Swamp Works

National Aeronautics and Space Administration

Philosophy

Kennedy Space Center's Swamp Works is a hands-on, lean development environment for innovation following the philosophies pioneered in Kelly Johnson's Skunk Works and Werner von Braun's development shops. The Swamp Works establishes rapid, innovative and cost-effective exploration mission solutions through a highly collaborative approach, leveraging partnerships across NASA, industry and academia.

Capabilities

The goal of Swamp Works is to accelerate innovation for NASA and for benefits on Earth — from the idea stage, through development and straight into application. Iterative testing is performed in the early stages to quickly drive design improvements. This rapid-development approach supports NASA's mission to provide government and commercial space ventures with technologies they need for working and living on the surfaces of the moon, planets and other bodies in our solar system.

Current capabilities include facilities and world-class expertise from the Science and Technology Projects Division at Kennedy, in such areas as applied physics; applied chemistry; granular mechanics and regolith operations; cryogenics; electrostatics and surface physics; regolith activities

SWAMP WORKS
NASA KENNEDY SPACE CENTER

Exploration Research and Technology Programs

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testing; robotics integration, checkout and assembly; corrosion technology; advanced materials and polymer science, advanced manufacturing and 3-D printing. Staffed with engineers, physicists and chemists, the labs use a "make it, test it, and improve it" model of work, one in which projects often undergo several generations of builds, each an inexpensive attempt to improve on the one before. The research labs maintain continuity of knowledge between generations of designs because the same team works on successive generations. Rather than looking for incremental advances, Swamp Works research teams strive for quantum leaps through rapid prototyping and experimentation. Open collaboration allows researchers to learn from each other and ask questions during a technology's development.

The Swamp Works vision is to be the premier government research and technology incubator for development of spaceport systems on Earth or at any space destination. One important area of development is surface systems, where the Swamp Works approach of rapid-concept to-application has resulted in the development of several unique technologies for future space exploration.

Regolith Bin

Swamp Works recently constructed a regolith test bed enclosure, which is believed to be the largest indoor, climate-controlled facility of its kind, measuring 8 meters on each side and packed with 120 metric tons of gray, simulated crushed basalt rock space regolith. It is helping engineers and scientists test mining and other technologies that could enable future explorers to live on another planetary surface by harvesting resources such as oxygen and water.