

Spurring Economic Growth and Development through NASA-Derived Technologies

Witnesses:

Mason Peck

Chief Technologist, National Aeronautics and Space Administration

George Beck

Chief Clinical and Technology Officer, Impact Instrumentation, Inc.

Brian Russell

CEO, Zephyr Technology

John Vilja

Vice President for Strategy, Innovation and Growth, Pratt & Whitney Rocketdyne

Richard Aubrecht

Vice President, Moog Inc.

Subcommittee Members Present:

Steven Palazzo (R-MS), Chair

Jerry Costello (D-IL), Ranking Member

Mo Brooks (R-AL)

Donna Edwards (D-MD)

Dana Rohrabacher (R-CA)

Hansen Clarke (D-MI)

Full Committee Members Present:

Ralph Hall (R-TX), Chair

The House Committee on Space Science and Technology Subcommittee on Science and Aeronautics held a hearing on July 12 to discuss the potential of National Aeronautics and Space Administration (NASA) research for technology marketable in the private sector. NASA was established by the National Aeronautics and Space Act of 1958 (P.L. 85-586) as the lead agency for space and aeronautics research. Since then, 1635 “spin-off” technologies, industry applications based on NASA research, have been registered by the Space Technology Program. Formed in 2010, the Space Technology Program’s mission is to oversee high-tech research and disseminate this technology to the private sector. Despite this, recent budget allocations to NASA have flat funded their research and development (R&D) programs while other agencies’ R&D programs have seen their budgets supported with increases. The NASA Inspector General (IG) released a report in March 2012 entitled *Audit of NASA’s Process for Transferring Technology to the Government and Private Sector* which concludes “NASA has missed opportunities to transfer technologies... maximize partnerships... and industry and the public have not fully benefited from NASA developed technologies.”

Chairman Steven Palazzo (R-MS) began his opening statement by saying he hoped this hearing would inform the public that publically used technologies derived from NASA innovations extend beyond “tang and Teflon.” He echoed the IG report’s claim that NASA has had a recent decline in technology transfer and pointed to the lowered budget as a cause, especially the “insufficient” number of patent lawyers in the Space Technology Program. Palazzo was curious about the necessity of the Space Technology Program asking, “Does technology transfer happen in more informal ways?” The chairman closed by stating he hoped the hearing could shed light on partnerships between NASA and industry, and how Space Technology policies “disseminate technology to the private sector.”

Ranking Member Jerry Costello (D-IL) submitted his opening statement to the record to allow more time from questioning. He hoped the witnesses could enlighten the subcommittee on how NASA’s technology transfer process could be improved. In defending NASA’s importance, Costello stated the agency’s history of inspiring young people to pursue careers in science, technology, engineering and mathematics (STEM).

Mason Peck, Chief Technology Officer at NASA, testified on behalf of the Space Technology Program. He said NASA-derived technology is used in manufacturing, medicine, transportation and renewable energy. Peck gave numerous examples of these spin-offs, such as a remote ultrasound which anyone can easily use to send images of an injury to a medical professional and hasten a diagnosis. NASA played a role in developing a phototropic cell to clean water. It is used in irrigation and even helped clean the Gulf of Mexico after the 2010 BP Deepwater Horizon oil spill.

In response to the IG report, Peck said that in addition to a decrease in funding, NASA employees are uninformed about the details of the technology transfer process. He claimed innovators “lack awareness of beginning steps in technology transfer channels” and how broadly NASA technologies can be applied. He stated that NASA staff “lack awareness of the agency’s technology transfer policy requirements.”

George Beck, Chief Clinical and Technology Officer of Impact Instrumentation, stated in his testimony that his organization has more of a “spin-in” agreement with NASA. Impact Instrumentation develops life-support systems to “expand the level of care” for astronauts. This technology is used by the Department of Defense (DoD) in treating and transporting injured soldiers. Beck said Impact, NASA and DoD work together “to leverage critical technology for space.”

He testified that the greatest challenge of working with NASA is “overcoming the questions [from the government] as to why would we want to have a noncompensated space act agreement.” Thankfully, Beck said, others within the agencies saw “that working together would benefit both groups.” Industry gained government support in its research, and NASA gained cost-effective and quickly-developed solutions to problems.

Congresswoman Donna Edwards (D-MD) introduced her constituent, Brian Russell, CEO of Zephyr Technology. Zephyr is based in Annapolis, MD.

