Return to Flight Task Group

Public Meeting

July 22, 2004
Teleconference

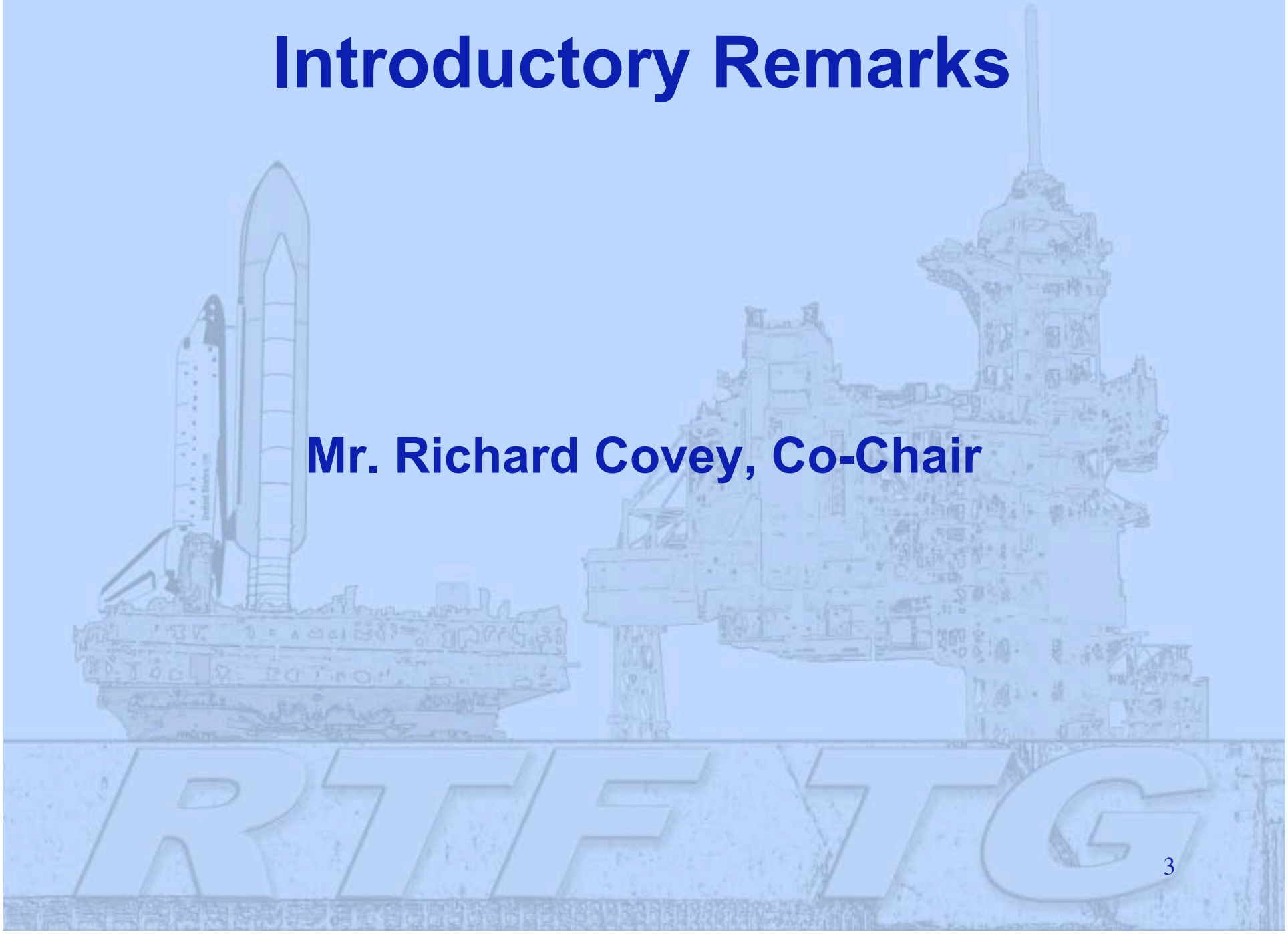
Public Meeting Agenda

July 22, 2004

- 1205 – 1215 Introductory Remarks:
  Mr. Richard Covey – Co-Chair
  Col. James Adamson – Operations Panel Lead
- 1215 – 1315 Operations Panel Presentations
  4.2-5 Foreign Object Debris
  Gen. Forrest McCartney
  10.3-1 Digitize Closeout Photography
  Mr. Robert Sieck
- 1315 – 1330 Action Item Summary and Closing Remarks
  Mr. Richard Covey – Co-Chair

