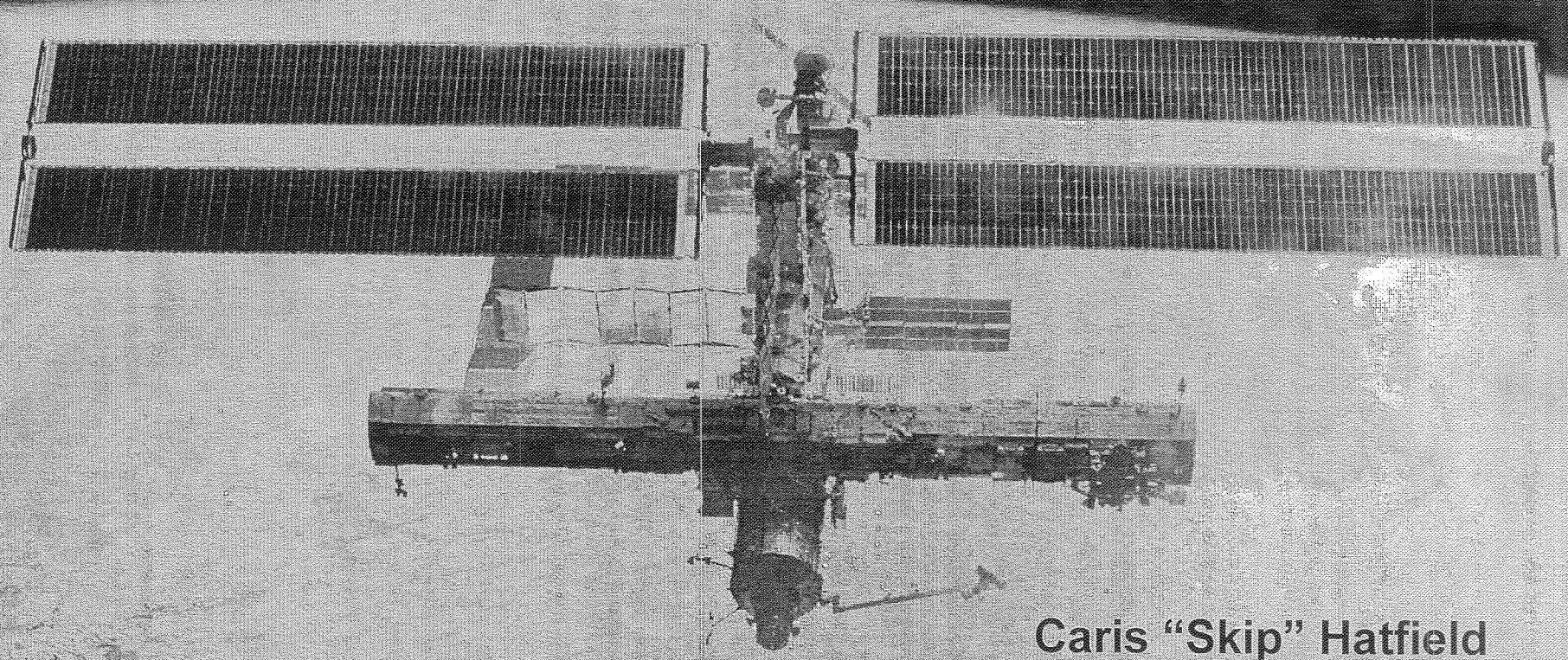
International Space Station
Introduction and ISS Familiarization



Caris "Skip" Hatfield
Manager, Program Integration Office
April 25, 2005

- The Vision for Space Exploration defines a series of objectives including
  - Return the Space Shuttle to Flight
  - Complete assembly of International Space Station
  - Retire the Space Shuttle by the end of the decade
  - Utilize the ISS in support of exploration goals; meet International Partner Commitments
- Today marks the beginning of a new era in supporting this unique orbiting laboratory
  - Commercial Cargo Services post shuttle retirement

- Provide an overview of:
  - Latest complete set of ISS cargo transportation requirements,
  - Visiting vehicle requirements, and
  - The infrastructure supporting transportation such as cargo bags, flight support equipment, etc.
- Provide an opportunity to exchange ideas with industry on clarifying the technical requirements

The International Space Station is more powerful, and 4 times larger, than any human space craft ever built.

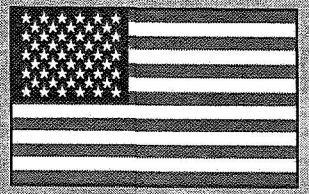
It is 171 ft. long, 240 ft. wide (solar array larger than the wingspan of a 777), 90 ft. high, weighs 197 tons (400,000 lbs.) and has 15,000 cubic feet of habitable living space (equivalent to a 3 bedroom house).

ISS plans include micro gravity science laboratories from four space agencies. U.S. Lab "Destiny" operating since Feb. 2001.

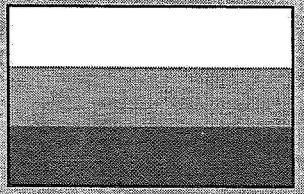
ISS flies in an orbital inclination of 51.6 degrees, approximately 240 miles above the Earth, in a path that covers 90% of the world's population. It is visible to the naked eye.

ISS travels at the speed of 17,500 miles per hour, and covers the equivalent distance to the Moon and back in a day.

