication and consultation with State Historic Preservation Officers, Native Americans and Native Hawaiians, local governments, and the interested public when projects arise which have the potential to adversely affect historic properties.



The Secretary of the Interior (SOI), who implements the NHPA, has developed standards and guidelines describing how federal agencies can comply with Section 110 of the NHPA

Standard 1. Establish and maintain a historic preservation program coordinated by a qualified Federal Preservation Officer (FPO) that is consistent with the NHPA; the agency head will be responsible for the preservation of historic properties owned or controlled by the agency.

Standard 2. Provide for the timely identification and evaluation of historic properties under agency jurisdiction or control and/or subject to effects by its actions.

Standard 3. Nominate historic properties under the agency's jurisdiction or control to the NRHP.

Standard 4. Give historic properties full consideration when planning or considering approval of any action that might affect such properties.

Standard 5. Consult with knowledgeable and concerned parties outside the agency about its historic preservation related activities.

Standard 6. Manage and maintain historic properties under its jurisdiction or control in a manner that considers the preservation of their historic, architectural, archeological, and cultural values.

Standard 7. Give priority to the use of historic properties to carry out agency missions.



Each NASA Center manages its cultural resources under the direction of an Historic Preservation Officer who is designated by the Center Director.

NASA Centers

Center	State	HPO Office
Ames Research Center	California	Facilities
Dryden Flight Research Center	California	Environmental
Goddard Space Flight Center (GSFC)	Maryland	Facilities
Wallops Flight Facility (Managed by GSFC)	Virginia	Facilities
Glenn Research Center (GRC)	Ohio	Facilities
Plum Brook Station (Managed by GRC)	Ohio	GRC
Jet Propulsion Laboratory (JPL)	California	Environmental
Goldstone Deep Space Communications Complex (Managed by JPL)	California	JPL
Johnson Space Center (JSC)	Texas	Facilities
White Sands Test Facility (Managed by JSC)	New Mexico	JSC
Kennedy Space Center	Florida	Environmental
Langley Research Center	Virginia	Operations
Marshall Space Flight Center (MSFC)	Alabama	Facilities
Michoud Assembly Facility (Managed by MSFC)	Louisiana	MSFC
Santa Susana Field Laboratory (Managed by MSFC)	California	MSFC
Stennis Space Center	Mississippi	Operations



NASA Establishes Database of Cultural Resources

Environmental Management Division, Office of Strategic Infrastructure, Headquarters, manages the NASA Environmental Tracking System (NETS). For over a decade it has been used to track a wide range of programs from recycling to hazardous waste management. In 2008, a NETS CRM Module was added.

Resource Identification

Linked to the agency's real property inventory, the module enables Historic Preservation Officers to report the historic status of these assets. The module identifies over 200 historic real property assets (buildings and structures) and more than 300 archaeological sites under NASA's purview, as well the handful of personal property assets that have met the definition of an historic structure (orbiter vehicles, crawler, mobile launch platforms, payload canisters, etc).

Agency Reporting

The module is used to meet report requirements:

- Historic status of real property holdings as required under EO 12337, Federal Facilities Asset Management (Annual)
- Federal Archaeological Activity as required under the Archaeological Resources Protection Act (Annual)
- CRM Progress Report as required by Executive Order 13287, Preserve America (Triennial) Document Repository

Document Repository

The module was expanded in 2009 to enable HPOs to attach CRM documents. The module now serves as the official repository of associated documents (drawings, photos, films and written record).

CRGIS

Through a Facilities Engineering & Real Property (FERP) Division Strategic Infrastructure Investment (SII) Project, data in NETS is being incorporated into the new Cultural Resource Geographic Information System. CRGIS graphically displays historic status of facilities for Center managers and planners. It also provides public access to information about NASA historic resources through the internet (URLs for Website and Youtube on back cover).

Policy & Guidance

A CRM NPR is expected to be executed this summer. A companion CRM Handbook is also under development which will provide guidance and resources for the HPOs and the agency's wide range of CRM stakeholders.

Number of Identified Cultural Resources (Archaeological and Above-Ground)

Center	NRHP-Listed or Eligible Buildings*	Archaeological Sites	NHLs
ARC	33	10	1
DSFC	0	5	0
GRC	67	0	1
PBS	2	0	1
GSFC	0	1	1
WFF	1	8	0
JPL	0	0	2
GDSCC	0	**	1
JSC	0	0	2
WSTF	0	94	0
KSC	78	100	1
LaRC	3	21	5
MSFC	32	22	4
MAF	2	0	0
SSFL	0	1	0
SSC	2	2	1
Totals	220	266**	20

* Does not include NHLs** Sites present, information pending

** (not including GDSCC)

Standard 1

NASA has established historic preservation program that uses Section 110 as a guideline to help develop agency standards for its historic preservation activities.

NASA's Federal Preservation Officer (FPO)

The National Historic Preservation Act requires each agency to assign a Federal Preservation Officer who is responsible for a broad range of cultural resource management requirements and meshes these mandates within the overall mission of the agency. Additionally, the EO 13287, Preserve America, requires the agency to assign a Senior Policy Officer (SPO) with the responsibility to have policy oversight responsibility for the agency's historic preservation program. The NASA SPO sits within the Office of Strategic Infrastructure, OSI, and Headquarters and designates the FPO. The FPO currently resides within the OSI Environmental Division. The FPO's primary role is to oversee the development of the agency's CRM Program. The FPO represents and supports the Historic Preservation Officers. NASA currently has 10 Center HPOs and 3 Facility HPOs who are responsible for overseeing NHPA-compliance activities for their Center/Facility.



