Exploration Conference
Development and Operations Panel

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Moving From Concepts to Reality Can Be Expensive

- Developers must adopt a “Design for Support” instead of a “Support the Design” approach, as seen in the Shuttle Program.
Development Decisions are Long Reaching

- It is common for up to 70% of a project’s life cycle costs to be in Operation and Support.

- Decisions made during the development process must consider the long term recurring impacts on operations.

![Graph showing Life Cycle Cost (LCC) with 30% and 70% distributions over years.](Image)
Development and Operations Must Collaborate

- The more a system is designed with operations in mind, the more efficient (labor, materials, facilities) it becomes
  - This is especially critical in programs that will be operated for several decades and programs featuring reusability
- Efficiencies lead to the reduction of the recurring overhead costs for processing and operating the system
  - Sustaining engineering
  - Shipping / storage
  - Facilities / equipment
  - Ops planning and execution
  - Processing of reusable hardware

Effective “Developer-Operator” collaborative relationships can successfully ensure a well-balanced and efficient Program
Integrated Design and Operations Approach Utilizes Complimentary Skills and Experience for Best Solution

Design, Development, Test and Evaluation

- Operations Concept(s)
- System Requirements
- Design Reviews (PDR, CDR)
- Validation / Certification
- Seamless Transition to Operations

Operational Experience and Skills

- Lessons Learned
- Operability & Supportability Design Features
- Life Cycle Cost/Performance Trades
- Perform Test and Validation
- Validate the Concept of Ops & Operability

Continual Assessment of Risks and Benefits

Design / Cost / Performance Trades to ensure Operability, Reliability, Availability, Maintainability