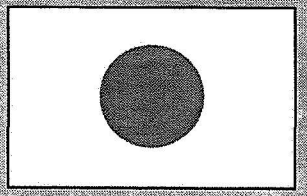
United States



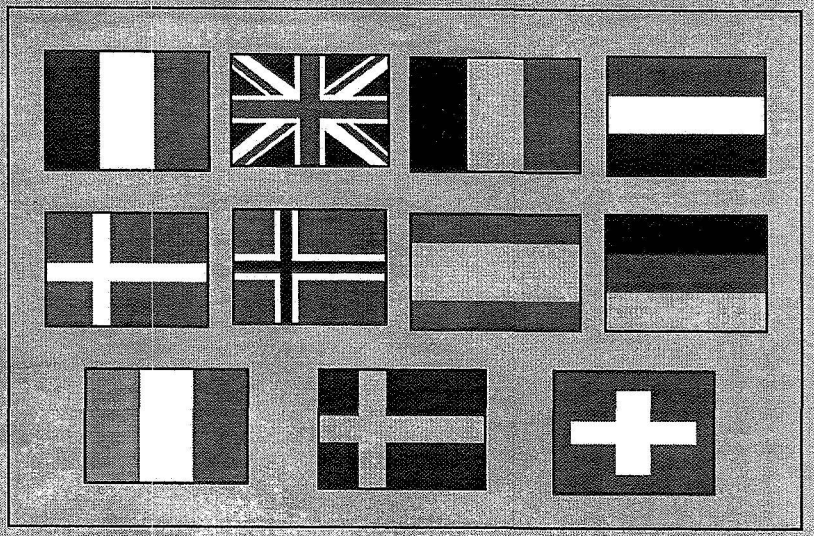
Russia



Canada

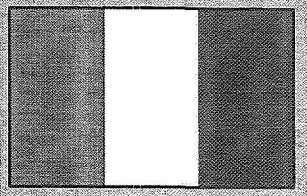


Japan



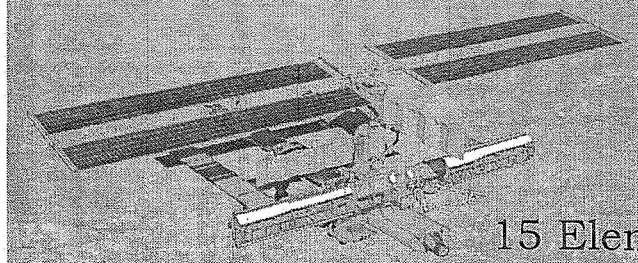
European Space Agency

France, U.K., Belgium, Netherlands, Denmark, Norway, Spain, Germany, Italy, Sweden, Switzerland

