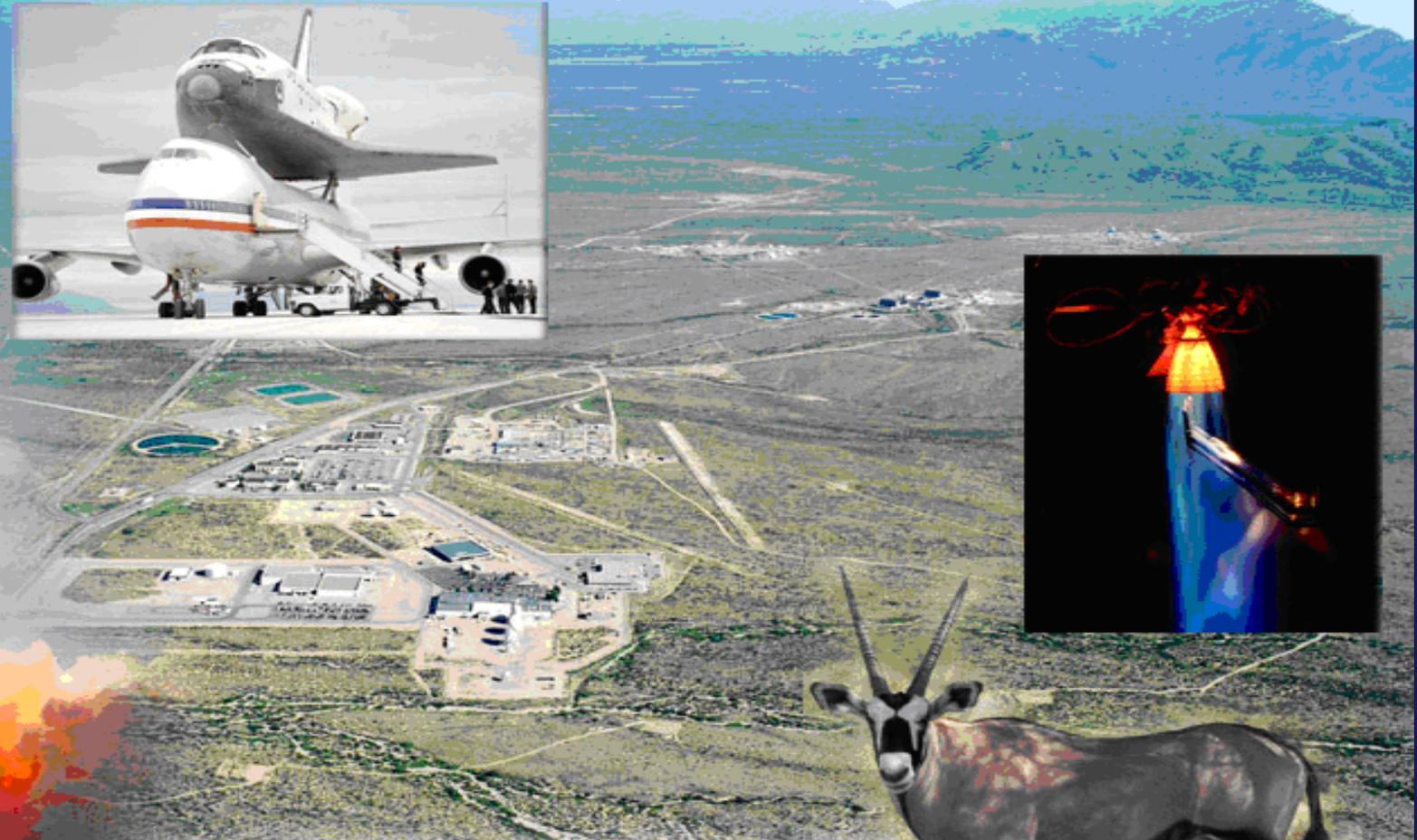


Lyndon B. Johnson Space Center
White Sands Test Facility
Las Cruces, New Mexico



**WELCOME
TO THE
WHITE SANDS TEST FACILITY SITE VISIT**



IT Infrastructure Integration Program (I³P)

May 14, 2009

Office of the Chief Information Officer

VISION: Integrated, secure, and efficient information technology and solutions that support NASA



Agenda

Office of the Chief Information Officer

- Introduction:
 - Jim Krupovage, WSTF IT Manager (JSC Information Resources Directorate)
 - George Alcantar, WSTF Customer Service Agent (JSC IRD)
- Welcome
 - Safety and Administrative Remarks
 - Process for Comments and Questions
- Site Visit Objectives
- Facility Overview
- Facility IT Infrastructure Today
 - End User Environment
 - Communication Environment
 - Data Center Environment
- Facility Tour



Safety Message

Office of the Chief Information Officer

- Fire Exits
- Restrooms
- Please adjust all cell phones and pagers to the “Off” or “Vibrate” setting.
- During the tour you will not be leaving the bus
 - Do not use cell phones or cameras to take pictures. Pictures and charts will be available later on the I³P website (I3P.nasa.gov).
- WSTF Safety Video



Process for Questions

Office of the Chief Information Officer

- Aside from site visit logistics questions, NASA will handle comments and questions as described below.
- Submit comments/questions to <http://I3P.nasa.gov> [Q/A tab].
- Comments Received by May 20:
 - Sender will receive acknowledgement e-mail.
 - Comments will not be posted online nor to any publicly accessible website but will be considered internally by the government when finalizing the RFP and no response will be provided.
- Questions Received by May 20:
 - Sender will receive acknowledgement e-mail.
 - Questions, in whole, in part, or consolidated with similar questions, will be posted online along with the government's response. Individual and company identifiers will not be used in the online posting.



