X-Sender: eraynor@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 26 Feb 2003 11:22:57 -0500
To: ssurber1@mail.hq.nasa.gov
From: Eric C Raynor <eraynor@HQ.NASA.GOV>
Subject: Records of Nonconformances Provided by NASA IG to Code Q
Cc: jlemke <jlemke@HQ.NASA.GOV>, wharkins@HQ.NASA.GOV, jlloyd@HQ.NASA.GOV

Sally:

Per your request this morning for information to support discussions between your office and the CAIB, here is a list of all the potentially nonconforming system and parts actions that Code Q has received from the NASA IG going back 5 years (1999-2003). The spreadsheet I've created is in reverse chronological order with the most recent records at the top of the list. Where you see more than one date under the "Issued by HQ/Code Q" column, please be advised that the earliest date listed was for the initial release of information by Code Q, with additional information released on the subsequent dates.

Earlier records (from the early 1990's through 1998) are also housed in paper form in our file cabinets, but were tracked and organized differently by my predecessors (Wil Harkins in the mid 1990's and Aldo Domenichini in the early 1990's)...so I'd need plenty of time to gather that information if you wanted it. I don't know if records exist prior to the early 1990's (possibly they do in NASA's archives) so if you needed to go back that far I'd also need some lead time to see what records are still available.

-Eric


HQ NASA Advisories Tracking.xls

Eric Raynor, Program Analyst
Code QS - Safety and Assurance Requirements Division
Office of Safety and Mission Assurance
NASA Headquarters, Washington, DC 20546

Phone: 202-358-4738
Fax: 202-358-3104
Email: eraynor@hq.nasa.gov

NSRS: http://www.hq.nasa.gov/nsrs
NSRS Intranet: http://nsrs-pbma-kms.intranets.com
LLIS: http://llis.nasa.gov
LLIS Intranet: http://llsc-pbma-kms.intranets.com
GIDEP: http://www.gidep.org
GIDEP Intranet: http://gidep-pbma-kms.intranets.com
SOLAR: https://solar.msfc.nasa.gov
Code Q Homepage: http://www.hq.nasa.gov/office/codeq

Tracking Number	Company Name	Concern	Date Issued by HQ/Code Q
Pending	PB Fasteners	TBD	
GIDEP Agency Action Notice AAN-U-03-37	Herco Aircraft Manufacturing, Inc.,	Non-Conforming Adapter Plate Assemblies (Aircraft Parts)	No Issue Required - Already Covered by AAN-U-03-37 issued 2/10/2003 by DCIS
NA-HQ-OIG-2002-07	Sensitron Semiconductor	Potentially Defective Electonic Parts	11/5/2002
NA-HQ-OIG-2002-06	L.S. Starrett Company	Potentially Defective Metrology/Calibration Product	10/23/2002
GIDEP Spot Check on WF-P-001 and 1A	ATP (Accurate Threaded Products)	Fastener Processing Practices	10/16/2002
NA-HQ-OIG-2002-05	Hydroform USA, Inc & Temperform USA Inc.	Alleged Improper Heat Treating/Testing	8/29/2002
NA-HQ-2002-04	BKC Industries, Inc.	Alleged Retesting of Hazmat Cylinders Without Calibration of Test Equipment	8/16/2002
GIDEP Spot Check on VV-A-01-06 & Rev's. A, B, &. C	RFI Filter	Defective filters	7/11/2002
NA-HQ-OIG-2002-03	American Plumbing Specialties Company Incorporated	Defective or Non-Conforming Critical Application Parts	5/9/2002
NA-HQ-OIG-2002-02	United Aircraft & Electronics	Suspected Defective Aircraft Parts	5/9/2002
GIDEP Spot Check on F3-A-02-01	Tuscon Spraying Technology	Process Control Testing Not Performed	3/7/2002
NA-HQ-OIG-2002-01	LM Products, Inc	Non-Conforming Parts, Plain Enclosed Gaskets	1/14/2002
NA-HQ-OIG-2001-03	Aerofit, Aerodrome, Faber, Nelson, Pamco, United Supply, Deutsch, MS Corp	Potentially Nonconforming Flareless Fittings for Fluid Connections	6/28/2001
NA-HQ-OIG-2001-02	National Technical Systems	Alleged Falsified Testing	3/15/2001 & 3/21/2001
NA-HQ-OIG-2001-01	Testlab N.A., Inc., Testlab Inc., Testing Labs of North America, Inc., Testing Labs, N.A. Inc.	Suspect Untested Components Certified for Spaceflight	3/6/2001 & 3/15/2001 & 3/19/2001 & 7/31/2002
NA-HQ-OIG-2000-06	VFI - Veriflite Incorporated	Suspected Unapproved Aircraft Part Repair & Service	6/25/2000

NA-HQ-OIG-2000-05	McGill USA, Smith Manufacturing	Potentially Defective Cam Follower - Needle Bearings (Aircraft Engine Parts)	4/13/2000 & 6/1/2000
NA-HQ-OIG-2000-04	Strandflex (A Division of Maryland Specialty Wire, Inc.)	Failure to Test Aircraft Control Cables in Accord. With MIL-W-83420	2/29/2000 & 5/19/2001 & 6/1/2001
GIDEP Agency Action Notice AAN-U-00-26	ECFN - Electronic Components and Fasteners North	Potentially Nonconforming Fasteners	2/8/2000
NA-HQ-OIG-2000-03	RAM Enterprises, Inc	Suspect Aircraft Parts	8/12/1999 & 11/17/1999 & 6/27/2000
NA-HQ-OIG-2000-02	Honeycomb Composite Systems, Inc., (HSC)	Suspect Unapproved Aircraft Composite Parts	10/12/1999
NA-HQ-OIG-2000-01	ATI Sales and Servicees, Inc.	Suspect Unapproved Aircraft Engine Parts/Repair (Pratt & Whitney JT8D)	10/12/1999
GIDEP Problem Advisory EB7-P-00-01	Vishay Sprague	Capacitor Reliability	No Issue Required - GIDEP Problem Advisory issued by the manufacturer on 12/15/99
No Tracking Number - Referred to Code AE/Mulville for Action	B.F. Goodrich Data Systems Division (BFG) (Formerly Gulton Data Systems)	Potentially Defective Printed Circuit Boards	4/6/1999 by Code AE/Mulville

Smart Questions:

1.Was RBAM ever totally integrated into all of the Agency's contracts?
Answer: Answers if any are available in the Code H Reports and in the PV Reports in QE. This area has been aggressively pursued during Code Q Reviews, of which PVs are in abeyance until May 2003.

2. Code Q did not have a Quality Assurance person assigned to Code Q for a lengthy period of time. When did this function return to Code Q and what was the program or project impact to mission success?
Answer: Management had detailed the primary function to another NASA location during the downsizing and recently instituted the function to a primary

3. The Michoud Assembly Facility contract with NASA has not been updated with current requirements of safety and quality programs. Could this have contributed to the mishap?
Answer: This is under investigation at time. The recent Operational Engineering Panel identified a need by MSFC to update contracts.

4. When did NASA stop "mandatory inspection reports" of all critical processes and what has been the effect to mission success?
Answer: Unknown

5. Risk Based Mission Assurance has been a contract requirement of the NASA FARs since 2000. Have all contracts been reviewed and updated as requested by the NASA Administrator Dan Goldin in November 2000?
Answer: Contracts are being updated as needed for additional specific NASA FAR safety, health, reliability requirements.

6. What has been the affect of the "greening" of NASA manufacturing processes with meeting EPA requirements to the reliability and maintainability of NASA flight hardware?
Answer: Unknown

7. What follow up and lesson learned have has been accomplished since the failure of programs such as Mar's Observer ($1 Billion) caused by a suspected valve, Mar's Rover, and other programs under "faster, better, cheaper" management philosophy.
Do you have the Mishap Reports on each of these, and can you comment on the efficacy of their corrective actions?

Answer: Unknow

Jon Mullin

NA-HQ-OIG-2000-05	McGill USA, Smith Manufacturing	Potentially Defective Cam Follower - Needle Bearings (Aircraft Engine Parts)	4/13/2000 & 6/1/2000
NA-HQ-OIG-2000-04	Strandflex (A Division of Maryland Specialty Wire, Inc.)	Failure to Test Aircraft Control Cables in Accord. With MIL-W-83420	2/29/2000 & 5/19/2001 & 6/1/2001
GIDEP Agency Action Notice AAN-U-00-26	ECFN - Electronic Components and Fasteners North	Potentially Nonconforming Fasteners	2/8/2000
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NA-HQ-OIG-2000-02	Honeycomb Composite Systems, Inc., (HSC)	Suspect Unapproved Aircraft Composite Parts	10/12/1999
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GIDEP Problem Advisory EB7-P-00-01	Vishay Sprague	Capacitor Reliability	No Issue Required - GIDEP Problem Advisory issued by the manufacturer on 12/15/99
No Tracking Number - Referred to Code AE/Mulville for Action	B.F. Goodrich Data Systems Division (BFG) (Formerly Gulton Data Systems)	Potentially Defective Printed Circuit Boards	4/6/1999 by Code AE/Mulville

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 28 Feb 2003 08:18:25 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Re: KSC Presentation Charts (Bert's Brief to an Element of the CAIB on February 27)
Cc: jlemke@hq.nasa.gov

Did he say how his talk with the CAIB went?
Do we still have a job?

At 08:11 AM 2/28/2003 -0500, you wrote:

> Anyone anxious to see the presentation charts I spoke about yesterday morning will be able later today when Bert sends me the "as-presented" charts. I will put the presentation on the "107 team" intranet working group web site.
>
> Recall that we will have a 1 pm telecon today with the SMA Directors.
>
> Jim

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

"Mission success starts with safety"

From: Don Vecellio <welcome@intranets.com>
To: <wharkins@mail.hq.nasa.gov>
Reply-to: dvecellio@arescorporation.com
X-your-intranet-is: http://107team.intranets.com
X-for-help-with-Intranets: mailto:support@intranets.com
Date: Sun, 02 Feb 2003 06:52:56 GMT
X-mailer: AspMail 4.0 4.03 (SMT412E7EF)
Subject: An Invitation from NASA Code Q
X-OriginalArrivalTime: 02 Feb 2003 06:52:57.0182 (UTC) FILETIME=[B7BD2FE0:01C2CA87]

Dear Wil,

We've set up an intranet for 107 Team and want you to check it out.

Here's a personal message from Don Vecellio:
****
The 107 Team internet work group has been establish to provide a communication clearinghouse for NASA personnel involved in the recovery and mishap investigation activities associated with the tragic loss of STS-107.

Key areas to visit include:
1. Documents
2. Members
3. Contacts

Please be sure to update your User Information in the Members section.

****

Our intranet is our group's private website. We can use it to share group documents, schedule events, hold online discussions, and more. Only people who are invited to join can become members. I've created a temporary login name and password to make it easy for you to access our site.

GETTING STARTED: To become a permanent member, all you have to do is complete your registration when you log in.

To begin, click here:

<http://107team.intranets.com/login.asp?tmplogin=wharkins&tmppswd=MTA3dGVhbQ&addcommand=accept>

Or go to http://107team.intranets.com and enter the following login information:

Login Name: wharkins
Password: MTA3dGVhbQ

If you are not interested in participating, you can decline your membership by clicking here:

http://107team.intranets.com/login.asp?tmplogin=wharkins&tmppswd=MTA3dGVhbQ&addcommand=decline>

I hope to see you soon in our intranet!

Regards,
Don

X-Sender: eraynor@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 16:01:25 -0500
To: jlloyd@hq.nasa.gov, jlemke@hq.nasa.gov, prutledg@hq.nasa.gov
From: Eric C Raynor <eraynor@hq.nasa.gov>
Subject: NSRS Reports Pertaining to Shuttle
Cc: wharkins@hq.nasa.gov, prichard@hq.nasa.gov, jlyver@hq.nasa.gov, whill@hq.nasa.gov, mkowales@hq.nasa.gov

I asked the NSRS contractor to review all NSRS reports, received since the inception of the program, to try to determine how many pertained to the shuttle program. There are 211 such reports (out of a total of 564 reports).

I have a list of them, identified by ascension number only. Any further analysis of these reports and their possible relevancy to the loss of Columbia would probably require a review of each report file by a person who is well-versed in shuttle program operations. With sufficient advance notice these files can be made available for review or inspection. The files are stored at the contractor's facility in Bethesda, Maryland.

-Eric

Eric Raynor, Program Analyst
Code QS - Safety and Assurance Requirements Division
Office of Safety and Mission Assurance
NASA Headquarters, Washington, DC 20546

Phone: 202-358-4738
Fax: 202-358-3104
Email: eraynor@hq.nasa.gov

NSRS: http://www.hq.nasa.gov/nsrs
NSRS Intranet: http://nsrs-pbma-kms.intranets.com
LLIS: http://llis.nasa.gov
LLIS Intranet: http://llsc-pbma-kms.intranets.com
GIDEP: http://www.gidep.org
GIDEP Intranet: http://gidep-pbma-kms.intranets.com
SOLAR: https://solar.msfc.nasa.gov
Code Q Homepage: http://www.hq.nasa.gov/office/codeq

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 14 Feb 2003 14:50:34 -0500
To: code-q@lists.hq.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Fwd: USA Today Depiction of Columbia Data
Sender: owner-code-q@lists.hq.nasa.gov

From: "ERMINGER, MARK D. (JSC-NC) (NASA)" <mark.d.erminger@nasa.gov>
To: "H - Kowaleski Mark (E-mail)" <mkowales@mail.hq.nasa.gov>,
"H - Bihner Bill (E-mail)" <wbihner@mail.hq.nasa.gov>,
"H - Hill Bill (E-mail)" <william.hill@hq.nasa.gov>
Subject: USA Today Depiction of Columbia Data
Date: Fri, 14 Feb 2003 13:19:58 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

> This is incredible
>
> http://www.usatoday.com/graphics/news/gra/gshuttle_disaster/flash.htm

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 13 Feb 2003 08:21:51 -0500
To: code-q@lists.hq.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Fwd: FW: Animated Oribter Wheel Well Viewer
Sender: owner-code-q@lists.hq.nasa.gov

From: "ERMINGER, MARK D. (JSC-NC) (NASA)" <mark.d.erminger@nasa.gov>
To: "JOHNSON, M. S. (SCOTT) (JSC-NC) (NASA)" <m.s.johnson@nasa.gov>
Cc: "MARSHALL, YOLANDA Y. (JSC-NA) (NASA)" <yolanda.y.marshall@nasa.gov>,
"JOHNSON, GARY W. (JSC-NA) (NASA)" <gary.w.johnson@nasa.gov>,
"HOLSOMBACK, JERRY B. (JSC-OE) (NASA)" <jerry.b.holsomback@nasa.gov>,
"H - Kowaleski Mark (E-mail)" <mkowales@mail.hq.nasa.gov>,
"H - Bihner Bill (E-mail)" <wbihner@mail.hq.nasa.gov>
Subject: FW: Animated Oribter Wheel Well Viewer
Date: Wed, 12 Feb 2003 14:37:15 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

KSC put this together

-----Original Message-----
From: GLANVILLE, ROY W. (JSC-NC) (NASA)
Sent: Wednesday, February 12, 2003 2:34 PM
To: ERMINGER, MARK D. (JSC-NC) (NASA); BROWNE, DAVID M. (JSC-NC) (NASA); DYER, KEITH W. (JSC-NC) (SAIC)
Subject: Animated Oribter Wheel Well Viewer

http://www-launchops.ksc.nasa.gov/etd/Investigation/IPIX/files/OV103LHWheelWell1.htm
<<iPIX Java Viewer v3.22.url>>


iPIX Java Viewer v3.22.url

X-Sender: rmielec@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 14 Feb 2003 06:34:20 -0500
To: pnapala@hq.nasa.gov, rmoyer@hq.nasa.gov, swander@hq.nasa.gov,
gwhite1@hq.nasa.gov, mcard@hq.nasa.gov, rpatrica@hq.nasa.gov,
Mark Kowaleski <mkowales@hq.nasa.gov>, Faith.Chandler@hq.nasa.gov,
jmullin@hq.nasa.gov, alee@hq.nasa.gov, jlemke@hq.nasa.gov,
twhitmey@hq.nasa.gov, pmartin@hq.nasa.gov,
Pamela Richardson <prichard@hq.nasa.gov>, rmielec@hq.nasa.gov
From: Roger Mielec <rmielec@hq.nasa.gov>
Subject: NASA unveils revised Columbia accident timeline (Feb 13)

NEWS ARTICLE from Feb 13:

http://spaceflightnow.com/shuttle/sts107/030213timeline/

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 12 Feb 2003 10:40:27 -0500
To: code-q@lists.hq.nasa.gov, bwatkins@mail.hq.nasa.gov,
whill@mail.hq.nasa.gov, dwhitehe@mail.hq.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Fwd: 02/11/03 MRT -- OVEWG TIMELINE
Sender: owner-code-q@lists.hq.nasa.gov

FYI...