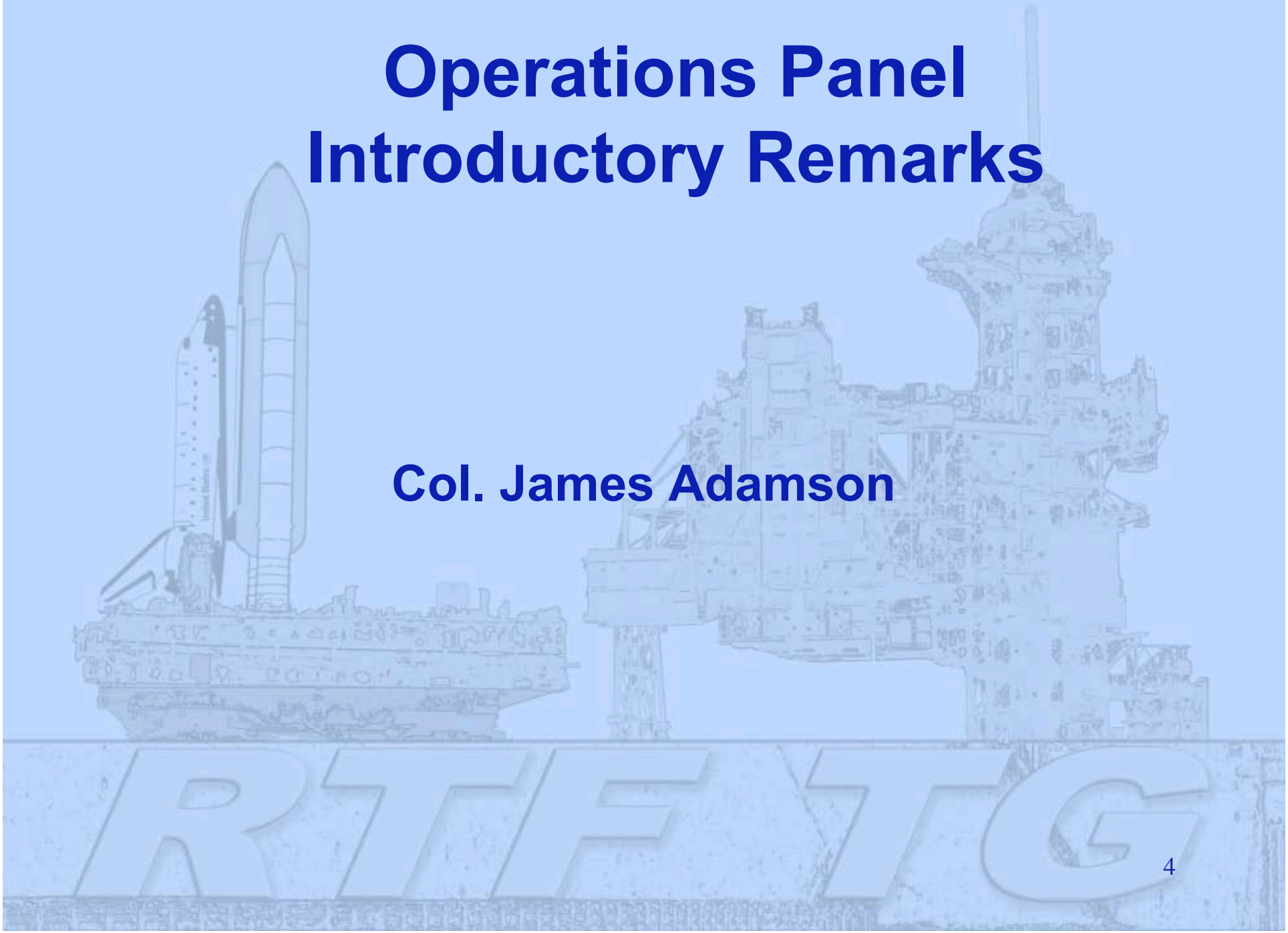
* Times are shown in Eastern Daylight Time

Introductory Remarks



Mr. Richard Covey, Co-Chair

Operations Panel
Introductory Remarks



Col. James Adamson

Operations Panel

R4.2-5 Foreign Object Debris

Gen. Forrest McCartney

4.2-5 - Foreign Object Debris (FOD)

CAIB Recommendation

Kennedy Space Center Quality Assurance and United Space Alliance must return to the straightforward, industry-standard definition of "Foreign Object Debris," and eliminate any alternate or statistically deceptive definitions like "processing debris."

