

Develop an Accepted Framework to Capture the Body of Knowledge for Commercial Spaceport Operations Best Practices

A study conducted under a grant from the FAA Center of Excellence at New Mexico State University.

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Overview

- Team Members
- Purpose of Task 1 and Survey Results
- Purpose of Current Task 2 – Research Existing and Applicable Standards and Material
 - Implementation of a Document Management System (DMS) including Development and Implementation of DMS Parameters and Data Fields
 - Documents added to the Body of Knowledge DMS Database
- Access to the Body of Knowledge Database
- Next Steps

Team Members

- **Pat Hynes**, Principal Investigator, New Mexico State University
- **Herb Bachner**, HBachner & Associates
- **Jim Hayhoe**, Spaceport America Consultants
- **Paul Arthur**, Rear Admiral (Retired), Former Technical
 - Director/Deputy Commander, White Sands Missile Range
- **Lou Gomez**, Program Manager, Spaceport America
- **Craig Day**, Director, Business Development, AIAA
- **Robert Reuter**, Project Manager, The Boeing Company
- **David Headley**, Program Strategic Planning, The Boeing Company
- **Sandy Saunders**, Vice President Operations, Locked On, Inc.
- **Norice Lee**, Interim Associate Dean, Library, NMSU
- **Hank Strevel**, Graduate Assistant, Dept. of Government, NMSU

Purpose of Task 1

Task 1: Develop a Framework - Completed

Prepare the framework in collaboration with Spaceport Directors

- Project began in February, 2011
- Held meeting to discuss framework variables
- Updated framework variables to account for public input
- Survey spaceport executive directors and selected range operators

Survey Results – Sample

1	AIRFIELD AND LAUNCH OPERATIONS	Include	Do Not Include	Not in This Topic
1.1	OPERATIONAL INFRASTRUCTURE & ACTIVITIES			
1.1.1	Runways	87.50%	12.50%	0.00%
1.1.2	Terminal Facilities	75.00%	12.50%	12.50%
1.1.3	Aircraft Rescue and Firefighting Facilities	85.00%	0.00%	12.50%
1.1.4	Hazardous Materials Storage and Transfer Facilities	75.00%	0.00%	25.00%
1.1.5	Aircraft/Spacecraft Tie Down Areas	75.00%	25.00%	0.00%
1.1.6	Hangar Facilities	75.00%	25.00%	0.00%
1.1.7	Mission Control Facilities	75.00%	25.00%	0.00%
1.1.8	Launch Control Facilities	75.00%	25.00%	0.00%
1.1.8.1	Launch Pad Safety	50.00%	0.00%	50.00%
1.1.8.2	Maintenance of Ground-Based Launch & Flight Safety Syst.	62.50%	25.00%	12.50%
1.1.9	Spaceflight Preparation Facilities	87.50%	12.50%	0.00%

Purpose of Current Task

Task 2: Research into Existing and Applicable Standards and other relevant material related to Framework classification areas - In progress

- Began work January, 2012
- The FAA determined that Section 5 (Safety) should be first priority
- Initial estimate was that 1000 documents would need to be reviewed for the entire Body of Knowledge (BoK)
- To prove that multiple sources could be accessed and to verify document estimates, an initial target of 10 – 20 documents would be reviewed and mapped into the Framework established in Task 1.

Document Management System (DMS)

- To accomplish this task it was determined that a Document Management System (DMS) was required.
- NMSU Library Digital Library was selected to support the development of the DMS for the Spaceport Operations Body of Knowledge
 - The New Mexico State University Library contained a DMS that included digitized documents from the Library's collection and partnering institutions.
 - The BoK Database would have secure access and be readily updated.
- The Working Group determined the parameters and data fields for the DMS. A procedure for document data extraction was defined and implemented by the working group and the Library.

