National Aeronautics and Space Administration

SBIR CASE**STUDY** NEVADA









With funds from NASA's SBIR program, DSSP developed several space technologies that will enable small satellite exploration. The company tested its technologies in a microgravity environment (top right) and leveraged insights to develop commercial products for avalanche control and oil well rejuvenation. Photos by NASA (far left) and DSSP.

Small Business Launches Down-to-Earth Products via NASA SBIR Program

SBIR contracts enabled DSSP to develop small satellite micro-thrusters and space propellants that led to new products and business growth in space, defense, and commercial markets.

Digital Solid State Propulsion (DSSP)
Reno, Nevada
dssptech.com
Founded: 2006
Staff Size: 6

DSSP leveraged its success with multiple NASA SBIR contracts to both develop space technologies and determine how to apply those technologies on Earth. The company's research and development (R&D) involving electric propellants for NASA has led to numerous commercial products that power satellites, rejuvenate oil wells, enable safer use of pyrotechnics, and streamline avalanche control.

> "The expertise we gained from our interactions with NASA was critical as we later applied those insights to other research projects with other government agencies and for commercial applications."



—Dr. Wayne Sawka, Founder and CEO, Digital Solid State Propulsion

Through the SBIR program, DSSP developed a multi-pulse solid rocket motor for NASA that will enable stabilized interplanetary flight for small satellites. Another of DSSP's core innovations with roots in the SBIR program is already having an even greater impact. Originally proposed to fuel a microsatellite thruster for Earth-observation missions, DSSP's HAN-based green electric monopropellants (GEM and AF-M315E) technology is powering larger satellites, enhancing downhole oil and gas recovery, and much more. Highly insensitive to ignition by spark, flame, or shock, GEM-based innovations are stable, non-toxic, and more controllable than conventional propellants.

DSSP's Path to Success

- **Meeting a NASA need:** The capability DSSP's rocket motor offered will allow NASA to perform high-value, low-cost science missions in deep space.
- **Commercializing proactively:** Recognizing the long road to "market" for NASA-specific innovations, DSSP sought commercial applications early on for its SBIR technology.
- **Strategic R&D planning:** DSSP leveraged NASA expertise to gain insights, applying them to other research projects and creating multiple commercial products.
- **Continuing to expand:** DSSP is investigating other applications in avalanche control and waterless fracking.
- **Pursuing other government agencies:** DSSP recognized its innovations' value beyond NASA and collaborated with the Department of Defense (DOD) and the Air Force Research Lab to advance the technologies.

Engaging with NASA

Having first gained experience with the SBIR program in 2006 with a DOD project, DSSP applied its "lessons learned" to NASA projects. DSSP successfully engaged with NASA by communicating with SBIR contacts to sustain interest in DSSP's technology, maintain awareness of NASA's needs as a customer, and anticipate the agency's future challenges.

Markets for DSSP's Technology

NASA Applications

- Satellite propulsion
- Non-toxic and low-hazard propellant systems

Commercial Applications

- Green satellite systems
- Oil well rejuvenation
- Waterless fracking
- Avalanche control
- Entertainment industry non-pyrotechnic sparks
- Military training simulations

> "Working with NASA on an SBIR contract helps to validate a small company's technology as unique in a space market crowded with entrenched technologies and large competitors."
>
> —Dr. Wayne Sawka, Founder and CEO, Digital Solid State Propulsion

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NASA SBIR/STTR Program
sbir.nasa.gov

www.nasa.gov

Join the hundreds of small companies that have participated in NASA SBIR projects.

Visit *https://sbir.nasa.gov* where you can:

- Learn more about the SBIR and STTR programs and how to get started
- View the annual Solicitation to find NASA needs that match your capabilities
- Sign up for newsletters and download other resources

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