4.2-5 - Foreign Object Debris (FOD)

RTF TG Interpretation

- KSC should use definitions for FOD consistent with standards for similar industry or DoD facilities
- KSC should remove all references to processing debris that results in ambiguity regarding FOD detected during ground processing operations

4.2-5 - Foreign Object Debris (FOD)

NASA Implementation

- Performed benchmarking for best practices and analysis to determine applicability to KSC
- Workforce Rollout and Training occurred prior to full implementation
- National Aerospace FOD Prevention, Inc. (NAFPI) industry standard definitions have been adopted
- The term “processing debris” has been eliminated
- Procedures have been updated
  - OP USA004706, Foreign Object Debris / Damage (FOD) Prevention
  - SOP 0801-O-035, Foreign Object Debris (FOD) Reporting
- KSC Safety & Mission Assurance submitted FOD definitions for inclusion in KSC policy document
  - KHB 5310.1 (KNPR 8720.1)

4.2-5 - Foreign Object Debris (FOD)

National Aeronautics and
Space Administration

Headquarters
Washington, DC 20546-0001

Reply to Attn of: M

June 15, 2004

Return to Flight Task Group
1740 NASA Parkway
Suite 101
Houston, TX 77058

Dear Task Group Members:

We are forwarding to you the attached material for review and consideration by the Return to Flight Task Group. This package represents NASA's plan for correcting the deficiencies specified in CAIB Recommendation 4.2-5, Foreign Object Debris. This plan was originated by the Return to Flight Planning Team, matured by the appropriate projects and elements of the Space Shuttle Program, approved by the Space Flight Leadership Council, and is being implemented by the Space Shuttle Program.

We feel that NASA has reached a level of maturity in the planning and implementation of this recommendation and that it warrants formal review by your Task Group for satisfactory compliance with the CAIB Report. Please advise us of your determination of whether the action can be considered closed, conditionally closed, or should remain open for further work specified in your response.

Even following formal closure of an action, NASA will continue to welcome clarifying comments, additional expert advice, and dissenting opinions of individual Task Group members that will aid our efforts to return the Shuttle to safe flight. We also respect the Task Group's prerogative to reopen a closed item if warranted.

If you require any further technical information on this topic, please contact Mr. Ronnie Lanier at (281) 244-7444 or Col. Jim Halsell at (281) 244-8973.

Cordially,

William F. Readdy
Co-Chair, Space Flight
Leadership Council

Michael Greenfield, Ph.D.
Co-Chair, Space Flight
Leadership Council

4.2-5 - Foreign Object Debris (FOD)

Closure Concurrences

The undersigned have reviewed the attached package detailing NASA's response to CAIB recommendation 4.2-5. We concur on its completeness and accuracy and submit it to the Return-to-Flight Task Group for closure.

William W. Parsons
Space Shuttle Program Manager

Ronald D. Halsell
Lead, Return to Flight Planning Team

Michael C. Kostelnik
Deputy Associate Administrator for International Space Station and Space Shuttle Programs

Bryan D. O'Connor
Associate Administrator, Office of Safety and Mission Assurance

William F. Readdy
Associate Administrator, Office of Space Flight

Michael D. Greenfield, Ph.D.
Associate Deputy Administrator for Technical Programs

4.2-5 - Foreign Object Debris (FOD)

NASA Verification Process

ontinuous tracking of metrics with emphasis on maintaining self-reporting

- FOD data collected and contained in updated and robust database
- Independent monitoring function has been added to FOD Prevention Program
  - Contractor Process Assurance Engineering function will assess FOD prevention behavior during in-process work
- Established dedicated FOD POC within USA Ground Operations
- Revised area access permissions for processing areas
  - Annual refresher required to maintain access
- NASA S&MA will perform baseline audit three months after initial implementation and periodically thereafter