From: "ERMINGER, MARK D. (JSC-NC) (NASA)" <mark.d.erminger@nasa.gov>
To: "H - Kowaleski Mark (E-mail)" <mkowales@mail.hq.nasa.gov>,
"H - Bihner Bill (E-mail)" <wbihner@mail.hq.nasa.gov>
Subject: 02/11/03 MRT -- OVEWG TIMELINE
Date: Tue, 11 Feb 2003 12:08:44 -0600
Importance: high
X-Message-Flag: Follow up
X-Mailer: Internet Mail Service (5.5.2653.19)

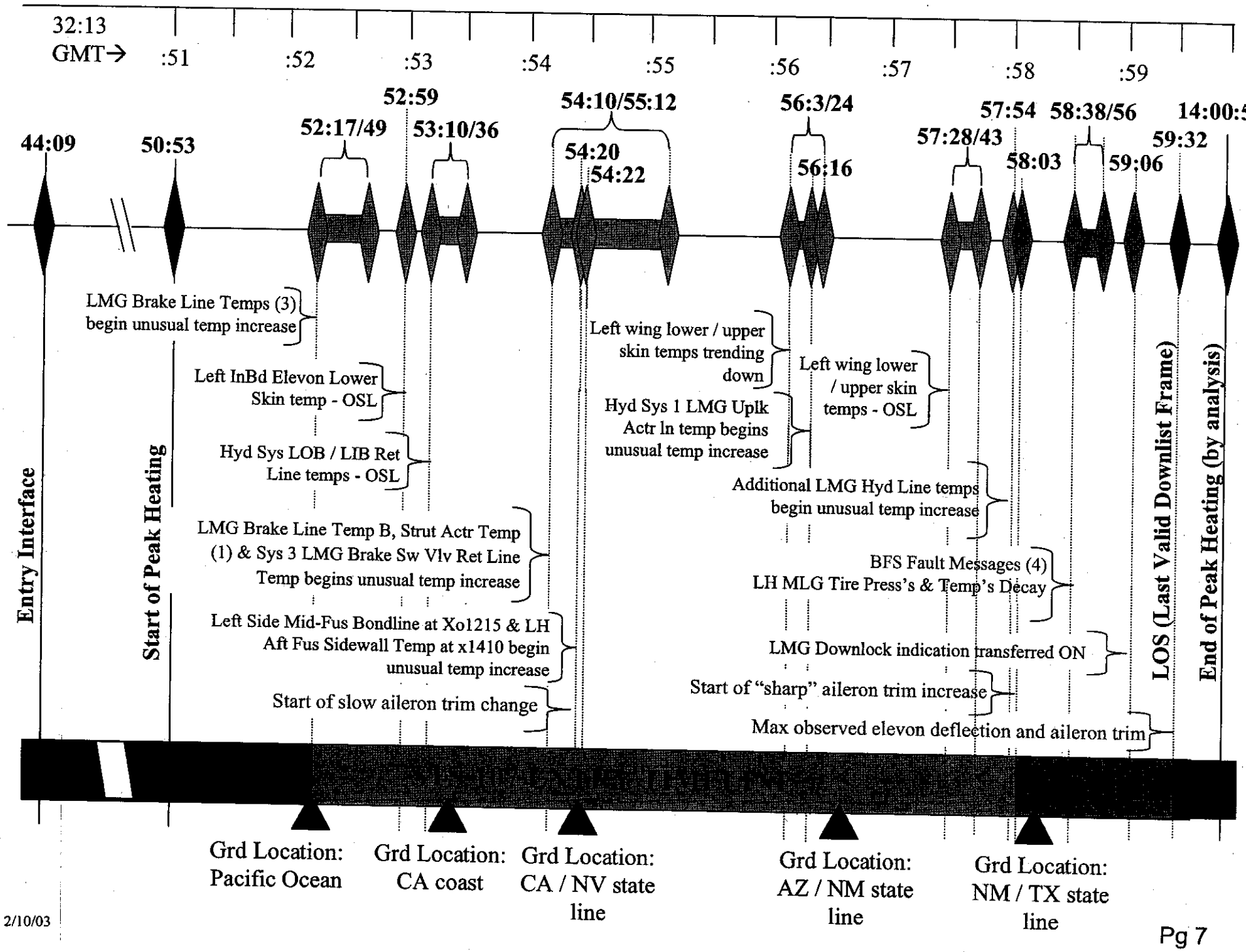
This timeline was baselined by Vehicle Engineering and presented to the MRT today.


02112003MRT_Graphic Timeline.pdf

DATA REVIEW AND TIMELINE TEAM

February 10, 2003

Don McCormack/MV


32:13
GMT→
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:57
:58
:59
44:09
50:53
52:17/49
52:59
53:10/36
54:10/55:12
54:20
54:22
56:3/24
56:16
57:28/43
57:54
58:03
58:38/56
59:06
59:32
14:00:5
Entry Interface
Start of Peak Heating
LMG Brake Line Temps (3) begin unusual temp increase
Left InBd Elevon Lower Skin temp - OSL
Hyd Sys LOB / LIB Ret Line temps - OSL
LMG Brake Line Temp B, Strut Actr Temp (1) & Sys 3 LMG Brake Sw Vlv Ret Line Temp begins unusual temp increase
Left Side Mid-Fus Bondline at Xo1215 & LH Aft Fus Sidewall Temp at x1410 begin unusual temp increase
Start of slow aileron trim change
Left wing lower / upper skin temps trending down
Hyd Sys 1 LMG Uplk Actr ln temp begins unusual temp increase
Left wing lower / upper skin temps - OSL
Additional LMG Hyd Line temps begin unusual temp increase
BFS Fault Messages (4)
LH MLG Tire Press's & Temp's Decay
LMG Downlock indication transferred ON
Start of "sharp" aileron trim increase
Max observed elevon deflection and aileron trim
LOS (Last Valid Downlist Frame)
End of Peak Heating (by analysis)
Grd Location: Pacific Ocean
Grd Location: CA coast
Grd Location: CA / NV state line
Grd Location: AZ / NM state line
Grd Location: NM / TX state line

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 13 Feb 2003 07:17:30 -0500
To: smadir@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Source of Some Good Information that has been Released to the Public Domain
Cc: code-q@lists.hq.nasa.gov
Sender: owner-code-q@lists.hq.nasa.gov

Dear SMA Director,

The charter for the investigation has been amended as a direct result of yesterday's hearing. This and additional information can be found at:

http://www.nasa.gov/columbia/COL_resources.html

****

James D. Lloyd (Jim)

Acting Deputy Associate Administrator
Office of Safety and Mission Assurance
Headquarters Room 5U11
desk phone 202-358-0557

fax 202-358-3104

"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 13 Feb 2003 08:21:51 -0500
To: code-q@lists.hq.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Fwd: FW: Animated Oribter Wheel Well Viewer
Sender: owner-code-q@lists.hq.nasa.gov

From: "ERMINGER, MARK D. (JSC-NC) (NASA)" <mark.d.erminger@nasa.gov>
To: "JOHNSON, M. S. (SCOTT) (JSC-NC) (NASA)" <m.s.johnson@nasa.gov>
Cc: "MARSHALL, YOLANDA Y. (JSC-NA) (NASA)" <yolanda.y.marshall@nasa.gov>,
"JOHNSON, GARY W. (JSC-NA) (NASA)" <gary.w.johnson@nasa.gov>,
"HOLSOMBACK, JERRY B. (JSC-OE) (NASA)" <jerry.b.holsomback@nasa.gov>,
"H - Kowaleski Mark (E-mail)" <mkowales@mail.hq.nasa.gov>,
"H - Bihner Bill (E-mail)" <wbihner@mail.hq.nasa.gov>
Subject: FW: Animated Oribter Wheel Well Viewer
Date: Wed, 12 Feb 2003 14:37:15 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

KSC put this together

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Subject: Animated Oribter Wheel Well Viewer

http://www-launchops.ksc.nasa.gov/etd/Investigation/IPIX/files/OV103LHWheelWell1.htm
<<iPIX Java Viewer v3.22.url>>


iPIX Java Viewer v3.22.url

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
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From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Fwd: 02/11/03 MRT -- OVEWG TIMELINE
Sender: owner-code-q@lists.hq.nasa.gov

FYI...

From: "ERMINGER, MARK D. (JSC-NC) (NASA)" <mark.d.erminger@nasa.gov>
To: "H - Kowaleski Mark (E-mail)" <mkowales@mail.hq.nasa.gov>,
"H - Bihner Bill (E-mail)" <wbihner@mail.hq.nasa.gov>
Subject: 02/11/03 MRT -- OVEWG TIMELINE
Date: Tue, 11 Feb 2003 12:08:44 -0600
Importance: high
X-Message-Flag: Follow up
X-Mailer: Internet Mail Service (5.5.2653.19)

This timeline was baselined by Vehicle Engineering and presented to the MRT today.


02112003MRT_Graphic Timeline.pdf

CASSETTA M. (JSC-MG) (USA); Daniel Lacy; DAVIS, JEFFREY R. (JSC-SA) (NASA); DITTEMORE, RONALD D. (JSC-MA) (NASA); Donald Reed; DRIVER, ROSS; DUTTON, JEFF (JSC-XA) (NASA); ELLERBE, VANESSA S. (JSC-MA2) (NASA); ENGELAUF, PHILIP L. (JSC-DA8) (NASA); ERMINGER, MARK D. (JSC-NC) (NASA); FISCHER, CRAIG L., MD (JSC-SD) (NASA); Goodson, Amanda; HALE, N. WAYNE (KSC); HAM, LINDA J. (JSC-MA2) (NASA); HARPOLD, JON C. (JSC-DA) (NASA); Hartwig,Scott; HCAT; HEFLIN, JAMES M., JR (MILT) (JSC-DA8) (NASA); HILL, PAUL S. (JSC-DA8) (NASA); Hill, William; Hollman, Andrea; HOLSTIEN, SHANNA L. (JSC-MG) (USA); HOWELL, JEFFERSON D., JR (JEFF) (JSC-AA) (NASA); Huddleston, Michael; JOHNSON, M. S. (SCOTT) (JSC-NC) (NASA); KAMINSKI, KATHLEEN E. (JSC-MG) (NASA); Knarr, Chuck; Lang, Bob; LARSEN, AXEL M. (SKIP) (JSC-MA2) (NASA); LAUNCH INTEGRATION; LEE, TIMOTHY F., LTCOL. (JSC-MT) (USAF); Leslie Ridgeway; LIGRANI, SUSAN (JSC-MG) (USA); Liz Wise; Logistics CM Receipt Desk; Lynn Birdsall (E-mail); MCCOOL, ALEXANDER A (JSC-REMOTE); McDede, James; McPherson, John; Mengo,Carr; MER-ADMIN; Mike Tankersley; Minute, Steve; MIT; NAVY, LISA A. (JSC-AA) (NASA); Nielsen, Gordon; NOAH, DONALD S. (DON) (JSC-MS) (NASA); O'BRIEN, DAVID E. (DAVE) (JSC-MA2) (NASA); Paul Adamek; PETETE, PATRICIA (TRISH) (JSC-MV) (NASA); Phyllis Berry; POOL, SAM L., MD (JSC-SA) (NASA); PPaceley; Randy Segert; RASCO, DOROTHY S. (JSC-MM) (NASA); REVIS, JAMES L. (JSC-MG) (USA); RHOADS, CLAIRE (JSC-MG) (USA); ROE, RALPH R. (JSC-MV) (NASA); ROMINGER, KENT V. (CAPT) (JSC-CB) (NASA); SCHAEFER, STANLEY J. (JSC-DF111) (NASA); SHRIVER, LOREN J.; Shuttle Propulsion Action Center(SPAC); Singer, Jody; STAFFORD, STACIA J. (JSC-JA) (DWC); TALONE, JOHN (JSC-REMOTE); Travassos, Frank; WALLACE, RODNEY O. (ROD) (JSC-MS2) (NASA); Wetmore, Michael; White, Bob; WOOD, DAVID A. (JSC-DX14) (JEC); Yolanda Harris (E-mail)
Subject: UPDATED FOIA POLICY

Attached is the updated FOIA policy as discussed at the February 10, 2003, MRT.

Leo Campos
Voice: 281/483-1306
Fax: 281/483-4082

Jim

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

"Mission success starts with safety"

</x-html>

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 13 Feb 2003 08:24:58 -0500
To: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Re: new charter for CAIB
Cc: jlemke <jlemke@hq.nasa.gov>

Yes, I talked to Beth Beck and they are putting stuff up on the Columbia web site as fast as it comes in, including the prophetic email from LaRC (there is always one somewhere) about potential problems with the landing gear. This will be a very open process. I wasn't sure if Maj Ramey knew about the web site.

W

At 08:08 AM 2/13/2003 -0500, you wrote:
Wayne, now that the entire country has the information, and the political persons have provided their needs, it looks like public data. Regards, Jon
At 07:53 AM 2/13/2003 -0500, you wrote:
Stan,

extracted verbatim from an email.

The charter for the investigation has been amended as a direct result of yesterday's hearing. This and additional information can be found at:

http://www.nasa.gov/columbia/COL_resources.html

I believe Maj Ramey was interested in this. Thanks.

Wayne
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

"Mission success starts with safety"
Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration

Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

~~~~~~
Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104
~~~~~~

"Mission success starts with safety"

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 13 Feb 2003 15:51:16 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Re: Fwd: FW: UPDATED FOIA POLICY
Cc: jlemke <jlemke@hq.nasa.gov>, rwillia3@hq.nasa.gov, cangotti@hq.nasa.gov, eraynor@hq.nasa.gov, fchandle@hq.nasa.gov, dthomas1@mail.hq.nasa.gov

Jim,

Frank's proposed rules seem appropriate.

I believe its a tiered approach.

First all data impounded by the board is not releasable until the board chair releases it. NPG 8621.1 does not specifically address when the chair can release data from impoundment(We can fix that in the upcoming revision). Appendix B-4 of NPG 8621.1 "NASA Mishap and Close Call Reporting, Investigating, and Recordkeeping" says ,

"If required for litigation, it is to be turned over to legal staff."

All impounded data being used to support the investigation is non-FOIA able I believe, probably under some pre decisional aspect, but this would have to be checked by legal.

Once the chair of the board releases the data, the data is treated as normal information subject to FOIA and Privacy Act requirements. NASA has attempted to keep witness statements and similar material from release as "privileged information" but must ultimately follow court direction.

From NPG 8621.1 Chapter 4

4.3.2 Appendix D details the procedures and guidelines for making timely release of information from NASA mishap
investigation reports, as appropriate, consistent with the provisions of the Freedom of Information Act (5 U.S.C. 552) and the
Privacy Act (5 U.S.C. 552a). In all cases, release of information must be coordinated and approved by the appropriate
NASA Headquarters or NASA Center public affairs offices.

4.3.3 All witness statements, eye witness accounts, or documented verbal accounts, given in the course of a NASA mishap
investigation are considered as privileged and protected and therefore cannot be released to the public or news media. NASA

will make every effort to keep testimony confidential and privileged to the greatest extent permitted by law. However, the
ultimate decision as to whether testimony may be released may reside with a court or administrative body outside NASA.

4.3.4 NASA may also refuse to release other information in an investigation report depending on additional factors such as
whether the information is classified or involves proprietary considerations.

In summary we follow FOIA and Privacy Act requirements for release after the board releases impounded data.

Wayne

At 04:11 PM 2/12/2003 -0500, James Lloyd wrote:

Please research Mishap Reporting Guidelines as well as any Medical policy or principles about release of information the Board is in possession of or would have control over. The Task Force is trying to use already developed precedent where available. The General Counsel is also addressing this concern. See below for more definition of need.

From: "RIPMA, EDWARD J. (JOE) (JSC-EA) (NASA)" <edward.j.ripma@nasa.gov>
To: "'jlloyd@mail.hq.nasa.gov'" <jlloyd@mail.hq.nasa.gov>
Subject: FW: UPDATED FOIA POLICY
Date: Wed, 12 Feb 2003 12:05:00 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

Jim,
One of the things Frank is fishing for here is if there is any Safety related precedence for responding to FOIA's that would give us guidance on how to properly respond with appropriate data and to avoid responding with inappropriate data. Do you have any input for us? There is a 2:00 central telecon with Pastorek to discuss the FOIA's.

Thanks,
Joe - 281-483-8574

-----Original Message-----
From: BUZZARD, FRANK T. (JSC-EA) (NASA)
Sent: Wednesday, February 12, 2003 10:51 AM
To: SHAFER, DONNA M. (JSC-AL) (NASA); RIPMA, EDWARD J. (JOE) (JSC-EA) (NASA); CARPENTER, DANIEL K. (JSC-AP111) (NASA)
Cc: DITTEMORE, RONALD D. (JSC-MA) (NASA); HARRIS, WILLIAM J. (JSC-MA) (NASA); 'ppastore@mail.hq.nasa.gov'; 'gmahone@mail.hq.nasa.gov'; 'mgreenfi@mail.hq.nasa.gov'; BRADLEY, THERON (JSC-MA) (NASA); ARCENEAUX, WILLIAM H. (BILL) (JSC-OB) (NASA); BECK, KELLY B. (JSC-DA8) (NASA); DUCOTE, GORDON J. (JSC-OA) (NASA); FORTENBERRY, LINDY S. (JSC-OL) (NASA); Ruth Harrison

(E-mail 2); SHANNON, JOHN P. (JSC-DA8) (NASA); Alex. C. Adams (E-mail); Ann Towry (E-mail); Bill Hill (E-mail); Ginny Kinslow (E-mail); Gregory. N. Katnik (E-mail); Keith Brock (E-mail); Kim Guin (E-mail); Liam Sarsfield (E-mail); MAYS, DONNA J. (JSC-EA) (NASA); Mike Hawes (E-mail)
Subject: FW: UPDATED FOIA POLICY

Team,

We are getting inundated with FOIA requests for Columbia Investigation sensitive information. Attached is a FOIA update. Unfortunately it says nothing about Impounded data or Investigation Board release of information that the board is investigating. I would like our Columbia Task Force (CTF) Legal rep, Donna Shafer; CTF PAO rep; and CTF Safety rep, Joe Ripma to recommend principles and rules to guide us in dispositioning FOIA requests with respect to the Columbia Accident Investigation. Please coordinate with your HQ counterparts. Also coordinate with Shuttle Program rep, Bill Harris. We have a bunch of FOIA's in the pipeline already so I would like a recommendation by Friday 2/14.