Site Visit Objective

Office of the Chief Information Officer

- What we are planning to do
 - Explain facilities & people (who we are)
 - Explain involvement with major programs, projects, and missions (what we do)
 - Explain the current state of IT infrastructure at the Facility
 - End-user services (desktop/laptop/workstations)
 - Communications (networks, phones)
 - Data centers
- What we are NOT planning to do
 - Explain further the five I³P acquisitions or associated strategy
 - Explain the content of the draft RFPs
 - Entertain questions on the acquisition strategy or draft RFPs
 - Discuss future state/plans for Facility IT infrastructure



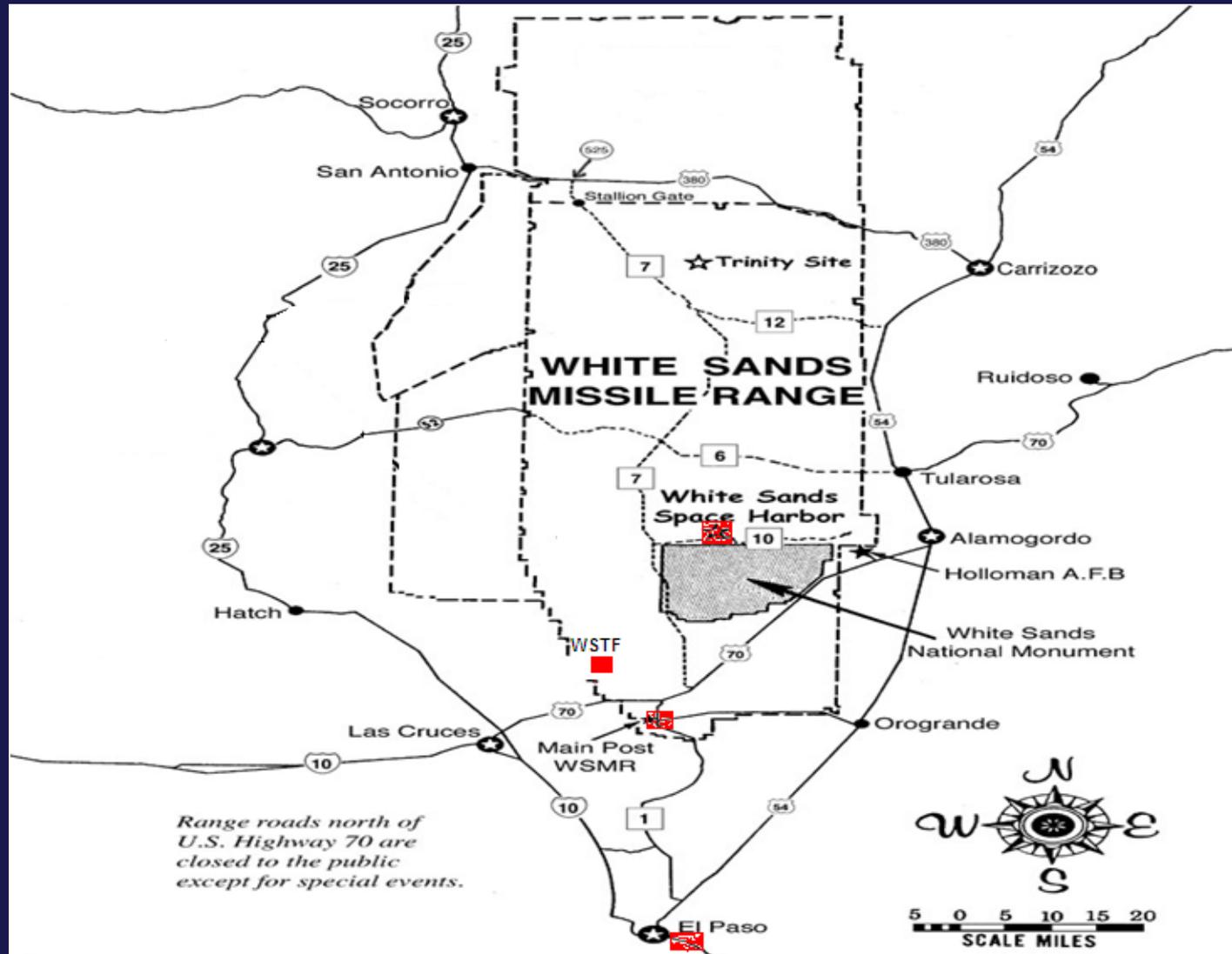
White Sands Test Facility

WSTF is located near Las Cruces, New Mexico.

The closest major airport is in El Paso, Texas about 45 miles south.

WSTF is a tenant of the White Sands Missile Range.

Other nearby NASA facilities include the White Sands Space Harbor, Sounding Rocket Facility, Orion Pad Abort, El Paso Hanger Operations and the White Sands Complex (Goddard)





White Sands Test Facility

Subsidiary unit of
the NASA
Johnson Space
Center

Constructed in
1962-1964 to
support the Apollo
Project

Occupies 28
square miles of
the southwest
corner of WSMR

56 NASA and 640
Contractor
personnel





White Sands Test Facility

Large buffer zone
and controlled
remote property



Moderate desert
climate with
minimal risk of
natural disasters





Mission Statement

Our mission is to provide the expertise and infrastructure to test and evaluate spacecraft materials, components, and propulsion systems to enable the safe exploration and use of space.





WSTF Tenets

- Support All NASA Endeavors
- Provide Unique Testing and Expertise for Other Agencies and Industry
- Host Goddard Space Flight Center (GSFC) and Aerospace Southwest Communications Facility