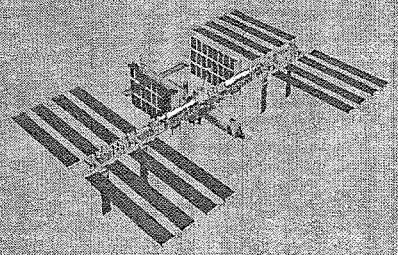


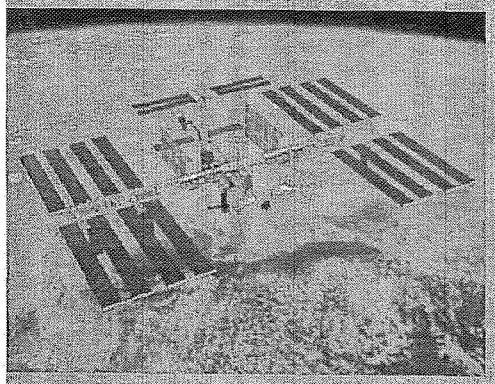
Italy

Brazil



ISS Today





15 Elements on Orbit

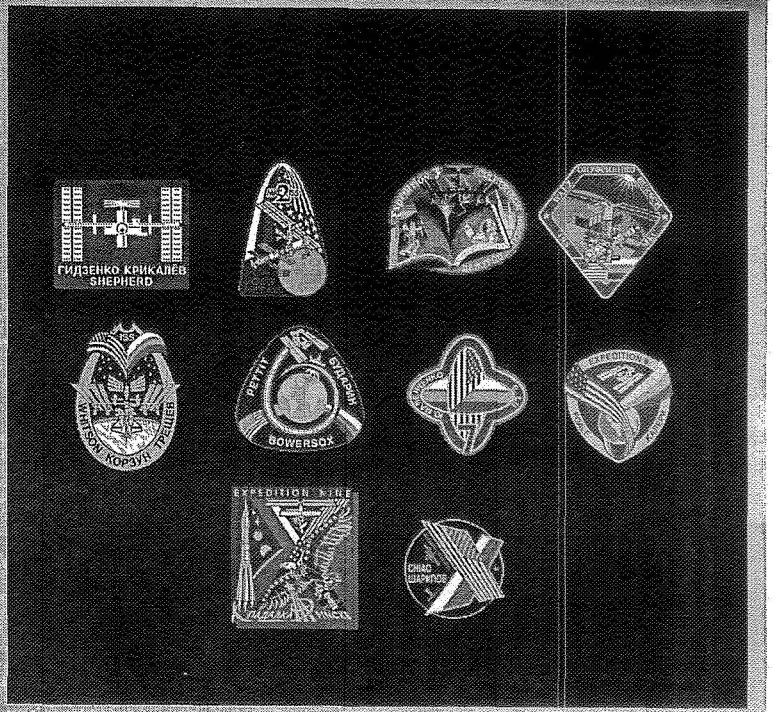
About 50% of ISS Configuration

9 at KSC for launch

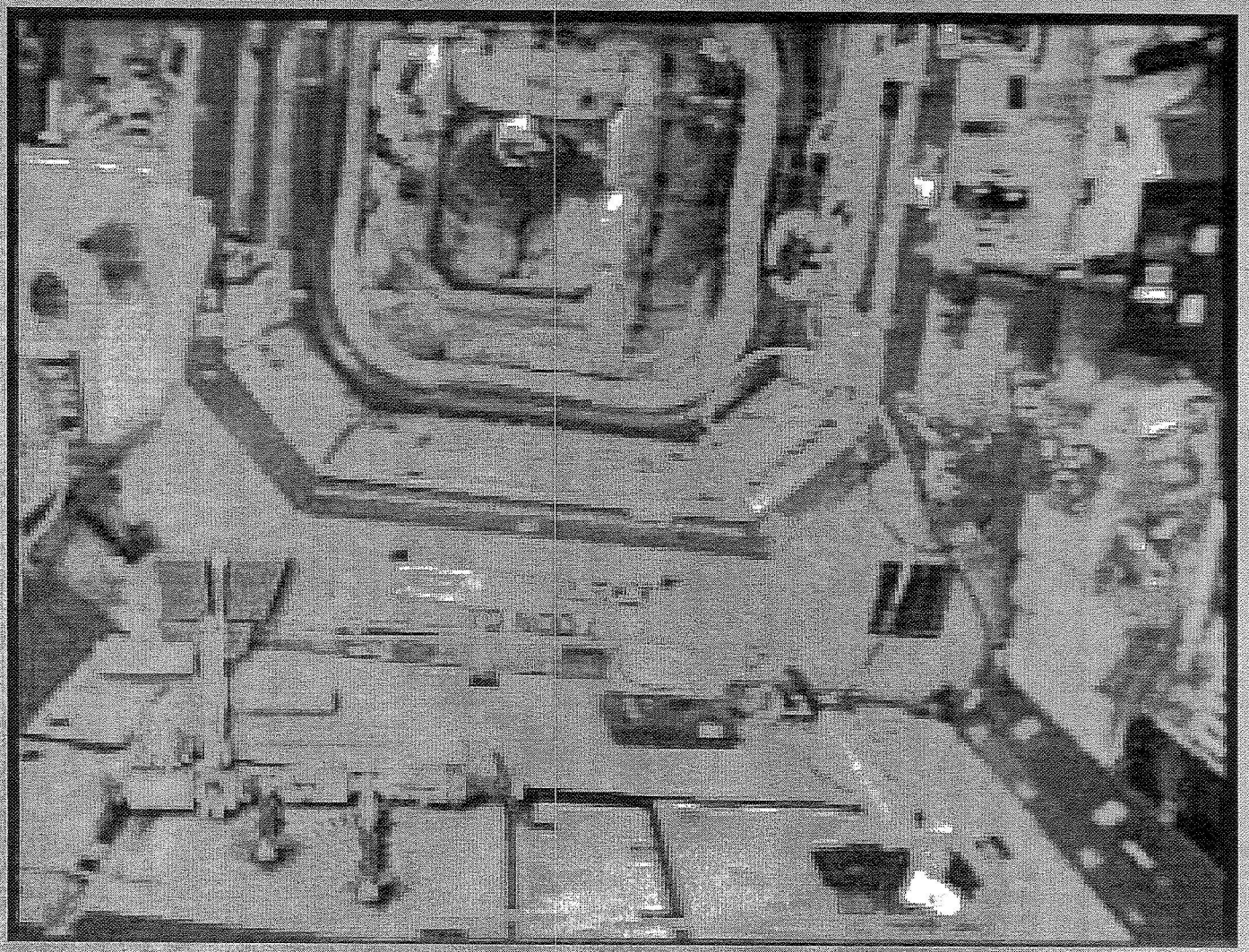
P3/P4 Truss	S6 Truss
P5 Truss	Node 2
S3/S4 Truss	JEM-PS (Pressurized Section)
Cupola	

9 In Process

European Columbus Lab (Development Complete)
Special Purpose Dexterous Manipulator - Canada hand (Development Complete)
Centrifuge Accommodation Module (CAM)
Node 3
JEM – EF & ES (Exposed Facility)
JEM – ES (Exposed Section)
Russian Science Power Module (SPM)
Russian Research Module -1
Russian Multipurpose Laboratory Module (MLM)