"Over the past several years I've really seen NASA step forward in meeting its CRM responsibilities. I'm also fortunate to have Dr. Tom McCulloch on my staff to work with NASA. His father was a NASA engineer for over 35 years, supporting the Apollo Program at the Marshall Space Flight Center in Alabama. Dr. McCulloch therefore has a keen understanding of NASA's mission and some of the unique challenges they face. Even as NASA's mission evolves and technologies advance, I'm pleased to see NASA accept the charge I've given all federal agencies — and that is to integrate CRM into mission planning."

John Fowler
Executive Director
Advisory Council on Historic Preservation
Washington, DC



Standard 1

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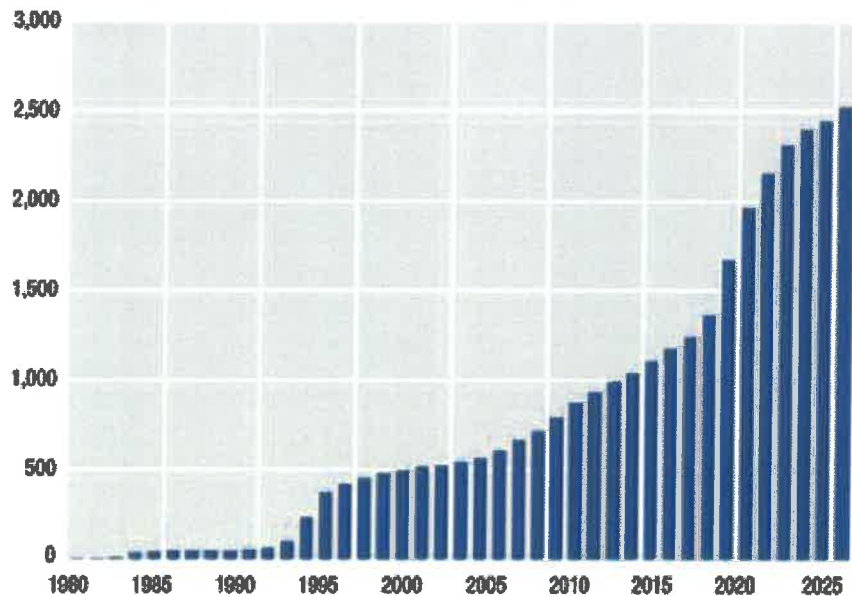
Eligibility for the NRHP is based in part on a property being at least fifty years of age. As NASA works to identify and manage its cultural resources, it is challenged by the requirement under Section 110 to consider NRHP eligibility as historic properties age, and by "Criterion Consideration G" which requires consideration of whether or not a property that is less than fifty years of age may be eligible for the NRHP based on exceptional significance in some aspect of history or design.

As illustrated in the accompanying graphs, many of NASA's real property assets (buildings, structures, districts) already meet this age requirement. Of greater challenge in the coming years, however, is the increasing number of assets that will become fifty years of age between FY 2010 and FY 2020.

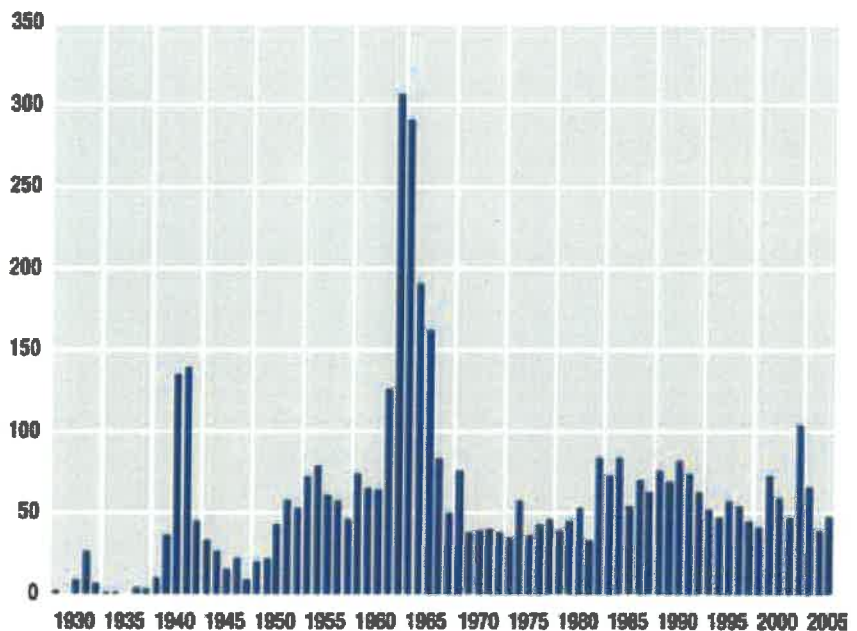
Although several NASA centers are located in places previously used by its predecessor, the National Advisory Committee for Aeronautics (NACA) and others more than fifty years ago, NASA's founding in 1959 means that assets constructed during the early days of its mission began to meet the fifty year age requirement in 2009. By FY 2020, more than

80% of its assets could be at least fifty years of age (not counting loss and construction of new assets). As NASA's inventory of real assets ages, the agency's CRM team will be conducting ongoing identification and evaluation of historic property eligibility to meet the requirements of Section 110. In order to manage this crucial regulatory requirement more efficiently the CRM database set up under the NASA Environmental Tracking System will "red flag" properties of interest moving forward.