My Rules would go like this:

1. No FOIA release of impounded information related to the Columbia Accident Investigation until the Investigation is complete, or the Columbia Accident Investigation Board Chair (CAIB) approves. (this should be a small set)
2. No FOIA release of information about crew remains or post accident medical reports or studies.

Please see if there are existing rules applying to release of information related to Safety Accident Investigation Boards and compare with my suggested rules. Make a recommendation and let's review with the CAIB ASAP. Until then I recommend that we NOT release FOIA information that is impounded or is needed to execute the CAIB process. The Agency and the CAIB need rules and principles defining FOIA information release that balance our desire for openess with the public and press while preventing public or press conclusions based on released data before the Board process completes.

Thanks. Frank

Frank Buzzard
Columbia Task Force Director
frank.t.buzzard@nasa.gov
281 483 8412 office

-----Original Message-----
From: DITTEMORE, RONALD D. (JSC-MA) (NASA)
Sent: Wednesday, February 12, 2003 10:04 AM
To: BUZZARD, FRANK T. (JSC-EA) (NASA)
Subject: FW: UPDATED FOIA POLICY

-----Original Message-----
From: CAMPOS, LEO (JSC-MG) (USA) **On Behalf Of** MG Coordinators
Sent: Tuesday, February 11, 2003 8:26 AM
To: Allen, Andrew; AUSTIN, LAMBERT D. (JSC-MS) (NASA); Barbara Wolfwagner; BARRETT, GERO L. (JSC-MG) (USA); Bill Pickavance; BREKKE, MICHELE A. (JSC-MT) (NASA); BRISCOE, ALAN L. (LEE) (JSC-DA) (NASA); BROWN, KENNETH L. (JSC-MV6) (NASA); CABANA, ROBERT D. (JSC-CB) (NASA); CAIN, LEROY E. (JSC-DA8) (NASA); CAMPOS, LEO (JSC-MG) (USA); CASTLE, ROBERT E. (BOB) (JSC-DA8) (NASA); Coleman,Sandy; CONOVER, SHARON C. (JSC-OA) (NASA); Cowart, Jon; Crews, James; CROMARTIE,

From: "Garrido-1, Humberto (Bert)" <Humberto.T.Garrido@nasa.gov>
To: "'snewman@hq.nasa.gov'" <snewman@hq.nasa.gov>
Cc: "Lebron-1, Edmundo (Eddie)" <Edmundo.J.Lebron@nasa.gov>,
Toledo-1 Oscar <Oscar.Toledo-1@nasa.gov>,
"'jlloyd@hq.nasa.gov'" <jlloyd@hq.nasa.gov>,
"'prutledg@hq.nasa.gov'" <prutledg@hq.nasa.gov>
Subject: Questions for Brian O'Connor's consideration:
Date: Tue, 4 Feb 2003 13:58:41 -0500
X-Mailer: Internet Mail Service (5.5.2656.59)

<<107 Board Questions.doc>>

Steve-

As requested by Jim and Pete we have polled the KSC SMA community to suggest potential questions for Brian. Here is what we have to date. We will pass to you any additional suggested questions as we receive them.

Regards,

Bert


107 Board Questions.doc

Questions for Brian O'Connor's consideration:

- Given the fact that the crew did not have the capability to check tiles through an EVA, was the use of ground and/or satellite imaging was considered to check the condition of tiles?
  - Assuming alternate methodologies of acquiring/assessing tile conditions exists, what actions (rescue, etc.) would have been taken with this data?
  - Assuming that the condition of tiles was known early on to be a problem for reentry, what rescue options exist?

- Is there any data to exonerate left main gear pyro from a possible premature firing to create or contribute to the abnormal wheel well conditions that might have resulted in excessive wing drag heating and loss of measurements?

- Were the roles and responsibilities of Safety and Mission Assurance personnel and organizations clearly defined and understood prior to the mishap?

- If NASA suspected inherent design weaknesses with external tank insulation (several past reviews indicated potential insulation separation issues), were any action taken to improve the design, material, and/or manufacturing?

- Were the safety recommendations from the Roger Report and the McDonald Report properly addressed and disposition by NASA?

- There were approximately 13 cylinders containing about 49 liters of a Hydrogen and Oxygen mixture (in addition to small methane and propane cylinders) in Space Hab. Pressures for the Hydrogen-Oxygen mixture varied from two 10-liter cylinders at 286-300 psi to three 0.73-liter cylinders at 1945 psi. Could these have contributed to the mishap?
  - About how many of the Hydrogen-Oxygen cylinders remained after the mishap?
  - Since payload potentially dangerous materials required secondary and tertiary containment, what was the secondary and tertiary containment for these flammable pressurized containers if a leak provided?
  - When were the cylinders last used, and what is done with the "empty" cylinders? Could these have had any structural problems?

X-Sender: pboldon@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 07 Feb 2003 14:34:44 -0500
To: James D Lloyd <jlloyd@mail.hq.nasa.gov>
From: pboldon <pboldon@hq.nasa.gov>
Subject: IV&V Shuttle Information
Cc: jlemke@hq.nasa.gov, Martha Wetherholt <mwetherh@hq.nasa.gov>

Jim,

John Lemke informed me that Ned Keller said I had requested a copy of all the data related to the Columbia Accident Investigation that they are sending to other sources involved in the investigation. I'm not sure how he got that impression. I did mention at our team teleconference today, that Code Q was preparing questions that might get asked (related to the investigation) and what our answers might be and I told Leigh Gatto that they might be thinking about whether they have any information that might help with this task and to contact someone in Code Q if they thought it would be beneficial. I never demanded to receive any data from IV&V related to the Columbia Investigation.

Paul Boldon
Code Q

X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Sat, 08 Feb 2003 09:54:57 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>, boconnor <boconnor@hq.nasa.gov>
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Re: Space Shuttle Columbia Tragedy
Cc: prichard@hq.nasa.gov, prutledg@hq.nasa.gov, jlemke <jlemke@hq.nasa.gov>,
mark Kowaleski <mkowales@hq.nasa.gov>,
michael Greenfield <michael.greenfield@hq.nasa.gov>

Not sure if Michael Greenfield approved yet, but it is in the Columbia Action Center's (CAC) database, at least in this draft form.

At 09:12 AM 2/8/2003 -0500, James Lloyd wrote:

Bryan,

Some interesting information that you will probably be interested in reading. Mark K. sent it to me and it came from (approved by?) the Columbia Action Center led by Michael G.

"Safety is priority one" is embedded in this and I am not going to spend any time explaining the foible of that statement, i. e. it isn't a trade point - it's a fundamental value. The paragraph includes some anecdotal observations to underscore the statement. The paper, I am sure, was written by a budgeteer. I feel like we are constantly tilting at that wind mill and too no avail. If people are even listening they still are not understanding the distinction. Sorry for the rant but it's a minor frustration that I can't seem to communicate this so it's understood.

Jim

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Sat, 08 Feb 2003 11:25:17 -0500
To: afalk <afalk@mail.hq.nasa.gov>
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: SMA Relationship with Programs
Cc: prutledg@hq.nasa.gov, mark Kowaleski <mkowales@hq.nasa.gov>,
rpatrican@hq.nasa.gov, prichard@hq.nasa.gov, jlemke@hq.nasa.gov

Andrea,

I have provided some source material for you to review in order to describe the subject relationship (see attached). The relationship is defined at successive levels starting at a very broad level and narrowing down to specifics as it "flows" into program documentation for the NSTS. I have given you a top and mid-level perspective. Let me know if this helps or if there is anything else I might provide.

I did not supply NPD/G 7120 documents but there may be some material in those documents that reflect at a very succinct level what I have provided herein.

****

James D. Lloyd (Jim)

Acting Deputy Associate Administrator
Office of Safety and Mission Assurance
Headquarters Room 5U11
desk phone 202-358-0557

fax 202-358-3104

"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Sat, 08 Feb 2003 15:28:39 -0500
To: Michael Greenfield <michael.greenfield@hq.nasa.gov>
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Re: CRS Feb 5 Colombia Report for Congress
Cc: lgiza@hq.nasa.gov, jlemke <jlemke@hq.nasa.gov>, space@hq.nasa.gov

Michael, Thanks. I had suspected that it had been answered. Can you have someone in your CAC provide the Agency answer on this question to Laura Giza with a copy to me?

Is the Columbia Accident Investigation Board—comprised of current or former government officials—the best group to assist NASA in this investigation, or should non-government experts be included? Should the White House establish an outside commission as was done following the Challenger tragedy in 1986?

At 01:41 PM 2/8/2003 -0500, Michael Greenfield wrote:
already addressed

At 12:04 PM 2/8/2003 -0500, you wrote:
I have a sense that the one you have suggested we answer has been addressed with the White House already in some form. Maybe Scott Pace or Michael Greenfield would know. It would be helpful to see that piece of information before we go ahead and build another similar (dissimilar?) story.

Scott? Michael?

What is deadline?

At 11:42 AM 2/8/2003 -0500, jlemke wrote:
Jim:

Laura Giza (GG) asked Q to take a look at the attached Congressional Research Service report and draft an answer to "Code Q related questions."

This one looks like ours. Should I start drafting a response?
Is the Columbia Accident Investigation Board—comprised of current or former government officials—the best group to assist NASA in this investigation, or should non-government experts be included? Should the White House establish an outside commission as was done following the Challenger tragedy in 1986?

The rest of the questions look like they belong to the program. The last one is a gem.

I also posted the complete set of questions below.

johnl

John Lemke
Manager, System Safety Engineering
NASA HQ, Code QS
202-358-0567 FAX 358-3104
jlemke@hq.nasa.gov
"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

A forthcoming CRS report will explore these issues in more detail, but the following is a brief list of some questions likely to frame the debate. A key factor in evaluating many of these questions is how long the
shuttle system may be grounded. That will not be known until the cause of the accident is determined and remedial steps identified.
! Was funding for the shuttle program adequate to ensure shuttle safety?

! Did NASA adequately respond to concerns expressed over the past several years by the Aerospace Safety Advisory Panel and others that the shuttle program was under stress due to funding and workforce constraints?

! Did NASA adequately investigate damage that might have been caused to Columbia's heat resistant tiles by foam that fell from the External Tank during launch? If Columbia had been damaged, was there anything NASA could have done to ensure the safe return of Columbia's crew, such as launching a rescue mission with another orbiter? Is NASA investigating alternative scenarios in which the tiles could have been damaged, perhaps by space debris during Columbia's 16-day mission?

! Is the Columbia Accident Investigation Board—comprised of current or former government officials—the best group to assist NASA in this investigation, or should non-government experts be included? Should the White House establish an outside commission as was done following the Challenger tragedy in 1986?

! What are the funding implications of the Columbia accident for the space shuttle program, and for the space station program, which relies on the shuttle for assembly and operation?

! What strategy should guide operation of the International Space Station while the space shuttle system is grounded? Should permanent

occupancy of the space station be suspended until the shuttle system is operating again, or should the space station partners (the United States, Russia, Europe, Japan, and Canada) rely on Russian Soyuz and Progress spacecraft to bring crews and cargo to space station?

! If the decision is made to rely on Russian Soyuz and Progress spacecraft beyond those that Russian already has agreed to provide at no cost to the other partners, who will pay for them? In this context, it is important to recall that the Iran Nonproliferation Act (P.L. 106-178) prohibits NASA from making payments to Russia, in cash or in kind, in connection with the space station program unless the President certifies to Congress that Russia is not proliferating nuclear or missile technologies to Iran.

! Should a replacement orbiter be built? If so, how much will it cost and how long will it take? If not, can NASA service the Hubble Space Telescope and continue assembly and operation of the space station with only three orbiters?

! What changes are needed to NASA's recently revised Integrated Space Transportation Plan? Should efforts to develop an Orbital Space Plane, announced in that plan, be accelerated instead of building a replacement for Columbia? To what extent can those plans be accelerated?

! Are the benefits of human spaceflight worth the risks and costs?

A joint hearing between the Senate Commerce Committee and the House Science Committee is scheduled for February 12, 2003.

Jim

Michael A. Greenfield, Ph.D
Associate Deputy Administrator
Technical Programs
NASA Headquarters
phone: 202-358-1820
fax: 202-358-2811

"Mission success stands on the foundation
of our unwavering commitment to safety"

Jim

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! Did NASA adequately respond to concerns expressed over the past several years by the Aerospace Safety Advisory Panel and others that the shuttle program was under stress due to funding and workforce constraints?

! Did NASA adequately investigate damage that might have been caused to *Columbia*'s heat resistant tiles by foam that fell from the External Tank during launch? If *Columbia* had been damaged, was there anything NASA could have done to ensure the safe return of *Columbia*'s crew, such as launching a rescue mission with another orbiter? Is NASA investigating alternative scenarios in which the tiles could have been damaged, perhaps by space debris during *Columbia*'s 16-day mission?

! Is the *Columbia* Accident Investigation Board—comprised of current or former government officials—the best group to assist NASA in this investigation, or should non-government experts be included? Should the White House establish an outside commission as was done following the *Challenger* tragedy in 1986?

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! Are the benefits of human spaceflight worth the risks and costs?

A joint hearing between the Senate Commerce Committee and the House Science Committee is scheduled for February 12, 2003.

Jim

Reply-To: jlloyd@mail.hq.nasa.gov
X-Originating-IP: 68.100.166.170
X-URL: http://mail2web.com/
From: "jlloyd@mail.hq.nasa.gov" <jlloyd@mail.hq.nasa.gov>
To: jlemke@hq.nasa.gov, prutledg@hq.nasa.gov
Subject: FW: Management Shuffles
Date: Sun, 9 Feb 2003 10:28:48 -0500
X-OriginalArrivalTime: 09 Feb 2003 15:28:48.0363 (UTC) FILETIME=[F0F8DBB0:01C2D04F]
X-MIME-Autoconverted: from quoted-printable to 8bit by bolg.public.hq.nasa.gov id KAA00804

I think I sent you a copy but can't tell from home.

Original Message:

From: jlloyd@mail.hq.nasa.gov jlloyd@mail.hq.nasa.gov
Date: Sun, 9 Feb 2003 10:26:56 -0500
To: mgreenfi@hq.nasa.gov, boconnor@hq.nasa.gov
Subject: Management Shuffles

Michael,

Yesterday we were wrestling with a question posed concerning the distraction caused by management shuffles since deciding to bring program management of programs (some) back to HQ. We assessed that this probably only covered the last 6 months as it relates to Shuttle and Station??. I suggest we expand the view a little and reach back to a time when George Abbey was eased out and replaced by an interim caretaker. I think you'll recall that there have been a lot of management shuffles since that time. I suggest that you task Code F to put together a time line for key management positions to include Center Directors of Human Space Flight, SMA Directors of Human Space Flight, Code M and Code Q AAs. A larger question is: Has this caused a gap or fracture in the safety-oriented ethos?

It will also be interesting to overlay this on the Shuttle decision points when that is assembled. These will be needed in order for the CAIB to go beyond the proximate causes and into the root causes investigation.

---

http://mail2web.com/ .

Reply-To: jlloyd@mail.hq.nasa.gov
X-Originating-IP: 68.54.247.98
X-URL: http://mail2web.com/
From: "jlloyd@mail.hq.nasa.gov" <jlloyd@mail.hq.nasa.gov>
To: bcherry@hq.nasa.gov
Subject: RE: Code Q Q&As
Date: Sun, 9 Feb 2003 17:17:35 -0500
X-OriginalArrivalTime: 09 Feb 2003 22:17:35.0393 (UTC) FILETIME=[0C38A110:01C2D089]
X-MIME-Autoconverted: from quoted-printable to 8bit by bolg.public.hq.nasa.gov id RAA24290

Barbara, I was told that Code G was doing this. We have been working with Jack Mannix, Code G, and Michael Greenfield, Code A on this requirement for the last 3 days. The Agency leadership is jointly reviewing these as we communicate. I would send the Code Q input to you but I don't have them from home. Bottom line-- Sean O'Keefe is getting the best we have to offer to date and I think Paul Pastorak has the lead as far as I am told. I suspect we'll have more work starting early tomorrow.

Jim

Original Message:

From: Barbara Cherry bcherry@hq.nasa.gov
Date: Sun, 09 Feb 2003 17:06:46 -0500
To: Jim.Lloyd@hq.nasa.gov
Subject: Code Q Q&As

Jim

Can you please send me electronically any Code Q questions/answers that have been developed regarding the Columbia accident?