Russell testified to the benefit of working with NASA in developing remote physiological monitoring technology (PSM). Zephyr Technology originally used NASA technology to monitor motion sickness in zero gravity for astronauts-in-training. Now, their PSM equipment is used by Olympic athletes, Major League Baseball, the National Basketball Association and various other health and athletics groups to monitor heart rate, skin temperature and even electrocardiography during training or recovery from an injury.

Russell said their technology was even used to monitor the health of the Chilean miners trapped during the 2010 Copiapo mining accident. Other than the obvious benefit of monitoring the health of these miners, Russell stated the situation was a learning experience as well and “mimicked” a long-term space travel scenario. He stated the benefits to PSM and similar technologies from increased funding to NASA.

John Vilja, Vice President for Strategy, Innovation and Growth for Rocketdyne, spoke to the difficulty in communicating the “everyday” importance of NASA beyond “tang and Teflon” in his testimony. Rocketdyne develops high-energy density engines used for rockets. It assists in launching DoD satellites. Rocketdyne technology has been used for water pumping technology and even a solar powered generator that makes energy at night. It works by heating salt solution during the day and converting the heat to energy during the night.

Vilja explained that the level of technology in corporations like Rocketdyne and NASA “is staggering” and NASA is considered a leader among these high tech groups. He urged the subcommittee to “keep investing in development.”

Richard Aubrecht, Vice President of Moog, discussed Moog’s relationship with NASA which began with Project Mercury, the first manned space program of the United States. Moog develops and tests precision motion controls. “We do the steering” said Aubrecht. His testimony focused on the need for NASA to “focus on really hard problems.” According to Aubrecht, a rocket launch is “ubiquitous” and has been achieved by many nations but deep space and manned space missions are essential to developing innovative, useful technology.

He said that when NASA tackles difficult problems, technology is advanced in fuel development, motion control, life support and medical equipment. Aubrecht advised the subcommittee that the best way for NASA to retain its technical expertise was to set clear, concise mission statements with lofty technological targets and keep the programs funded consistently.

Full committee Chairman Ralph Hall (R-TX) opened the question and answer portion by criticizing the closure of the Constellation program by President Obama. Constellation was a NASA project formed under the Bush Administration to send astronauts back to the Moon. President Obama shut down the project in his 2011 budget, choosing instead to invest in a “space-taxi” program and pursue research to enable human exploration of the solar system.

Palazzo asked about the role of field centers throughout the country in disseminating NASA technology as opposed to NASA’s

Space Technology Program. Peck answered that field centers like Goddard Space Flight Center work with individual companies, usually in the area and actually distribute the research while Space Technology formulates policy in technology transfer. Congressman Mo Brooks (R-AL) asked how the field centers find corporations to utilize their technology. Peck replied that this occurs in various ways, the Space Technology Program can organize conferences like the automotive conference in Detroit where relevant research is presented to industry or companies contact NASA themselves. He discussed NASA web sites where companies can search for technology relevant to their mission.

Congressman Hansen Clarke (D-MI) asked the panel what improvements could be made to move technology to industry. Aubrecht answered that to “complete a project and demonstrate its capability in space” is the best way to reduce risk sufficiently for companies looking to gain licenses to NASA technology. Moog recently developed a “green propellant” and cannot find a commercial space flight to utilize it because of high risk. NASA can undertake that risk more easily with federal support, demonstrate its capability and ease the private sector into new technology.

Congressman Dana Rohrabacher (R-CA) asked about the cost of the new green propellant. Aubrecht replied the propellant itself is more expensive, but the reduction of safety equipment lowers the overall cost significantly.

Clarke told the panel that “Detroit is ready and open to work with NASA,” citing its cheap land and high unemployment rate of technically experienced workers. Russell explained that Zephyr began a relationship with NASA simply by showing a value proposition to the agency. He stressed the need to be enthusiastic about a problem and said, “NASA will take care of the rest.” Peck said that the Space Technology Program estimates that 14,000 jobs have been created by NASA-derived technology.

Costello asked how NASA is working to improve the public’s understanding of how deeply NASA-derived technology affects everyday life. Peck discussed NASA’s Spinoff Publication which lists spinoff technologies from every year, as well as its Twitter and Facebook accounts to raise awareness. The ranking member asked if NASA works with universities to promote research on NASA technology. Peck explained that Space Technology Program offers a scholarship to undergraduates and is developing plans to being working with faculty. He said this “trickle down” affect will inspire more students to embrace STEM careers and strengthen industry.

Opening statements, witness testimonies, and a live web cast of this hearing can be found at the committee web site.