

NASA Range Safety Program 2006 Annual Report

DEVELOPMENT, IMPLEMENTATION, SUPPORT OF RANGE SAFETY POLICY UNMANNED AIRCRAFT SYSTEMS WORKING GROUP UPDATE

In August of 2005, the Kennedy Space Center's Applied Technology Directorate formalized activities for the development of an unmanned aircraft systems program to support future missions at Kennedy Space Center, Patrick Air Force Base, and Cape Canaveral Air Force Station. To aid in meeting program requirements, the Air Force's 45th Space Wing Safety Office, the Kennedy Space Center Range Safety Office, and the Applied Technology Directorate formed a working group to develop three joint initiatives:

- Cape Canaveral Spaceport Unmanned Aircraft System Range Safety Requirements
- Cape Canaveral Spaceport Unmanned Aircraft System Flight Operations Manual
- Cape Canaveral Spaceport Unmanned Aircraft System Concept of Operations.

Working Group Goals

The working group's efforts are supporting near-term goals of Kennedy Space Center and the 45th Space Wing to provide enhanced mission support from mobile aerial platforms. Specifically, the goals are to incorporate unmanned aircraft systems to supplement existing range functions of tracking and surveillance and to respond on short notice to supplement existing range functions.

The joint documentation will provide requirements for all unmanned aircraft system operations to be conducted at Kennedy Space Center, Cape Canaveral Air Force Station, and Patrick Air Force Base. Although NASA currently conducts unmanned aircraft systems operations at Dryden Flight Research Center, Goddard Space Flight Center/Wallops Flight Facility, Ames Research Center, and Langley Research Center, Kennedy Space Center and the 45th Space Wing have been contracted by several parties interested in conducting operations at the Cape Canaveral Spaceport.

Kennedy Space Center and the 45th Space Wing recognize that Cape Canaveral Spaceport poses many unique challenges due to the complexities of human space flight and expendable rocket flight operations as well as the existence of a large number of high-valued assets, such as launch complexes, fuel storage facilities, launch vehicles, and supporting equipment within the confines of Kennedy Space Center, Patrick Air Force Base, and Cape Canaveral Air Force Station. These challenges require a fundamental change from Range Safety's current paradigm for launching space vehicles to one that includes unmanned aircraft systems operations.

Document Review

To address these challenges, the working group conducted an extensive document review to aid in determining the compulsory subtopics to be addressed in a requirements document and a flight operations manual. Once completed, an exhaustive outline was developed and sections were assigned to personnel to construct requirements based on subject matter expertise. The working group was further challenged to incorporate future concepts of operating unmanned aircraft systems in the National Airspace.

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Responsibilities

The 45th Space Wing will be responsible for managing the requirements for unmanned aircraft systems f

Kennedy Space Center will be responsible for managing the process for unmanned aircraft systems flight operations at Kennedy Space Center, Patrick Air Force Base, and Cape Canaveral Air Force Station through the Cape Canaveral Spaceport Unmanned Aircraft Systems Flight Operations Manual. The Applied Technology Directorate has compiled the draft Flight Operations Manual that describes the processes and procedures for gaining unmanned aircraft systems flight operations approval from NASA and the 45th Space Wing. This manual includes an air worthiness and range safety certification approval process; describes operational agreements between NASA, the 45th Space Wing, and the Federal Aviation Administration; and lists project and program interfaces and standards.

The Cape Canaveral Spaceport Unmanned Aircraft Systems Concept of Operations document describes a generic model for unmanned aircraft systems requirements and flight operations at Cape Canaveral Spaceport. Kennedy Space Center will be responsible for developing and maintaining this document. The document will assist the potential user and the range by providing a generic end-to-end model of mission timelines, support staff, equipment, and range services for a typical unmanned aircraft systems mission at Cape Canaveral Spaceport. The draft will be completed by the Applied Technology Directorate the first quarter of 2007.

Next Phase

The next phase for Cape Canaveral Spaceport unmanned aircraft systems document reviews will expand the working group to include members from the Federal Aviation Administration, other NASA centers, and Department of Defense ranges to ensure accuracy, consistency, and comprehensiveness.

In the future, unmanned aircraft systems operations at Kennedy Space Center, Patrick Air Force Base, and Cape Canaveral Air Force Station will support mission requirements, program requirements, and instrument testing for NASA, the 45th Space Wing, other federal and state agencies, educational institutions, and commercial entities. It is not the intention of NASA or the 45th Space Wing to authorize flight tests for the sole purpose of testing the flight capability of an unmanned aircraft systems airframe. The working group is striving to encompass all aspects of Range Safety that will maximize the protection of personnel, property, other aircraft, and national assets.