We are putting together a briefing book for the administrator.

Thanks.

Barbara Cherry

Reply-To: jlloyd@mail.hq.nasa.gov
X-Originating-IP: 68.54.247.98
X-URL: http://mail2web.com/
From: "jlloyd@mail.hq.nasa.gov" <jlloyd@mail.hq.nasa.gov>
To: bcherry@hq.nasa.gov
Cc: jlemke@hq.nasa.gov, prutledg@hq.nasa.gov, mpavlik@hq.nasa.gov, dmoore@hq.nasa.gov, jmanix@hq.nasa.gov, mgreenfi@hq.nasa.gov
Subject: RE: Code Q Q&As
Date: Sun, 9 Feb 2003 18:39:46 -0500
X-OriginalArrivalTime: 09 Feb 2003 23:39:46.0712 (UTC) FILETIME=[87843180:01C2D094]
X-MIME-Autoconverted: from quoted-printable to 8bit by bolg.public.hq.nasa.gov id SAA03542

Barbara,

Thanks for the heads up. Any chance of sending these "several assigned questions to Code Q" to all of us tonight to assure we have some head start? We are shorthanded and have to cover staff stuff (meetings) tomorrow morning. I need to get these assigned. To whom did you send these actions?
Help us help you out on this.

Did you not see the 25+ pages of Code Q Q&As today; I thought they were part of the overall discussion. I am a little puzzled but generally not surprised. We provided 12 copies to Jack Mannix which I thought were to be discussed by staff on the weekend; it sounds to me that you only participated in part of the meeting? I only sound annoyed because we spent a whole lot of extra staff hours doing this for the Adminisatrator and it seems like the effort is quite disjointed.

Makes no difference, I'll provide what you requested tomorrow shortly after I get in at 7AM.

Jim

Original Message:

From: Barbara Cherry bcherry@hq.nasa.gov
Date: Sun, 09 Feb 2003 17:43:41 -0500
To: jlloyd@mail.hq.nasa.gov
Subject: RE: Code Q Q&As

Jim

I am aware that Code G is putting together information. Charlie Horner, Mary D and I met with Paul Pastorek this morning and in the afternoon with

Paul, Fred Gregory, Bill Readdy and others. Code G is putting together a comprehensive book which we do not intend to duplicate. I am only looking for the Code Q Q&As.

FYI - At that meeting we went through a list of Congressional questions we received and several assignments were made with questions due back to Code L by noon tomorrow. Several of the Questions were assigned to Code Q.

Would appreciate it if you could send me your list of Q&As when you get in tomorrow morning.

Thanks.

Barbara

At 05:17 PM 2/9/2003 -0500, you wrote:
>Barbara, I was told that Code G was doing this. We have been working with
>Jack Mannix, Code G, and Michael Greenfield, Code A on this requirement for
>the last 3 days. The Agency leadership is jointly reviewing these as we
>communicate. I would send the Code Q input to you but I don't have them
>from home. Bottom line-- Sean O'Keefe is getting the best we have to offer
>to date and I think Paul Pastorak has the lead as far as I am told. I
>suspect we'll have more work starting early tomorrow.
>
>Jim
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>Original Message:
>----------
>From: Barbara Cherry bcherry@hq.nasa.gov
>Date: Sun, 09 Feb 2003 17:06:46 -0500
>To: Jim.Lloyd@hq.nasa.gov
>Subject: Code Q Q&As
>
>
>Jim
>
>Can you please send me electronically any Code Q questions/answers that
>have been developed regarding the Columbia accident?
>
>We are putting together a briefing book for the administrator.
>
>Thanks.
>
>Barbara Cherry
>
>

>
>----------
>mail2web - Check your email from the web at
>http://mail2web.com/ .

---

mail2web - Check your email from the web at
http://mail2web.com/ .

Reply-To: jlloyd@mail.hq.nasa.gov
X-Originating-IP: 68.100.166.170
X-URL: http://mail2web.com/
From: "jlloyd@mail.hq.nasa.gov" <jlloyd@mail.hq.nasa.gov>
To: prutledg@hq.nasa.gov, jlemke@hq.nasa.gov, wfrazier@hq.nasa.gov
Cc: jmannix@hq.nasa.gov, dthomas@hq.nasa.gov, lgiza@hq.nasa.gov,
bcherry@hq.nasa.gov
Subject: Monday Morning
Date: Sun, 9 Feb 2003 20:39:20 -0500
X-OriginalArrivalTime: 10 Feb 2003 01:39:21.0103 (UTC) FILETIME=[3BC961F0:01C2D0A5]
X-MIME-Autoconverted: from quoted-printable to 8bit by bolg.public.hq.nasa.gov id UAA16831

John, Pete, Wayne,

There will be a need to asemble early today because of a number of actions/activities due before noon:

1) MAG said there are 5 tough actions from the meeting today that we either are lead or support to Code M. MAG will be at work at 0730 or we can retrieve from his desk before he arrives.

2) Barbara Cherry, Legislative, has suggested we have several actions that are at this point also unspecified (hopefully these cross relate to MAG actions)

3) We have an action to settle the approval and appointing authority for the CAIB. In my mind this was a Board appointed by the Administrator with not much thought about to whom it is to be delivered (just going from the indication about all the present concern). 20/20 hindsight would suggest to me that this Board should be accepted by the Administrator and deliverd to the President's proxy for approval (OSTP?). I think the Board has been offered the resources of the Agency and the processes of NPG 8621.1 for their use as they desire but are fee to proceed unfettered.

Have a good evening and I'll see you all bright and early tomorrow.

Jim

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 07:23:29 -0500
To: boconnor@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: new CAIB member
Cc: jlloyd@hq.nasa.gov, jlemke@hq.nasa.gov, prutledg@hq.nasa.gov

Bryan,

I am supporting legal on the dirty ? for SO'K in how we did it for 51-L contrasted with now. I just found out from Bill Hill that a new member has been added to the CAIB. Mr. Tetrault. We have no info on him or where he comes from. Can you help? Thanks,

Wayne

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

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X-Sender: lawrence_davis@mail.dfrc.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 5.0.2
Date: Mon, 10 Feb 2003 09:07:06 -0500
To: jlemke@hq.nasa.gov, Pete Rutledge <prutledg@hq.nasa.gov>
From: Lawrence Davis <lawrence.davis@dfrc.nasa.gov>
Subject: Questions to be answered

Pete & John
I've received this too late to react, but the two things that have caught our attention for landing are:

1. The lakebed runway support has been deleted. That decreased options for landing with crosswinds, in particular, for very little savings.
2. Some of the procedures are under revision relating to towing the Shuttles from the runway to the Dryden Facility because of a reduction of personnel sent here before a landing. Consideration was being given to towing without electrical power, as I understand it, which means the internal information would not be monitored in the control room at all during that tow period. A 2500 foot keep away zone was in question also.

This is quick and not as factual since the time is already late. Lawrence

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 09:49:46 -0500
To: yolanda.y.marshall1@jsc.nasa, Oscar.Toledo-1@ksc.nasa.gov,
Amanda.Goodson@msfc.nasa.gov, Michael.Smiles@ssc.nasa.g,
mark.d.erminger@nasa.gov, GarriH@kscems.ksc.nasa.gov,
Alex.Adams@msfc.nasa.gov, smadir@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Re: Hearing Questions (Code Q's been assigned a role in 5 out of 24) URGENT
Cc: jmannix@hq.nasa.gov, James Lloyd <jlloyd@hq.nasa.gov>,
prutledg@hq.nasa.gov, jlemke <jlemke@hq.nasa.gov>,
mgstamatelatos <mstamate@mail.hq.nasa.gov>, dmoore@hq.nasa.gov

URGENT

This is a follow-up to Jim's message of 8:49 this am, regarding the question number 24 "What is the difference between the approach of the Rogers Commission and the approach laid out by NASA?" which I have been assigned the action, Bob Stevens Deputy General Counsel has asked that we try to show the level of direct NASA support to the Roger's commission. In that regard, I have determined that NASA organized into 4 teams to support the 4 Roger's Commission investigation teams, each of which was chaired by a commission member.

Team 1 was led by Jack Lee from MSFC and supported the Dev and Production team chaired by Joe Sutter.

Team 2 was led by Tom Utsman from KSC and supported the Pre-launch team led by David Acheson

Team 3 was led by Tommy Holloway from JSC who supported the Mission Planning and Ops team chaired by Dr. Sally Ride.

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Before noon, today, I need to populate these teams with the NASA members. Please go into your memory banks or talk to folks who were around then and provide the names to me.

Again, we need this by noon to the General Counsel. thanks, Call me or email me.

Wayne

I need topopulate with names how the Rogers commission was organized from the NASA support staff. We need you to go into your memory if available At 08:49 AM 2/10/2003 -0500, James Lloyd wrote:
Dear Human Space Flight SMA Director,

We have been handed 5 questions for which we at Code Q will play a role in answering. For one question we are assigned the lead role and the remaining 4 we are playing a support role to either Code M or Code G. I have only sent the 5 out of the entire batch of 24 to you for your information.

By noon we have to have an answer assembled for our External Affairs Office. What I would like from you are short bulletized thoughts on what you think should be addressed in the NASA answer. Although you may have thoughts on question 4 and question 24 (and these are certainly welcome), I would really like you to concentrate on the three questions numbered 8, 11, and 16. Provide your feedback in the next two hours directly by email to the named action lead with a copy to me.

We will talk at 1 PM EST this afternoon at the normally established teleconference.

Jim

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

"Mission success starts with safety"

</x-html>

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 09:54:41 -0500
To: BOConnor@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Fwd: Re: Hearing Questions (Code Q's been assigned a role in 5 out of 24) URGENT
Cc: jlemke <jlemke@hq.nasa.gov>, jlloyd@hq.nasa.gov, prutledg@hq.nasa.gov

Bryan, '
I know you're busy, but if you could go into your memory banks and provide any info on the NASA support teams to the Rogers Commission, it would help us respond to Code G by noon today. thanks.

W

Date: Mon, 10 Feb 2003 09:49:46 -0500
To: yolanda.y.marshall1@jsc.nasa, Oscar.Toledo-1@ksc.nasa.gov, Amanda.Goodson@msfc.nasa.gov, Michael.Smiles@ssc.nasa.g, mark.d.erminger@nasa.gov, GarriH@kscems.ksc.nasa.gov, Alex.Adams@msfc.nasa.gov, smadir@hq.nasa.gov,
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Re: Hearing Questions (Code Q's been assigned a role in 5 out of 24) URGENT
Cc: jmannix@hq.nasa.gov, James Lloyd <jlloyd@hq.nasa.gov>, prutledg@hq.nasa.gov, jlemke <jlemke@hq.nasa.gov>, mgstamatelatos <mstamate@mail.hq.nasa.gov>, dmoore@hq.nasa.gov

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Before noon, today, I need to populate these teams with the NASA members. Please go into your

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Again, we need this by noon to the General Counsel. thanks, Call me or email me.

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Jim

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

"Mission success starts with safety"

</x-html>

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 10:45:18 -0500
To: yolanda.y.marshall1@jsc.nasa.gov, Oscar.Toledo-1@ksc.nasa.gov,
Amanda.Goodson@msfc.nasa.gov, Michael.Smiles@ssc.nasa.gov,
mark.d.erminger@nasa.gov, GarriH@kscems.ksc.nasa.gov,
Alex.Adams@msfc.nasa.gov, smadir@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
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Cc: jmannix@hq.nasa.gov, James Lloyd <jlloyd@hq.nasa.gov>,
prutledg@hq.nasa.gov, jlemke <jlemke@hq.nasa.gov>,
mgstamatelatos <mstamate@mail.hq.nasa.gov>, dmoore@hq.nasa.gov

Here is what I have been able to piece together so far!! Need input before noon.
As near as I can read, these teams were part of the Data and Design Analysis Task Force (DDATF) chaired by Rear Adm Richard Truly, which was established by the Acting NASA Administrator William Graham. I have conflicting dates for their charter, either Feb 5, 1986 or Mar 11 1986 depending on which appendix you reference of the Rogers Commission. Any help would be appreciated.

W

NASA Dev and Production team

T.J. Lee MSFC Chair
C.E. McCullough JSC
Robert Stewart JSC
Ms. S.G. Henderson MSFC
D. L. Riley JSC
+ senior members from level III project offices

NASA Prelaunch team

Tom Utsman KSC Chair
Col R. Bourne USAF
J. Harrington KSC
W. Rock KSC
M. Jones KSC
S. Hawley JSC

NASA Mission Planning and Operations

Tommy Hollowy JSC Chair

Harold Draughon JSC ???

others???

NASA Accident Analysis

J. R. Thompson MSFC Chair
John W. Thomas MSFC
R. J. Schwinghamer MSFC
+ level III booster
+Morton Thiokol

URGENT

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~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

"Mission success starts with safety"

</x-html>

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 14:26:55 -0500
To: prichard@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Fwd: Re: Old shuttle risk study by Pate-Cornell
Cc: mstamate@hq.nasa.gov, prutledg@hq.nasa.gov, jlemke@hq.nasa.gov, jlloyd@hq.nasa.gov, sbrookov@hq.nasa.gov

I have received a clean copy of the report plus three magazine articles from Michael S. and will take up to Legal per Pete's direction.
W

Pamela please add this to your log of actions done. Sylvia, please close this out on the QS log.
X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 10:37:24 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>, "Wayne R. Frazier" <wfrazier@hq.nasa.gov>, mstamate@hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Re: Old shuttle risk study by Pate-Cornell
Cc: jlemke@hq.nasa.gov, jlyver@hq.nasa.gov

Jim,

We had already anticiapted the need for the report. Couldn't find it here. I asked Michael S. to call her. Should arrive today via FedEx. I hope our call didn't cause her to give a press conference!!

Pete

At 10:26 AM 2/4/2003 -0500, James Lloyd wrote:
I recall seeing the study and recall it being on workmanship and its relationship to goodness of tile application. The study also treats the risk in a probabilistic sense. Maybe Bill Loewy could do a search on the web if it might be available externally or on the servers if internally. I think it predates Bob Weinstock but I may be wrong unless it was worked through Vitro. I would bet it is somewhere where we might have all the supporting documents for risk assessment.

At 09:58 AM 2/4/2003 -0500, Wayne R. Frazier wrote:
Jack Mannix from legal just called me. They are looking for a 1990 study by Elizabeth Pate-Cornell at Stanford on Shuttle Risk Analysis. I think I remember Bob Weinstock working that from here out of Code Q funds. Does anyone have a copy. Apparently its getting some press.

Wayne
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
Wayne R. Frazier
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104
~~~~~~

"Mission success starts with safety"

Jim

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104
~~~~~~