4.2-5 – Foreign Object Debris

FOD DEFINITIONS

- New definitions adopted from NAFPI guidelines and industry standards:
  - Foreign Object Debris (FOD) – A substance, debris or article alien to a vehicle or system which would potentially cause damage.
  - Foreign Object Damage (FOD) – Any damage attributed to a foreign object which may degrade the product's required safety and/or performance characteristics.
  - Clean-As-You-Go – Clean the immediate area when work cannot continue. Clean the immediate area when debris has the potential to migrate to an out-of-sight or inaccessible area and give the appearance of poor workmanship. Clean the area prior to leaving it unattended, when work cannot continue, after work is completed or at the end of shift, whichever comes first. If you see something, drop something, see or hear something drop, pick it up.
- Documented in KHB 5310.1 (KNPR 8720.1)

4.2-5 – Foreign Object Debris

Schedule

- Operating Procedure update
  - Release Date – 07/08/04
- Database update
  - Database Procedure Release Date – 07/01/04
  - Database Online – 07/01/04
- Workforce Rollout/Training
  - Rollout Complete – 07/01/2004
  - CBT Training Startup – 05/24/2004
  - CBT Training Complete ECD – 09/01/04
- Implementation
  - Program Startup – 07/01/04
- NASA Audit
  - NASA Follow up Audit ECD – 10/01/04

4.2-5 - Foreign Object Debris (FOD)

Panel Assessment

- Conducted fact-finding at KSC on September 24, 2003, March 11, 2004, and May 14, 2004
- NASA has implemented the intention of the CAIB. This new program is very rigorous.
- Only concern of the RTF TG Operations Panel is the impact of the additional oversight and metrics on the workforce.
  - It is imperative that NASA ensure continued self-reporting without concern that workforce will be penalized indiscriminately.

4.2-5 - Foreign Object Debris (FOD)

Planned Work

- Completion of baseline audit three months after implementation and periodically thereafter
  - Periodic surveillance audit planned every two years (variable depending on trends)
- Completion of CBT training

4.2-5 - Foreign Object Debris (FOD)

Recommendation

- NASA has met intent of CAIB Recommendation
- No constraints to closure

Operations Panel

R10.3-1 Digitize Closeout Photography

Mr. Robert Sieck

10.3-1 – Digitize Closeout Photography

CAIB Recommendation

Develop an interim program of closeout photographs for all critical sub-systems that differ from engineering drawings. Digitize the closeout photograph system so that images are immediately available for on-orbit troubleshooting.

10.3-1 – Digitize Closeout Photography

RTF TG Interpretation

- Background
  - The engineering drawing system has not been kept up to date
  - Difficulty determining “as flown” hardware configuration from drawings and documentation
  - Difficulty accessing closeout photography information
- Interpretation
  - To allow for an accurate representation of vehicle configuration, closeout photography and documentation of discrepancies is necessary
  - This photographic documentation must be easily accessible and searchable for use in real-time analysis when required

10.3-1 – Digitize Closeout Photography

NASA Implementation

- Developed and approved a new General Closeout Requirement and clarified Closeout Inspection Requirements
- Mandated that photography of all Material Review Board (MRB) conditions be entered into the Still Image Management System (SIMS) closeout database; Implemented requirements
- Obtained specific photography requirements from Program Flight Elements.
- Implemented enhancements to SIMS
  - Developed and released a graphical drilldown software system and established associated requirements
  - Defined new zone maps for external tank and solid rocket boosters. Enhanced existing Orbiter Zone Map.
  - Developed a SIMS Operations Procedure to define drilldown requirements and incorporate previous images
  - Implemented a new documentation standardized photography step for KSC work documents

10.3-1 – Digitize Closeout Photography

NASA Implementation (cont.)