Real Property Assets over 50 years of Age



Real Property Assets Construction Date



Source: Facilities Engineering & Real Property Division (Jan 2010)

Standard 2

NASA identifies and evaluates historic properties under its jurisdiction or control or that are affected by its actions.

The John H. Glenn Research Center at Lewis Field (GRC) originated as an aircraft research laboratory operated by NASA's predecessor, NACA, and was the site of early air races in the 1930s. The Center's sixty plus years of history are reflected in its historic campus-like appearance of administrative and office buildings dating from the 1940s amidst a landscaped setting. This historic setting also features significant engineering structures, including the Icing Research Tunnel, built at the end of World War II in 1944, the 10-Foot by 10-Foot Supersonic Wind Tunnel (1956), and the Altitude Wind Tunnel (early 1940s), among other test facilities from later periods. Test facilities comprise approximately half of the buildings and structures at GRC; for the most part, these resources are significant for their association with historically important research and development programs and activities.

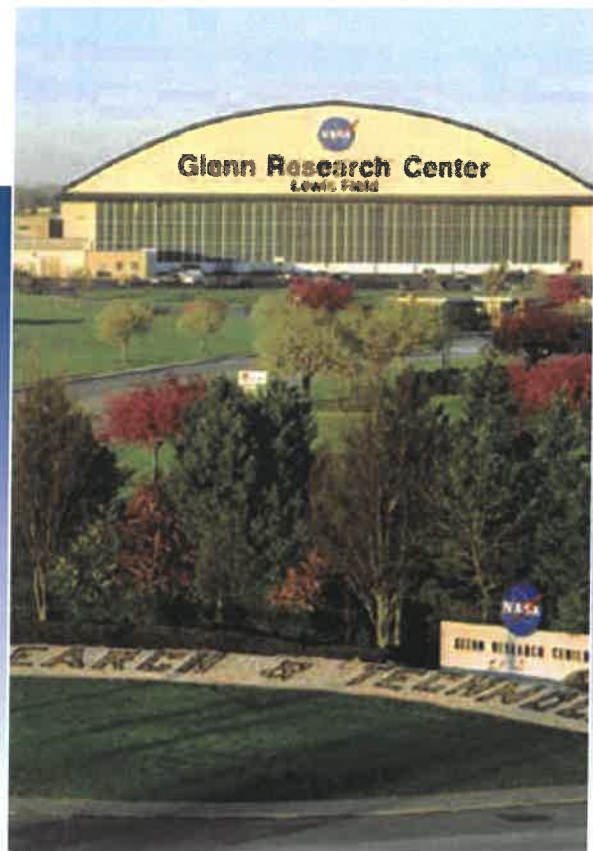
Since the 1990s, GRC has conducted studies to identify its historic properties, first completing a cultural resources reconnaissance survey of Lewis Field using a comprehensive "gate-to-gate" approach to identify which components of the complex were historic and which were not. The study revealed a potential historic district that appeared to meet NRHP eligibility criteria for its associations with important technological and scientific advances in aeronautics and aerospace. The survey also identified buildings and complexes which appeared individually National Register eligible, including those cited above.

With the passage of time and the aging of individual facilities, GRC reevaluated its resources in 2002. This analysis reconsidered the recommendations offered by previous studies and concluded that Lewis Field did contain a NRHP eligible historic district representing the period from 1940 to 1970. The central area of the district contains the largest concentration of buildings at Lewis Field, including administrative buildings, wind tunnels, and laboratories which collectively reflect the original 1940s conception of the center as a landscaped industrial campus.



Above: Test performed in Glenn's 10- by 10-Foot Supersonic Wind Tunnel.