"Mission success starts with safety"
~~~~~~

James Lloyd, 11:53 AM 2/10/2003 -0500, NASA Mishap Briefing to CAIB

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 11:53:41 -0500
To: boconnor@mail.hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: NASA Mishap Briefing to CAIB
Cc: jlemke <jlemke@hq.nasa.gov>, wfrazier@hq.nasa.gov,
jmullin@mail.hq.nasa.gov

Bryan,

Has the CAIB indicated any additional need for a mishap investigation briefing from a NASA instructor? I have asked to see what could be done to place Connley Perry on stand-by notice for any such need. This is being arranged through a potential Hernandez Engineering link if deemed needed.

Also, slightly off subject,

I brought up in Senior Staff a point about the independence of the CAIB that is key. To me the solid line relationship from the CAIB to a person or organization has not been discussed in clear terms. Right now that solid line goes to Sean O'Keefe. There will be forever questions about the Independence if this stays that way irrespective of all the confidence in the team and in SO'K. Thought you'd want to be aware that I threw that in the punch bowl. Scott Pace went on the explain how that relationship was going to be accepted and acceptable.

Jim

X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 11:31:40 -0500
To: whill@hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Code Q input on Questions 4, 4.a., 8, 11, and 16
Cc: rpatrica@hq.nasa.gov, jlemke@hq.nasa.gov, jlloyd@hq.nasa.gov, bcherry@hq.nasa.gov

Question4: Suggest adding the following to answer the main question 4:

The first probabilistic risk assessment of the Space Shuttle that calculated a number for the risk of catastrophic accident on ascent was completed in 1989. That number was 1/78 and was widely cited in newspaper accounts at the time. The nation continued to support the flight of the Shuttle, despite their knowledge of the risk level. While subsequent updates and refinements of the risk numbers for the Shuttle actually improved (as a result of additional flight and test data, and incorporation of actual Shuttle upgrades into the PRA models), these risk numbers were not widely publicized. The numbers were, however, shared with the Congress on more than one occasion in the last 4-5 years in the context of funding needed for the Shuttle Upgrades Program.

Very recent public opinion polls (since the Columbia accident) seem to demonstrate that the public overwhelmingly favors continuing the exploration of space and is willing to accept the risk even though the public's perception of Shuttle risk is now based on 2 failures in 113 flights, or a demonstrated catastrophic failure probability of approximately 1/56.

Question 4.a.: Suggest adding the following to your proposed answer to 4.a.:

The probability of rare events such as the catastrophic failure of the Space Shuttle, requires the development of mathematical models based on a methodology called probabilistic risk assessment (PRA). A very important strength of PRA is that it recognizes uncertainty to be inherent, i.e., a fact of life. Uncertainties are generally things that "we know we don't know and those that we don't know that we don't know" (a recent quote about uncertainty from Secretary Rumsfeld). Uncertainties are described in a PRA in terms of mathematical probability distributions. Uncertainties are provided because exact values of the sought probabilities are never known. The PRA model yields a probability distribution whose mean (average) or median (50% confidence value) typically describe the probability of interest. The Quantitative Risk Assessment System (QRAS) model calculated the median probability of the catastrophic failure of the Space Shuttle to be 1 in 265 (1/265). The probability distribution also expresses the degree of confidence in the quoted probability numbers. For example, the associated high (95%) confidence number from the QRAS model is 1 in 130. As more Shuttle flights occur and the experience database increases, the calculated distribution can be updated using statistical techniques yielding a new distribution which generally tends to have a narrower uncertainty range than the previous distribution. Also, the current PRA effort being conducted now by the Space Shuttle program is expected to yield a more accurate probability distribution than the previous ones.

Question 8: Code Q concurs with Code M's proposed answer.

Question 11: Suggest that Code M add the following thought to their response:
An important point to remember is that prior to the Challenger mishap, there was a general tendency to assume that the Shuttle was safe to launch unless proven otherwise. After Challenger, NASA changed this approach to one in which the Shuttle cannot launch unless it is proven safe.

Question 16: You should change the word "reduce" in the next to last line of your proposed answer to "eliminate."

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

To: Humberto.T.Garrido@nasa.gov
From: jlemke <jlemke@hq.nasa.gov>
Subject: Fwd: Re: Hearing Questions (Code Q's been assigned a role in 5 out of 24) URGENT
Cc:
Bcc:
Attached:

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 09:49:46 -0500
To: yolanda.y.marshall1@jsc.nasa, Oscar.Toledo-1@ksc.nasa.gov,
Amanda.Goodson@msfc.nasa.gov, Michael.Smiles@ssc.nasa.g,
mark.d.erminger@nasa.gov, GarriH@kscems.ksc.nasa.gov,
Alex.Adams@msfc.nasa.gov, smadir@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Re: Hearing Questions (Code Q's been assigned a role in 5 out of 24) URGENT
Cc: jmannix@hq.nasa.gov, James Lloyd <jlloyd@hq.nasa.gov>,
prutledg@hq.nasa.gov, jlemke <jlemke@hq.nasa.gov>,
mgstamatelatos <mstamate@mail.hq.nasa.gov>, dmoore@hq.nasa.gov

URGENT

This is a follow-up to Jim's message of 8:49 this am, regarding the question number 24 "What is the difference between the approach of the Rogers Commission and the approach laid out by NASA?" which I have been assigned the action, Bob Stevens Deputy General Counsel has asked that we try to show the level of direct NASA support to the Roger's commission. In that regard, I have determined that NASA organized into 4 teams to support the 4 Roger's Commission investigation teams, each of which was chaired by a commission member.

Team 1 was led by Jack Lee from MSFC and supported the Dev and Production team chaired by Joe Sutter.

Team 2 was led by Tom Utsman from KSC and supported the Pre-launch team led by David Acheson

Team 3 was led by Tommy Holloway from JSC who supported the Mission Planning and Ops team chaired by Dr. Sally Ride.

Team 4 was led by J.R. Thompson from MSFC who supported the Accident Analysis team chaired by MG Don Kutyna.

Before noon, today, I need to populate these teams with the NASA members. Please go into your memory banks or talk to folks who were around then and provide the names to me.

Again, we need this by noon to the General Counsel. thanks, Call me or email me.

Wayne

I need topopulate with names how the Rogers commission was organized from the NASA support staff. We need you to go into your memory if available At 08:49 AM 2/10/2003 -0500, James Lloyd wrote:
Dear Human Space Flight SMA Director,

We have been handed 5 questions for which we at Code Q will play a role in answering. For one question we are assigned the lead role and the remaining 4 we are playing a support role to either Code M or Code G. I have only sent the 5 out of the entire batch of 24 to you for your information.

By noon we have to have an answer assembled for our External Affairs Office. What I would like from you are short bulletized thoughts on what you think should be addressed in the NASA answer. Although you may have thoughts on question 4 and question 24 (and these are certainly welcome), I would really like you to concentrate on the three questions numbered 8, 11, and 16. Provide your feedback in the next two hours directly by email to the named action lead with a copy to me.

We will talk at 1 PM EST this afternoon at the normally established teleconference.

Jim

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

"Mission success starts with safety"

</x-html>

John Lemke
Manager, System Safety Engineering
NASA HQ, Code QS
202-358-0567 FAX 358-3104
jlemke@hq.nasa.gov
"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

X-Sender: twhitmey@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 12:40:06 -0500
To: rmoyer@hq.nasa.gov
From: Thomas Whitmeyer <Tom.Whitmeyer@hq.nasa.gov>
Subject: Info for Green book, and MER
Cc: JLemke@hq.nasa.gov

Ron

This web based information on Shuttle data for all flights which can be sorted a number of different ways

Here is the green book

https://ssveo.jsc.nasa.gov/greenbook/searchov.cfm

Here is the MER

https://ssveo.jsc.nasa.gov/merifa/view_ifa2.cfm?display=ss

Do your own search
https://ssveo.jsc.nasa.gov/merifa/view_ifa.cfm#OV_Number
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

Tom Whitmeyer
Manager, Agency Quality Program
NASA Headquarters
Office of Safety and Mission Assurance
Code QS
Ph: 202 358-2228 Fax: 202 358-3104
~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 12:06:34 -0500
To: jlemke <jlemke@hq.nasa.gov>
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Re: Fwd: crew escape system studies list.ppt

Thanks

At 11:36 AM 2/6/2003 -0500, you wrote:
> At 11:31 AM 2/6/2003 -0500, you wrote:
> Hi Folks,
>
> This is a question from HCAT:
>
> Does anyone have any of the following:
>
> Negative for John Lemke

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-qs using -f
X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 11:31:24 -0500
To: code-qe@lists.hq.nasa.gov, code-qs@lists.hq.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Fwd: crew escape system studies list.ppt
Cc: Charles.M.Chesser@msfc.nasa.gov, Thomas.W.Hartline@msfc.nasa.gov
Sender: owner-code-qs@lists.hq.nasa.gov

Hi Folks,

This is a question from HCAT:

Does anyone have any of the following:

– Crew Escape Module Study, Rockwell, 1989
– Shuttle Evolution Crew Escape Study, Rockwell, 1991
– Access to Space Study, NASA, 1994
– Space Transportation Architecture Study, NASA, 1999

X-Sender: whill@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 11:00:02 -0500
To: Mark Kowaleski <mkowales@hq.nasa.gov>
From: William Hill <whill@hq.nasa.gov>
Subject: crew escape system studies list.ppt

Think Safe, Be Safe
NASA's New Vision: To improve life here,
to extend life to there,to find life beyond.

NASA's new Mission Statement:
To understand and protect our home planet
To explore the universe and search for life
To inspire the next generation of explorers
.....as only NASA can.

X-Sender: pboldon@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 07 Feb 2003 09:09:04 -0500
To: JKelly@hq.nasa.gov, mwetherh@hq.nasa.gov, jlyver@hq.nasa.gov
From: pboldon <pboldon@hq.nasa.gov>
Subject: Re: a beginning of some software questions
Cc: jlemke@hq.nasa.gov, aparra@csc.com

John & Martha,
I heard this topic discussed on PBS radio last night. Some experts are saying that some of experiments that were done on this last mission could have been done by computers.
Paul
At 02:58 AM 2/7/2003 -0500, JKelly@hq.nasa.gov wrote:
Martha,

One general computer/software question that could be asked in one form or another (I was asked it by and elderly lady named Nancy during a visit to my Mom in a nursing home on Monday) is: "Couldn't NASA do all of these experiment using computers so they didn't have to risk human lives?" My answer was that computers and software were sophisticated and could do many things, but there were still many things that could only be done by humans. The real difficult part of the question left unanswered is where the practical boundary is between knowledge that can be gained via computers verses humans in a space environment.

This is probably more of a Code R, S and Y question, than Q or AE.

Take Care,
John C. Kelly

(Message from Skytel Blackberry)

Lynne Loewy, 10:45 AM 2/7/2003 -0500, Questions about downsizing and contracting out...

X-Sender: lloewy@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 07 Feb 2003 10:45:19 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>, Pete Rutledge <prutledg@hq.nasa.gov>,
jlemke <jlemke@hq.nasa.gov>, jlyver@hq.nasa.gov
From: Lynne Loewy <lloewy@hq.nasa.gov>
Subject: Questions about downsizing and contracting out...
Cc: dmoore@hq.nasa.gov

Two questions that fall into the resources area are:

Has NASA's downsizing impacted the Agency's ability to conduct its programs and operations safely?
What effect has contracting out had on safety?

In a nutshell, I don't think we can have complete, well documented answers to these two questions by COB today. I can, and will, prepare a general statement, to the effect that we've been extra vigilant regarding safety during downsizing. Some civil service functions were transferred to contractors to complete, that we made sure that nothing fell through the cracks, that the SMA directors meet quarterly to discuss issues, and that to date, no one in SMA ever said they did not have the needed resources for safety (i.e., no one has said "We can't do our job, we don't have enough resources" (although some are one-deep in some areas), and anything else I find on Dale's desk (I spoke to Dale, and she pointed me to a couple of references to look at.) However, at this time I don't really have much data to back this up.

I think on these two questions, we need to be complete, open, and honest; we really need Center input (particularly the Human Space Flight Centers - JSC, KSC, MSFC, and SSC); and we need to complete the staffing call action. If you think it's appropriate, perhaps you could mention these two questions in the 1:00 p.m. meeting and see if we can get some feedback from the field. I'll continue to check the files here for data.

Lynne

p.s. I just got off the phone with Dale. She suggests sending the complete matrix of questions and answers to the Field for their input.

X-Info: This message was accepted for relay by
smtp02.mrf.mail.rcn.net as the sender used SMTP authentication
X-Trace: UmFuZG9tSVZ8I/woTgvxGs5brXqzq/5RhRX3ub7sEQVDanwClQOPPCpV0ztA594o
X-Sender: jlyver@pop.erols.com
X-Mailer: QUALCOMM Windows Eudora Version 5.2.0.9
Date: Thu, 06 Feb 2003 16:00:40 -0500
To: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
From: "John W. Lyver, IV" <jlyver@erols.com>
Subject: Re: Smart Questions:
Cc: jlemke@hq.nasa.gov, tom.whitmeyer@hq.nasa.gov

Jon,

Thanks, but, I need the answers as well. Please add them to your file or tell me which answers they go to on my listing.

John

At 03:46 PM 2/6/2003 -0500, Jonathan B. Mullin wrote:
First round of Smart Questions, copy in your envelope. Regards, Jon

Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

John W. Lyver, IV

Safety means staying a step ahead of the grim reaper

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 15:27:43 -0500
To: "Camomilli-1, Guy" <Guy.S.Camomilli@nasa.gov>
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: Re: Approved One-Page Shuttle Debris Fact Sheet
Cc: jlloyd@hq.nasa.gov, jlemke@hq.nasa.gov

Guy has this gone to all of the response locations? Jon
At 01:32 PM 2/6/2003 -0500, you wrote:
ATTENTION DEBRA ADDE:

The attached guidelines have been approved by the Chief Health and Medical Officer (Dr. R. Williams) for general dissemination to public service personnel.

Please give it a broad distribution from your command post. If you have any questions, please don't hesitate to call.

Thank you.

Guy Camomilli, MPH, CSP
Senior Environmental Health Officer,
OCHMO Tenant Office
guy.camomilli-1@ksc.nasa.gov
Voice (321) 867-1417
Fax (321) 867-8870

Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

From: JKelly@hq.nasa.gov
Subject: Re: a beginning of some software questions
Date: Fri, 7 Feb 2003 02:58:18 -0500
To: mwetherh@hq.nasa.gov, jlyver@hq.nasa.gov
Cc: jlemke@hq.nasa.gov, pboldon@hq.nasa.gov, aparra@csc.com
X-MIMETrack: Serialize by Router on bes1/HQ/NASA(Release 5.0.11 |July 24, 2002) at 02/07/2003 02:58:18 AM

Martha,

One general computer/software question that could be asked in one form or another (I was asked it by and elderly lady named Nancy during a visit to my Mom in a nursing home on Monday) is: "Couldn't NASA do all of these experiment using computers so they didn't have to risk human lives?" My answer was that computers and software were sophisticated and could do many things, but there were still many things that could only be done by humans. The real difficult part of the question left unanswered is where the practical boundary is between knowledge that can be gained via computers verses humans in a space environment.

This is probably more of a Code R, S and Y question, than Q or AE.

Take Care,
John C. Kelly

(Message from Skytel Blackberry)

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 07 Feb 2003 07:21:34 -0500
To: jlemke@hq.nasa.gov, prutledg@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Fwd: Re: SMA Supplied Questions (and Answers (to be supplied))
for Congressional Testimony

X-Sender: jmannix@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 22:22:13 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>
From: "John G. Mannix" <jmannix@hq.nasa.gov>
Subject: Re: SMA Supplied Questions (and Answers (to be supplied)) for
Congressional Testimony

Thanks for your help. Please keep sending questions and answers as you get them.

At 07:27 PM 2/6/2003 -0500, you wrote:
Jack,

We are supplying you with a collection of questions that have been assembled by the staff of Code Q mainly this afternoon after we had our discussion. Some of these we will try to provide or postulate an answer for the Agency. We hope that the vetting process on the week-end will be an opportunity to scrub these well.

We will continue to work this task.

****
James D. Lloyd (Jim)

Acting Deputy Associate Administrator
Office of Safety and Mission Assurance
Headquarters Room 5U11
desk phone. 202-358-0557

fax 202-358-3104

"Mission success stands on the foundation of our unwavering commitment to safety"

Administrator Sean O'Keefe January 2003

Jim

From: "Camomilli-1, Guy" <Guy.S.Camomilli@nasa.gov>
To: "'Jonathan B. Mullin'" <jmullin@hq.nasa.gov>,
"Camomilli-1, Guy" <Guy.S.Camomilli@nasa.gov>
Cc: jlloyd@hq.nasa.gov, jlemke@hq.nasa.gov,
"Angotti, Cathy" <cangotti@hq.nasa.gov>,
"Barry-1, William" <William.S.Barry@nasa.gov>,
"Gettleman-1, Alan" <Alan.G.Gettleman@nasa.gov>,
"Geyer-1, Bart" <Bart.Geyer-1@ksc.nasa.gov>
Subject: RE: Approved One-Page Shuttle Debris Fact Sheet
Date: Fri, 7 Feb 2003 08:07:19 -0500
Importance: high
X-Mailer: Internet Mail Service (5.5.2653.19)

Jon,

It only went to the addressees. I expect that the HCAT will make the appropriate distribution. If you have a distribution that you'd like to send it to, feel free to do so. The only caveat I would make is to advise them that the new "one-pager" is guidance for "lay people".

The other one is for health and safety professional. Also, in using the other one (the 5 pager), please pass along the suggestion that it's up to the health and safety professional in the field to evaluation the situation and apply the "guidelines" as they see fit. This is a must, because there's no way anyone can call the shots from off-site and adequately control all the hazards.

Guy Camomilli, MPH, CSP
Senior Environmental Health Officer,
OCHMO Tenant Office
guy.camomilli-1@ksc.nasa.gov
Voice (321) 867-1417
Fax (321) 867-8870

-----Original Message-----
From: Jonathan B. Mullin [mailto:jmullin@hq.nasa.gov]
Sent: Thursday, February 06, 2003 3:28 PM
To: Camomilli-1, Guy
Cc: jlloyd@hq.nasa.gov; jlemke@hq.nasa.gov
Subject: Re: Approved One-Page Shuttle Debris Fact Sheet

Guy has this gone to all of the response locations? Jon
At 01:32 PM 2/6/2003 -0500, you wrote:
>ATTENTION DEBRA ADDE:

>
>The attached guidelines have been approved by the Chief Health and Medical
>Officer (Dr. R. Williams) for general dissemination to public service
>personnel.
>
>Please give it a broad distribution from your command post. If you have
any
>questions, please don't hesitate to call.
>
>Thank you.
>
>Guy Camomilli, MPH, CSP
>Senior Environmental Health Officer,
>OCHMO Tenant Office
>guy.camomilli-1@ksc.nasa.gov
>Voice (321) 867-1417
>Fax (321) 867-8870
>
Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 10:54:39 -0500
To: jmannix@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Fwd: Safety Reports--Shuttle safety studies needed
Cc: Dan Thomas <dthomas1@mail.hq.nasa.gov>,
pete Rutledge <prutledg@hq.nasa.gov>, jlemke <jlemke@hq.nasa.gov>

Jack,
We have focused our search and provided expanded guidance to every one of our counterparts in the organization throughout NASA. We'll let you know how this search progresses; we have a telecon scheduled with these folks at 1 PM today. Dan Thomas has been sitting with us on those meetings he is able to support. This will probably be one of the main points of discussion today.

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-smadir using -f
X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 10:40:21 -0500
To: smadir@lists.hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Safety Reports--Shuttle safety studies needed
Cc: rmoyer@hq.nasa.gov
Sender: owner-smadir@lists.hq.nasa.gov

SMA Directors,

Ref.: Jim Lloyd's message of last night, Feb. 5, 2003, 19:52 EST, subj: Safety Reports (the onslaught is starting)

This message expands on Jim's.

The General Counsel's office has asked for our help in identifying and collecting Shuttle-related safety studies that have been done since Challenger. So it's more than just those funded by Code Q RTOP money. You have seen examples of some of these studies held up by reporters on the TV news stories and in the newspapers (the one by Pate-Cornell and Fishbeck actually was funded by Code Q). Please have someone do a search (of your memory, of your office, etc.) for Shuttle-related safety studies, especially those that might be most related to the Columbia mishap and the circumstance surrounding it (Shuttle safety, tile, ET, insulation, escape, repair, control, avionics, hydraulics, tires, aerodynamics, debris damage, etc.). So what do we need?

1. Certainly we need bibliographical citations of any such reports you are able to locate and a little more, which will require some intellectual work (see entries in format below).
2. Ideally we'd like to have copies of the reports overnight mailed to us (it's OK if we end up getting multiple copies of studies found at multiple locations).

Here's a reporting format desired by General Counsel:

Name of Document:
Author(s) of Document:
Date (of document):
Brief Summary of Document:
Bad News:
Good News:
NASA Response: (how did NASA respond to the studies' recommendations?)
Tough Questions and Answers: (knowing about this report, what might a reasonable person ask NASA?)
Preparer (of the information in this format):

As with everything else, this information is needed as soon as possible, but the need won't end immediately, either. Partial responses are desirable; i.e., any studies you find, as they are located. And continuing responses are desirable, so if a study report can't be gotten until next week or the week after or the week after that, we still want it. Consider this to be an open request until we shut it down.

Please send your feedback to Ron Moyer in my office (see his e-mail address on the cc: line above).

And, as Jim said, we're doing the same search right here.

Thank you very much for your help,

Pete

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

Jim

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 08:44:30 -0500
To: J Steven Newman <snewman@hq.nasa.gov>, prutledg@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Re: 13 Pages of Questions by SMA Area Used in NNBE

I think it would be helpful for you to glean the essence of what may be applicable and throw it in the mix. We'll vet against another list we have developed last evening and have sent to Michael Greenfield. More on this shortly.

At 08:25 AM 2/6/2003 -0500, J Steven Newman wrote:
Jim/Pete:

I was out of time and heading out the door (when I thought of this. Let me explain how these might help.

The NASA and Navy NNBE management teams (lots of experienced players) developed these questions as a two way lens to use in understanding key attributes of each other's SMA processes.

If I understand at least one of the many actions up in the air - "prepare the Administrator for potential questions concerning SMA processes, practices, management etc." This question-set can possibly be used as a cross-check on the matrix of questions I understand are being developed.

If you see value let me know and our team can reformat, flip questions, or rework as appropriate.

If OBE or not applicable - toss.
Regards/Steve

At 07:29 PM 2/5/2003 -0500, you wrote:
In this form and for the intended purpose this is not of too much help to me. Was this intended for the list being built for Bryan or something else? Pete?

At 04:49 PM 2/5/2003 -0500, J Steven Newman wrote:
Jim/Pete
Hope this helps
R/Steve

Jim

Jim

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: snewman@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 08:44:51 -0500
To: code-q@lists.hq.nasa.gov
From: J Steven Newman <snewman@hq.nasa.gov>
Subject: NAVSEA ppt Charts for NASA
Sender: owner-code-q@lists.hq.nasa.gov

Q:
Some very nice / uplifting ppt charts sent over by NAVSEA.
R/Steve

==========INCOMING==========
Subject: NASA IS A PART OF WHAT MAKES THE UNITED STATES A GREAT COUNTRY
Date: Wed, 5 Feb 2003 17:09:05 -0500
MIME-Version: 1.0
X-Mailer: Internet Mail Service (5.5.2653.19)
Shipmates,

The scenes in the short PowerPoint show below are impressive and inspiring.
It is an honor to have the opportunity to work with such fine people through
our NASA/NAVY Benchmarking Exchange.

R/Al

Pete Rutledge, 09:20 AM 2/6/2003 -0500, Your help is needed: Qs and As for Congressional Testimony

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 09:20:22 -0500
To: code-q@lists.hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Your help is needed: Qs and As for Congressional Testimony
Sender: owner-code-q@lists.hq.nasa.gov

Code Q staff members,

Michael Greenfield has been assigned, by the Administrator, the task of collecting anticipated questions (Qs) along with proposed answers (As) for Mr. O'Keefe's Congressional testimony, which will take place next Thursday, February 13. We have been tasked to collect safety and mission success (SMS) and safety and mission assurance (SMA) related Qs and As. We have to hand in our Qs and As by 9PM tomorrow, Friday, Feb. 7.

Note that by "SMS," we are referring to the Programs' implementation of our requirements (and perhaps other things) in order to achieve safe and successful missions. So some questions may be of this nature; i.e., not merely about what we do. "SMA" refers to those things that our SMA community does to assist NASA programs to achieve safety and mission success.

This task is something we can all help with. Please put your Congress-person hat on and think about what SMS/SMA-related questions pertaining to this mishap (directly or indirectly) might be asked of the Administrator. If you are the expert in the area of your question, please propose the right answer for it. If you are not, then just give us the question. We will keep your name associated with the question so that we can come back to you for more information, if needed.

Please send your Qs, with or without As to Juanita Sandin. She will create a running list of them. Later we will parse them into categories for inclusion in the master list of Qs and As.

Thank you for your help on this.

Pete

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

X-Sender: prichard@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 06:24:22 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>, boconnor@mail.hq.nasa.gov
From: Pamela Richardson <prichard@hq.nasa.gov>
Subject: Re: New Questions for Today
Cc: pete Rutledge <prutledg@hq.nasa.gov>, jlemke <jlemke@hq.nasa.gov>

Jim --

I am not sure how you are sending stuff to Bryan, but, until I actually get caught up and stop inserting questions into the time line (this should be today), you might want to send the whole file to Bryan. Because so much of the files were jumbled, yesterday's and Tuesday's stuff was quite mixed. Hopefully today I will get caught up and will just send you a delta to go out. This is the reason I sent you the whole file.

Pam

At 08:39 PM 2/5/2003 -0500, James Lloyd wrote:

Bryan,

These are two new questions to be added to the list sent yesterday based on questions received yesterday.

Things are getting fairly crazy around here as we begin to posture the Administrator for the hearing next Thursday. I won't bore you with any details.

02/04/03, 10:29AM, Mark Erminger, JSC

25. Outline of considerations for the MIB provided to Bryan O'Connor directly via e-mail. You evidently have something from Mark Erminger direct; we have a separate file if you need to have it recreated but we are cataloguing it under this number.

02/04/03, 10:47 AM, Pam Richardson, Code QE (no e-mail record)

26. Ron Dittemore mentioned yesterday the changes in temperature at various locations on the Orbiter during reentry. He called this evidence of a thermal event. If indeed a thermal event was happening and we have some concern that damage was done to the Orbiter on ascent, have we looked at the ascent data of the same sensors (and others) to see if we have any indication of thermal events (however slight) of those sensors on ascent?

Regards,

Jim

Pamela F. Richardson
Aerospace Technology Mission Assurance Manager
Enterprise Safety and Mission Assurance Division, Code QE
Office of Safety and Mission Assurance, NASA Headquarters
300 E. Street, S. W., Washington, DC 20546
phone: 202-358-4631, fax: 202-358-2778

"The meek can *have* the Earth. The rest of us are going to the stars." --- Robert Heinlein
"We have to learn to manage information and its flow. If we don't, it will all end up in turbulence." --- RADM Grace Hopper

Roger Mielec, 03:29 PM 2/5/2003 -0500, Main Propulsion System (MPS) Sensor Assesments and Related

X-Sender: rmielec@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 15:29:53 -0500
To: prutledg@hq.nasa.gov
From: Roger Mielec <rmielec@hq.nasa.gov>
Subject: Main Propulsion System (MPS) Sensor Assesments and Related Assessments
Cc: jlemke@hq.nasa.gov, mkowales@hq.nasa.gov, prichard@hq.nasa.gov, rmielec@hq.nasa.gov

Per your request today, the following copies of MPS and MPS related assessments where provided to QS/John Lemke

1.	QT-90-32	Space Shuttle Sensor Assessment
2.	QT-91-48	MPS Temperature Transducer Failure, OV-102, Engine 3
3.	QT-91-49	OV-102 MPS Temperature Sensor Cracking
4.	QT-91-51	Space Shuttle MPS Cryogenic Hydrogen Temperature Transducer Incident Report
5.	----------	MPS Tank Leak Investigation
6.	QT-92-27	Space Shuttle Problem Reporting System Response to Issues Documented by MPS Temperature Sensor Investigation Team -- Briefing for George A. Rodney

Roger Mielec 02/05/03

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-qs using -f
X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 07:23:14 -0500
To: code-qe@lists.hq.nasa.gov, code-qm@lists.hq.nasa.gov,
code-qs@lists.hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: hearings
Sender: owner-code-qs@lists.hq.nasa.gov

I just heard from legal that the hearings have been moved up to Wed. Dan Thomas has some G2 on it.

