Office of Space Launch
Program Overview for California Space Authority

Col Mick Hatch
27 March 2003
Agenda

- Office of Space Launch Mission
  - Organization
  - Programs
  - Manifest
  - Launch in Transition
• Single NRO interface for all launch activities
  ➢ NRO Mission Director has clear responsibility, accountability, authority for NRO missions from inception through launch
  ➢ Provides independent Mission Assurance Team reviews for launch vehicles
  ➢ Provides centralized control for launch vehicle hardware, launch services, integration, and operations
  ➢ Integral part of NRO “Cradle-to-Grave” philosophy for all mission areas
  ➢ Principal external interface with industry, AF, NASA
  ➢ NRO satellite program offices have “one stop shopping” for launch support

• NRO launch model validated by Space Launch Broad Area Review

• Work jointly with Air Force Space Command and NASA for Mission Success
GATEWAY
FOR FREEDOM'S SENTINEL IN SPACE!

SUCCESSFULLY DELIVER EVERY NRO SATELLITE ON ORBIT ON TIME!

"WHAT YOU WANT, WHERE YOU WANT IT, WHEN YOU WANT IT!"
OSL Priorities

- Successful extended fly-out of legacy systems
  - Transition Titan fly-out effort to NRO contract 1 October 2003

- Successful transition to EELV
  - Preparing next two EELV acquisitions
  - First NRO EELV mission is from Vandenberg in April 2004
    - New satellite, new booster, new launch complex, new satellite processing facility

- Transition from government facility to commercial facility for satellite processing at Vandenberg

Mission Success!
Agenda

- Office of Space Launch Mission
- Organization
- Programs
- Manifest
- Launch in Transition
OSL Interfaces

- NRO Satellite SPOs
- HQ USAF
- HQ AFSPC
- HQ NASA
- DNRO/DDNRO
- Requirements
- Requirements & $$$
- NASA Facilities
- Space Vehicle Contractors
- Titan IV SPO
- Launch Vehicle Integration Contractors
- Air Force Space Command
- Atlas II SPO
- EELV SPO
- Delta SPO

Office of Space Launch

National Reconnaissance Office
Agenda

- Office of Space Launch Mission
- Organization
- Programs
- Manifest
- Launch in Transition
Titan IV

- Current heavy lift capability for National Security Payloads

- Configuration:
  - Core: Lockheed Martin
  - Centaur: Lockheed Martin
  - Solid Rocket Motor: Alliant
  - Payload Fairing: McDonnell Douglas (Boeing)
  - Liquid Rocket Engine: Aerojet

- Capability (weight to orbit)
  - Centaur to GEO: 12,700 kg
  - Centaur to HEO: 14,500 kg
  - NUS to LEO Polar: 38,800 kg
Titans IV

- Facilities:
  - Cape Canaveral: SLC-40
  - Vandenberg: SLC-4 East

- Flown To Date
  - 30 of 34 successful launches

- 2 AF Missions Remaining

- 3 NRO Missions Remaining
• Current medium lift capability
  ➢ Supports both government and commercial requirements

• Configuration:
  ➢ Core: Lockheed Martin
  ➢ Centaur: Lockheed Martin
  ➢ Payload Fairing: Lockheed Martin
  ➢ Booster Engine: Rocketdyne

• Capability (weight to orbit)
  ➢ Centaur to LEO: 19,000
  ➢ Centaur to LEO Polar: 15,900
  ➢ Centaur to GTO: 8,150
Atlas IIAS

- Facilities:
  - Cape Canaveral: SLC-36A
  - Vandenberg: SLC-3E

- NRO Flown To Date: Four

- NRO Remaining: One

- Contract Status:
  - Atlas IIAS follow-on buy is on contract
  - Includes production, storage, launch processing, launch site support and logistics
OvervieCSP - 15

UNCLASSIFIED

Office of Space Launch

Atlas IIIB

- Transitional medium lift capability
  - Supports both government and commercial requirements

- Configuration
  - Core: Lockheed Martin
  - Centaur: Lockheed Martin
  - Payload Fairing: Lockheed Martin
  - Booster Engine: Energomash

- Capability (weight to orbit)
  - Centaur to LEO: 23,630
  - Centaur to LEO Polar: N/A
  - Centaur to GTO: 9,920