Right: Aerial view of the Glenn Research Center at Lewis Field

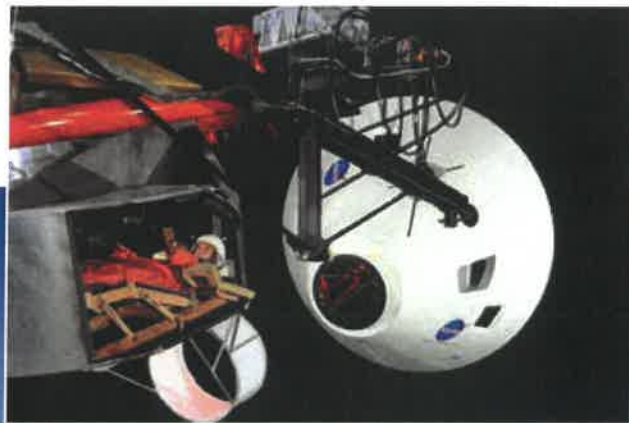
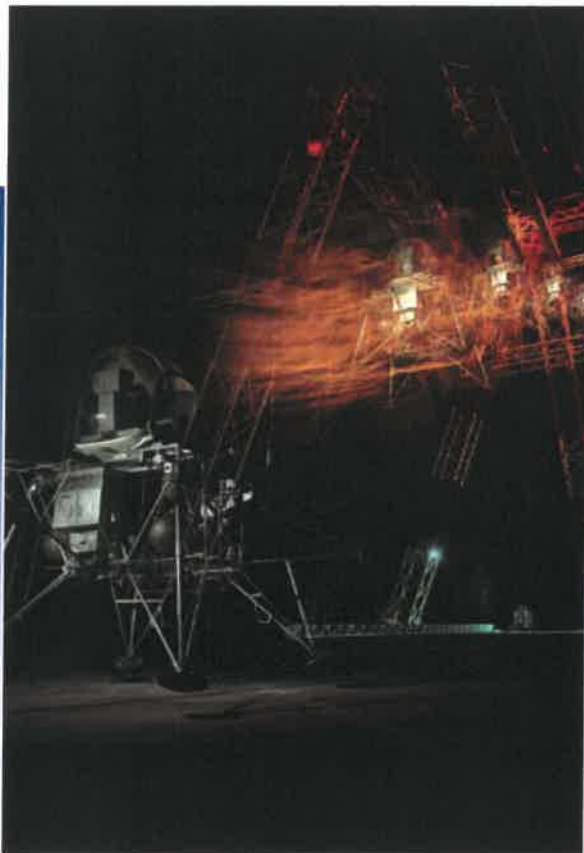


Standard 2

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Langley Research Center (LaRC) in Hampton, Virginia has been at the forefront of flight research since opening in 1915 as the country's first civilian aeronautics center. After NASA was formed, LaRC helped give birth to the space age: Project Mercury, the nation's first man-in-space program, was conceived and initially managed here, followed by various components of the Gemini, Apollo, and Skylab manned programs. Langley also remained an important center for noteworthy research in aeronautics with breakthroughs in supersonic flight and the enhancement and refinement of energy-efficient engines and fuels. Numerous research and testing facilities now exist at Langley that are distinctive in design as well as function and represent the multiple layers of historical development at the site. LaRC has conducted numerous cultural resource studies and surveys to evaluate its facilities for NRHP eligibility. Three examples of resources representing LaRC's diverse historic character were identified through these studies and include the 20-Foot Vertical Spin Tunnel (20-Ft VST), the 8-Foot Transonic Pressure Tunnel (TPT), and the Gantry.

Initiating operations in 1941, the 20-Ft VST consists of a 12-sided test structure that is 20 ft across by 25 ft tall built to test scale models of airplanes for their spinning characteristics and ability to recover from spins. The TPT began operating in 1953 as a transonic testing (speeds near the speed of sound) tunnel which was instrumental in the development of a revolutionary new wing shape that allowed for higher flight speeds than ever before during the 1960s. Through the 1980s and 1990s, LaRC engineers used the TPT to evaluate the design properties of the space shuttle and conducted experiments requiring both subsonic and transonic capabilities. The Lunar Landing Research Facility (1965), popularly known as "The Gantry" was designated as a NHL in 1985. Though less than fifty years of age, the 240-foot tall, 400-foot long A-frame steel structure is of exceptional significance due to its association with training techniques that simulated lunar gravity and was used to train 24 astronauts for lunar missions, including Neil A. Armstrong and Edwin E. "Buzz" Aldrin, Jr., of Apollo 11, the first men to walk on the Moon.



Standard 3

NASA nominates historic properties under its jurisdiction or control to the NRHP.

Nomination of NASA's historic properties to the National Register either individually or as districts is a planning tool that helps Centers manage historic resources in a proactive manner. At LaRC, NASA's nomination of historic properties began as early as the 1980s with research and field surveys that helped cultural resource professionals identify its most important resources. LaRC was also surveyed as part of the Man in Space theme study conducted by the NPS in 1981, which identified resources that significantly contributed to the Apollo Program. This project encompassed multiple NASA facilities and resulted in the listing of five LaRC properties in the National Register as NHLs, the highest historic designation a property can achieve.

With the passage of time, LaRC undertook additional surveys in the 1990s for the purpose of evaluating the Center's historic aviation properties. A National Register nomination followed the survey work that documented LaRC's origins with primary sources and produced histories of the early airfield. In 1995, LaRC sponsored a cultural resource study of LaRC's West Area with the goal of placing the area's most significant properties on the National Register. Survey work continued in 2006-2007, with 164 buildings and structures surveyed and documented by LaRC staff. As time goes by, additional resources may be found to possess the level of significance required for National Register eligibility.

Assessing the significance of historic resources at LaRC challenged historians to look beyond the topic of space exploration and to recognize the many advances in the field of aeronautics at LaRC. These include the development of retractable landing gear in the Full Scale Tunnel (NHL); aircraft winglets in the 8-Foot Transonic Pressure Tunnel (NHL); engines cowls in the Propeller Research Tunnel; grooved pavement at the Landing Dynamics Facility, and advances in aircraft design at the Impact Dynamics Facility.



