Air Armament Center

War-Winning Capabilities...On Time, On Cost

AF Nonnuclear Munitions Safety Approval Process

An Overview

This presentation is cleared for public release
AF Nonnuclear Munitions Safety Approval Process

- **Who:** Melvin Duval, Chief, AAC/SES
- **Where:** AF System Safety Office, Air Armament Center
- **Experience:** 20 + years in acquisition at Eglin, Chief Engineer several times, ~6 years in AAC/SES
- **What:** Overview of what is needed for a successful Nonnuclear Munitions Safety Board (NNMSB) evaluation
System Safety begins at the inception of the program

Acquisition management authorities need to ensure system safety is an integral part of the acquisition strategy. (AFI 91-202, Chapter 9 and AFI 91-205)

The AAC System Safety Office (AAC/SES) is primary AF source of conventional munition safety expertise

- Ensuring program design safety requirements
- Assisting in defining contractual system safety requirements
- Supporting the systems engineering processes
- Evaluating and documenting design as required for NNMSB safety approval/ certification actions for all conventional munition systems
Background

- **NNMSB Core Mission**
  - Review Authority and System Safety Group for All USAF Conventional Munitions
  - Advisor to Acquisition Authorities on Design Safety and Qualification Issues
  - Approval Authority for Airborne Flight Testing of Uncertified, Live-Loaded Munitions and Associated Subsystems
  - Design Safety Certification Authority for all Air Force Conventional Munitions

- **AAC/SES, as NNMSB Executive Secretariat, assures execution of the Board’s Core Mission**
Background

- Authority rests with AFI 91-205
- Chairperson: Chief, Weapons Safety Division, Hq AF Safety Center
- Membership:
  - Air Combat Command
  - Air Mobility Command
  - AF Special Operations Command
  - Pacific Air Forces
  - USAF Europe
  - Air Force Space Command
  - AF Materiel Command
  - AF Operational T&E Center
  - Air Education & Training Cmd
  - Air National Guard
  - AF Reserve Command
  - Global Strike Command
- AFI 91-205 also designates AAC/SES, through Hq AFMC, as the agency to provide the Technical Support of the NNMSB
USAF Nonnuclear Munitions Safety Board
AAC/SES Role

• AAC/SES is the Engineering Arm of the NNMSB
  • Performs Hazard Analyses
  • Performs Independent Fault Tree Analyses
  • Generates Safety Studies for assigned systems
  • Briefs the Safety Studies to the NNMSB
  • Obtains Approval for Live Flight Test/ Recommendation for Certification for Operational Use

• SES is part of the systems engineering team and will work with you from the start of the program through all milestones
Meeting the NNMSB is event driven, not milestone
NNMSB scheduled Boards are April and October
Special Boards can be held out of cycle if required
Funding required for Board members’ TDYs
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- First meeting with the Board is informational brief
- Scheduled 6 to 12 months before first live flight test
- Informational brief given by contractor in most cases
- Content is high level with specifics on safety aspects
- Feedback from the board will be comments on design, implementation, handling and storage
- Outcome will be concept agreement, subject to implementation
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- Second meeting with the Board is live flight test
- Live flight test includes live fuze, warhead, rocket motor, live Flight Termination System (FTS) or combination thereof
  - Live FTS has Range Safety and System Safety aspects
- Called Test Hazards Assessment Review (THAR)
  - THAR written by and presented to NNMSB by SES
  - THAR goes to NNMSB 30 days ahead of review
  - SES prep typically 30 days – Data in by 60 days ahead
  - Serial fashion is best – Don’t wait for complete package
  - Must be approved by NNMSB for test to proceed
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- Third meeting with the Board is operational use
- Occurs after all testing is complete with no safety related failures – Can be held with minimal work left to conduct
- Documented by Technical Munitions Safety Study (TMSS) and in some cases by Munitions Safety Analysis for non-complex items – Time line is the same as THAR
- TMSS generated by and presented to NNMSB by SES
- Outcome is recommendation for certification for operational use by the NNMSB – May result in action items
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• For joint programs, SES will work with Service System Safety Counterparts to coordinate with and support review milestones, including formal Joint Meetings of the Boards
  • Key Distinction—There is no “Joint Board”

• Service Counterparts are invited to any review they have need to attend

• Can be informational or formal depending on requirements
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• What is important to know about the SES approach?
  • Primary desire is for concrete understanding of all safety critical elements of system, subsystem and components including:
    • Clear and detailed comprehension of design
    • What the hazards are to personnel/property
    • Who will use the system and how they will use it
  • Is an iterative process - “Come Early, Come Often”
    • The earlier we understand your system, the better we can help you through the process
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• What is important to know about the SES approach? (cont)
• No formal submission guidelines or format requirements
• Emphasis is on technical content, not format
• Technical content is basically the same as for other service Boards and for a well prepared Safety Assessment Report – makes a good data transfer vehicle
  • Well defined/detailed physical/functional description
  • Full schematic diagrams of adequately mature design
  • Well defined/documentated safety analyses
  • Well defined/documentated safety specific testing
  • Well defined/documentated system/subsystem testing
What to do to maximize your probability of a successful NNMSB?

- Provide clear schedule requirements for program
- Provide adequate information on system
- Provide information in a timely manner
- Provide technical support to Fault Tree Analysis
- Provide support at the NNMSB Meeting
- Respond to input from SES and the NNMSB
- Notify AAC/SES of Program Changes ASAP
- Work issues in real time  -- No Surprises!!
As said before, our motto is “Come Early, Come Often”

- Contact assigned engineer and set up informal and formal review times/dates
- Be prepared to discuss the system at the lowest levels – Typically with the designer
- Be prepared to discuss all hazards of the system
- Be aware you are not the only one wanting a review, so plan ahead and have back-up dates ready
USAF Systems Safety Location

AAC/SES
Systems Safety
Bldg 129 3rd floor
Eglin AFB, FL
882-7306/7327
Questions...