33 Major Elements to Complete The ISS



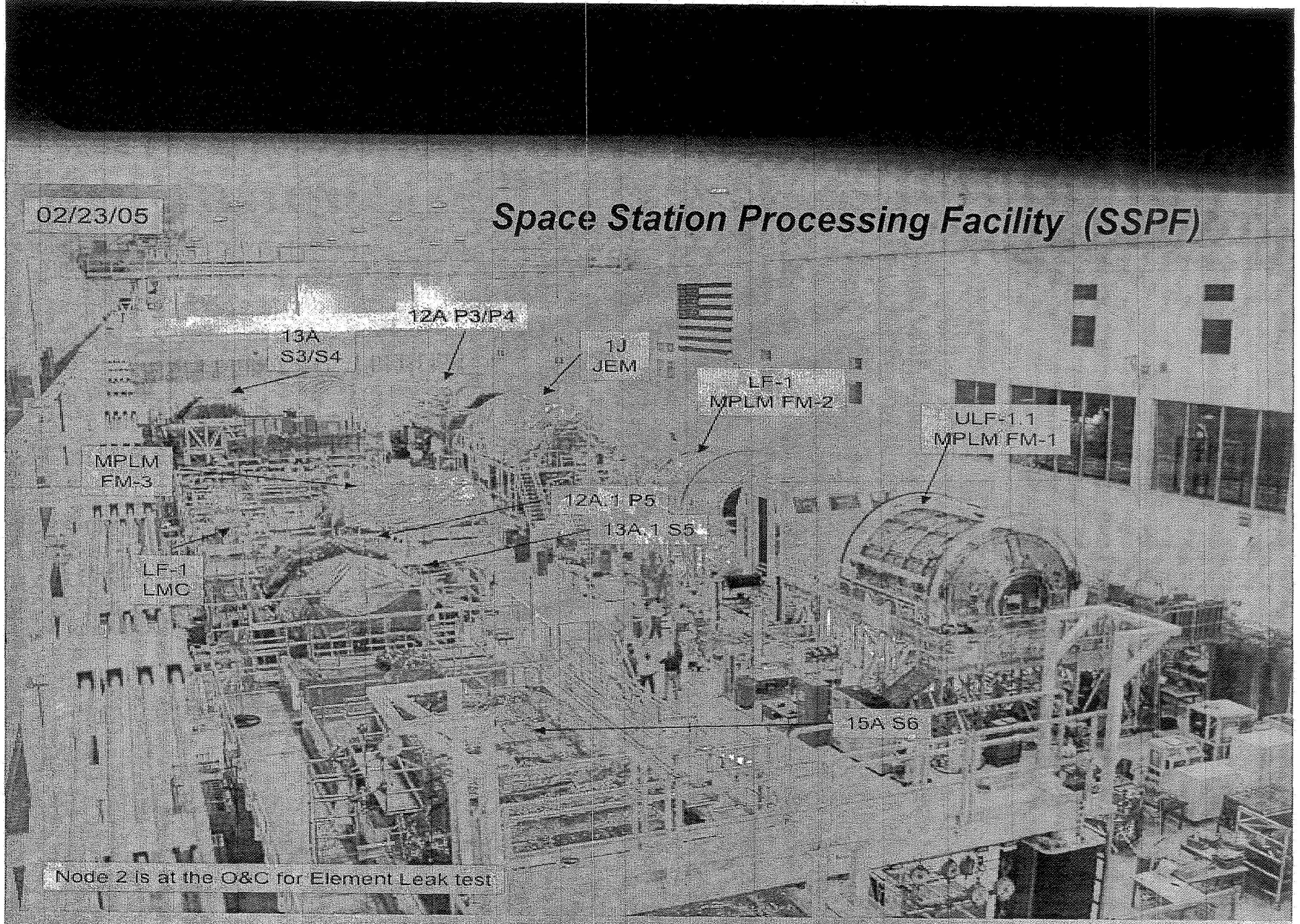
Video clip

- Meets the cargo transportation needs of ISS
  - In conjunction with Progress, ATV, HTV vehicles provide by International Partners
  - Not seeking a direct Space Shuttle replacement
- Consistent with 2004 National Space Transportation Policy
  - EELV shall be used for launch of intermediate & large payloads to maximum extent possible
  - USG departments and agencies shall purchase commercially available U.S. space transportation products and services to maximum extent possible
  - USG payloads shall be launched on space launch vehicles manufactured in the U.S., unless exempted by Director, OSTP

- Service will support ISS configuration endorsed at January 2005 Heads of Agency meeting
  - 28 shuttle flights to complete configuration
- Select one or more providers to provide end-to-end cargo service to and from ISS
- Providers to supply End-to-End Transportation Service
- Procurement will be managed by Launch Services Program Office at KSC
  - Supported by ISS Program Office
- NASA is currently finalizing acquisition strategy
  - Next planned milestone is summer release of draft RFP
  - Cargo Service to be in place by Space Shuttle retirement

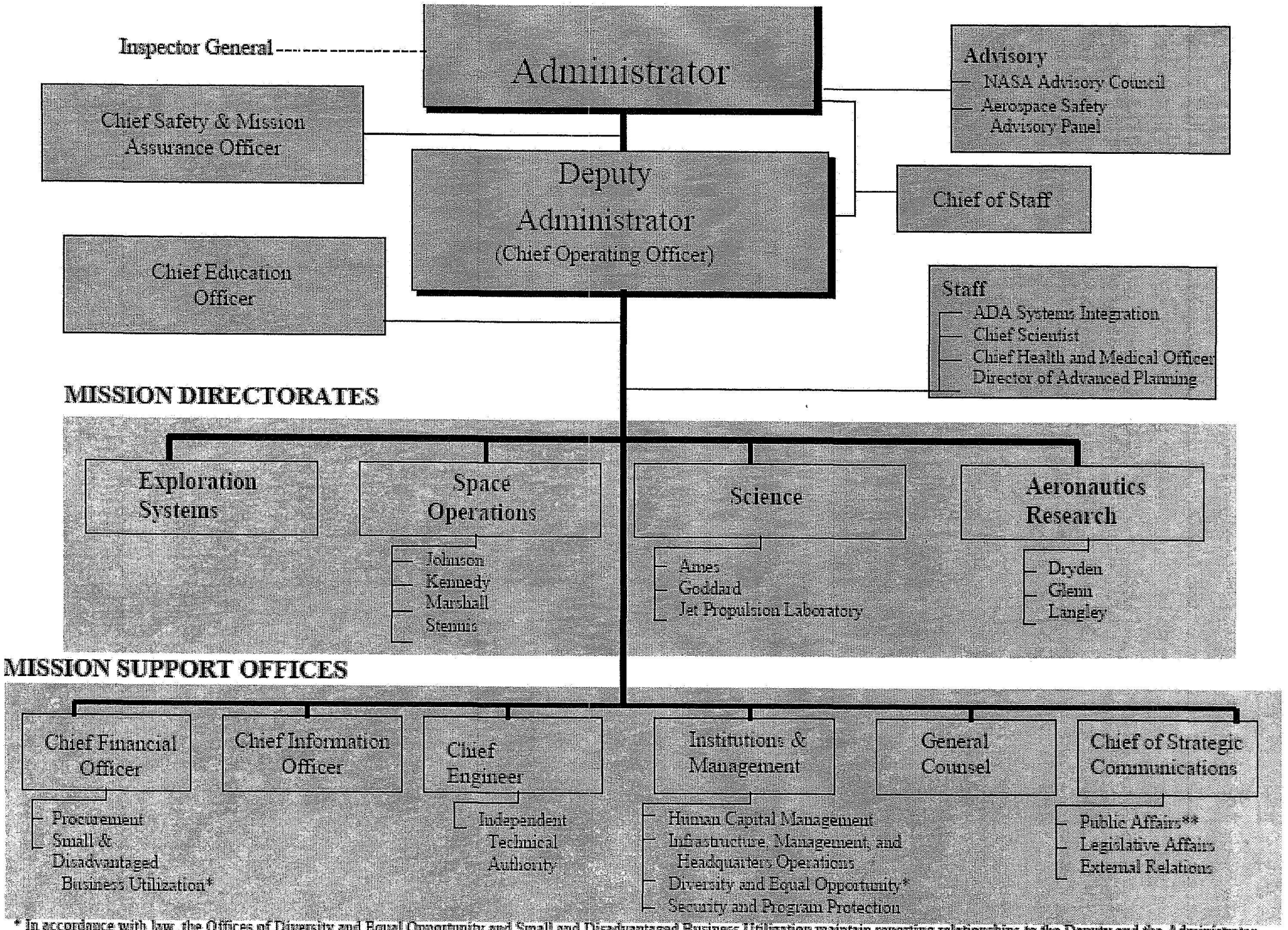
02/23/05

Space Station Processing Facility (SSPF)