~~~~~~
Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104
~~~~~~

"Mission success starts with safety"

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 16:21:55 -0500
To: jlemke@hq.nasa.gov
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: TEXAS Web Page for Columbia
Cc: jlloyd@hq.nasa.gov, Wayne Kee <Wayne.Kee-1@ksc.nasa.gov>,
michael.stevens-2@ksc.nasa.gov, guy.camomilli-1@ksc.nasa.gov,
Catherine.Angotti@hq.nasa.gov, rwillia3@mail.hq.nasa.gov,
william.barry-1@ksc.nasa.gov, alee@hq.nasa.gov, wfrazier@hq.nasa.gov,
dan.thomas@hq.nasa.gov, prichard@hq.nasa.gov

John, take a look at this one. The one page "guidance" which is limited in scope is on the web.
http://www.txdps.state.tx.us/dem/
Guy Camomilli is working to get his data on it, so that "better guidance" is available to help assure protection of the employee.
Regards, Jon

Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 19:52:43 -0500
To: smadir@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Fwd: Safety reports (the onslaught is starting)
Cc: prichard@hq.nasa.gov, Pete Rutledge <prutledg@hq.nasa.gov>,
jlemke <jlemke@hq.nasa.gov>, pboelne@hq.nasa.gov, dmoore@hq.nasa.gov

Dear SMA Directors,

Heads up; be prepared or advised.

This may only apply to Human Space Flight Centers but be advised we will soon have to supply copies of studies that have been funded with RTOP money since 17 years ago. The focus will be on research done in support of Shuttle Safety. Please review your archival holdings and make a list of reports that you have. We will try to review our projects from past years from our end to help identify the work done.

Some of these reports may include as an example, the work done by Elizabeth Pate-Cornell on orbiter tile workmanship. Are there others like these?

Hang in there,

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 12:47:51 -0500
To: jlloyd@hq.nasa.gov, jlemke@hq.nasa.gov, prutledg@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Safety reports (the onslaught is starting)

Dan Thomas from legal called with a tip that we might want to start collecting all of the shuttle safety or risk studies we have funded since 51-L. He hinted it might be needed in several weeks for some info going to the Hill. (could we look at the RTOP $$ and spread sheet as a start). I suspect at some time we will actually have to go thru our files and provide copies of shuttle safety studies we funded. Maybe the centers can help with the actual reports since they probably did a lot of the work. (Perhaps mentioning at the 1300 telecon???)

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104
~~~~~~

~~~~~~

"Mission success starts with safety"

Jim
~~~~~~

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 14:20:48 -0500
To: dthomas1@mail.hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: legal question
Cc: jlemke@hq.nasa.gov, jlloyd@hq.nasa.gov

Dan,

What came up today at the 1:00 telecon. SMA folks at centers wondered what is the impact of the IG as as observer on the CAIB with witness statements, non punitive etc aspects, etc.?? Your thoughts please since I know you have worked this.

W

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

"Mission success starts with safety"

To: Eric C Raynor <eraynor@hq.nasa.gov>
From: jlemke <jlemke@hq.nasa.gov>
Subject: Re: NSRS Exceprt for MIB
Cc:
Bcc:
Attached:

Eric:

Thanks.

Pete included it in the final.

johnl

At 11:33 AM 2/5/2003 -0500, you wrote:

Eric Raynor, Program Analyst
Code QS - Safety and Assurance Requirements Division
Office of Safety and Mission Assurance
NASA Headquarters, Washington, DC 20546

Phone: 202-358-4738
Fax: 202-358-3104
Email: eraynor@hq.nasa.gov

NSRS: http://www.hq.nasa.gov/nsrs
NSRS Intranet: http://nsrs-pbma-kms.intranets.com
LLIS: http://llis.nasa.gov
LLIS Intranet: http://llsc-pbma-kms.intranets.com
GIDEP: http://www.gidep.org
GIDEP Intranet: http://gidep-pbma-kms.intranets.com
SOLAR: https://solar.msfc.nasa.gov
Code Q Homepage: http://www.hq.nasa.gov/office/codeq

John Lemke

Manager, System Safety Engineering
NASA HQ, Code QS
202-358-0567 FAX 358-3104
jlemke@hq.nasa.gov

"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

Date: Wed, 05 Feb 2003 09:11:38 -0500
From:
Subject: Sorry for the Loss
To: "'John Lemke (jlemke@hq.nasa.gov)'" <jlemke@hq.nasa.gov>
Cc:

X-Mailer: Internet Mail Service (5.5.2654.89)

John

I, along with everyone else in the US, am praying for the Columbia crew & their families. I also know how it feels when an organization loses crewmembers. Please know you are all in my prayers.

I have a late invitation, only because I'm such a dolt. We are providing a Starlight demonstration tomorrow at 1230 in Crystal City, for a company we are beginning to team with. If you or anyone from your office would like to sit in, you are more than welcome. I know you will be receiving massive amounts of data. Starlight might be able to help. Go to http://starlight.pnl.org for more info on the tool. We have a suite of tools like SPIRE for text analysis, and a Data Analysts Notebook for conducting investigations & Collaborative Services, for secure sharing of information on the web. I'm no expert on these services, but can put you in contact w/ the people who can answer any questions.

I have talked with my superiors. If you think Starlight, or any of the other tools, might be of benefit during the Columbia investigation, Battelle will do everything we can to support you.

Battelle, Crystal City Operations

1725 Jefferson Davis Highway, Suite 600

Arlington, VA 22202-4172

Main (703) 413-8866

Direct (703) 413-7241

Fax (703) 413-8880

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 09:51:14 -0500
To: jlemke <jlemke@hq.nasa.gov>
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: Re: Supporting Bryan on the Columbia Accident Investigation Board (CAIB)

John,could you provide the current attachment. You message did not have an attachment. Regards, Jon
At 04:49 PM 2/4/2003 -0500, you wrote:

> At 07:49 PM 2/2/2003 -0500, Pete wrote:
>
> > Attached is a rough list we prepared today of investigative areas--for the most part these are areas in which the SMA community has some special expertise. For each area we have tentatively named an OSMA lead (and in some cases more than one person to work together). If you can think of other areas that we have not captured, and should, let me know. If we've associated you with the wrong area(s) or failed to associate you with the right area(s), let me know. We don't want to disrupt the investigation--we want to be prudent; we want to help Bryan. Think about whether and how you might be able to be helpful in these areas; then, before you take any action, write down your plan in a clear, concise manner, and send it to me--state what you might be able to do and how you would propose to do it. Then wait for a go-ahead from Jim or me. Keep in mind that we have asked the SMA directors at JSC, MSFC, KSC, LaRC, ARC, and SSC to work with us as needed, so this can be part of your plan, if appropriate.

There have been some questions about the attachment to the above email. Therefore I'd like to parse and restate Pete's direction. The specific **action** asked of us is:

1. "Think about whether and how you might be able to be helpful in these areas." If your name is next to the item, this means we are asking YOU if you think there is something to be done that would be helpful. If the answer is NO--so advise your boss.

2. If the answer is YES: "then, before you take any action, write down your plan in a clear, concise manner, and send it to me--state what you might be able to do and how you would propose to do it." Do not work the action--explain how it could be worked--including who, what, etc. (For QS--please run the plan by me before you send to Pete.)

3. "Then wait for a go-ahead from Jim or me (Pete)." (Pete--please run the QS go-aheads through me with a copy to Sylvia for tracking purposes.)

Easy as 1-2-3. (QS: can we do ours by COB Thursday? Thanks.)

johnl

John Lemke
Manager, System Safety Engineering
NASA HQ, Code QS
202-358-0567 FAX 358-3104
jlemke@hq.nasa.gov

"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

To: prichard@hq.nasa.gov
From: jlemke <jlemke@hq.nasa.gov>
Subject: Fwd: Code GG Tasking Columbia
Cc: jmullin@mail.hq.nasa.gov
Bcc:
Attached:

Pam:

For inclusion in the log.