Standard 3

NASA nominates historic properties under its jurisdiction or control to the NRHP.

Constructed in 1965, The John F. Kennedy Space Center (KSC) in Florida has been the launch site for every American manned space mission since 1968 and is home to a variety of buildings and structures representing the technological advancement of human space flight. KSC was founded in 1958 near Cape Canaveral, where the Air Force has tested ballistic missiles in previous years, and was expanded after President John F. Kennedy decided to send man to the moon.

At KSC, eleven facilities have been listed in the National Register, including launch control and pad facilities, crawler ways, and one of the world's largest enclosed structures – the Vehicle Assembly Building – built to house the Saturn V rocket. Launch Complex 39, Pad A, constructed in 1965 and listed in the National Register in 2000 as part of a historic district representing the Apollo program, is an example of the variety of unique historic resources at KSC. Although less than fifty years of age, it was found eligible because it had achieved exceptional significance as the site of the first Saturn V launch, the Apollo 4 mission, and the Apollo 11 mission to the moon. It has since gained importance in the context of the Space Shuttle Program and, along with two other facilities at KSC has been declared a NHL.

NASA largely relied upon the existing Apollo infrastructure during the transition to the Space Shuttle mission. From 1976 to 1978 Launch Complex 39, Pad A underwent major modifications to accommodate the 1981 launch of the first space shuttle and 23 subsequent launches. Additional structural modifications have been made since 1986, demonstrating how NASA's historic facilities evolve over time to accommodate changing mission needs, avoiding costly demolition and reconstruction of new facilities.



Standard 4

NASA gives historic properties full consideration when planning or considering approval of any action that might affect such properties.

Ames Research Center (ARC) was founded in 1939 at Moffett Field in California by NACA to conduct research concerning propeller-driven aircraft in wind-tunnels. First operating as the Naval Air Station Sunnyvale in 1933, Moffett Field was the site of Hangar 1, a massive free-standing structure covering eight acres built to house the USS Macon, a naval dirigible airship. Hangar 1 has been the focal point of the redevelopment of the property after federal military base closures led to the transfer of portions of the property from the United States Navy (Navy) to NASA. When NASA decided in 1994 to develop a portion of ARC into a shared-use campus for research and education, it carefully considered how the changes would affect its historic properties, in particular Shenandoah Plaza National Register Historic District.

The Historic District was nominated by the Navy to the National Register in 1994. It consists of 124 acres of buildings, structures and monuments with more than 1.54 million square feet of historic floor space. To develop the property with preservation principles as guidance, ARC executed a Programmatic Agreement (PA) in 2002 that included a Historic Resources Protection Plan (HRPP) for the historic district and the remainder of Moffett Field. The HRPP in this 10-year PA establishes procedures for ARC to comply with its Section 106 project review/consultation requirements while it continues to develop a contemporary campus for new users. The HRPP establishes building categories, which direct the maintenance and rehabilitation of contributing properties in the district and offers guidelines that outline various levels of treatment depending on the significance and integrity of the resource. The guidelines follow the Secretary of the Interior's Standards for Rehabilitation and clarify what types of physical changes are allowed in the context of reuse and code compliance and describe appropriate maintenance and repair methods.



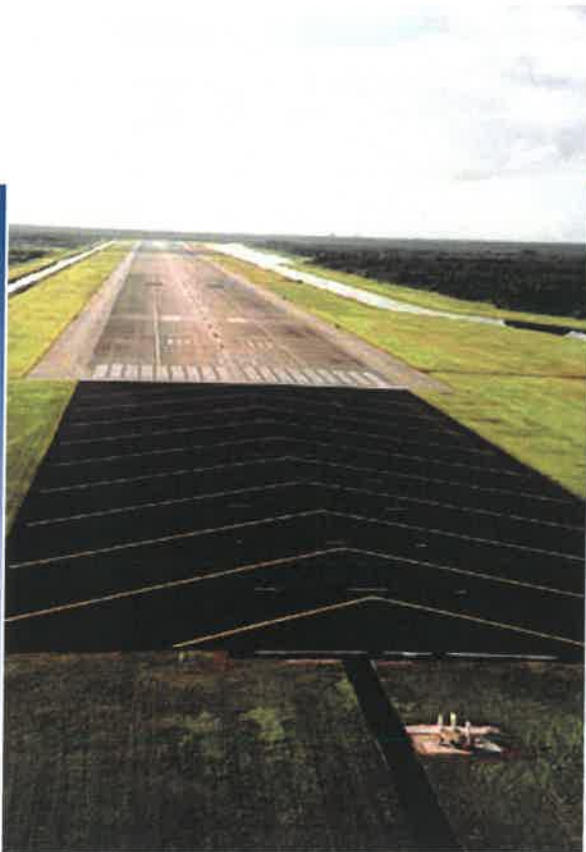
Standard 4

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Following procedures spelled out by the NHPA can create challenges for NASA as it balances its overarching mission with the requirement to consider historic properties and cultural resources. One effective tool that is beginning to help managers at some NASA Centers strike this balance are Programmatic Agreements (PAs) created under the framework of the NHPA. PAs can streamline the review of projects affecting historic properties and tailor historic regulatory compliance to the special circumstances of NASA and its unique mission.