- Incorporated Photographic Equipment Upgrades
  - Evaluated and set camera minimum specification standards for KSC
  - Procured 36 Nikon D100 6.1 mega pixel digital cameras and accessories
  - Updated KSC SIMS Operations Procedure to incorporate new standards
- Developed Photographer Certifications and End User Training
  - Created Training Modules and Certification for KSC Quality and Engineering to ensure image quality
  - Performed training for JSC and MSFC users

10.3-1 – Digitize Closeout Photography

National Aeronautics and
Space Administration

Headquarters
Washington, DC 20546-0001

Reply to Attn of: M

June 15, 2004

Return to Flight Task Group
1740 NASA Parkway
Suite 101
Houston, TX 77058

Dear Task Group Members:

We are forwarding to you the attached material for review and consideration by the Return to Flight Task Group. This package represents NASA's plan for correcting the deficiencies specified in CAIB Recommendation 10.3-1, Closeout Photography. This plan was originated by the Return to Flight Planning Team, matured by the appropriate projects and elements of the Space Shuttle Program, approved by the Space Flight Leadership Council, and is being implemented by the Space Shuttle Program.

We feel that NASA has reached a level of maturity in the planning and implementation of this recommendation and that it warrants formal review by your Task Group for satisfactory compliance with the CAIB Report. Please advise us of your determination of whether the action can be considered closed, conditionally closed, or should remain open for further work specified in your response.

Even following formal closure of an action, NASA will continue to welcome clarifying comments, additional expert advice, and dissenting opinions of individual Task Group members that will aid our efforts to return the Shuttle to safe flight. We also respect the Task Group's prerogative to reopen a closed item if warranted.

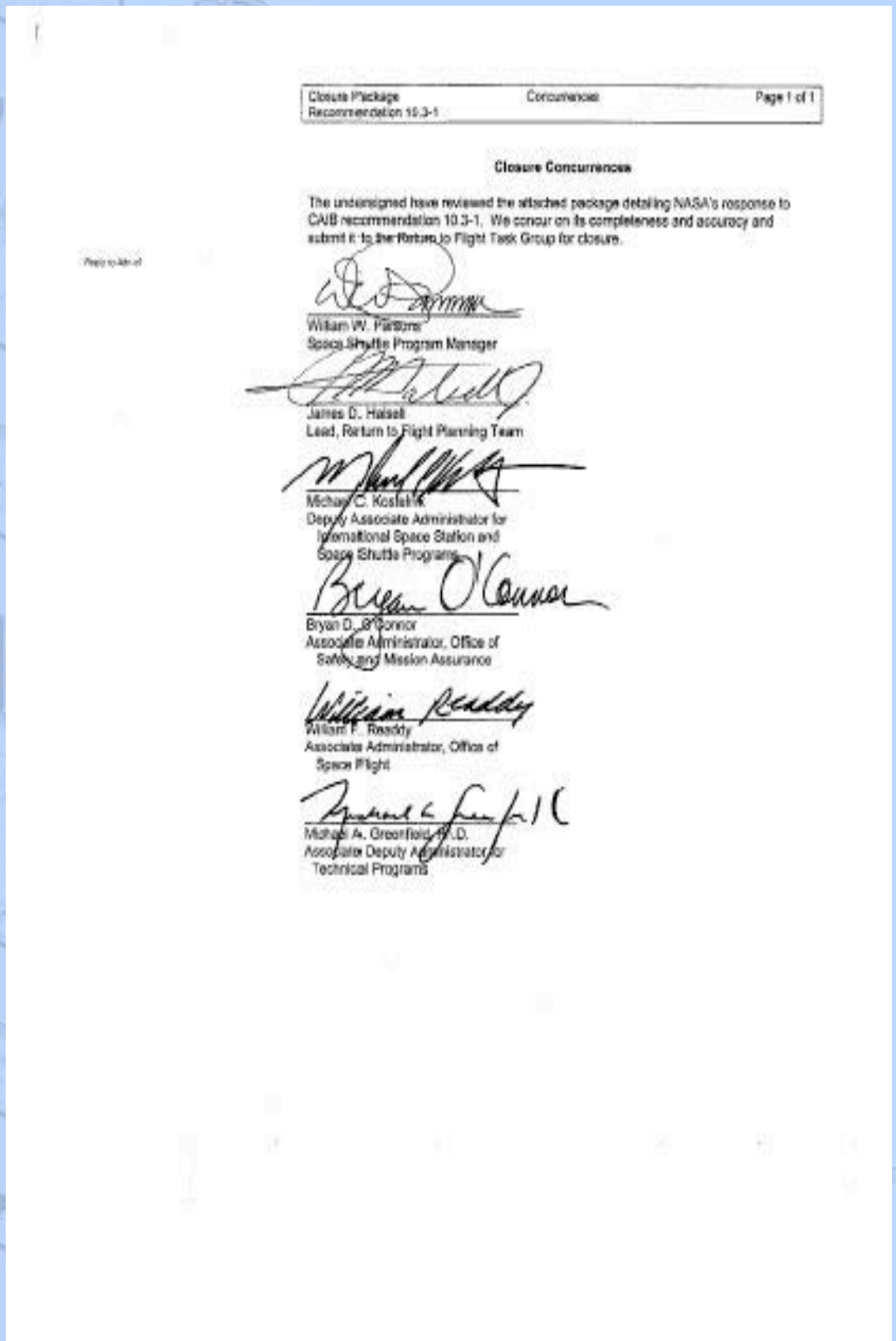
If you require any further technical information on this topic, please contact Mr. Ronnie Lanier at (281) 244-7444 or Col. Jim Halsell at (281) 244-8973.