Thanks.
johnl

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 09:58:48 -0500
To: Sylvia Brookover <sbrookov@hq.nasa.gov>
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: Code GG Tasking Columbia
Cc: jlemke@hq.nasa.gov

I was tasked to support Sara Najjar-Wilson in the resolution of a question concerning Disaster Funding and Donations Program.
I provided guidance from the Federal Response Plan and NPG 8715.2.
The second concern generated from FEMA as to what was NASA's Policy for Donations. I recommended those who were serving NASA operations on the ground, Salvation Army, Baptist Men, Red Cross, etc. These groups have served 39,000 meals and they are running out of funding.
Regards, Jon

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"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: prichard@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 10:29:32 -0500
To: code-q@lists.hq.nasa.gov
From: Pamela Richardson <prichard@hq.nasa.gov>
Subject: Robert G. Alexander
Sender: owner-code-q@lists.hq.nasa.gov

I am looking for the e-mail that someone sent me saying that Robert G. Alexander of LMCO is offering assistance. If you sent me that e-mail, please send it again.

Thanks!

Pam

~~~~~~
Pamela F. Richardson
Aerospace Technology Mission Assurance Manager
Enterprise Safety and Mission Assurance Division, Code QE
Office of Safety and Mission Assurance, NASA Headquarters
300 E. Street, S. W., Washington, DC 20546
phone: 202-358-4631, fax: 202-358-2778
~~~~~~
"The meek can *have* the Earth. The rest of us are going to the stars." --- Robert Heinlein
"We have to learn to manage information and its flow. If we don't, it will all end up in turbulence." --- RADM Grace Hopper
~~~~~~
~~~~~~

To: Eric C Raynor <eraynor@hq.nasa.gov>
From: jlemke <jlemke@hq.nasa.gov>
Subject: Re: 1) Role of the NSRS in the Columbia Accident Investigation, and 2) Close Out of the NASA IG NSRS Audit
Cc:
Bcc:
Attached:

Eric:

Nice work.

johnl

At 02:58 PM 2/4/2003 -0500, you wrote:
NASA Safety Reporting System (NSRS) Technical Advisory Group (TAG) Representatives:

John Lemke
Manager, System Safety Engineering
NASA HQ, Code QS
202-358-0567 FAX 358-3104
jlemke@hq.nasa.gov
"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 15:34:47 -0500
To: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>, prichard@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Re: Fwd: Re: Old shuttle risk study by Pate-Cornell
Cc: mstamate@hq.nasa.gov, prutledg@hq.nasa.gov, jlemke@hq.nasa.gov, sbrookov@hq.nasa.gov

I have also provided to HCAT who were actually very interested in the excellent illustrations which they have not been able to secure. They have no access to the JSC source data base for the illustrations evidently.

At 02:26 PM 2/4/2003 -0500, Wayne R. Frazier wrote:

I have received a clean copy of the report plus three magazine articles from Michael S. and will take up to Legal per Pete's direction.
W

Pamela please add this to your log of actions done. Sylvia, please close this out on the QS log.

X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 10:37:24 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>, "Wayne R. Frazier" <wfrazier@hq.nasa.gov>, mstamate@hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Re: Old shuttle risk study by Pate-Cornell
Cc: jlemke@hq.nasa.gov, jlyver@hq.nasa.gov

Jim,

We had already anticiapted the need for the report. Couldn't find it here. I asked Michael S. to call her. Should arrive today via FedEx. I hope our call didn't cause her to give a press conference!!

Pete

At 10:26 AM 2/4/2003 -0500, James Lloyd wrote:

I recall seeing the study and recall it being on workmanship and its relationship to goodness of tile application. The study also treats the risk in a probabilistic sense. Maybe Bill Loewy could do a search on the web if it might be available externally or on the servers if internally. I think it predates Bob Weinstock but I may be wrong unless it was worked through Vitro. I would bet it is somewhere where we might have all the supporting documents for risk assessment.

At 09:58 AM 2/4/2003 -0500, Wayne R. Frazier wrote:

Jack Mannix from legal just called me. They are looking for a 1990 study by Elizabeth Pate-Cornell at Stanford on Shuttle Risk Analysis. I think I remember Bob Weinstock working that from here out of

Code Q funds. Does anyone have a copy. Apparently its getting some press.

Wayne

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

"Mission success starts with safety"

Jim

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

~~~~~~

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NASA Headquarters - Code QS
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Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

"Mission success starts with safety"

Jim

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 14:10:17 -0500
To: jlemke@hq.nasa.gov, jlloyd@hq.nasa.gov, prutledg@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: task group support

I was talking to legal about my finessing the even number of board members for my chart for the AA briefing, and we got off on the subject of the task force support as required by the appointment letter. It is confusing, but it appears to come from the OSF contingency plan. According to the appointment letter, Brian and Theron , Readdy, and a center director have 72 hours to recommend to the CAIB chair (with approval from Mr. O'Keefe) other non-task team support members. I wonder if Brian knows he is on the hook for something by tomorrow.

I asked Laura to clarify what exactly Bryan has to do and she could not answer. Laura has a 5:00 pm telecon everyday with the GRC Chief Counsel who is at Barksdale supporting the CAIB. The subject of subgroups and data flow has come up and she asked me to join her with Bob Stephens at 3:30 to discuss this topic relative to our policies and how we thought it should work, before she talks at 5:00. I told her I will join her, but you might want to also join the discussion in bob Stephens office.

Wayne

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

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X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 14:14:28 -0500
To: Carolyn Johnson <cjohnson@hq.nasa.gov>
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Re: Meeting w/Mr. Stephens Code G today!
Cc: jlemke@hq.nasa.gov, jlloyd@hq.nasa.gov, prutledg@hq.nasa.gov

Yes, I will be there and may have my boss. At 01:51 PM 2/4/2003 -0500, you wrote:
A meeting has been scheduled for you to meet w/Mr. Stephens, Code G, regarding Board Process for today
2/4/03 at 3:30 pm in Mr. Stephens office 9W23. Please confirm.

Any questions, please call me Carolyn Johnson on x2053.

Thanks

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~

"Mission success starts with safety"

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 15:30:34 -0500
To: wfrazier@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Re: Briefing for Bryan
Cc: prutledg@hq.nasa.gov, jlemke@hq.nasa.gov

Roger that. Good job.

At 03:06 PM 2/4/2003 -0500, Pete Rutledge wrote:
Wayne,

Can we send your briefing to Bryan today? We should try. Looks like correcting typos and adding Faith's input (one chart?) should do it nicely. If neither Jim nor I are around, just send it to Bryan.

Thanks,

Pete

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

Jim

To: James Lloyd <jlloyd@hq.nasa.gov>
From: jlemke <jlemke@hq.nasa.gov>
Subject: Re: PRP
Cc:
Bcc:
Attached:

At 11:12 AM 2/4/2003 -0500, you wrote:
Can you **frame a question** for the CAIB set that doesn't mention PRP but does ask how NASA assures that people having access to the hardware and software have only the most honorable intentions?

Pass to me and we'll put on the CAIB list that Pam is building.

Jim
Wayne has seen
How about this?

johnl

Question: Over the last year or so, government and contractor employees who may have legal or character problems have been discovered working on sensitive national efforts in other Federal agencies. Does the Shuttle program share in this problem, and if not, why not?

Answer: It is very unlikely that the Shuttle program shares in this problem. NASA assures that people having access to Shuttle hardware are closely screened. Those that have a need for the privilege of unescorted access to critical space hardware undergo even closer scrutiny. This screening includes more than just the usual security criteria. It also includes such considerations as medically assessing the employee's fitness. Earning the privilege of unescorted access also requires a nomination from one's supervisor attesting to the worker's suitability and assuring the employee's ability to perform mission critical duties--as evidenced by performance during training and while on the job.

John Lemke
Manager, System Safety Engineering
NASA HQ, Code QS
202-358-0567 FAX 358-3104
jlemke@hq.nasa.gov
"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

X-Sender: mstamate@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 11:13:52 -0500
To: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
From: Michael Stamatelatos <mstamate@hq.nasa.gov>
Subject: Re: Old shuttle risk study by Pate-Cornell
Cc: jlloyd@hq.nasa.gov, prutledg@hq.nasa.gov, jlemke@hq.nasa.gov, jlyver@hq.nasa.gov

We talked about this and I gave you copies of two papers Cornell wrote based on it. I should also get later today a copy of the report and I will make you a copy.

At 09:58 AM 2/4/2003 -0500, Wayne R. Frazier wrote:
Jack Mannix from legal just called me. They are looking for a 1990 study by Elizabeth Pate-Cornell at Stanford on Shuttle Risk Analysis. I think I remember Bob Weinstock working that from here out of Code Q funds. Does anyone have a copy. Apparently its getting some press.

Wayne
~~~~~~
Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104
~~~~~~

"Mission success starts with safety"

****
Dr. Michael Stamatelatos
Manager, Agency Risk Assessment Program
NASA Headquarters - Mail Code QE
Office of Safety and Mission Assurance
300 E Street, SW
Washington, DC 20024
Phone: 202/358-1668 Fax: 202/358-2778
E-mail: Michael.G.Stamatelatos@nasa.gov
(Please note change in e-mail address)
****
"Mission success starts with safety"

X-Sender: mstamate@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 11:11:16 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>,
"Wayne R. Frazier" <wfrazier@hq.nasa.gov>
From: Michael Stamatelatos <mstamate@hq.nasa.gov>
Subject: Re: Old shuttle risk study by Pate-Cornell
Cc: prutledg@hq.nasa.gov, jlemke@hq.nasa.gov, jlyver@hq.nasa.gov

Jim:
I already gave Wayne copies of two papers published by Elizabeth based on that work. I am also getting a copy of the report today and I will forward a copy to you and Wayne.
Michael

At 10:26 AM 2/4/2003 -0500, James Lloyd wrote:
I recall seeing the study and recall it being on workmanship and its relationship to goodness of tile application. The study also treats the risk in a probabilistic sense. Maybe Bill Loewy could do a search on the web if it might be available externally or on the servers if internally. I think it predates Bob Weinstock but I may be wrong unless it was worked through Vitro. I would bet it is somewhere where we might have all the supporting documents for risk assessment.

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NASA Headquarters - Code QS
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Ph: 202 358-0588 Fax: 202 358-3104
~~~~~~

"Mission success starts with safety"

Jim

****

Dr. Michael Stamatelatos
Manager, Agency Risk Assessment Program
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Office of Safety and Mission Assurance
300 E Street, SW
Washington, DC 20024
Phone: 202/358-1668 Fax: 202/358-2778
E-mail: Michael.G.Stamatelatos@nasa.gov
(Please note change in e-mail address)

****

"Mission success starts with safety"

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 12:11:49 -0500
To: jlloyd@hq.nasa.gov
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: Fwd: RE: Any Requirements?
Cc: jlemke@hq.nasa.gov, guy.camomilli-1@ksc.nasa.gov

Jim, for your information. At the FEMA EST meeting 0900 Feb 4, 2003, I learned that Dave King (MSFC) ? is developing a "one pager" for toxic guidance? to the recovery debris groups at 1000 hours today.
This information struck my concern.
I can assure you, it is most difficult to accomplish this on a one pager. I called Guy Camomilli who was also in the process of developing a "one pager." Guy Camomilli will be calling Wayne Kee at Barksdale, AFB to get this concern resolved as Guy C. is continuing to develop this guidance.
The action is in Code AM, this is information only.
Regards, Jon

From: "Kee-1, Wayne" <Wayne.M.Kee@nasa.gov>
To: '"Jonathan B. Mullin '" <jmullin@hq.nasa.gov>
Subject: RE: Any Requirements?
Date: Tue, 4 Feb 2003 09:00:04 -0500
X-Mailer: Internet Mail Service (5.5.2653.19)

Jon, I have received many calls from our NASA family offering assistance with in regards to PPE requirements. Many feel we should be in full level A PPE.....not gonna happen. Teams have been briefed on PPE, and monitoring/reading before touching. With 10's of thousands of pieces, full level A approach is impossible. As far as a cost center, yes.

Wayne
-----Original Message-----
From: Jonathan B. Mullin
To: Wayne Kee
Cc: Michael.B.Stevens@nasa.gov
Sent: 2/4/2003 8:17 AM
Subject: Any Requirements?

Wayne, let me know if you have any thing that we can help with from the NASA EPP perspective. I am sure that FEMA is providing a great deal of data
and services, but let me know if there is something that I can do.
Are all of the "Responders" aware of the hazards and PPE needs? I know the
AF is pretty well covered.
On a note of finance. Have they set up a financial cost center?
Regards, Jon

Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
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Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

Camomilli-1, Guy, 01:28 PM 2/4/2003 -0500, RE: RE: Any Requirements?

From: "Camomilli-1, Guy" <Guy.S.Camomilli@nasa.gov>
To: "Mullin, Jonathan" <jmullin@mail.hq.nasa.gov>
Cc: jlemke@hq.nasa.gov, "Angotti, Cathy" <cangotti@hq.nasa.gov>,
"Geyer-1, Bart" <Bart.Geyer-1@ksc.nasa.gov>, jlloyd@hq.nasa.gov,
"Taffer-1, James" <James.Taffer-1@ksc.nasa.gov>,
"Creech-1, Joanne" <Joanne.Creech-1@ksc.nasa.gov>
Subject: RE: RE: Any Requirements?
Date: Tue, 4 Feb 2003 13:28:46 -0500
X-Mailer: Internet Mail Service (5.5.2656.59)

Jon,

I was able to talk with Wayne Kee just after we spoke. Wayne didn't know about this and is trying to get the contact numbers for Mr. King at Lufkin TX for me. The "one-pager" that you mentioned, that is being put together at KSC, is actually several pages, but not lengthy. It's just about ready to go out. Drafts have already been released, and Dave King may actually be using one of these drafts.

Two main points with respect to following the procedures:

1. Several organizations, including the USA folks at Barksdale, have their own procedures for doing this type of thing. If they've done things like this before (as with USA) they pretty much know what they're doing. Even if their procedures aren't exactly like ours, their procedures are probably fine. We should let the folks who get our procedures know that there is more than one right procedure for collecting debris.

2. The EH/IH folks onsite have more "each-case" specific information that we do, and should be given enough latitude to use their professional judgment in using procedures for collecting the debris. The procedures that do get used in the field, should be used as information and guidelines as they apply to the specific on-site conditions.

Hope this helps. I'm continuing the search for a contact number for Dave King and will try to follow this out to a end today.

If you have any questions about the above aspects, please give me a call.

Guy Camomilli, MPH, CSP
Senior Environmental Health Officer,
OCHMO Tenant Office
guy.camomilli-1@ksc.nasa.gov
Voice (321) 867-1417
Fax (321) 867-8870

-----Original Message-----
From: Jonathan B. Mullin [mailto:jmullin@hq.nasa.gov]
Sent: Tuesday, February 04, 2003 12:12 PM
To: jlloyd@hq.nasa.gov

Cc: jlemke@hq.nasa.gov; Guy.S.Camomilli@nasa.gov
Subject: Fwd: RE: Any Requirements?

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The action is in Code AM, this is information only.
Regards, Jon
>From: "Kee-1, Wayne" <Wayne.M.Kee@nasa.gov>
>To: "'Jonathan B. Mullin '" <jmullin@hq.nasa.gov>
>Subject: RE: Any Requirements?
>Date: Tue, 4 Feb 2003 09:00:04 -0500
>X-Mailer: Internet Mail Service (5.5.2653.19)
>
> Jon, I have received many calls from our NASA family offering assistance
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>Subject: Any Requirements?
>
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>
>
>Jonathan B. Mullin

>Manager Operational Safety
>Emergency Preparedness Coordinator
>Headquarters National Aeronautics and Space Administration
>Phone (202) 358-0589
>FAX (202) 358-3104
>"Mission Success Starts with Safety"
Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

To: <sbrookov@hq.nasa.gov>, jlloyd@hq.nasa.gov, prutledg@hq.nasa.gov
From: jlemke <jlemke@hq.nasa.gov>
Subject: Fwd: PRP
Cc: prichard@hq.nasa.gov, code-qs
Bcc:
Attached:

Sylvia: Per QS staff meeting, please enter into HATS.

Jim and Pete:

Please cc Sylvia and myself on future taskings to QS. This is to help our internal management of these actions and provide a QS record of the team's contributions for use in future performance appraisals, individual and group recognition, etc.

Thanks to all.

johnl

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 11:12:31 -0500
To: jlemke@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: PRP
Cc: prutledg@hq.nasa.gov, prichard@hq.nasa.gov, mcard@hq.nasa.gov

Can you frame a question for the CAIB set that doesn't mention PRP but does ask how NASA assures that people having access to the hardware and software have only the most honorable intentions?

Pass to me and we'll put on the CAIB list that Pam is building.

Jim

John Lemke
Manager, System Safety Engineering
NASA HQ, Code QS
202-358-0567 FAX 358-3104
jlemke@hq.nasa.gov
"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 12:01:21 -0500
To: sbrookov@hq.nasa.gov, jlemke@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Fwd: Re: Old shuttle risk study by Pate-Cornell

Not sure if this is my final tasking or Dr. M's, but here it is.

X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 10:37:24 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>,
"Wayne R. Frazier" <wfrazier@hq.nasa.gov>, mstamate@hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Re: Old shuttle risk study by Pate-Cornell
Cc: jlemke@hq.nasa.gov, jlyver@hq.nasa.gov

Jim,

We had already anticiapted the need for the report. Couldn't find it here. I asked Michael S. to call her. Should arrive today via FedEx. I hope our call didn't cause her to give a press conference!!

