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**The Air Force Flight Test Center Test Safety Review Process**

**Overview:** The Air Force Flight Test Center (AFFTC) uses a system safety approach to flight test safety planning. The basic premise is to identify test specific hazards so that controls can be placed on the test to minimize the probability of the hazards occurring. Once all the hazards and minimizing procedures are in place, a safety review board assesses the risk of the entire test or individual test points. The assigned risk level (low, medium, or high) determines the level of supervision required to approve the test plan.

**The Safety Package:** The project personnel prepare a safety package using standardized local forms. The package includes the test plan, any supporting documentation, and the safety paperwork. The safety paperwork is similar to an Air Force Staff Summary Sheet. The cover page has the signatures of the safety reviewers, the offices that must coordinate on the package, and the approving official. Every safety package contains the same information. The first section has all of the following paragraphs with information on the test: background, objectives, system maturity, types of tests, differences from previous tests, a brief synopsis of the technical and safety reviews, references, mishap responsibility and accountability, general minimizing considerations, test article restrictions, special considerations, any action items from a formal safety review, risk assessment, and a section for coordination comments. These paragraphs give the reader an overview of what the test is about and the safety issues associated with its conduct. The second section of the safety package contains the Test Hazard Analyses (THA). Each individual THA documents a test specific hazard that could be encountered during the test. There is one hazard per THA and every THA has the same format.

The hazard (anything that could lead to a mishap. It must be test specific and not a

generic hazard associated with generally flying airplanes)

The causes of the hazard (anything that could lead to the presence of the hazard)

The effect of the hazard (the mishap you are trying to prevent; death, loss of

aircraft, major damage, etc.)

Minimizing procedures which address the specific causes of the hazard to prevent

its occurrence (breaks the link between the causes and the hazard)

Corrective actions which document what to do if the hazard occurs to prevent it

from becoming a mishap (breaks the link between the hazard and the

effect or mishap)

Remarks which document additional applicable information about the hazard.

Each hazard is classified by severity category (Catastrophic, Critical, Marginal, Negligible) and probability of occurrence (Frequent, Probable, Occasional, Remote, Improbable).

**The Safety Review:** Every safety package (which includes the test plan) goes through a safety review. The number of reviewers and the forum of the review is tailored to the complexity and expected risk level of the test. As a minimum, the review is accomplished by a member of the AFFTC Test System Safety Office (AFFTC/SET). This office is staffed with highly experienced flight test pilots and engineers with system safety training. As a general rule, the safety package is also reviewed by at least one operations representative and one engineering representative. The reviewers should be experienced with the type of test planned but be independent of the test, i.e. not a member of the test team. Maintaining this independence during the review is a key element in the AFFTC process. The review is typically accomplished informally by routing the package through individual reviewers. Generally, any test expected to be medium or high risk (beyond normal operations) will have a formal review. During a formal review, all the reviewers, the project manager, and project pilot meet to discuss the test plan and safety paperwork page by page. This can take anywhere from a few hours to several days depending on the size of the test plan and complexity of the test. The safety review board discusses the test approach (build up) and the planned minimizing procedures. Based on the experience of the board members, additional minimizing procedures or test plan changes may be recommended to minimize the risk. The final action by the review board is to assign a risk level (Low, Medium, High) representing the residual risk with all safety procedures in place. The entire test may have the same risk level or specific test points could be assessed an individual risk level. The risk level determines who approves the test. The higher the residual risk, the higher the level of management required to assume the risk. Low risk requires Operations Group Commander approval (Colonel, O-6); Medium risk requires Wing Commander approval (Colonel, O-6); and High risk requires Flight Test Center Commander approval (General Officer). The SRB only advises the project and the approval authority. The final decision to proceed with a test belongs to the approval authority who accepts the risk.