Abort Flight Test Project Overview

RAF Cranwell Visit
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DFRC Exploration Mission Directorate

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Program Planning & Control

CEV Abort Flight Test
PAD Abort Flights
Ascent Abort Flights

SE&I Support
Test and Verification Support
Integrated Flight Test Strategy
Test and Verification Development

Shuttle Transition Support
Shuttle Assets Transition

Projects Formulation
Chute Tests
TPS/Skip re-entry
Lunar Lander
West Coast Landing Recovery
C3PO Support
Abort Flight Test

- 18 months since Abort Flight Test started
- 17 months to Pad Abort 1 First Flight
- Multi-center, multi-agency team Govt/Ctr team
  - JSC, DFRC, LaRC, GRC, WSTF, 3STS, & WSMR
  - LMSSC, Orbital Sciences Corp

DFRC Role:
- Flight Test Mgmt and Systems Engineering
- Abort Test Booster Acquisition
- Flight Test Article Management/Engineering
  - Lead Developmental Flight Instrumentation
  - Avionics, Structures, GN&C
  - Test and Launch Operations/Facilities
- Ground Systems, Range and Safety Support
- Mission Monitoring, Data Reporting
Flight Test Configurations

High Altitude Test at WSMR drives Launch Complex Cost
  - Taller Stack
  - Taller Gantry

ATB configurations notional
• Manage the project Mission and Flight Test Objectives

• Lead the engineering technical effort

• Manage integrated and detailed analysis

• Perform “tiger-team” analysis and allocate additional work, if required
DFRC FTA Scope

• Support FTA requirements development

• Developmental Flight Instrumentation

• Subsystem assembly, integration & test

• Flight test preparation and support
  – Participate in system level tests, training, and control room activities

• Provide technical mission assurance

• Lead the Hazard Analysis Effort

• Lead the Working Group schedule efforts
Flight Test Operations

DFRC Responsibilities:

- Assembly, Integration, and Test
- FTA Secondary Structure Design and Fabrication
- Facilities Design and Fabrication
- Transportation: Large Items: CM, LAS, and SepRing
- Range Architecture
- Ground and Range Safety
- Ground Ops and Flight Ops Plans and Procedures
- Flight Test Operations
- Recovery Ops

Execute Successful Abort Flight Tests
- Multiple Configurations
- Increasing Complexity
- Designing to most complex case: High Altitude Test
DFRC Ops Support

• **Machine Shop, Weld Shop, and Sheetmetal Shop**
  – FTA Secondary Structures
  – FTA Modification and Repair Support
  – DFRC MGSE Fabrication

• **Avionics Technicians**
  – Avionics Installation
  – Instrumentation Fabrication, Installation, Calibration and Checkout
  – Troubleshooting
  – Systems Checks and Preflights
  – Flight Support

• **Mechanics**
  – Secondary Structure Installation
  – Final CM Assembly
  – Mechanical Stacking/Mating
  – Transportation and Handling
  – Flight Support

• **AGE Support**
  – Ground Support Equipment Maintenance
  – Vehicle Maintenance
  – Critical Lift Certifications

• **Range Support**
  – DFRC Range Systems Installation and Checkout
  – DFRC Data Collection and Processing
Launch Facilities

- Abort Flight Test Launch Facilities
  - Pad Abort Launch Pad
  - Ascent Abort Launch Pad
  - Ascent Abort Gantry
  - Final Integration and Test Facility (FITF)
  - Other Existing WSMR Facilities Supporting Abort Flight Test

![Notional FITF](image-url)
Scope of Launch Abort Flight Test

Increasing Maturity of Crew Module and Launch Abort System

Inform the Design
Gov’t Provided Test Article
Integrate and Test at DFRC
Launch at WSMR

Flight Certify the LAS
Prime Provided Test Article
Integrate and Test at KSC (O&C)
Launch at WSMR