FINAL

NATIONAL AERONAUTICS AND SPACE ADMINISTRATION

National Environmental Policy Act; Testing of Scale-Model Solid Rocket Motors at George C. Marshall Space Flight Center

AGENCY: **National Aeronautics and Space Administration (NASA)**

ACTION: **Finding of No Significant Impact**

SUMMARY: Pursuant to the National Environmental Policy Act of 1969 (NEPA), as amended (42 United States Code [U.S.C.] 4321 et seq.), the Council on Environmental Quality (CEQ) Regulations for Implementing the Procedural Provisions of NEPA (40 *Code of Federal Regulations* [CFR] Parts 1500 through 1508), and NASA's regulations (14 CFR Part 1216, Subpart 1216.3), and based on the analyses in the Environmental Assessment (EA), the National Aeronautics and Space Administration (NASA) has made a Finding of No Significant Impact (FONSI) with respect to the Proposed Action. The action involves future testing of scale-model solid rocket motors (SRMs) at NASA's George C. Marshall Space Flight Center (MSFC).

DATE: September 2010

ADDRESSES: No comments were received during the 30-day public review of the Draft EA, which was held from June 27, 2010 through July 26, 2010. All comments received from federal, state, and local entities on the Draft EA are addressed in the Final EA.

To receive a copy of the Final EA, contact AS10/Mr. Allen Elliott, Manager, Environmental Engineering and Occupational Health Office, NASA Marshall Space Flight Center, AL 35812, phone: (256) 544-0662, e-mail: Allen.Elliott@nasa.gov.

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SUPPLEMENTAL INFORMATION:

As NASA's principal propulsion research center, MSFC has the lead role of conducting SRM research and development (R&D), and is the only NASA Center currently capable of conducting static scale-model SRM testing. Static scale-model SRM testing allows NASA to reduce the risk and expense associated with the design of new SRMs and the selection/qualification of new SRM materials prior to implementation of full-scale static

tests. The EA that has been prepared broadly analyzes the conceivable scope of future static scale-model SRM testing that could occur at MSFC.

Under the Proposed Action, future static scale-model SRM testing would be conducted in the East Test Area of MSFC on various types and sizes of scale-model SRMs. To provide a comprehensive analysis of the scope of future static scale-model SRM testing that could occur at MSFC, scale-model SRMs are grouped into three size classes, based on maximum thrust potential, to define the Proposed Action: small, medium, and large scale-model SRMs. Small, medium, and large scale-model SRMs are defined as having maximum thrust potentials, measured in pounds force (lbf), of 10,000 lbf, 60,000 lbf, and 100,000 lbf, respectively. Based on the current goals of NASA's SRM R&D program, small SRMs are expected to be tested at a frequency of 35 times over a two year period. Medium SRMs and large SRMs are each expected to be tested once a year. Maximum annual testing frequencies are expected to be 25 small SRM tests, five medium SRM tests, and two large SRM tests. The average duration of a future small SRM test would be approximately 4 seconds. The average durations of a future medium SRM test and a future large SRM test would be approximately 20 seconds and 30 seconds, respectively. Future static scale-model SRM testing would be conducted at the following facilities at MSFC: Test Complex 116 (small SRMs), Test Complex 500 (medium SRMs), Test Stand 4520 (medium and large SRMs), and Building 4583 (very small SRMs).

The test facilities at MSFC are all currently operational and do not require any modifications to accommodate testing. Conducting static scale-model SRM testing at any other NASA Center would require new facility construction and/or existing facility modifications, resulting in significant costs and associated testing delays. There are no technical alternatives to actual scale-model testing that alone can provide the simulation of full-scale tests needed for development/qualification of new materials/ instrumentation or to conduct ballistics, thermal, or acoustics analyses. The testing frequency currently proposed at MSFC is based on the current goals of NASA's SRM R&D program. The proposed testing frequency is largely driven by cost and schedule and, therefore, is limited to the minimum extent feasible by these factors. Conducting testing at a lower frequency would not adequately support NASA's current SRM R&D program or future advancement of SRM technology. In summary the site, technical, and operational alternatives that were considered were determined to not be reasonable alternatives to the Proposed Action. Under the No-Action Alternative, scale-model SRM testing would not be conducted at MSFC.

Based on the findings of the EA, the Proposed Action would have no effect, or minimal impacts, on land use, topography, geology, soils, groundwater, floodplains, surface water, cultural resources, socioeconomics, housing, schools, recreation, utilities, solid waste, traffic flow, rail transportation, water transportation, or aviation. The Proposed Action would have minor impacts on air quality, noise levels, biological resources, public/occupational health and safety, and hazardous materials/wastes. The impacts that the Proposed Action would have on these resources would not be significant. The Proposed Action would not have disproportionately high or adverse human health or environmental effects on minority or low-income populations, and would not result in environmental health or safety risks to children. No adverse cumulative impacts would occur when the Proposed Action is combined with past, present, or reasonably foreseeable actions.

Based on the air dispersion modeling conducted for the EA, air emission concentrations from future scale-model SRM testing at MSFC would be below applicable standards at the Redstone Arsenal (RSA) boundary, nearest residential areas, nearest ecologically sensitive areas (ESAs), and within the Wheeler National Wildlife Refuge (WNWR). Hydrochloric acid (HCl) deposition resulting from testing would have no impact on residents or listed species, and would have little potential to impact biological receptors within the WNWR. Depending on meteorological conditions, biological receptors closer to the tests sites may be affected by HCl deposition. However, the potential impact would be minor because the exposure potential would be temporary and infrequent, and the quantities deposited would be small. Based on the predicted annual carbon dioxide emissions that would be generated, future testing would have a negligible contribution to greenhouse gas emissions. Based on acoustic predictions developed for the EA, future testing would have an extremely low probability of damaging structures in the nearest residential area and in any new residential or commercial development that may occur. Noise levels generated during testing would be a minor noise impact to residents because of the low frequency and short durations of future tests. High noise levels generated by testing would be experienced in a relatively small portion of the WNWR. Any noise disturbance experienced by wildlife in the WNWR would be infrequent and of short duration. Based on the distances of the ESAs and documented occurrences of listed species from the test sites, future testing is expected to have minimal noise impacts on wildlife and listed animal species that utilize the ESAs on RSA and on listed species that occur outside RSA. Based on established Quantity Distances, security controls, safety protocols, and standard operating procedures specific to scale-model SRM testing, the potential for safety and occupational health impacts under the Proposed Action would be low. Propellant trimmings would be the only hazardous material/waste that would potentially be handled/generated under the Proposed Action. Propellant trimming would be conducted at MSFC by qualified personnel and trimmings would be properly disposed of by RSA personnel by appropriate methods.

The No-Action Alternative would have no impact on any resource evaluated. However, the No-Action Alternative would have a negative impact on NASA's ability to advance SRM technology and on NASA's overall mission.

After careful review of the EA, NASA has determined that the Proposed Action would not generate significant controversy or have a significant impact on the quality of the human or natural environment. This analysis fulfills the requirements of the National Environmental Policy Act and Council on Environmental Quality regulations. An Environmental Impact Statement will not be prepared, and NASA is issuing this Finding of No Significant Impact.

Robert M. Lightfoot
Director
George C. Marshall Space Flight Center
National Aeronautics and Space Administration

Date Issued: September 2010