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Panel Session II - Sea Launch Overview BCSC Perspective

Malcom J. Philips
Boeing Commercial Space Company

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Panel Session 2

“Sea Launch Overview BCSC Perspective”
Malcolm J. Philips
Sea Launch Overview
BCSC Perspective

Malcolm J. Phillips
Manager, Mission Requirements & Interfaces
Boeing Commercial Space Company

Overview

- Organization
- Key Sea Launch Elements
- Launch Campaign Flow
- Unique Characteristics of Commercial Launch Business and Sea Launch
Sea Launch Company
Key Locations and Roles

Sea Launch Company is a limited liability corporation with headquarters and Home Port in Long Beach, California.

- Formed in April 1995, with first launch in March 1999
- Commercial Launch Services Provider

Sea Launch Partner Locations

Seattle
Long Beach
Moscow
Dnepropetrovsk
Oslo

Sea Launch Contractor Team
Experienced Industry Leaders

Roles and Relationships

- Boeing Commercial Space Company
  - Home Port Operations
  - Payload Fairing & Adapter
  - Mission Integration
  - Mission & Range Operations

- Astrotech Space Operations
  - Payload Processing Facility
  - Payload Support Services

- Barber Moss Ship Management
  - Launch Support Equipment & Support
  - Launch Support

- KB Yuzhnoye/PO Yuzhmash
  - Zenit Rocket Production
  - Zenit Test & Integration
  - Mission Integration & Launch Support

- RSC Energia
  - Block DM Production
  - Block DM Test & Integration
  - Ground Processing Equipment
  - Mission Integration & Launch Support

- KBTM
  - Launch Vehicle Erector
  - Ground Processing Equipment
  - Launch Support
Sea Launch Company
Our Past and Momentum Forward...

- Sea Launch has successfully completed 22 missions to-date
  - 20 consecutive mission successes prior to NSS-8
- Successfully have flown or are integrating every major spacecraft platform

Launch tempo
- Successfully demonstrated six launches from June 03 to June 04
- One of Industry’s most proven heavy-lift vehicles

Sea Launch – 12th Year Since Inception!

Sea Launch System
Sallent Features for today’s commercial customers

- Boeing quality oversight & integration
  - Ensures high reliability and mission assurance
  - Quarterly reviews conducted by Sea Launch at major contractors and subcontractors
- Processed in major metropolitan area – Long Beach, CA
  - Conveniently close to airports, immense supplier base, most US sat makers
  - Other launchers process in remote locations
  - Vessels never enter a foreign jurisdiction during a mission
- Compelling Value Proposition
  - Creative business terms and conditions
  - Low cost base a function of international sourcing, unique & efficient operations and good management
Sea Launch Company
Facilities & Assets

Home Port Segment
- Systems integration
- Rocket segment processing
- Payload processing and encapsulation
- Pier and marine provisioning
- Support engineering
- Logistics support
- Rocket segment storage
- Launch vehicle checkout
- Launch vehicle fueling

Marine Segment
- Rocket integration and test
- Mission control
- Launch team accommodations
- Range support and helo operations

Rocket Segment
- Sea Launch Zenit rocket
- Sea Launch Block DM upper stage
- Payload accommodations
- Sea Launch Block DM lower stage

Rocket Segment Storage

BCSC Payload Accommodations
- Produced in Seattle, Washington
- Graphite/epoxy fairing
- Shipped to Home Port by road
- Processed and integrated at Home Port

Encapsulated Payload

Booster Adapter
Graphite/epoxy Fairing
Typical Launch Campaign

- Payload Unit (PLU) transfer to Assembly Command Ship (ACS) (24 days before launch)
- Integrated Launch Vehicle (ILV) Transfer to Launch Platform (LP) (11 days before launch)
- ACS Transit to Launch Site (Departs 12 days before launch)
- Integrated Systems Test (17 days before launch)
- PLU to Block-DM-SL Mate (19 days before launch)
- Launch Operations (Begins 3 days before launch)
- Launch (day 0)

Sea Launch Advantages

- Proven launch system - Mature launch vehicle – no new upgrades or major changes planned
- Competitive Business Terms & Insurance Rates
- Schedule Assurance - Dedicated launch system
  - No co-passenger impacts
  - Benign launch site weather, Onboard spares, No range conflicts & Robust launch system.
- U/S only personnel involved in spacecraft processing
  - Secure/Dedicated state-of-the-art spacecraft processing facility
- Mission Management with Sea Launch/Boeing Interface
  - Proven Mission Processes
- Insight and Oversight in Zenit-3SL and Payload Hardware
  - Ensures high reliability and mission assurance
  - Quarterly reviews conducted by Sea Launch at major contractors and subcontractors
- Excess vehicle performance and equatorial launch site provides superior orbit and spacecraft lifetime expectations
- Veteran Leadership and Launch Support Personnel will ensure mission objectives are met
Unique Aspects of Commercial Launch Business

- Multiple Domestic & International Customers
- Schedule (Cash Flow) Driven
- Intense Competition, Cyclical Demand
- Reliability, Affordability & Flexibility are Key Discriminators

Unique Aspects of Sea Launch

- Compliant with U.S. ITAR Regulations
- Serial & Sequential, but Adaptable and Flexible
- International, “Virtual” Enterprise
- Small, Entrepreneurial, Dedicated Team

Sea Launch Mission Integration

- Mission Integration is a collaborative effort amongst the partners
  - Sea Launch, BCSC, RSC Energia, SDO Yuzhnoye

- Team Based, supported by matrixed organizations within each partner organization
  - Mission Team
    - Lead by Sea Launch Mission Manager, Supported directly by Mission Integrator (BCSC) and Payload Integration Manager (Sea Launch Operations), and indirectly by other Sea Launch, BCSC, and partner personnel
  - Responsible for:
    - Spacecraft requirements integration
    - ICD requirement definition and verification
    - Execution of program specific requirements
    - Program and customer coordination
Summary

- Unique, International Consortium Specifically Developed to Support Commercial Launch
- Experienced Team
- Proven Launch System Comprised of Pedigreed Components
- “Virtual”, Team Based Integration Approach
- Best Value Solution for Commercial Launch Customers.