Cordially,

William F. Readdy
Co-Chair, Space Flight
Leadership Council

Michael Greenfield, Ph.D.
Co-Chair, Space Flight
Leadership Council

10.3-1 – Digitize Closeout Photography



Closure Package Recommendation 10.3-1 | Concurrences | Page 1 of 1

Closure Concurrences

The undersigned have reviewed the attached package detailing NASA's response to CAIB recommendation 10.3-1. We concur on its completeness and accuracy and submit it to the Return to Flight Task Group for closure.

William W. Parsons
Space Shuttle Program Manager

James D. Halsell
Lead, Return to Flight Planning Team

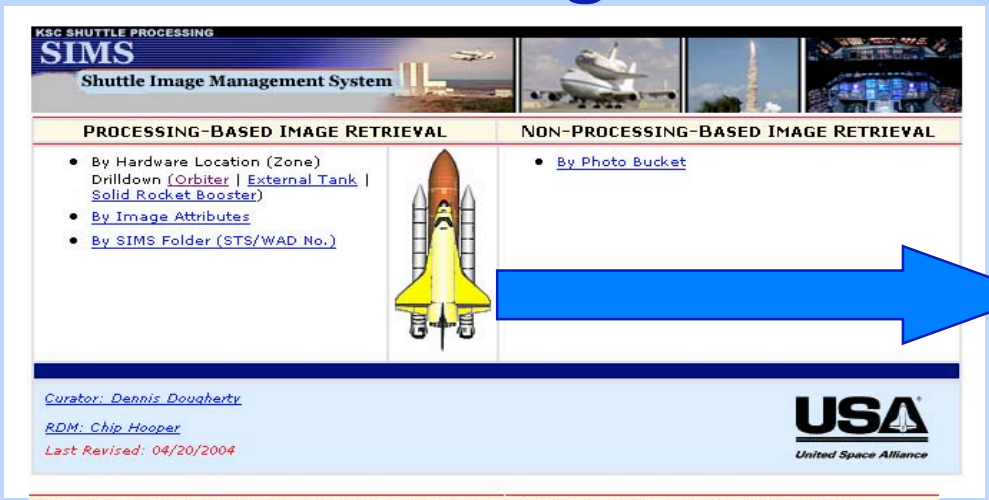
Michael C. Kostelnik
Deputy Associate Administrator for International Space Station and Space Shuttle Programs