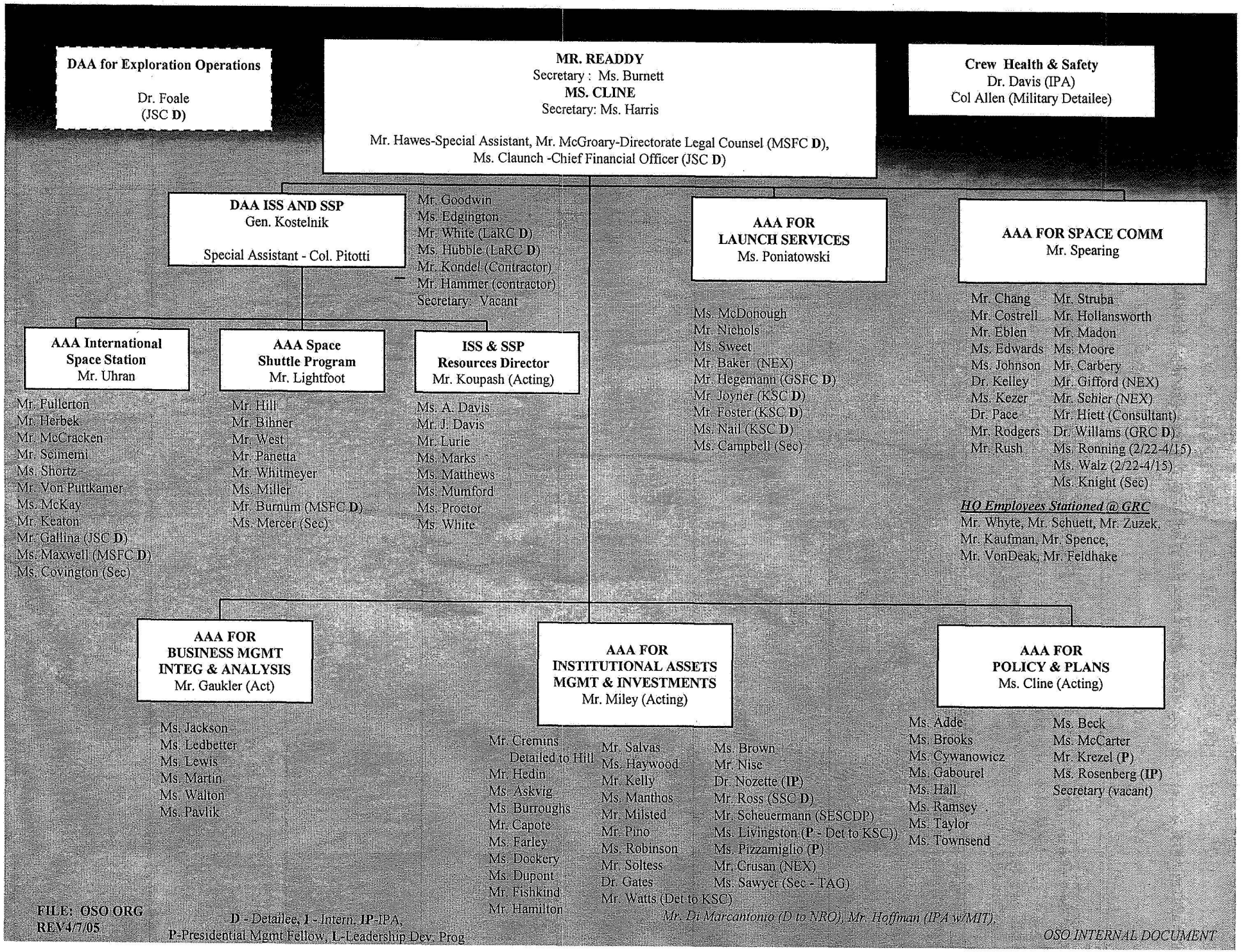
Node 2 is at the O&C for Element Leak test

