Report to Congress on the Solid Rocket Motor Industrial Base Sustainment and Implementation Plan
Redacted Version

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May 2011

Preparation of this study/report cost the Department of Defense a total of approximately $763,988 for FY 2011.
Generated on March 15, 2011, 1000 RefID: 4-FE22256

Solid Rocket Motor (SRM) Sustainment Plan

The Department of Defense (DoD) is providing this SRM sustainment plan to the congressional defense committees as directed in section 1078 of the National Defense Authorization Act, Public Law 111-84, dated October 28, 2009. This sustainment plan also documents the Department's implementation of the sustainment plan as directed by section 916 of the National Defense Authorization Act, Public Law 111-383, dated January 7, 2011.

The Department's primary objectives for the SRM Industrial Base Sustainment Plan are to: (1) sustain production capabilities for national assets; (2) keep critical design teams in place for future system needs; and (3) to the extent practical, preserve the option to satisfy new government demand in the future. For the purpose of this study, the DoD used pounds of propellant as an indicator of overall SRM industrial base viability. After careful analysis, the DoD concluded that it can achieve its sustainment goals through a combination of initiatives. The Department needs industry's cooperation to make the effort affordable: industry must first take the lead by "right-sizing" its excess capacity to align with projected demand. The DoD will then invest in SRM science and technology (S&T) and research and development (R&D) along with procurements each year of systems that will sustain the base.

The Department identified the resources within the DoD budget that implement the Department's Sustainment Plan for the SRM industrial base. The Defense budget includes funding for SRM S&T activities, the Air Force R&D Propulsion Application Program, and R&D funding for four defense missiles that are developing new SRMs or are modernizing older SRMs over the FYDP. The budget includes funding for the production of the Trident II D5 SRM motor sets and missile defense and tactical missile programs that contribute to sustaining the SRM industrial base. The budget also includes funding for EELV strap-on SRMs that helps stabilize the large SRM industrial base by purchasing a planned number of boosters each year. The SRM funding portion of the missile defense and tactical missile programs generally ranges between three to twenty percent of the acquisition cost of a missile program.

The DoD needs to sustain the SRM industry because the United States will continue to rely on SRMs over the long term. Large SRMs (40- to 92-inch diameter) propel all of DoD's strategic missiles. Solid rockets are by far the best technology for strategic systems because they offer rapid employment capability, long-term storability, and maximum safety. The recent Nuclear Posture Review described the Department's plan to preserve its strategic systems through the foreseeable future, thus reinforces the need to retain a SRM capability. The Department also uses SRMs for space launch, tactical missiles, and missile defense. Many of these uses require SRMs for the same reasons that strategic weapons require them. The sustainment plan takes advantage of these additional sources of demand to contribute to economic production levels and to hone design teams' technical capabilities.

The Department delivered an interim report in June of 2010 that provided the summary of the significant SRM market decline and discussed the DoD's activities and efforts to develop the SRM industrial base sustainment plan. Last year, the Department established an Interagency Task Force – with members from all the Military Services, Defense Agencies and NASA. The task force identified critical technical and production capabilities across a disparate DoD and NASA enterprise and determined whether the current and projected large-SRM requirements are

sufficient to provide an adequate economic base to support those capabilities without intervention, then evaluated alternative business models that may better sustain the industry in the future.

Based on the analysis and findings of the Interagency Task Force, the DoD concludes:

(1) The Department must preserve the scientific, engineering and design skills and production capabilities necessary to support both large- and small-SRMs. The DoD cannot allow the SRM industrial base to shut down until DoD determines its next generation requirements because the potential expense and schedule delays of restarting the industry would be too great. The SRM production capabilities are needed to support the MM III through 2030 and the D5 through 2042.
(2) The Department relies on SRMs to meet many of its national security requirements. Specifically, the DoD must have large SRMs for propulsion of strategic missiles, as well as for heavy space launch applications, which are vital to its national security strategic deterrence mission.
(3) Industry must better align its capacity with the Department's current and future large-SRM market demand.
(4) The Military Services and Defense Agencies need to better define future needs for SRMs beyond the FYDP, at least through 2030, and then communicate those needs to the supplier base. The Office of the Secretary of Defense (OSD) needs to work across program and Service/Agency lines and remain involved in the deliberate management of this vital industrial sector.
(5) Production activities alone will not be sufficient to protect and/or restore critical technical and creative skills necessary for future missile development and current missile sustainment, regardless of what company or what facility executes the production. Research and development programs, such as the Air Force ICBM Demonstration and Validation program, are required to preserve SRM science and technology, engineering and design teams and their critical skills.
(6) The most efficient business model for the large-SRM industry is competition with continued rationalization. The upfront requalification and facilitization costs associated with natural monopoly or a government-owned/contractor-operated model are prohibitive.

While most of the Department's conclusions are directed at the large-SRM industrial base, production of smaller SRMs (less than 40-inch diameter) that are used in missile defense and tactical missile systems can also help sustain some parts of the industrial base. Overall, small- and large-SRM capabilities are not interchangeable. In most cases, large SRMs have size-driven production requirements for ingredient-handling equipment, mixers, casting pits, cranes, and testing fixtures. It may take several large mixing bowls to cast a single large SRM, adding significant complexity to the mixing, pouring, and casting processes. Smaller SRMs, on the other hand, use a common infrastructure that includes commercial handling equipment, cranes, and machining equipment. A single mixing bowl will pour many small SRMs. Furthermore, the design requirements for large and small SRMs also differ, in part because the longer burn times for the larger SRMs limit the materials that can be used. Large SRMs also need particular structural elements to manage vibration and stresses during the launch and boost phases.

Because of these different characteristics in design and production, small SRM demand, which has increased recently and will increase still further in the near-term program of record, will contribute to sustaining the SRM industrial base mostly at the subtier supplier level. Specifically, planned small SRM programs will purchase more than one million pounds of propellant per year.

OSD will continue its efforts with the Services and Defense Agencies to select an appropriate mix of SRM investments that will sustain the SRM industrial base. The DoD also will continue efforts to coordinate investment decisions with NASA to ensure that SRM industrial base sustainment is considered as part of all relevant programmatic decisions and will continue the SRM Inter-Agency Task Force activities: monitoring the SRM industrial base, identifying capability issues at the prime- and subtier- supplier levels, and jointly addressing mitigation options.