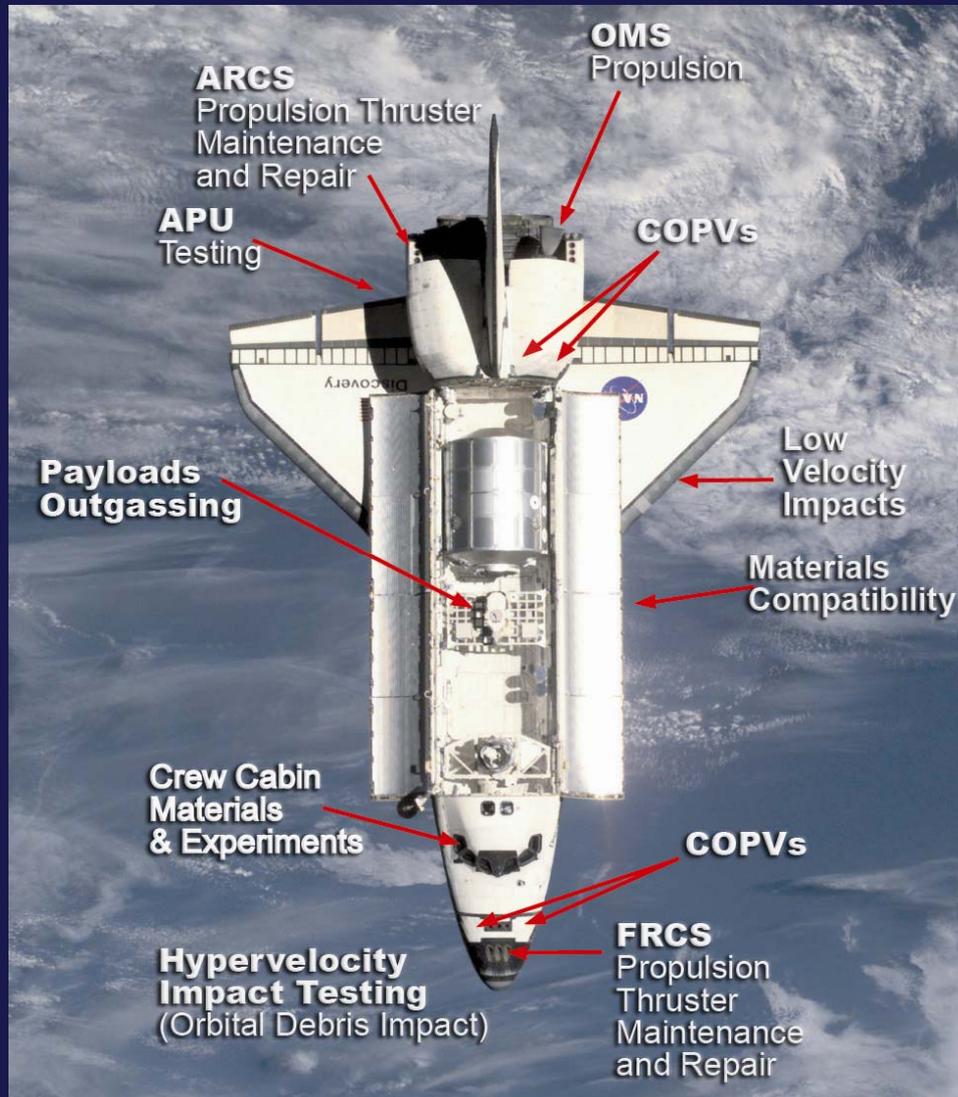


Customer Base

- Johnson Space Center - Shuttle Orbiter, Payloads, International Space Station, Crew Training, Constellation Program, and Special Projects
- NASA Headquarters and Other Field Centers
- Other US Government Agencies - Army, Navy, Air Force, DOD, DOE, EPA
- Commercial Industry

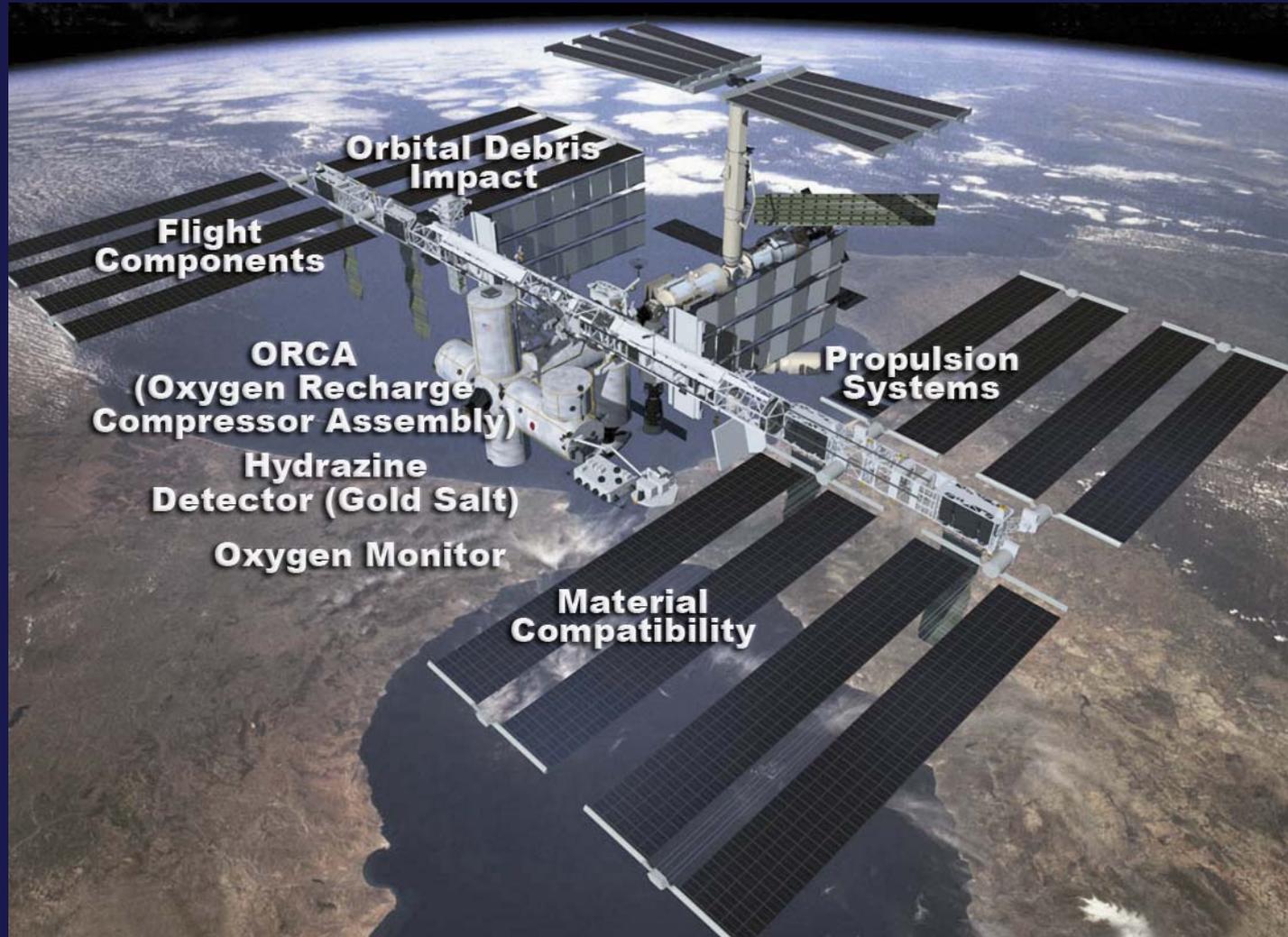


Capabilities





Capabilities



**Flight
Components**

**Orbital Debris
Impact**

**ORCA
(Oxygen Recharge
Compressor Assembly)**

**Hydrazine
Detector (Gold Salt)**

Oxygen Monitor

**Material
Compatibility**

**Propulsion
Systems**



Facilities

- Rocket Engine System Test Stands with Vacuum
- Long-duration Large-altitude Simulation System
- Full-scale Hypergolic and Cryogenic Propulsion Test Systems
- Chemistry and Metallurgical Laboratories
- Flight Component Repair, Refurbishment, and Test Facilities
- High Energy Blast Facility
- Oxygen-enriched Atmosphere Test Facilities
- Hypergolic Materials and Components Test Facilities
- Hypervelocity and Low Velocity Impact Test Facilities
- White Sands Space Harbor Launch and Landing Site