Flt	Delivered Elements
LF1	MPLM-P; ESP-2; LMC (CMG)
ULF1.1	MPLM-P; ICC; LMC
ATV1	ATV First Flight
12A	P3/P4
12A.1	Spacehab Single Cargo Module; ICC; P5
13A	S3/S4
13A.1	Spacehab Single Cargo Module; ICC; S5
15A	S6 (P6 move)
10A	Node 2 (4 Sys racks, 4 ZSRs); Sidewall (PDGF)
1E	Columbus Module (3 Columbus Sys racks, 4 ISPRs, 1 ISPR); CBC-ND (2 EPF P/Ls)
ULF2	MPLM-A (RSPs, RSRs, ARED, 5 ISPRs); LMC (NTA)
1J/A	ELM PS (3 ISPRs, 4 JEM PM System, 1 JEM RSR); SLP-D1 (Dextre (SPDM)); [SLP-D1 rtn]
1J	JEM PM (4 JEM Sys racks, JEM RMS)
3R	Multi-purpose Laboratory Module (MLM) w/ERA (FGB-2)
17A	MPLM-P (OGS, WRS-1, WRS-2, incl. WRS-1 WRS-2 Offloaded Equip, RSPs, RSRs, 3 ISPRs); LMC (NTA)
UF-3	MPLM-A (1 JEM ICS RACK, JAXA Outfitting, 4 ISPRs, RSPs, RSRs); LMC (ATA, SPDM SPU)
UF-4	AMS; Express Pallet-1
2J/A	JEM EF; ELM-ES (EF P/L, ICS, SFA); SLP-D2 (MT/CETA Stbd Rails)
UF-5	MPLM-A (JAXA Outfitting, RSPs, RSRs, 5 ISPRs); LMC (ATA)
HTV1	HTV First Flight
20A	Node 3 (2 Avionics Racks, ARS, ZSRs)
19A	MPLM-A (RSRs, RSPs, 1 ISPR, 4 Crew Qtrs, Galley, WHC, TVIS-2, CHeCS-2, TeSS rtn); LMC (LON ORUs)
	Six-person Crew Capability (Jan-2009)
UF-7	Centrifuge Accomodation Module (Centrifuge Rotor)
14A	Express Pallet-2; ULC-D1 (2 EPF P/Ls, LON ORUs); SLP-ND (Cupola)
ULF3	Express Pallet-3; ESP-3 (PVR FSE for 1 PVR Stowage, LON ORUs); ULC-ND (2 EPF P/Ls, LON ORUs); [2 EPF P/Ls rtn]
9A.1	Science Power Module (SPM)
ULF4	MPLM-A (RSRs, RSPs, 2 ISPRs)
ULF5	SLP-D1 (MT/CETA Port Rails); ESP-4 (PVR FSE for 1 PVR Stowage, LON ORUs); ULC-ND (1 EPF P/L, LON ORUs); [ULC-D1 rtn]; [SLP-D2 rtn]; [1 EPF P/L rtn]
9A.2	VCC-RD1 (SPM Outfitting - 4 SAs & 3 beams); ULC-D2 (LON ORUs); ULC-ND (LON ORUs); [SLP-D1 rtn]
ULF6	ULC-D3 (LON ORUs); ULC-D4 (LON ORUs); ULC-ND (LON ORUs); [ULC-D2 rtn]
ULF7	VCC-RD2 (SPM Outfitting - 2 SAs & 2 beams; SM MMOD Wings); ULC-D1 (LON ORUs); ULC-ND (LON ORUs); [ULC-D3 rtn]; [VCC-RD1 rtn]
	ISS Assembly Complete
9R	Research Module



* In accordance with law, the Offices of Diversity and Equal Opportunity and Small and Disadvantaged Business Utilization maintain reporting relationships to the Deputy and the Administrator.

** Including a new emphasis on internal communications.


DAA for Exploration Operations
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(JSC D)
MR. READDY
Secretary : Ms. Burnett
MS. CLINE
Secretary: Ms. Harris
Mr. Hawes-Special Assistant, Mr. McGroary-Directorate Legal Counsel (MSFC D),
Ms. Claunch -Chief Financial Officer (JSC D)
Crew Health & Safety
Dr. Davis (IPA)
Col Allen (Military Detailee)
DAA ISS AND SSP
Gen. Kostelnik
Special Assistant - Col. Pitotti
Mr. Goodwin
Ms. Edgington
Mr. White (LaRC D)
Ms. Hubble (LaRC D)
Mr. Kondel (Contractor)
Mr. Hammer (contractor)
Secretary: Vacant
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Mr. Kaufman, Mr. Spence,
Mr. VonDeak, Mr. Feldhake
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Ms. Hall
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Ms. Taylor
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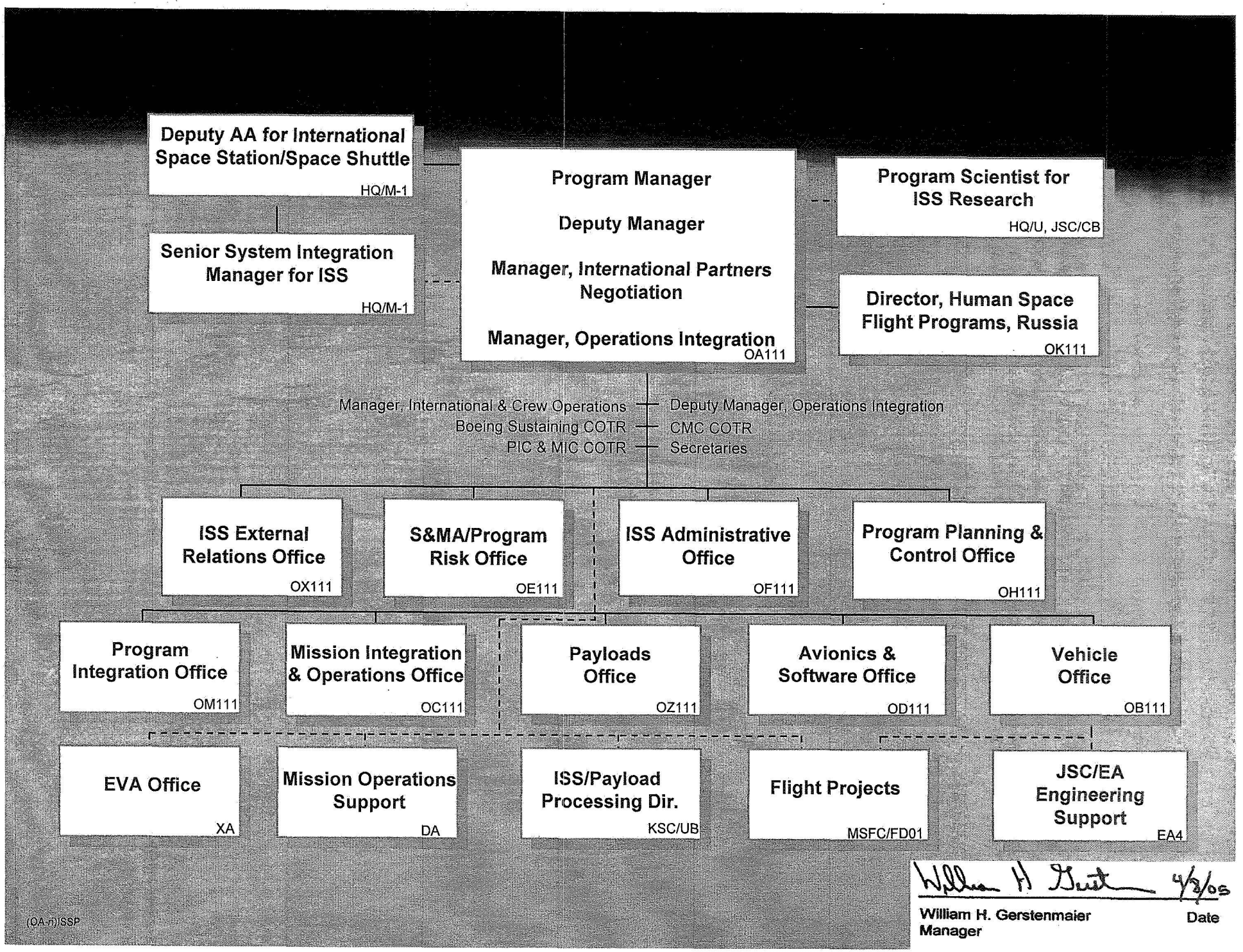
Ms. Beck
Ms. McCarter
Mr. Krezel (P)
Ms. Rosenberg (IP)
Secretary (vacant)
FILE: OSO ORG
REV4/7/05
D - Detailee, I - Intern, IP-IPA,
P-Presidential Mgmt Fellow, L-Leadership Dev. Prog
OSO INTERNAL DOCUMENT