NASA has developed three PAs to date: a nationwide agreement concerning NHLs and two Center-specific PAs, one at ARC and one at KSC. The KSC PA approved in early 2009 is a Center-wide cultural resources management tool created to help manage historic properties affected by the planned phase-out of the Space Shuttle Program and its replacement with the Constellation Program, when some facilities will be modified or replaced to accommodate the change in mission.

Since 1981, KSC has been mostly busy processing and launching Space Shuttle missions. However, it has also been the launch site for every U.S. human space flight since 1968 and eleven KSC facilities are listed in the NRHP representing that history, including the Central Instrumentation Facility, the Headquarters Building, and Launch Complex 39. The 2009 PA cuts down on review times by identifying a list of actions for which KSC does not need to review under the NHPA, enabling it to carry out actions such as building maintenance and repair, demolition of buildings that are not historic, antiterrorism and force protection measures, among other types of activities in a timelier manner. Yet the PA also directs NASA to look for ways to adaptively reuse historic buildings and structures when their utility changes and proactively seek alternatives to harming or destroying cultural resources whenever possible.



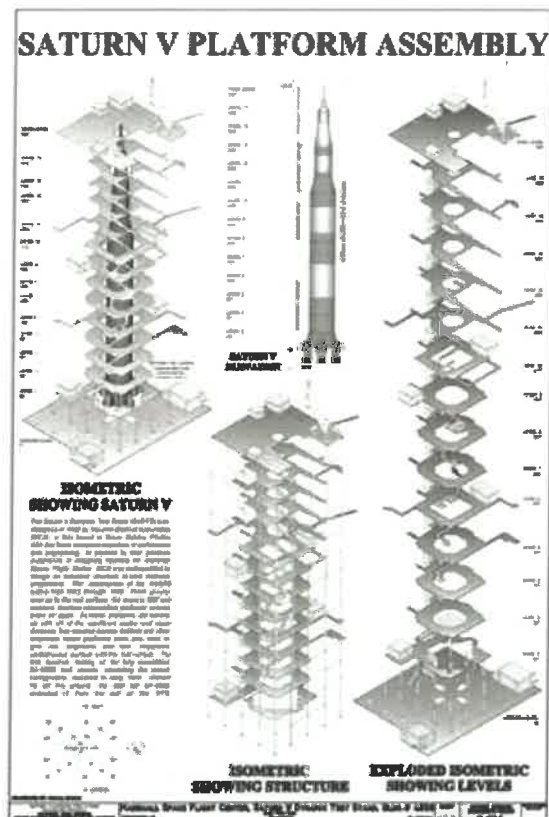
Standard 5

NASA consults with knowledgeable and concerned parties outside of NASA about its historic preservation related activities.

NASA's first home, the George C. Marshall Space Flight Center (MSFC), was activated at the Redstone Arsenal near Huntsville Alabama in 1960 by one of the early twentieth century's most important rocket developers and champions of space exploration, Dr. Wernher von Braun, MSFC 's first director. MSFC remains the agency's lead Center for the Space Shuttle propulsion and its external tank; payloads and related crew training, and; International Space Station (ISS) design and assembly.

MSFC's historic resources physically embody the Mercury-Redstone Program that lifted America's first astronaut, Alan B. Shepard, on a suborbital flight; the 1965 Pegasus unmanned satellites program that detected micro-meteoroids; the development of Saturn rockets which boosted humans to the Moon in 1969, and; development of the Lunar Roving Vehicle used in the last three Apollo lunar missions. In recognition of the outstanding historic and cultural importance of MSFC, the NPS has designated five facilities here as NHLs: the Redstone Test Stand; the Propulsion and Structural Test Facility; the Saturn V Dynamic Test Stand; the Neutral Buoyancy Simulator, and; the Saturn V rocket.

MSFC has partnered with the NPS since 1996 to document its NHLs by entering into cooperative agreements that enable interns pursuing graduate studies in architectural history or other related fields the opportunity to hone their research and building drawing skills. Called the Heritage Documentation Program, this program provides training in the documentation of historic sites and structures of architectural, landscape and technological significance. Duties involve on-site field work, preparation of measured and interpretive drawings and written historical reports for the Heritage Documentation Programs, Historic American Buildings Survey; Historic American Engineering Record; Historic American Landscapes Survey (HABS/HAER/HALS), a division of the NPS, which will be archived at the Library of Congress.



Standard 5

NASA consults with knowledgeable and concerned parties outside of NASA about its historic preservation related activities.

As historic test facilities at LaRC have been retired from active use, the Center has reached out to former employees to capture stories about working at the Center. These personal perspectives enrich our understanding of how LaRC's significant historic facilities functioned and make the case for their preservation. The most recent outreach event in September, 2009 was a celebration of the Full Scale Tunnel (FST) in conjunction with its closing. Declared a NHL in 1985, the FST was used before and during World War II to test almost every high performance aircraft used by the United States. In honoring the FST, the outreach event included a public lecture on the history of the tunnel, an exhibit of test models and historic photographs, and tours of the structure. As other wind tunnels have been retired, LaRC has invited collections specialists from the Smithsonian Institution and the National Institute of Aeronautics to inspect the facilities to determine the use of artifacts and operational components for interpretive purposes.