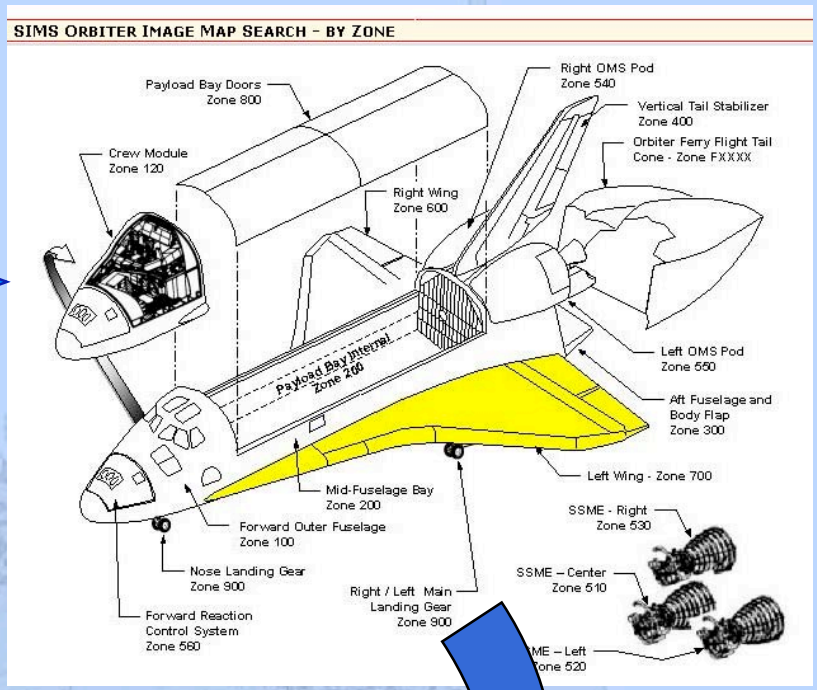
Bryan D. O'Connor
Associate Administrator, Office of Safety and Mission Assurance

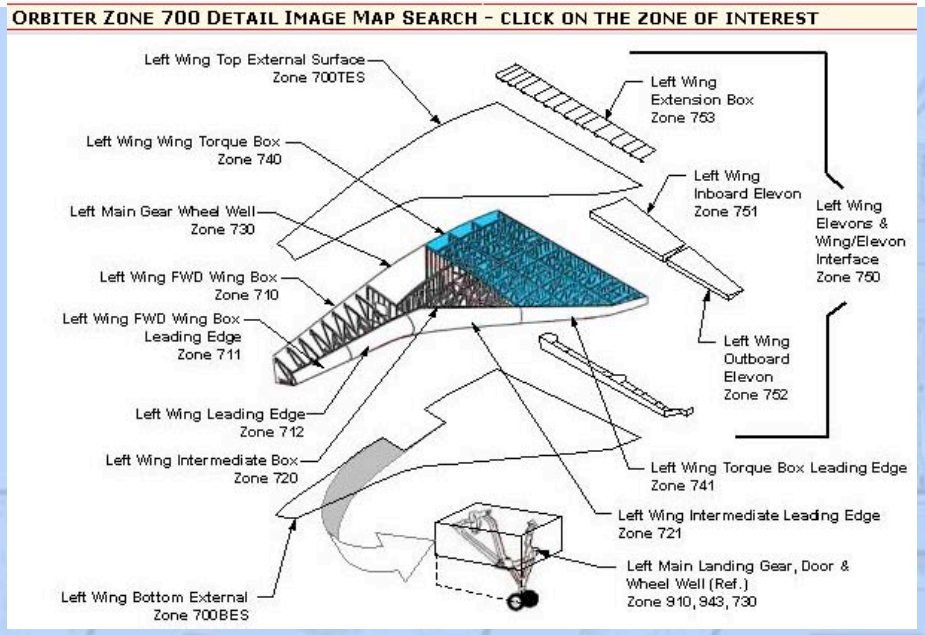
William F. Readdy
Associate Administrator, Office of Space Flight

Michael A. Greenfield, Ph.D.
Associate Deputy Administrator for Technical Programs

10.3-1 – Digitize Closeout Photography







Example: SIMS Graphical User Interface Drilldown

10.3-1 – Digitize Closeout Photography

Panel Assessment

- Conducted fact-finding at KSC on December 2, 2003, February 10, 2004, March 11, 2004, May 14, 2004, and June 29, 2004
- The Program has identified requirements for closeout photographs
- Requirements are being implemented during KSC processing
- Updates to the SIMS database have been demonstrated
- NASA has demonstrated that the database provides appropriate and expeditious access to images by various users