Support Services

- Calibration Services
- Clean Room
- Component Services
- Composites Analysis
- Computer Services
- Construction
- Engineering Design
- Fabrication Services
- Fire and Emergency Services
- Maintenance and Operations
- Photo/Video
- Publications and Records Center
- Quality Assurance and Engineering
- Radio Communications
- Safety and Industrial Hygiene
- Security





Laboratories Office

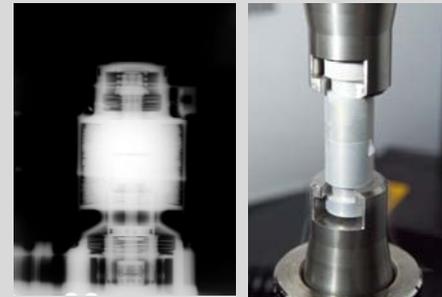


MDAL/Offgassing Laboratory



Space Environment
Simulation Laboratory

Chemistry & Metallurgy Laboratories



Metallurgy Laboratory



Propellant Laboratories



Instrumentation, Analytical, and
Gas Analysis Laboratories



Laboratories Office

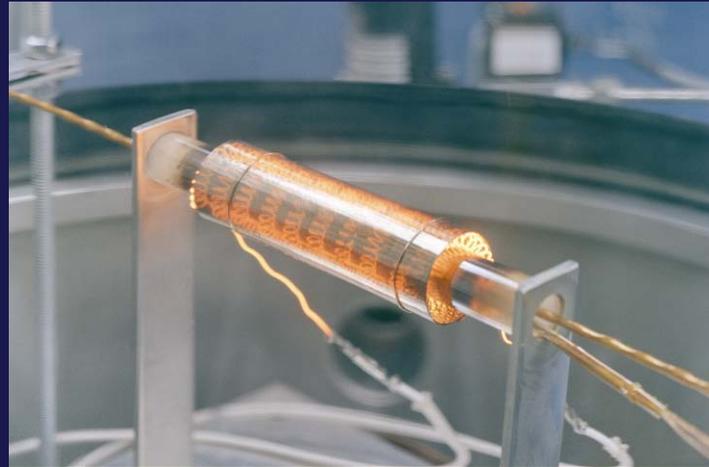
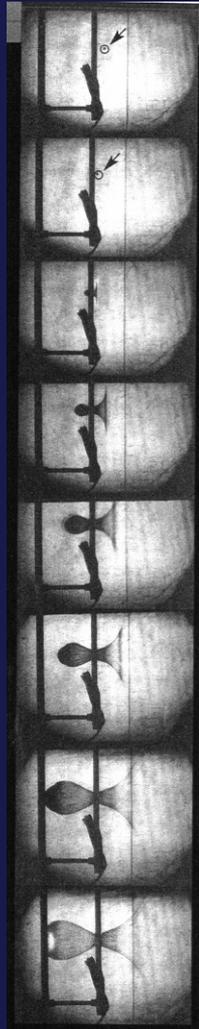


Low Velocity Ice Impact Testing



Laboratories Office

- Micrometeoroid/
Debris
Hypervelocity
Impact Testing
- Shuttle Kapton
Instrumentation
Wire Testing for
Extreme Heat
- Propellant and
Explosion
Hazards
Assessment