LaRC has also led the way in use of the internet to inform the community about its cultural resources and historic preservation activities and provide a way for members of the public to present their perspectives. The website was first conceived after 9-11-01 to provide virtual tours after the gates were closed to the general public due to increased security. The website is publically accessible and includes a collection of previously unavailable documents, historic photos and video clips, and virtual tours of the Center. The website also includes narrative histories and historical maps of the area. In addition, the development of the website serves as negotiated mitigation resulting from Section 106 consultation that addresses adverse effects to historic properties at LaRC. Originally planned as a means to inform the general public about the Center's historic significance, the website has yielded unexpected benefits as a vital tool for contractors, museum personnel and historians alike to remotely obtain data about the historic and current conditions of specific historic structures or particular aspects of LaRC history.

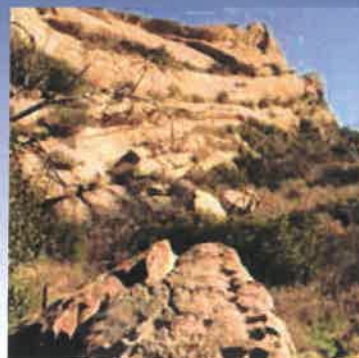


Standard 6

NASA manages and maintains its historic properties in a manner that considers the preservation of their historic, architectural, archeological, and cultural values.

Burro Flats Painted Cave is a prehistoric archaeological site located at NASA's Santa Susana Field Laboratory (SSFL) in Ventura County, California that is known for its many pictographs (rock art paintings) and petroglyphs (rock art that has been scored or incised into the rock surface). The site also includes evidence of habitation. The pictographs first came to archaeological attention in the early 1950s when members of an amateur archaeological club visited the site and published a report in their club's newsletter. Subsequent visits, including a UCLA Archaeological Survey, resulted in the site's listing in the NRHP. The pictographs at Burro Flats are a remarkable record of prehistoric Native American art and include some of the finest and best preserved examples of pictographs in North America.

Given NASA's responsibility to ensure that the site does not suffer from any inadvertent or intentional damage, visits to the site are limited to those with a demonstrated, significant need to visit the site. In 2008, NASA provided a tour for eight members of the Chumash tribe. During the visit, the tribal leader, Mati Waiya, performed a ceremony and sang songs at each location followed by a group offering of tobacco at the main gallery. The group conducted prayers in the Chumash language, burned sage and performed a sage cleansing on NASA's site caretaker. In 2009, additional tours were provided to a representative and elders from the Santa Ynez Chumash tribe who conducted prayers and rituals at the site. These tours, and others planned for 2010, evidence NASA's commitment to protecting Burro Flats and providing access to tribal representatives for religious, ceremonial, and heritage purposes.



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When GRC determined the need for an addition to the 1942 Icing Research Tunnel (IRT) – an American Society of Mechanical Engineers Landmark – the Center recognized the importance of selecting a design that would be appropriate for the National Register-eligible facility located within a proposed historic district. GRC consulted with the Ohio SHPO to ensure that the design would be compatible with the existing building and the characteristics that exemplify its historic function and role at GRC.

With research operations beginning in 1944, the IRT has served NASA and the commercial aviation industry by investigating the problems of aircraft icing. Work continues today in the development of ice protection systems for military and commercial aircraft. Over the years, the technical capabilities of the IRT have been upgraded and modernized to improve the tunnel's ice generation systems. Alterations include improving air flow through the expansion of the tunnel loop, the ITR's most significant feature used to simulate natural icing conditions on aircraft.

The office and shop areas which have played a secondary support role historically at the IRT retain their physical integrity and are an important contributing element of the facility. Surrounding the refrigerated, closed circuit tunnel loop, the office and shop complex is clad in a buff-colored brick, typical of the simplified 1940s "moderne" institutional style. The proposed design for the addition will incorporate architectural materials and design features reflective of the building's original design intent, including buff colored brick and alternating bands of brick detailing at the window level. This stylistic feature provides a subtle "streamlined" appearance evocative of the building's dynamic function. When completed, the addition to the IRT building will complement the 1940s period architecture and support the continued viability and use of a designated historic property.