Document Management System (DMS)

Current Status:

- Defined approach for capturing safety requirements
 - Defined what is in the “family” of commercial spaceport safety documents and what is not i.e. the group accepted that some documents used by Federal Ranges (NASA and Air Force) may be useful in a “family” of commercial spaceport safety documents.
 - Clarified/defined the criteria for Spaceport Operator and Spaceport User. A Spaceport User may include a launch operator, a payload developer, a payload operator or funding provider.
- Reviewed copyright requirements and developed letters requesting the use of on-line documents by the Spaceport Working Group in the establishment of the Body of Knowledge.
 - Currently 45 documents have been inserted into the DMS
 - Multiple document sources reviewed (NASA, AF, FAA, WSMR, NFPA)
- DMS has been Beta Tested to improve it’s accessibility

Sample of Documents added to the Body of Knowledge

- Air Force Space Command Manual 91-710 Range Safety User Requirements [USAF]
- NASA-STD-8719.12 : Safety standards for explosives, propellants, and pyrotechnics [NASA – JSC]
- NASA-STD-8719.13B NASA technical standard: Software Safety Standard [NASA]
- National Fire Protection Association 407 Standard for Aircraft Fueling Service [NFPA]
- NFPA 495: Explosives materials code [NFPA]
- NPD 8700.1E NASA policy for safety and mission success [NASA]
- NPR 8705.5A Technical probabilistic risk assessment (PRA) procedures for safety and mission success for NASA programs and projects [NASA – JSC]
- NPR 8715.3C NASA General Safety Program Requirements [NASA - JSC]
- NPR8715.5A Range flight safety program [NASA]
- United Facilities Criteria (UFC) 3-575-01: Lightning and static electricity protection systems [DoD]
- White Sands Missile Range: Range Customer Handbook [WSMR]
- Guide to reusable launch and reentry vehicle software and computing system safety [FAA]

Access the Body of Knowledge Database

- Access the Bok Database using the guest login:
- Access the URL: <http://contentdm.nmsu.edu>
- Refresh the page (or it won't load the BoK information)
- LOGIN: Username: libguest
- PASSWORD: libguest23

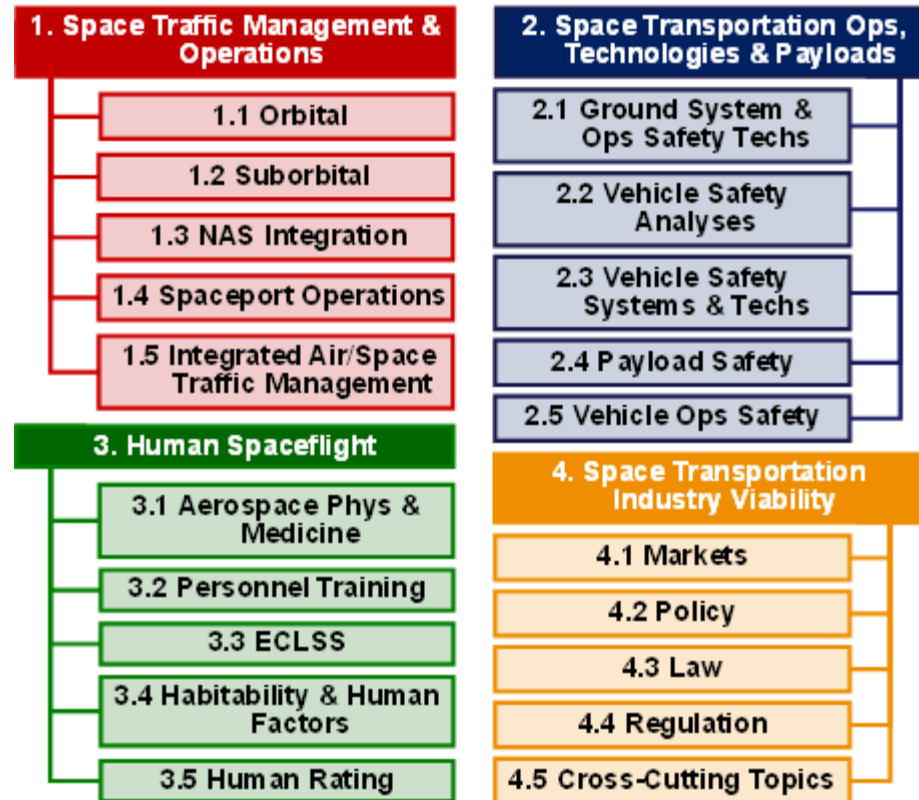
Next Steps

Task 3: **Gap Analysis:**

A gap analysis will be conducted to compare the variables in Framework of Task 1 with the existing practices, standards, policies and best practices documentation identified in Task 2.

Identify where gaps exist.

Center Of Excellence CST Research Tasks



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U.S. Spaceports

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Presentation to the FASTFORWARD Working Group Meeting on November 9, 2012