



Building the International Space Station (ISS) is much like putting together a giant puzzle in space. Imagine the planning required to construct the ISS so far from Earth and prepare for launching the components to build the structure. In the past, NASA used common scheduling systems for similar complex missions to determine which tasks needed to be accomplished and when. This took a great deal of time and did not always result in the best approach.

PROJECT

Complex scheduling software that leverages artificial intelligence

MISSION DIRECTORATE

Human Exploration and Operations

COMMERCIALIZATION SUCCESS

Over \$13 million in follow on sales for artificial intelligence scheduling software based on SBIR contracts from NASA space centers. Customers include Boeing, Bombardier, Department of Defense, Honda, Lockheed Space, and Pfizer.

SNAPSHOT

Aurora™, a sophisticated scheduling system used by NASA, combines a variety of scheduling techniques, intelligent conflict resolution, and decision support to make scheduling faster and easier

STOTTLE HENKE ASSOCIATES, INC.
1650 South Amphlett Boulevard
Suite 300
San Mateo, CA 94402
www.stottlerhenke.com

NASA needed sophisticated software to create multi-mission plans faster and more efficiently. Stottler Henke Associates, Inc., a San Mateo, California company, proposed using their unique scheduling system called Aurora™ to help NASA meet this need through its Small Business Innovation Research (SBIR) program. By leveraging artificial intelligence (AI), Aurora™ produces optimal scheduling to reduce risk and ensure space missions are launched on time.

Aurora™ was designed to make decisions, like humans, at a faster rate. The software's capability to enable NASA to analyze numerous what-if scenarios efficiently using AI technologies and apply extensive scheduling knowledge and rules is what gives it its edge.

"What differentiates Aurora™ from other scheduling software is that it mimics human thought processes to solve challenging problems. We have applied decades of research on human reasoning, tactical decision-making, and deliberative planning and scheduling to develop the software," according to Annaka Kalton, Stottler Henke Technical Lead. "The software achieves efficiency through iterations and considers a multitude of variables to generate the best scheduling option which is refined over time."

NASA is using Aurora™ for the Space Launch System (SLS) which is considered the world's most powerful rocket. SLS is designed to launch astronauts in NASA's Orion spacecraft on missions to an asteroid and eventually to Mars. In 2014, Stottler Henke was awarded a 28-month SBIR Phase II contract for ground processing optimization using AI techniques for SLS. A version of Aurora™, tailored to NASA Kennedy Space Center (KSC) activities, is now being used for scheduling of a future SLS test flight under the Phase III of the SBIR program.

NASA used Aurora™ to generate short-term and long-term (10 year) schedules of ground-based activities that prepared space shuttles before each mission and refurbished them after each mission



Stottler Henke has a long history of working with NASA dating back to 1992 when the company was awarded its first grant to solve scheduling challenges. Stottler Henke has further developed the AI-based software for two decades through SBIR programs which resulted in the creation of Aurora™. This system became operational at KSC in October 2003 when it was used to schedule floor space usage and other resources at the Space Station Processing Facility. NASA also used Aurora™ for maintenance, repair and overhaul of space shuttles.

“Coming from the aerospace sector that has the most complicated scheduling needs, our ‘space grade’ scheduling system has made an impact on other industries thanks to NASA’s investment in our company,” according to Stottler Henke President Dick Stottler. “We are grateful for our relationship with NASA SBIR which spans over twenty-five years and we will continue to develop innovative breakthroughs for NASA’s planning needs to keep space exploration on track.”

“We are grateful for our relationship with NASA SBIR which spans over twenty-five years and we will continue to develop innovative breakthroughs for NASA’s planning needs to keep space exploration on track.”

STOTTLER HENKE ASSOCIATES, INC.
PRESIDENT
DICK STOTTLER

In 2004, Stottler Henke reached a commercialization turning point after entering Boeing’s worldwide search challenge to solve a scheduling problem for the 787 Dreamliner, the aerospace company’s most fuel-efficient airliner. Aurora™ out-performed all the other competition participants including Boeing’s scheduling solution at the time. This led to Stottler Henke being awarded a multimillion-dollar contract from Boeing to help realize manufacturing efficiencies by optimizing aircraft assembly schedules.



NASA is implementing Aurora™ to schedule the ground-based activities that are preparing the Space Launch System before its maiden flight

Born from America’s space program twenty-five years ago, Aurora™ now helps a range of government agencies and companies which include Department of Defense, Boeing, General Dynamics, Learjet, and Partners Healthcare (Massachusetts General Hospital).