Laboratories Office

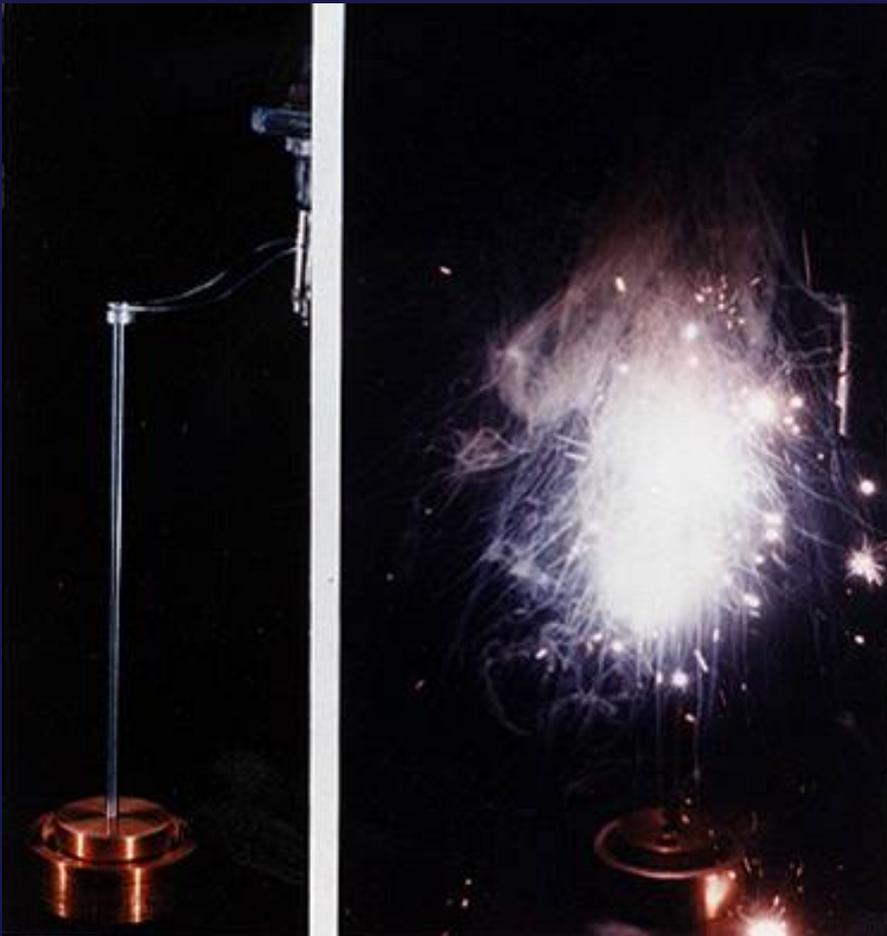


STS COPV Testing on a Centaur Vessel





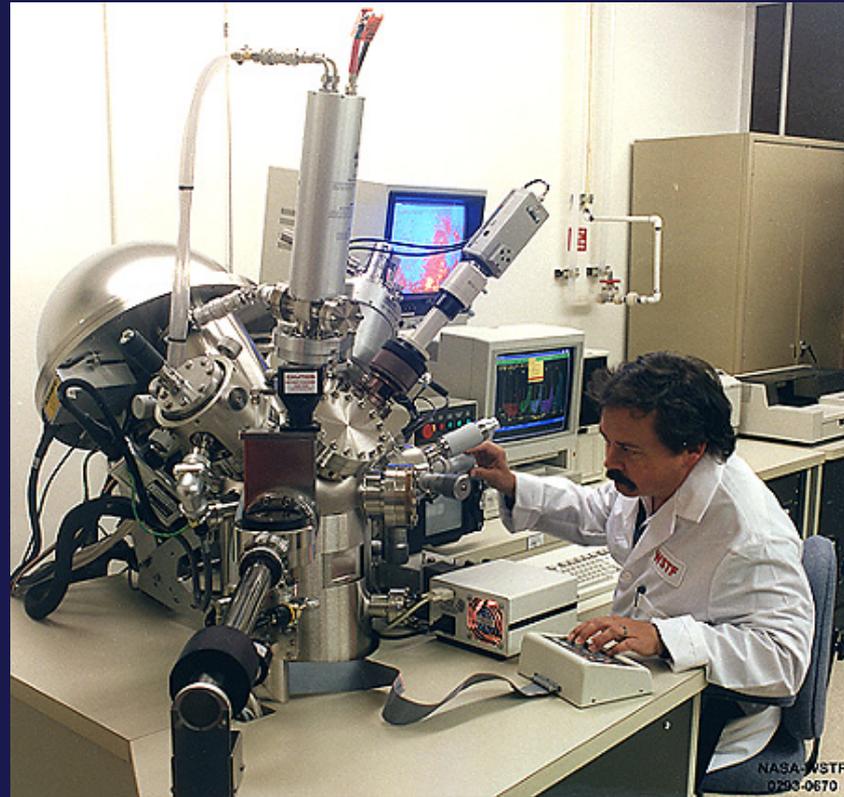
Laboratories Office



Research on
Flammability of
Materials
(including Metals) in
Oxygen-enriched
Atmospheres



Laboratories Office



Molecular Analysis of Surface Effects using
X-ray Photoelectron Spectroscopy Instrument