- Facilities:
  - Cape Canaveral: SLC-36B

- NRO Flown To Date: None
- NRO Remaining: Two

UNCLASSIFIED
**Delta II**

- **Configuration: (7925)**
  - Stage 1: Rocketdyne
  - Stage 2: Aerojet
  - Stage 3: STAR 48 Boeing/Thiokol
  - 9 GEM Solid Rocket Boosters

- **Capability (weight to orbit):**
  - GTO: 4,120
  - Final orbit achieved by S/V propulsion

- **Facilities:**
  - Cape Canaveral: SLC-17
  - Vandenberg: SLC-2W

- **Contract structure:**
  - Commercial launch service acquired through SMC/CL
Evolved Expendable Launch Vehicle (EELV)

- Next Generation Family of Launch Vehicles
  - Provide a medium and heavy space launch capability
  - Support government and commercial requirements
  - Reduce cost for assured access to space
  - Improve operability and capability
  - Standard Interface

- USAF awarded two Development Agreements
  - The Boeing Company (Delta IV)
  - Lockheed Martin Corporation (Atlas V)

- Initial Launch Service contracts awarded for 28 missions
  - Boeing awarded 21 missions (18 AF, 3 NRO)
  - Lockheed Martin awarded 7 missions (6 AF, 1 NRO)

- Purchasing a launch service, not specific hardware
Evolved Expendable Launch Vehicle (EELV)

- Facilities
  - Cape Canaveral
    - SLC-37 (Delta IV)
    - SLC-41 (Atlas V)
  - Vandenberg
    - SLC-6 (Delta IV)

- Schedule
  - Delta IV
    - First Flight MLV – November 2002
    - First Government Mission – 10 Mar 2003 (DSCS)
    - First Flight HLV – September (TBD) 2003
    - First NRO Mission – April 2004
  - Atlas V
    - First Flight MLV – August 2002
    - First NRO Mission – October 2006
Agenda

- Office of Space Launch Mission
- Organization
- Programs
- Manifest
- Launch in Transition
# NRO Working Manifest

## 2003 - 2006

<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>-------------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
<td>--------</td>
</tr>
<tr>
<td>SLC-40</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titan IV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLC-36</td>
<td>Asia Sat</td>
<td>19 Apr 03</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atlas II/III</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLC-41</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atlas V</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLC-37</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta IV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLC-4E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titan IV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLC-4W</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Titan II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>VAFB</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLC-3E</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Atlas II</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>SLC-6</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Delta IV</td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

**Note 1:**

- Titan II launch window of opportunity
- Launch-Operations Contract
- Period of Performance Expiration
- Performance Extension
- Period of Performance Extension

**Launch Dates:**

- Bold: Range or CLSRB approved date
- Italic: Proposed date
- All dates based on Zulu launch times.

**As Of:**

24 Mar 03

**UNCLASSIFIED**
Agenda

- Office of Space Launch Mission
- Organization
- Programs
- Manifest
- Launch in Transition
Launch in Transition

Legacy Era

Legacy Launch Vehicles
- Atlas
- Titan

High Cost
Commercial Leverage
Measurable Risk

EELV Transition Era

Goals:
- Lower Cost
- Reduce Time on Pad
- Improve Business Practices
- Leverage
  -- Commercial
  -- DoD

New family of boosters

Evolved Expendable Launch Vehicles (EELV)

Lower Cost
Commercial Leverage
Measurable Risk
Launch in Transition – Challenges

- Near term heavy dependence on legacy launch systems
  - Extended flyout of Titan IV due to satellite program delays
  - Aging Titan launch base infrastructure

- EELV transition
  - Government is the primary EELV customer, including many “firsts”
  - Foreign technology dependency
  - New main engine engine development
  - Sole source dependence
    - West Coast, heavy lift, upper stage engine
  - Risk
    - Higher for last legacy flights, first EELV flights
    - Aggressive mission assurance program in place for legacy and EELV
Risk to Mission Success
(Notional Data)

- Human Interaction
- Harshness of Environment
- First Time Events

Increasing Risk

Launch
Launch Pad
Satellite Operational
Early Ops
Normal Ops

Program Start
Pack & Ship
Test

4 Years
1 yr
6 Mo
4-15 Years

Time
This *is* Rocket Science!