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## **Sally K. Ride Papers - STS-51L Mission Operations Manual**

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the Orbiter, and major loss of payload capability. All of the possible first stage crew escape enhancements would require a method to detect the impending failure in time to take successful action, a requirement that currently has no practical solutions for all the possible scenarios.

In summary, the NSTS must maintain and be successful with its previous first stage design philosophy of ensuring first stage reliability through design and certification to preclude failures. However, the program should evaluate the options and utility of providing crew escape systems and augmenting Orbiter abort modes for failures such as loss of two SSME's.

#### c. KSC Landing Considerations

Perhaps no other question in the entire NSTS commands more emotional discussion than the issue of KSC end-of-mission (EOM) landings.

The primary reasons for landing at KSC are: avoiding the time required to transport the Orbiter from EAFB, avoiding Orbiter exposure to risks associated with handling and transporting from EAFB to KSC, maintaining efficient utilization of Orbiter processing personnel during the turnaround operations, and avoiding up to a \$1M cost for each EAFB turnaround operation. On the other hand, EAFB provides additional margins for remote failures and adverse weather conditions that makes it an attractive landing base. Significant findings discussed in appendix B are: at the time of STS 51-L launch, KSC landings did not constitute an unreasonable safety of flight risk based on known, credible failures. However, program need for KSC landings and related system performance criteria should be reevaluated. Routine KSC landings should continue only after such reevaluation is complete and resultant criteria are satisfied. The STS Program must have multiple landing sites available for EOM landings to protect against weather violations at the planned landing site; KSC should continue to be supported as one of the alternate EOM landing locations. Current landing and deceleration systems have not demonstrated an adequate margin for routine KSC and TAL abort operations.

For a detailed discussion of findings on KSC landing considerations, refer to appendix B.

#### 6. Astronaut Involvement in the Space Shuttle Program

An area of interest since the Challenger accident has been the level of astronaut involvement in the Space Shuttle Program. This subject was discussed at a public hearing of the Presidential Commission on the Space Shuttle Challenger Accident. Review of the subject has shown that astronauts are involved in a variety of program activities that include assignment to KSC to support test and checkout of the spacecraft payloads, to the Shuttle Avionics Integration

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