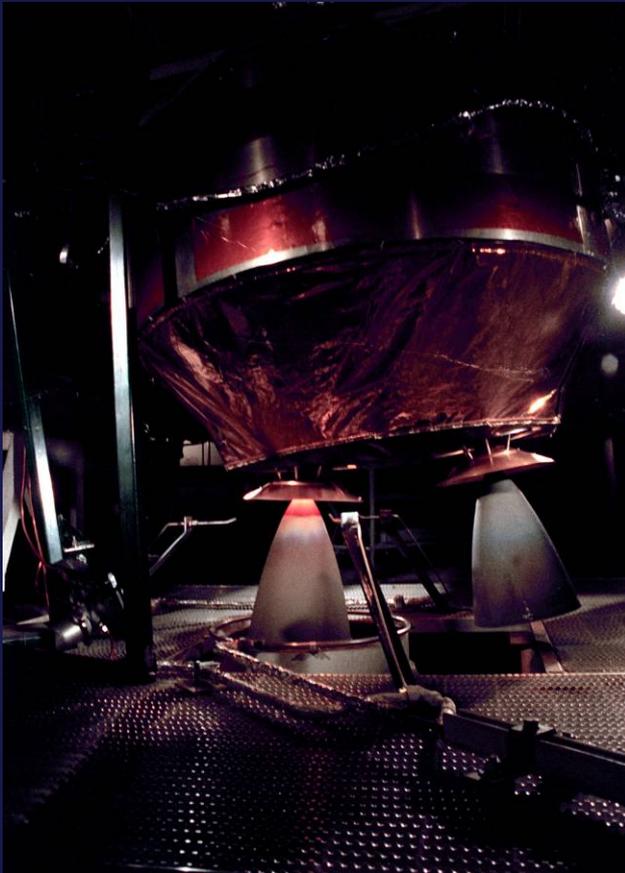
Propulsion Test Office



Night Firing of Shuttle Forward RCS
Primary and Vernier Thrusters



Propulsion Test Office



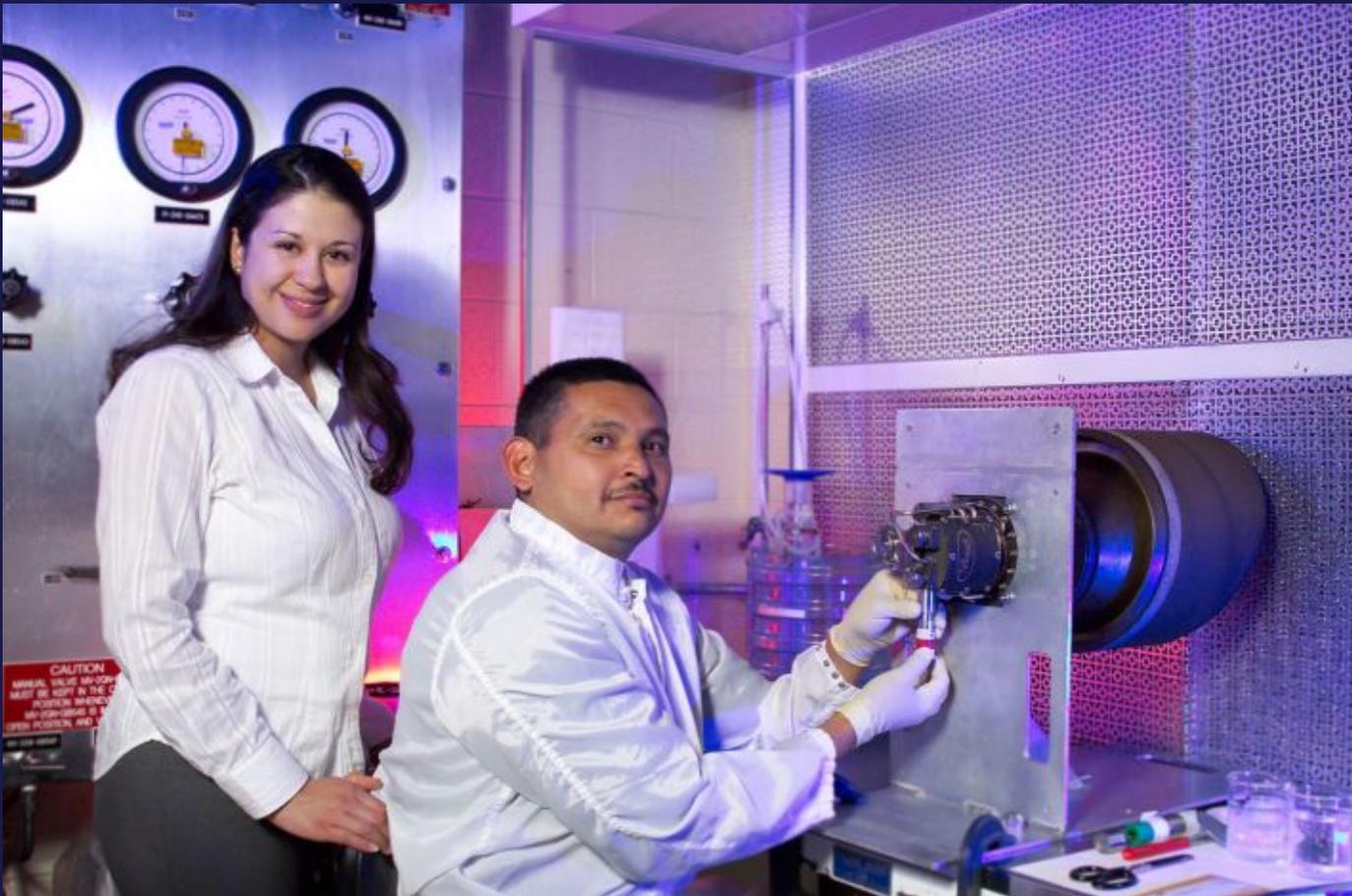
- Cassini – Saturn Orbit Insertion Engine Glows during 3-h 20-min Continuous Firing



- Shuttle PRCS Thruster Hot-fire Testing
- Minuteman Qualification Firing inside Vacuum Test Cell



Propulsion Test Office



Depot Refurbishment of Flight Critical
Propulsion System Components



Propulsion Test Office



Static Firing of DC-X
with 4 LOX/Hydrogen
RL10-A5 Engines



Propulsion Test Office



DC-X Executes Vertical
Landing at WSMR



WSSH



- Orbiter Approach and Landing Training Facility
- Restricted, Controlled Airspace
- Long, Wide Lakebed Runways
- Year-round Flying Weather
- No “Bird-strike” Problems



WSSH



- Landing Training for Astronauts
- Landing/NAVAID Development
- Procedure Development
- Contingency STS Landing Site
- Training Aircraft Hangared at El Paso Airport
- Schedule 250 Days for Flight Time
- Average 190 Days Flown





TDRSS



60-ft Diameter Microwave Antennas for
Communication with TDRSS Satellites



WSTF IT Infrastructure Today

Office of the Chief Information Officer

WSTF Environment

- **WSTF standardizes with JSC**
- The WSTF IT infrastructure supports many different environments both on and off-site
 - Engineering and test facilities
 - Scientific laboratories
 - Office environments
 - Warehousing and storage facilities
 - Meeting, conferencing and auditorium facilities
- The numbers included in this presentation are all estimates - a snap shot in time to explain the WSTF environment. Companies must refer to the RFPs for the official numbers.



Engineering, Maintenance and Operations Management

Office of the Chief Information Officer

Management

- Currently, NASA\ODIN personnel meet weekly to discuss network design requirements and network operational issues
 - @ JSC
 - Backbone Meeting
 - Used to effectively define and discuss and JSC/WSTF network/phone design requirements between ODIN and NASA personnel.
 - Operations Meeting
 - Used to discuss any JSC/WSTF operational issues between ODIN and NASA personnel
 - ODIN/NASA Management Tagup
 - Used to review current and future network/phone projects. Also to review any topics or issues that need ODIN and NASA ma
 - @ WSTF
 - Weekly meeting with WSTF ODIN lead discussing projects/actions



Engineering, Maintenance and Operations Management

Office of the Chief Information Officer

Process

- New network hardware and software requests are procured thru two mechanisms
 - Catalog Purchase
 - ODIN managed ordering system for hardware and software.
 - Infrastructure Upgrade Service Requests/Proposals
 - Formal Documented project that include materials, labor and maintenance.



End User Environment

Office of the Chief Information Officer

Overview/Scope

- IRD is the organization responsible for providing institutional end user services at JSC & WSTF
- Institutional end user services are utilized by personnel in all WSTF organizations for office automation and scientific/engineering tasks
- Mission critical end user services
 - IRD provides institutional end user services (e.g., phones, desktops, etc.) in mission critical facilities such as the WSSH facility
 - Mission critical end user services are not provided by IRD and are out of scope for these procurements.



End User Environment

Office of the Chief Information Officer

End User service categories / providers

- Desktop computers / laptop computers / workstations – ODIN
- Shared Printers – ODIN
- Multi Function Devices – Agency Multifunction Device Contract
- Cell phones / Blackberry's – ODIN
- Pagers
 - WSTF – WSTF pagers are provided by the Facility Operations Support Contract (FOSC). They are part of the WSTF Emergency Communication System and are out of scope for this procurement.



