



Propulsion Industrial Base Sustainment

Preserving the Nation's Critical Propulsion Capabilities

In a budget-challenged federal environment and an era of increasing industry consolidation, there is an urgent need to integrate across government requirements and to sustain the critical national capabilities in rocket propulsion, research, development, and manufacturing. Marshall has decades of experience working with other government agencies and industry partners to study these capabilities and coordinate efforts to keep the industry moving forward. Erosion of the propulsion industrial base would seriously impact U.S. defense capabilities, space exploration potential, and economic health.

Marshall has led efforts to bring stakeholders together to work these issues, contributed technical expertise to key studies and review boards, and consistently participated in interagency working groups to address propulsion issues.

Collaborating To Identify Challenges and Facilitate Solutions

The Center continues to serve as a resource for collaboration and integration among all sectors of the rocket propulsion community. Most recently, Marshall embraced the challenge of preserving and strengthening U.S. leadership in rocket propulsion by inviting government, industry, and academic partners to form the National Institute for Rocket Propulsion Systems (NIRPS). NIRPS examined existing studies and identified "grand challenges" facing the industrial base. The team's work supports policy analyses, identifies technology requirements, and offers options to make best use of national resources to meet future needs. Among its many efforts, this Marshall-led team:

- Led an interagency task team responding to a congressional requirement and the Office of Science and Technology (OSTP) tasking to support development of a National Rocket Propulsion Strategy

At-A-Glance

Rocket propulsion is an enabling technology for our nation's way of life. The technologies that have been developed to support propulsion are critical to national defense, intelligence gathering, weather forecasting, navigation, entertainment, land use, Earth observation, scientific exploration, and many other endeavors. The rocket propulsion industry is also a source of high-quality jobs. Marshall Space Flight Center has continually embraced the challenge of preserving and strengthening U.S. leadership in rocket propulsion by its participation in industry forums and collaboration with other government agencies.



- Facilitated a coordinated purchase of ammonium perchlorate propellant used by every armed service and many commercial firms to stabilize demand for this solid propellant and provide significant cost savings to all government buyers
- Collaborated with the Chemical Propulsion Information Analysis Center at Johns Hopkins University to develop the Cross-Community Skills and Capabilities Directory, which allows propulsion partners and potential customers to easily locate specific propulsion expertise, capabilities, and facilities across the U.S. government
- Developed supply chain analysis methods to support the Space Launch System (SLS) architecture decisions and determine impacts of those decisions on the industrial base
- Developed a survey for Industrial Base Health Metrics
- Performed an OSTP study on national altitude test capability
- Worked with the Air Force Research Laboratory to integrate NASA technology roadmaps with Air Force Integrated High-Payoff Rocket Propulsion Technology roadmaps
- Developed strategies for easier access to government facilities and expertise in partnership with the Defense Acquisition University
- Led two technical interchange meetings focused on additive manufacturing and green propulsion
- Managed execution of a propulsion repository contract

NIRPS works with multiple government, industry, and academic partners across the country to provide comprehensive factual information to both the propulsion development community at large and policymakers about all issues affecting the U.S. propulsion industry. The Center collaborates with those partners to identify solutions to problems both technical and programmatic as they emerge.

As part of the Joint Army, Navy, NASA, and Air Force (JANNAF) interagency propulsion committee, Marshall has participated in numerous subcommittees on all aspects of propulsion technology development. The JANNAF executive committee, consisting of two representatives from each member agency, has included a representative from Marshall since its inception in 1969. The Center has also had numerous executive committee chairs during that time. Through its participation in JANNAF and its subcommittees, Marshall has consistently provided its technical expertise in an advisory capacity to those making decisions about the nation's investment in propulsion technology development and adoption.

As a leader in propulsion development, Marshall has also consistently participated in professional organizations' forums regarding aerospace engineering, particularly in the area of propulsion systems development. Engineers, scientists, and program/project managers from the Center routinely provide papers to trade journals and conferences such as the The American Institute of Aeronautics and Astronautics (AIAA) Joint Propulsion Conference, JANNAF conferences, the Institute of Electrical and Electronics Engineers (IEEE) Vehicle Power and Propulsion Conferences, and the International Aeronautical Congress. This collaboration and exchange of ideas with the broad community of aerospace and propulsion development provides Marshall with the necessary situational awareness to advise the Agency and the nation on investments and partnerships with the propulsion industrial base.

The rocket propulsion industrial base is a crucial capability to the United States for national security, scientific research, human exploration, and economic growth and development. Yet many challenges are now facing that base, including decades of industry mergers and consolidations, the end of the Space Shuttle Program, declining federal budgets, and international competition. At the same time, the emergence of new commercial capabilities offers new opportunities. Marshall continues to offer its unique expertise, insight, and experience to government and industry partners to ensure that this capability remains healthy for future scientific and exploration missions.



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