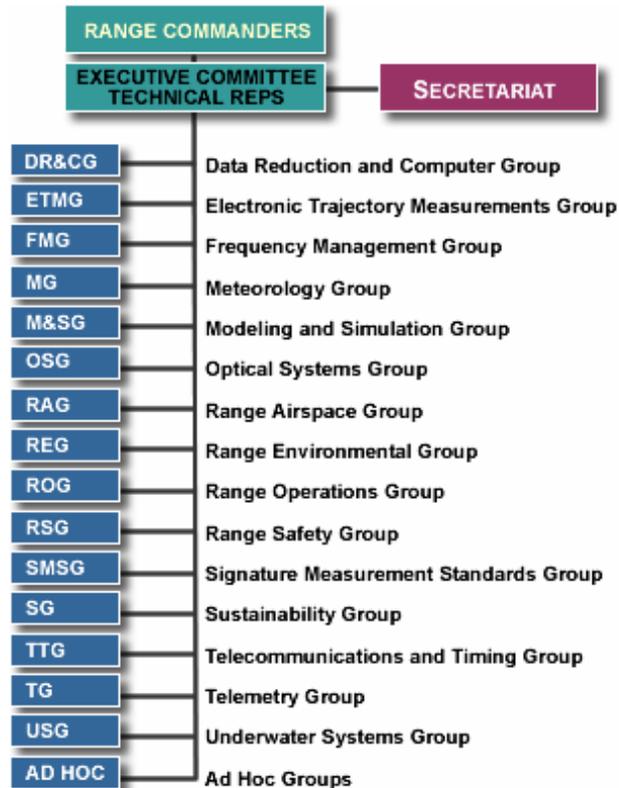


# NASA Range Safety Program 2006 Annual Report

## DEVELOPMENT, IMPLEMENTATION, SUPPORT OF RANGE SAFETY POLICY RANGE SAFETY GROUP

Through standardization, development, and continuous improvement, the Range Safety Group supports the safe conduct of hazardous operations on test, training, and operational ranges and related facilities. The 98<sup>th</sup> Range Safety Group meeting was held at White Sands Missile Range in April. The main committee and the Flight Termination Systems Committee and Risk Committee met concurrently.

Highlights of the meeting included a special briefing and video of the autonomous flight safety system sounding rocket test conducted at White Sands Missile Range on April 5<sup>th</sup> and the tour of the range on the third day.



The Naval Air War Center, Patuxent River, Maryland hosted the 99<sup>th</sup> Range Safety Group meeting in October. The main committee and the Flight Termination Systems, Risk, and Laser committees met at that time. Highlights included special briefings by the Southern California Offshore Range and the Joint Strike Fighter Program, the election of new Range Safety Group officers, and a tour of Pax River. Walt Montieth, Air Armament Center at Eglin Air Force Base, was elected the new Range Safety Group Secretary. Michael Young moved from Vice Chair to Chair, and Greg Speth moved into the Vice Chair position. Southern California Offshore Range also petitioned for and received approval to join the Range Safety Group as an Associate Member.

**Flight Termination Systems Committee.** The Flight Termination Systems Committee provides a forum for all issues and technologies related to the flight termination system effort. One of the tasks the committee was asked to complete was the rewrite of RCC 319, *Flight Termination Systems Commonality Standard*. RCC 319 establishes common flight termination system design and testing requirements for different programs and different ranges. This document is being revised to update, clarify, and amend certain sections and requirements to reflect new technologies, studies, and lessons learned.

The task to rewrite RCC 319 began in 2003 and is expected to be completed in early 2007. Members of numerous ranges and organizations are involved in the rewrite to obtain a variety of inputs and ideas from many different sources and ranges. Other topics being discussed by this committee include emerging technologies such as the enhanced flight termination system, autonomous flight safety system, and subminiature

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flight safety system as well as potential problems such as the radar interference to flight termination system receivers.

**Risk Committee.** In early 2004, the Range Safety Group initiated Phase II of a Risk and Lethality Commonality Team effort to revise RCC 321, *Common Risk Criteria for National Test Ranges*. Because injury criteria were not defined during Phase I of the Risk and Lethality Commonality Team effort, the Department of Defense major range and test facility bases have diverged from use of the standard since it addresses acceptable risk criteria pertaining only to fatalities. The second phase of the Risk and Lethality Commonality Team effort has focused on establishing acceptable risk criteria based on casualties.

The Range Safety Group also recommended that RCC 321 be updated and expanded to include flight safety hazards in addition to inert debris. The Risk and Lethality Commonality Team II was initially established as an ad hoc committee under the Range Safety Group. However, after a few meetings, the identification of additional risk-related topics, and the more detailed development of tasks, the need for a standing committee was realized. In February 2005, the Risk and Lethality Commonality Team was renamed the Risk Committee with a specific objective to rewrite RCC 321.

The committee has spent the last three years focusing on establishing updated acceptable risk criterion and developing detailed supporting rationale for inert debris and other range hazards, including distant focusing overpressure and toxics. The group has also decided to establish an aggregated risk criterion, evaluating the combination of all launch hazard risk against one acceptable level. The group has examined and incorporated discussion and/or criterion for the following topics:

- Major activities required to conduct the entire risk management process and considerations to address hazards beyond just inert debris
- Requirements for computational models used to analyze the risks posed by inert and explosive debris
- Hazard thresholds for inert and explosive debris as well as screening criteria for other hazards including toxics and distant focusing overpressure
- Aircraft and ship risk management requirements
- Catastrophic risk
- Space craft protection

In October 2006, the Risk Committee submitted the final draft of the revised RCC 321 to the Range Safety Group for review. The revised document is expected to follow the standard Range Commander Council issue process. The Risk Committee is currently in the process of developing a new task statement for the upcoming session with potential topics to include:

- Space craft protection to include satellite protection beyond orbital insertion, safety responsibility for space systems, and space craft protection for exo-atmospheric and

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orbital debris hazards

- Reusable launch vehicle and other controlled reentry related issues
- Conditional risk criterion for foreseeable conditions
- Treatment of uncertainty in risk assessments
- Asset protection
- Hazard thresholds for land vehicles
- Assessment and application of catastrophic risk
- Minor injuries

These topics will be further developed at the next Range Safety Group/Risk Committee meeting in April 2007 to be co-hosted by NASA – Kennedy Space Center and Patrick Air Force Base.

NASA Range Safety will continue to work with the Range Commanders Council and the various ranges that comprise the forum to ensure that NASA is involved in the new, groundbreaking technologies as well as potential issues that could change the way we send astronauts into space.