End User Service Quantities

Office of the Chief Information Officer

Type	WSTF
ODIN Desktop Seats (PC/Macintosh)	450/0
ODIN Laptop Seats (PC/Macintosh)	188/0
ODIN Workstation Seats (PC/Macintosh)	80/0
ODIN Shared Printers - Institutional	97
ODIN Shared Printers - PRN Seats	2
ODIN Shared Printers - Printers on LAN-C Seats	25
ODIN MC1 (Blackberry) Seats	30
ODIN PCELL (Cell Phone) Seats	75
ODIN PG1/PG2/PG3 (Pager) Seats	0
Xerox Multi-Function Devices (MFD)	47



End User Environment

Office of the Chief Information Officer

Current End User Service Standards at WSTF

- ODIN Desktop/Lap/Workstation Seats
 - Monitor – 17” LCD (Desktop seats), 19” LCD (Workstation seats)
 - Return To Service – by COB next business day
 - Hardware refresh - 3 years
 - Email – 400 MB mailbox
 - Home Directory – 50 MB
 - Desktop UPS (Supplied but not in seat definition)
 - Help Desk support – weekdays – 6:00 AM – 6:00 PM
- ODIN MC1 (Blackberry) and PCELL (cell phone) Seats
 - Return To Service – within 8 work hours
 - Hardware refresh - 18 months
 - Help Desk support – weekdays – 6:00 AM – 6:00 PM
- Agency MFD's
 - Begin Repairs / Return To Service – 4 work hours/20 work hours



End User Environment

Office of the Chief Information Officer

Standard Software Load (WSTF) as of 5/1/09

– PC/Windows

- Microsoft Windows XP SP3
- Microsoft Office 2007 SP1
- Internet Explorer 7
- Symantec Anti-Virus 10.1.6.6010
- Adobe Acrobat Reader – 9.1.0
- Win-Zip 11.1
- Timbuktu Pro 2000
- QVT Term
- WS-FTP pro 2007
- .Net 1.1 SP1 / .Net 2.0 SP1
- Entrust 7 (PKI)
- QuickTime 7.5.5
- Filenet eForms 4.2



Communication Environment

Data Networks

Office of the Chief Information Officer

Scope

- The WSTF Institutional Network System is used by NASA employees for office automation functions (i.e. email, printing and file sharing)
 - Available 24/7
 - Used to provide access to other NASA Centers and to the Internet
 - Services are also provided at the White Sands Space Harbor and the El Paso Hanger.



Communication Environment

Data Networks

Office of the Chief Information Officer

Equipment

- Routers 6
- Switches 40
- Wireless Access Points 50
- Wireless Bridge Links 4





Communication Environment

Data Networks

Office of the Chief Information Officer

General Design

- WSTF network is currently a segment of the JSC LAN with the primary core/distribution networking hardware located in the B101 WSTF Data Center.
 - The secondary core/distribution networking hub is located in B200.
 - The secondary location ensures there is no loss of networking requirements or functionality in case of failure of the primary.
- Cisco is the primary routing and switching hardware vendor
 - Aruba Networks is the vendor for wireless access points
 - WSTF Network is fully VoIP capable
- The WSTF network supports approx. 750 users
 - This includes both onsite users and off-site users
- WAN – Node on Qwest ring with redundant OC-12 paths. Qwest demarc in B100 has capacity for OC-192.



Communication Environment

Data Networks

Office of the Chief Information Officer

Cable Plant

- Inter-building fiber is mostly single-mode fiber, with some multimode fiber.
 - Four main fiber hubs 101,200,300,400 provide fiber connectivity to WSTF buildings
 - WSTF fiber is mostly installed as building to building conduit system. WSTF has a tunnel system between the blockhouse and test-stand environments.
- WSTF copper cabling is Cat5e
 - Copper cabling installed and tested per existing regulations



Communication Environment

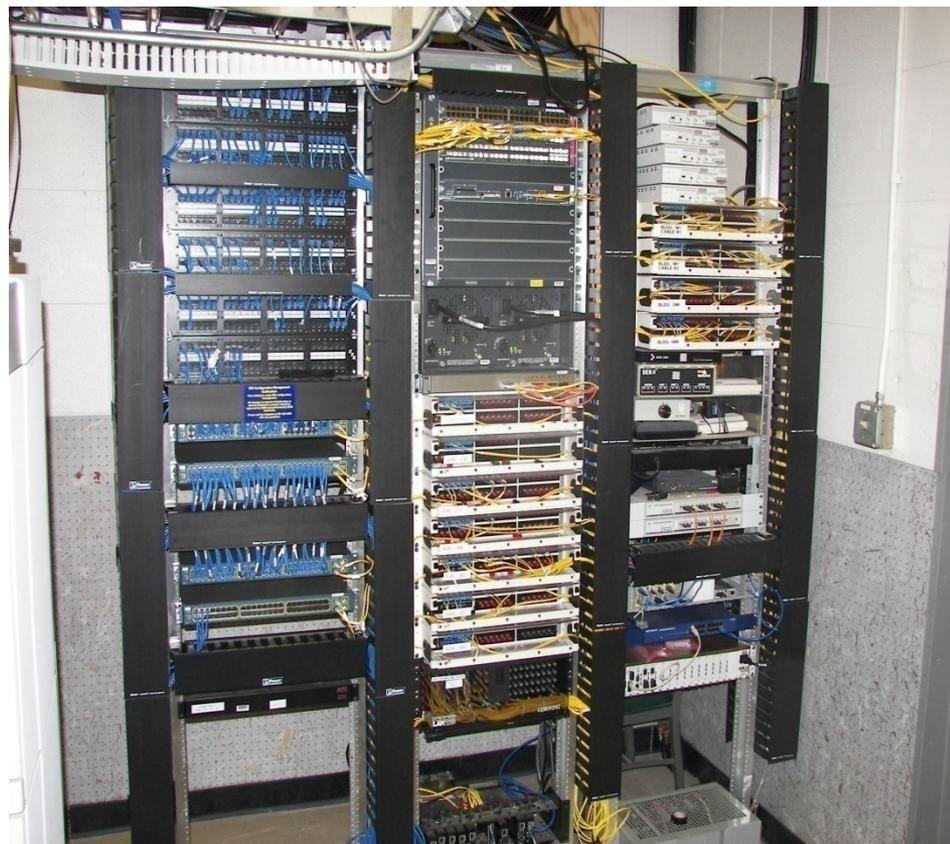
Data Networks

Office of the Chief Information Officer

Test Stand Tunnels



B200 Copper/Fiber Distro





Communication Environment

Firewall Systems

Office of the Chief Information Officer

Equipment

- Virtual Private Network (VPN)
 - WSTF supports two VPN systems
 - Microsoft Point to Point Tunneling Protocol (PPTP)
 - Juniper Secure Socket Layer (SSL)
 - Built with fault tolerant redundant design
- WSTF Firewall System
 - WSTF has Checkpoint Firewalls currently; migrating to Juniper Firewalls
 - Blue Coat provides web proxy and web-filtering services for the WSTF private networks