William H. Gerstenmaier 4/8/05

William H. Gerstenmaier
Manager

Date

(OA-n)ISSP

- NASA provides cargo elements to Contractor at the Contractor's integration facility for delivery to the ISS
- Contractor performs all Transfer Vehicle manifesting analyses & loads certification (for both up-mass & down-mass)
- Contractor loads cargo aboard Transfer Vehicle and launches Transfer Vehicle to the ISS
- NASA accepts delivery at ISS, ISS crew unloads Transfer Vehicle

- ISS crew loads Transfer Vehicle for return flight (for both destructive and recoverable down-mass scenarios)
- Contractor returns Transfer Vehicle to Earth (for both destructive and recoverable down-mass scenarios)
- For recoverable down-mass scenario, Contractor delivers returned cargo to NASA

KSC/LSP

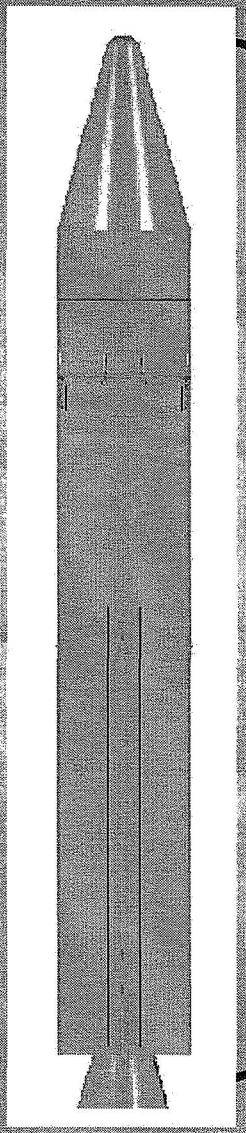
- Acquisition, Technical Oversight Integration & Launch Countdown
- Launch Site Processing

JSC/ISSP

- Cargo Manifest
- Visiting Vehicle Requirements and Ground Safety Reviews
- Autonomous Rendezvous & Proximity Operations (ARPO) Requirements