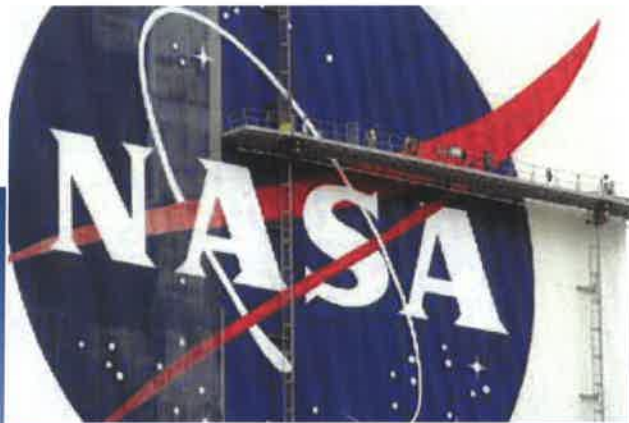


Standard 6

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NASA's largest rocket testing facility, the John C. Stennis Space Center (SSC) in Hancock County Mississippi, was constructed in 1961. Three of the facility's original concrete and metal Test Stands – known as Rocket Propulsion Test Complexes A-1, A-2, and B-1/B-2 – were originally used to test-fire the Saturn V rockets that were instrumental in landing men on the moon and have therefore been designated as NHLs. In 1996, under the direction of NASA's Constellation Program, the A-1 test stand began a new chapter in its operational history. Following a temporary decommissioning, the stand was converted to test the J-2X engine. That engine was designed to power the upper stage of NASA's crew launch vehicle, Ares I, and the Earth departure stage of the new cargo launch vehicle, Ares V. As with many of NASA's notable historic structures, the Test Stands were built as adaptive resources, with future modifications always kept in mind. As such, Test Stand A-1 has served the development of no fewer than three generations of rocket engines, illustrating how NASA continues to find new, compatible uses for its historic properties. Test Stand A-2 will continue testing space shuttle main engines through the end of the program. In 1998, the A-1 was called upon once again to test the engines for another futuristic spacecraft – the X-33, an experimental, half-scale, sub-orbital flight demonstrator. The XRS-2200 Linear Aerospike engine, projected to power the X-33, was successfully tested on the A-1 stand until the X-33 Program was canceled in 2001.

The Test Stands have also been designated as an American Institute of Aeronautics and Astronautics (AIAA) Historic Site (as are Tranquility Base on the Moon and Kitty Hawk, NC), further demonstrating their historic value and significance that calls for preservation and conservation. The AIAA designation process was the result of a nomination request submitted by SSC's Senior Management. Because of these designations, all proposed construction activities in the Testing Complex that include demolition, dismantling, relocation, or removal of significant elements of the structures that contribute to their significance requires consultation with the Mississippi SHPO.



Standard 7

NASA gives priority to the use of historic properties to carry out agency missions.

Located at the Jet Propulsion Laboratory (JPL) in Pasadena, California, the Space Flight Operations Facility (SFOF) serves a critical role in tracking spacecraft and processing scientific data received from JPL's Deep Space Network. The SFOF was constructed in 1963 and is composed of three floors and a basement. At the heart of the SFOF is the Network Operations Control Center (NOCC) which provides a centralized control point for NASA's Deep Space Network. Because of its significant contribution to space flight, the SFOF was designated a NHL in 1985.

Within the SFOF, the NOCC houses numerous communications, data storage and processing facilities necessary to control and monitor deep space flight operations. Other areas of the building house offices, public viewing areas and additional support facilities. The SFOF supports various ongoing NASA projects including tracking the Voyager Spacecraft. It has continually been modified and its equipment upgraded since it was built and put into operation in 1964. The SFOF received a major upgrade around 1980 when it transitioned from analog to digital. It is of vital importance that modifications occur on a routine basis as it allows the SFOF to utilize the most advanced technologies required to conduct NASA's missions.

Because of its designated status as a NHL, the SFOF is closely monitored by NASA's cultural resources specialists for any potential modifications. Modifications are initially developed by the JPL Facilities Organization, which then presents its proposal to the Environmental Affairs Program Office (EAPO). The EAPO reviews the proposal and determines whether there will be effects to the NHL. Only after EAPO approval and SHPO concurrence can a project proceed. Whether SHPO consultation is required or not, all modifications are submitted in an annual report to the SHPO per a PA among NASA, the California SHPO and the ACHP signed in 1989.



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SSC's identification as a Historic Aerospace Site in 2006 – and the earlier NHL designation of the Rocket Propulsion Test Complex with its three Test Stands' (A-1, A-2, and the twin B-1/B-2) in 1984 – recognized and celebrated the essential historic role SSC played in sending man to the moon. At the same time, the continued use and reuse of these historic assets demonstrates how NASA is committed to utilizing its historic properties as both its mission and technologies change over time. The official boundaries of the NHL-designated area encompass only the test stands themselves; however, more than 40 additional supporting resources, including test control centers, observation bunkers, pump houses, storage tanks, and ground service equipment make up a complex surrounded by 118,000 acres of acoustic buffer zone protected by an easement. NASA maintains the operational functions of this large and complex facility while responding to new mission directives and honoring its responsibility to protect the nation's heritage represented by these technical and scientific structures.

SSC is not only a place of historic significance but continues to operate as an important center for innovation. The 1990s saw development of a new test complex "E" where a hybrid rocket motor was designed to power the Scaled Composites' SpaceShipOne that made the first privately-funded human spaceflight in 2004. Rolls-Royce Group PLC opened a new outdoor aero engine test facility later in that decade to test the latest high-thrust Trent engines that will be used for the Airbus A380 and Boeing 787 Dreamliner. SSC's continued use of its historic assets in this dynamic and forward-thinking environment exemplifies NASA's commitment to managing and celebrating its historic facilities without compromise to its complex scientific operations or its role in technological innovation.



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<http://environmental.hq.nasa.gov/ep.html>

NASA CRM Website (Internal)

<http://nets.grc.nasa.gov/histpreserve/home/index.cfm>

Cultural Resources GIS Websites

<http://CRGIS.NDC.nasa.gov/historic>

www.youtube.com/user/Nasa.CRgis

**For more information on NASA's CRM Program, including the list of Center
Historic Preservation Officers, please contact:**