10.3-1 – Digitize Closeout Photography

Planned Work

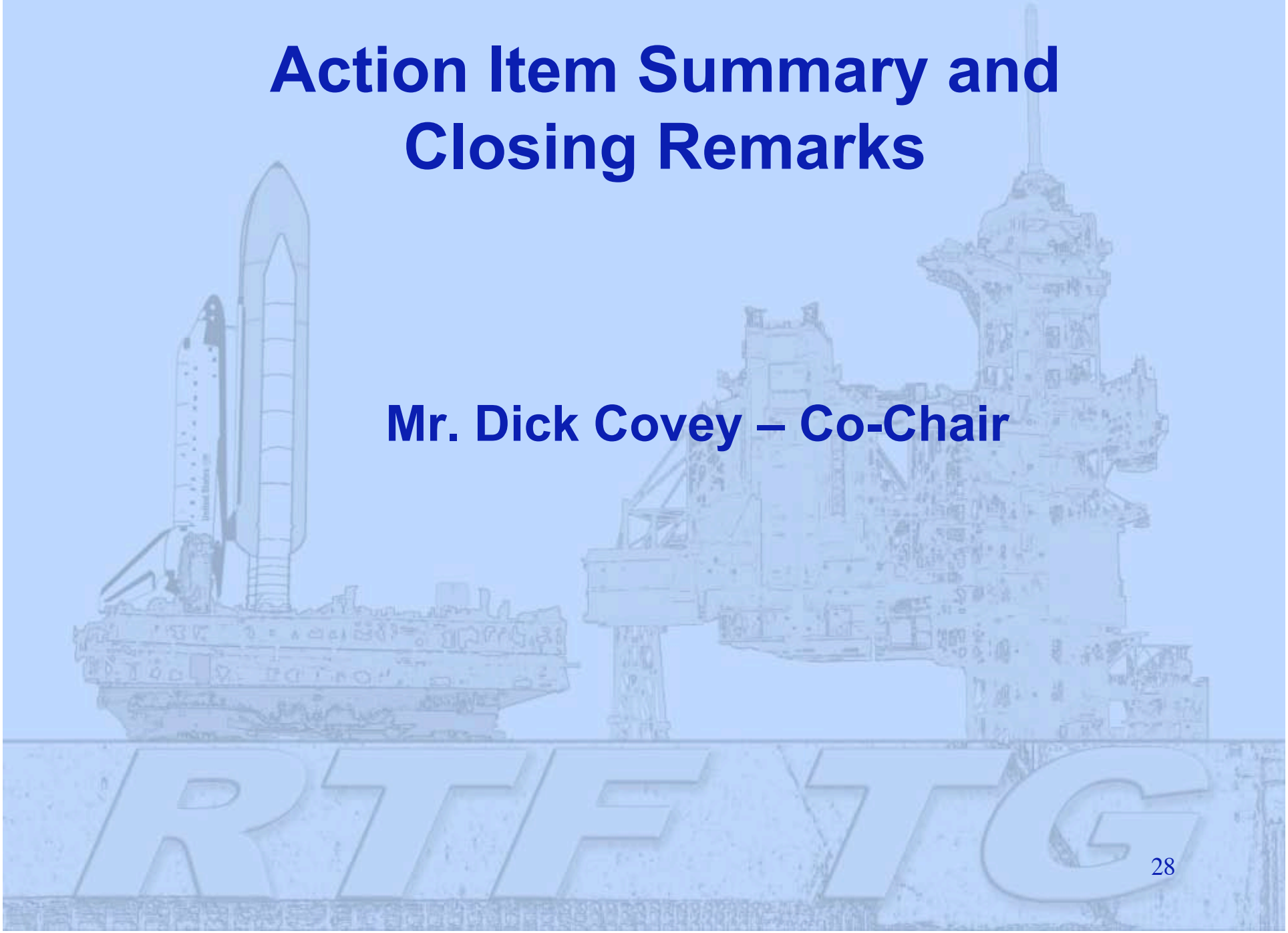
- Completion of KSC photographer training
- Completion of SIMS Familiarization Course and Computer Based Training development
- Incorporation of general closeout photograph requirements into KSC work documents
- Demonstration of SIMS database during training simulations

10.3-1 – Digitize Closeout Photography

Recommendation

- **NASA has met intent of CAIB Recommendation**
- **No constraints to closure**

Action Item Summary and Closing Remarks



Mr. Dick Covey – Co-Chair