JSC/MOD
JSC/E&D

- Technical oversight/insight of Transfer Vehicle ARPO system



Launch Services Program Management Mission Success

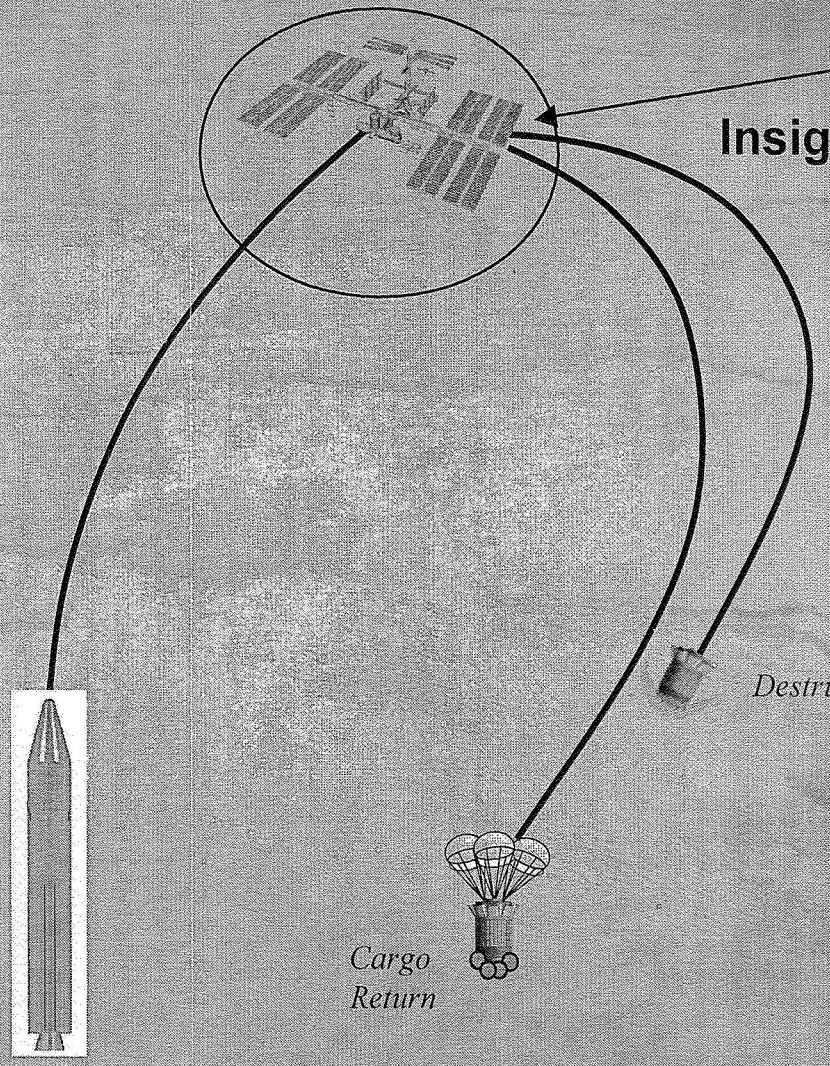
SOMD

ISSP

Insight/Oversight

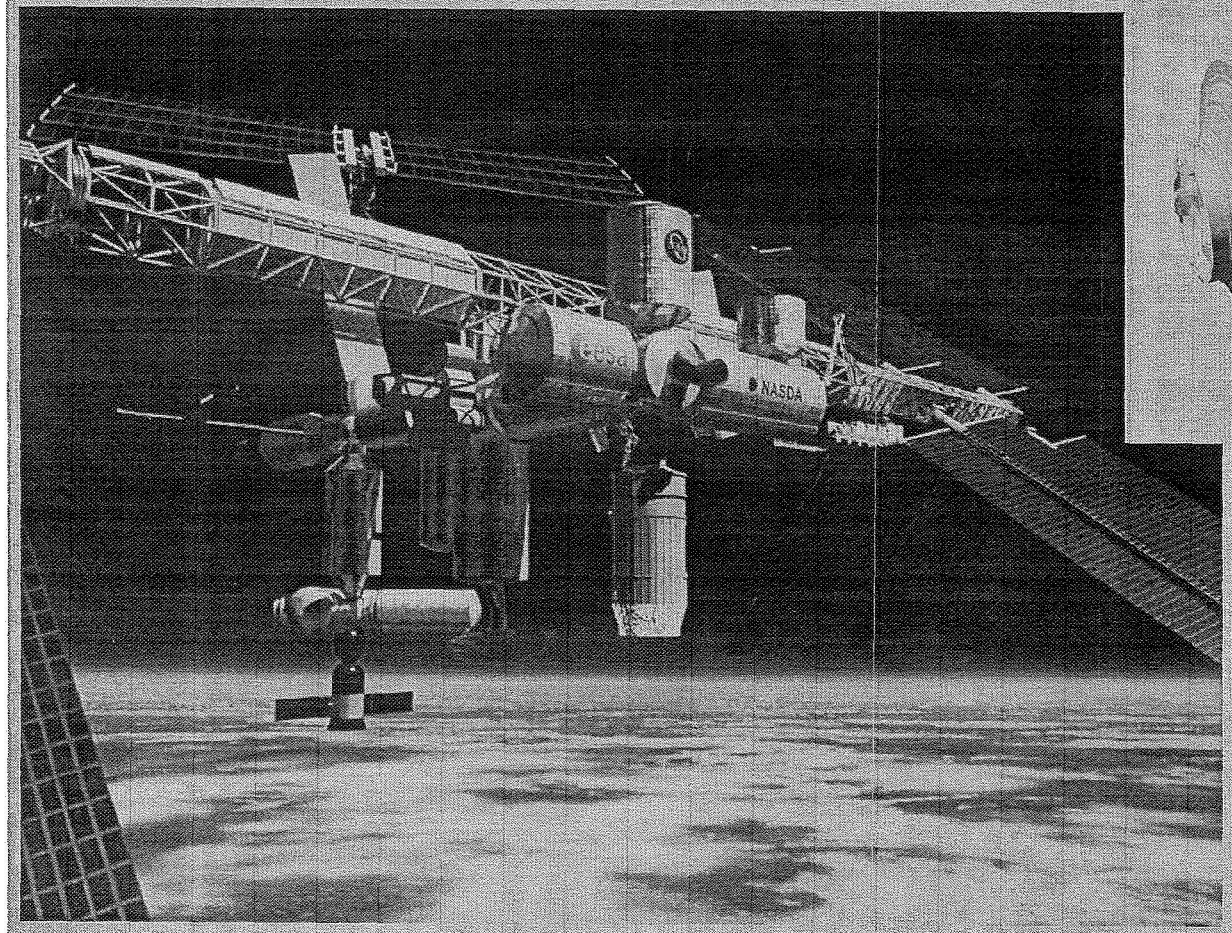
LSP

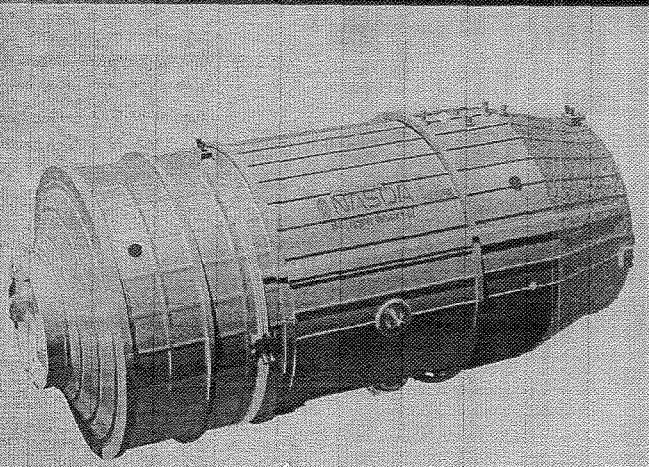
Insight/Oversight



Destructive Reentry

Cargo Return





Provides launch of both pressurized and unpressurized logistics and payloads

- Length: 9.2m (Mixed Logistics Carrier Type); 7.4m (Pressurized Logistics Carrier)
- Diameter: 4.4m
- Weight: about 15 metric ton (at launch)
- Payloads: about 6 metric ton (pressurized/unpressurized mix); about 7 metric ton (Pressurized only)
- Orbit: altitude 460km~350km, inclination 51.6 degrees