Communication Environment

Voice Services

Office of the Chief Information Officer

Scope

- Local phone service, long distance service and 4 digit dialing for onsite phone service
- Caller ID
- Voice mail service with password control
- Fax/Voice to the desktop
- Data service: inward and outward dialing from modem equipped computers and facsimile machines attached to analog subscriber lines



Communications Environment

Voice Architecture

Office of the Chief Information Officer

Equipment

- Three nodes.
 - Node 1 (WSTF Data Center B101) contains the primary PBX and voice mail system along with the Distribution Frame connecting to B100 Qwest Demarcation.
 - Node 2 (B200 North High Bay) contains the secondary PBX
 - Node 3 (WSSH Comm Building) connected through WSMR communication lines to WSTF Microwave to B200 North High Bay.
 - Each Node is Nortel Option 61C Switch connected by multiple T1 lines.
 - Serve over 1,500 digital and analog subscriber lines located at WSTF and WSSH.
- El Paso Hanger is standalone switch supporting 30 digital and analog subscriber lines.
- Voice traffic to other NASA and government locations as well as long distance service is handled by the Networx contract



Communications Environment

Voice Architecture

Office of the Chief Information Officer

Primary PBX B101 Rm 210 (WSTF Data Center)





Communications Environment

Voice Architecture

Office of the Chief Information Officer

Secondary PBX B200





Communications Environment

Voice Architecture/VoIP

Office of the Chief Information Officer

Scope

- WSTF has a small proto-type deployment of Cisco VoIP technology (10 phones at WSTF).
- WSTF call manager resides at JSC, with plan to incorporate onsite call managers in the future.
- Quality of Service (QoS) prioritizes voice traffic on the network, specifically, Cisco's AutoQoS technology.



Communications Environment

Voice Architecture/VoIP

Office of the Chief Information Officer

VoIP General Design

- WSTF will follow JSC design
- JSC VoIP system uses the same IP network as data traffic.
- JSC VoIP systems uses the same 5 digit dialing as the Center Telephone System (CTS).
- No current plans for Unified Messaging services.
- Separate voice Virtual Local Area Network (VLAN).
- All locations with VoIP have Uninterruptible Power Supplies attached.
- VoIP emergency locator information uses the same system as the CTS.



Communication Environment

Teleconferencing

Office of the Chief Information Officer

Scope

- Audio and Video Teleconferencing
 - At WSTF, there are two (2) ISDN based rooms, one (1) IP based system (Lifesize) and a number of audio teleconferencing equipped rooms.
 - Available for use by WSTF and the White Sands Complex (Goddard)
 - Teleconferencing room systems are used to support
 - business meetings between Centers
 - meetings with other Government agencies
 - inter-center mission support reviews
 - meetings with the ISS International partners and non-Government entities working with NASA (e.g. universities)
 - In addition to video, there are a number of rooms equipped only for audio-conferencing.



Communication Environment

Teleconferencing

Office of the Chief Information Officer

General Design

- Larger ISDN-based rooms use multiple cameras and interfaces to display computer graphics and the video teleconferencing components are connected for operation by using a room control system (e.g. AMX).
- The IP-based rooms use Lifesize technology for video-teleconferencing capabilities. Lifesize is a technology which makes use of High Definition video coupled with an advanced audio system that provides for a very natural interaction.
- The audio systems are COTS products (e.g. Shure, Polycom) that utilize the Center's phone system.



Communication Environment Teleconferencing

Office of the Chief Information Officer

WSTF Medium ViTS and Mission Management Team Room B101





Communication Environment Teleconferencing

Office of the Chief Information Officer

ViTS Room Equipment





Communication Environment

Teleconferencing

Office of the Chief Information Officer

WSTF Large ViTS Room (Rotunda)





Communication Environment

Teleconferencing

Office of the Chief Information Officer

WSTF VoTS Services (WSTF Managers Conference Room)





Data Center Environment

Facility Infrastructure

Office of the Chief Information Officer

Scope

- WSTF is a remote site (Physically Secure)
- WSTF is not susceptible to natural disasters
- WSTF's Data Center is housed in Building 101 on the 2nd floor
- Protected by electronic keypad entry
- 2 Pamona Air Handlers, replacing with new units providing more cooling capacity and redundancy
- Electrical capacity is 85 KVA (50% utilized) of UPS power utilized to transition power to 200 KVA Generator. Increasing electrical capacity to 500 KVA.
- Square Footage to host 50 additional cabinets or approximately 800 servers
- Potential use as contingency site for Agency/JSC requirements



Data Center Environment

Hosting Information

Office of the Chief Information Officer

Equipment

- WSTF Servers - GIS-DB, ENVR-SYS, WSTF-FS01(Fileshare), WSTF-NS1, WSTF-SMSPS4, WSTF-PRN, WSSH1, WSTF-DC1, WSTF-ACS-03, WSTF-NNM, PHOTO-WEB, WSTF-CP-WEB, WSTF-WEB, WSTF-DC2, WSTF-LMIT-FS01, WSTF-APPS (Applications), WSTF-NS2, HVAC, Energy Mgmt, DACS, WSTF Business System, IPAM
- Contingency Site for MAS (MOD), SDIL (ISS), Syren
- Contractor Lab
- Hosts local contractors data acquisition, storage and application servers



Data Center Environment

Hosting Information

Office of the Chief Information Officer

Contingency Site





Contractor Lab





Data Center Environment Hosting Information

Office of the Chief Information Officer

Data Networks, Servers and WAN Gateway





WSTF Tour

Office of the Chief Information Officer

- Must show your govt issued ID to be allowed on bus tour
- Tour will be windshield tour of WSTF facilities
- Please bring bottled water
- Hazardous Test Operations: Tour may not be allowed in some areas of WSTF due to Test Operation schedule.