Pete

At 10:26 AM 2/4/2003 -0500, James Lloyd wrote:
I recall seeing the study and recall it being on workmanship and its relationship to goodness of tile application. The study also treats the risk in a probabilistic sense. Maybe Bill Loewy could do a search on the web if it might be available externally or on the servers if internally. I think it predates Bob Weinstock but I may be wrong unless it was worked through Vitro. I would bet it is somewhere where we might have all the supporting documents for risk assessment.

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Wayne
~~~~~~
Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
~~~~~~

Ph: 202 358-0588 Fax: 202 358-3104
~~~~~~

"Mission success starts with safety"

Jim

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104
~~~~~~

"Mission success starts with safety"
~~~~~~

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 11:45:29 -0500
To: sbrookov@hq.nasa.gov, jlemke@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Fwd: Soon to be available briefing packages

My HATS for the briefings for Bryan

X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 09:30:56 -0500
To: wfrazier@hq.nasa.gov, fchandle@mail.hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Fwd: Soon to be available briefing packages

Faith, Wayne,

We have an answer from Bryan--see below--he wants both briefings when they're ready.

Pete

X-Sender: boconnor@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 03 Feb 2003 22:45:57 -0500
To: prutledg@hq.nasa.gov
From: boconnor <boconnor@hq.nasa.gov>
Subject: Fwd: Soon to be available briefing packages

Pete,
I'll take them both. Thanks to you and Faith and Wayne.
We're still in the early flail mode here...these guys have a lot to learn before they can even begin to look for root cause.
Best,

Date: Mon, 03 Feb 2003 21:03:57 -0500
From: Pete Rutledge
Subject: Soon to be available briefing packages
To: boconnor@hq.nasa.gov
Cc: james.d.lloyd@hq.nasa.gov, wayne.frazier@hq.nasa.gov,
faith.chandler@hq.nasa.gov
X-Mailer: Microsoft Outlook Express 6.00.2800.1106

Bryan,

Hope all is going well. A couple of briefing packages should be ready for you tomorrow, Tuesday, if you want them. One is a briefing about NASA mishap investigation requirements, updated to include the formation of the Mishap Investigation Team and your Columbia Accident Investigation Board. This is an update of the briefing used for the NTSB meeting; Wayne updated it today. It could probably be e-mailed to you early tomorrow. It mostly (maybe entirely) PowerPoint text, so shouldn't take too long to download at modem speed. The second will be a briefing about the mishap investigation process; i.e., what a mishap board should do; e.g., constructing mishap timeline, interviewing witnesses, constructing fault trees, analyzing data, etc. Faith is working on this one and I suspect it would be available later in the day tomorrow. Do you want either or both of these? Or do you have any more specific needs on these or anything else?
I'm e-mailing you from home, but please respond to my work e-mail address.

Thanks,

Pete

O'C

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

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

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Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104
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"Mission success starts with safety"
~~~~~~

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 11:31:55 -0500
To: code-q@lists.hq.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: OSMA SLEP presentation
Sender: owner-code-q@lists.hq.nasa.gov

Hi Folks,

At the SMA telecon yesterday, we talked about crew escape, etc.

If you would like to see the SLEP presentation I gave (for Bryan) at the SLEP Kick-off Meeting, it is on the U-Drive.

Go to Qall / QE / Shuttle Backup / SLEP. It is called: Code Q_SLEP_OC mods.ppt

Mark

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 11:12:31 -0500
To: jlemke@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: PRP
Cc: prutledg@hq.nasa.gov, prichard@hq.nasa.gov, mcard@hq.nasa.gov

Can you frame a question for the CAIB set that doesn't mention PRP but does ask how NASA assures that people having access to the hardware and software have only the most honorable intentions?

Pass to me and we'll put on the CAIB list that Pam is building.

Jim

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Sat, 01 Feb 2003 16:22:33 -0500
To: snewman@hq.nasa.gov, pnapala@hq.nasa.gov
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: statement to read to all witnesses fromNPG 8621
Cc: fchandle@hq.nasa.gov, jlemke@hq.nasa.gov


Doc12.doc

~~~~~~

Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

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"Mission success starts with safety"

Appendix E-1. Statement to Witnesses

The purpose of this safety investigation is to determine the root cause(s) of the mishap that occurred on _____, and
to develop recommendations toward the prevention of similar mishaps in the future. It is not our purpose to place blame or to
determine legal liability. Your testimony is entirely voluntary, but we hope that you will assist the board to the maximum extent
of your knowledge in this matter.

Your testimony will be documented and retained as part of the mishap investigation report background files but will not be
released as part of the investigation board report.

NASA will make every effort to keep your testimony confidential and privileged to the greatest extent permitted by law.
However, the ultimate decision as to whether your testimony may be released may reside with a court or administrative body
outside NASA.

For the record, please state your full name, title, address, employer, and place of employment.

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Sat, 01 Feb 2003 14:38:10 -0500
To: Frank Mortelliti <Frank.P.Mortelliti@jpl.nasa.gov>
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Re: Any assistance needed
Cc: jlemke <jlemke@hq.nasa.gov>, wfrazier@hq.nasa.gov, jmullin@hq.nasa.gov

Thanks Frank. We'll be in touch if need arises. You've received word that Safety Directors' meeting at Cocoa Beach is canceled?

Plan accordingly.

At 10:51 AM 2/1/2003 -0800, Frank Mortelliti wrote:
Jim, needless to say, any help you feel JPL can offer, let us know-- Frank

Jim

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Sat, 01 Feb 2003 20:32:53 -0500
To: adiaz@hq.nasa.gov, whill@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Fwd: Tech Order 00-105E-9 (emergency rescue and mishap resp-orbiter vehicle)
Cc: jmullin@hq.nasa.gov, prutledg@hq.nasa.gov, mark Kowaleski <mkowales@mail.hq.nasa.gov>, jlemke <jlemke@hq.nasa.gov>

Angela and Bill,

For whatever purpose that you may need this information; this attached PDF summarizes hazards of the orbiter. We are also expecting to receive additional information in paper form this evening from KSC. I suggest that this may be a good reference source for inquiries over the next several days and offer it for your use. The attached contains
Emergency Response Information for Orbiter (Air Force Tech Order). It's the document I gave you earlier, Angela.

We also understand that there is a compiled list of hazards in a Finding of No Significant Impact (FONSI) an environmental document that is owned by the Shuttle Manifest Office at JSC..

X-Sender: mgaier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Sat, 01 Feb 2003 17:46:11 -0500
To: jlloyd@hq.nasa.gov, jmullin@hq.nasa.gov
From: Matthew Gaier <mgaier@hq.nasa.gov>
Subject: Tech Order 00-105E-9 (emergency rescue and mishap resp-orbiter vehicle)

Jim/Jon,
Attached is the Tech Order, it also contains info on types of hazards.
Matt

Matt Gaier
NASA Aviation Safety Manager
Code QS

WK: (202) 358-0308
FAX: (202) 358-3104

mgaier@hq.nasa.gov

X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 10:37:24 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>,
"Wayne R. Frazier" <wfrazier@hq.nasa.gov>, mstamate@hq.nasa.gov
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Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

"Mission success starts with safety"

Jim

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: dmoore@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 10:00:52 -0500
To: code-q@lists.hq.nasa.gov
From: Dale Moore <dmoore@hq.nasa.gov>
Subject: SMA Directors' Meeting
Sender: owner-code-q@lists.hq.nasa.gov

The SMA Directors' Meeting scheduled for February 12 and 13 has been postponed indefinitely.

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-code-q using -f
X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 09:52:27 -0500
To: code-q@lists.hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Information we prepare and provide in support of HCAT and/or the MIT/CAIB
Sender: owner-code-q@lists.hq.nasa.gov

Code Q staff members,

Please make sure Jim or I get to see and initial off on any new material we prepare for the HCAT and/or the MIT/CAIB. This is not necessary when responding to a request for copies of existing material that has already had management approval in the past. When seeking management buy-off on new material, please bring two copies; one will go to Pam Richardson, who is keeping the official collection of what we have done. When providing existing material, it would be helpful if you would at least let Pam know what you provided (no copy needed as long as you identify it), so that we will have a complete record of what goes out.

Thanks,

Pete

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 09:43:08 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>, jlemke@hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Re: Fwd: COFR and PRACA

I hadn't seen them until now. I was aware of the questions. Mark told me. I suggested that they were questions for someone like Mark Erminger to answer rather than us. JSC subsequently prepared the answers. But I'll make sure we have a process.

Pete

At 09:33 AM 2/4/2003 -0500, James Lloyd wrote:

John,
Passed along for information.
Pete,
Did you have an opportunity to review these before dispatched on Sunday? I may have been asked to review them but I certainly don't recall the request. We need to set up a process internally for vetting answers to these questions; perhaps we have it now. I want QS to be included to provide a fresh set of eyes and thoughts on what we say. I will look at these today myself.

X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 04 Feb 2003 09:18:39 -0500
To: prichard@hq.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Fwd: COFR and PRACA
Cc: jlloyd@mail.hq.nasa.gov, rpatrican@hq.nasa.gov, fchandle@mail.hq.nasa.govm, prutledg@mail.hq.nasa.gov

Pam,

For our files...

Here is the response I sent to the two actions on Sunday. JSC SMA blessed these.

Mark

Date: Sun, 02 Feb 2003 17:13:44 -0500
To: bhill,bwatkins
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: COFR and PRACA
Cc: cheryl.m.kokoszl@jsc.nasa.gov,sjohnson,merminger,"JOHNSON, M. S. (SCOTT) (JSC-NC) (NASA)" <m.s.johnson@nasa.gov>,"CAZES, DAVID (JSC-NA) (SAIC)"

gaiermj@mfr.usmc.mil


Segment%2010.pdf

****

James D. Lloyd (Jim)

Acting Deputy Associate Administrator
Office of Safety and Mission Assurance
Headquarters Room 5U11
desk phone 202-358-0557

fax 202-358-3104

"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
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ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

<david.cazes1@jsc.nasa.gov>, "DYER, KEITH W. (JSC-NC) (SAIC)"
<keith.w.dyer1@jsc.nasa.gov>, "BALU, BRIAN K. (JSC-NC) (SAIC)"
<brian.k.balu1@jsc.nasa.gov>

Bill & Bobby,

Here are the two White House actions I hard-copied to you.

They address the COFR process and the PRACA process.

Methods of risk assessment is addressed in the dealing with flight constraints section of the PRACA write-up.

JSC SR&QA folks helped pull these responses together.

Mark

PS: Cheryl & Scott - thanks for your help.

Jim

Peter J. Rutledge, Ph.D.
Director, Enterprise Safety and Mission Assurance Division
Acting Director, Review and Assessment Division
Office of Safety and Mission Assurance
NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579
FAX:202-358-2778
e-mail: pete.rutledge@hq.nasa.gov

Mission Success Starts with Safety!

James Lloyd, 07:34 AM 2/12/2003 -0500, Re: Fw: FRR Charts

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 12 Feb 2003 07:34:59 -0500
To: MGreenfi@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Re: Fw: FRR Charts

It certainly has more depth at this point than does the AA, OSF's recollection which is probably accurate as far as it goes. Our report is nearing readiness.

At some point I would like to see the Program's own rendition of what they did in response to foam shedding -- still only one of the leading theories. Remember the rule of engagement here is that the program is to prove it is safe and that Safety is to assure. It is not that safety has to prove it unsafe. I know you know this; at the same time, I appreciate that we have to have our story together. Bill Readdy has made a statement on the very top slice. Who is his adviser on these decisions he is making at the COFR process time frame? Is it Bill Hill?

At 05:58 AM 2/12/2003 -0500, MGreenfi@hq.nasa.gov wrote:

Is your cofr brief ready yet

----- Original Message -----
From: William Readdy [wreaddy@hq.nasa.gov]
Sent: 02/11/2003 10:05 PM
To: SOKeefe@hq.nasa..gov; Fred Gregory <fgregory@hq.nasa.gov>; gmahone@hq.nasa.gov; ppastore@hq.nasa.gov; Michael Greenfield <michael.greenfield@hq.nasa.gov>
Subject: FRR Charts

Gents,
I revisited my STS-113 FRR briefing charts and, although the STS-112 bipod foam was mentioned, it was briefed as *no safety of flight* issue. S&MA concurred in that assessment. It was not briefed *at all* in the STS-107 FRR.
V/r,
Reads

Jim

Eric C Raynor, 03:31 PM 2/11/2003, NSRS and FOIA Requests....

X-Sender: eraynor@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 11 Feb 2003 14:31:04 -0500
To: James.J.Weller@nasa.gov, tom.ambrose@mail.dfrc.nasa.gov,
david.g.cleveland@nasa.gov, frank.p.mortelliti@jpl.nasa.gov,
Brian.Hey@ssc.nasa.gov, Manuel.B.Dominguez@grc.nasa.gov,
daniel.l.clem1@jsc.nasa.gov, l.l.rine@larc.nasa.gov,
prince.kalia@msfc.nasa.gov, james.t.hawkins@maf.nasa.gov,
lester.a.mcgonigal.1@GSFC.NASA.GOV, dhall@wstf.nasa.gov,
Randall.Tilley-1@ksc.nasa.gov, dwayne.a.rye.1@GSFC.NASA.GOV
From: Eric C Raynor <eraynor@hq.nasa.gov>
Subject: NSRS and FOIA Requests....
Cc: jlemke@hq.nasa.gov, wharkins@hq.nasa.gov

NSRS TAG Representatives:

As a result of the Columbia accident, I received yesterday a FOIA request for information from the NSRS. And I just got a call from the JSC NSRS rep, Dan Clem, indicating that JSC has also received a FOIA request regarding NSRS data. Code Q has denied the request we received. Our response is enclosed as an attachment to this email. If you should receive FOIA requests for access to NSRS data, you have a few options: 1) you can use the same justification that I used to deny it, or 2) you can ask your local FOIA officer to refer the request to the HQ FOIA officer for action, who will consult with me on it...

If you have questions, please let me know!

- Eric


FOIA Number 10 F 2003 135.doc

Eric Raynor, Program Analyst
Code QS - Safety and Assurance Requirements Division
Office of Safety and Mission Assurance
NASA Headquarters, Washington, DC 20546

Phone: 202-358-4738
Fax: 202-358-3104
Email: eraynor@hq.nasa.gov

NSRS: http://www.hq.nasa.gov/nsrs
NSRS Intranet: http://nsrs-pbma-kms.intranets.com
LLIS: http://llis.nasa.gov
LLIS Intranet: http://llsc-pbma-kms.intranets.com
GIDEP: http://www.gidep.org
GIDEP Intranet: http://gidep-pbma-kms.intranets.com
SOLAR: https://solar.msfc.nasa.gov
Code Q Homepage: http://www.hq.nasa.gov/office/codeq

Response to FOIA No. 10-F-2003-135

The NASA Safety Reporting System is designed, first and foremost, to be an anonymous hazard reporting system. Paramount is the protection of that anonymity, and continued confidence on the part of the submitters that this anonymity will never be compromised.

NASA's Office of Safety and Mission Assurance at NASA Headquarters independently manages the NSRS. An independent contractor receives and processes incoming NSRS reports. The contractor removes submitters identifying information (known as the identification strip) and forwards a transcripted version of the reporter's concerns to the NASA Headquarters Office of Safety and Mission Assurance for immediate analysis and investigation. The report is transcripted in an attempt to cloak the submitter's handwriting and writing style.

The contractor maintains a database that includes the transcripted summaries of reports received and other information pertaining to the reports. It possible that those familiar with problems and processes at a submitter's workplace might recognize the verbatim wording and phasing used by the anonymous reporter. As such, we consider the transcripted summaries and other information in the database to be proprietary and sensitive.

Public release of this information through FOIA could compromise the reputation of the NSRS **and** the anonymity of past submitters. This would have a chilling effect on the future willingness of NASA personnel to trust and use the NSRS to report hazards.

The NSRS database also contains information about reports that are under active investigation. This documentation is pre-decisional and deliberative in nature, and contains opinions and recommendations that are part of the ongoing hazard correction process, and as such would not be releasable under FOIA.

From: "welcome@intranets.com" <welcome@intranets.com>
To: John Lemke <jlemke@hq.nasa.gov>
X-for-your-own-intranet: http://pbma.hq.nasa.gov/index2.html
X-for-help-with-Intranets: mailto:support@intranets.com
Date: Sun, 02 Feb 2003 02:43:16 GMT
X-mailer: AspMail 4.0 4.03 (SMT412E7EF)
Subject: Welcome to 107team.intranets.com
X-OriginalArrivalTime: 02 Feb 2003 02:43:16.0355 (UTC) FILETIME=[D6786530:01C2CA64]

Dear John,

Welcome! Thank you for joining the 107 Team intranet site.

GETTING STARTED

As a reminder, your Login Name is: jlemke
If you forgot the password you selected, we'll email it to you at your request. Just follow this link:
http://107team.intranets.com/forgot.asp

To log in to your intranet, go to http://107team.intranets.com and enter your personal Login Name and Password in the space
You will no longer need to use the Registration Code you w
when you were first invited to join.

The site administrators for your intranet are Don Vecellio a
J. Steven Newman.

USING YOUR INTRANET

To become familiar with how to use your intranet, please review the NASA Getting Started:
http://107team.intranets.com/help/us/to.asp?page=start.html&admin=False

To change your Login Name or Password, go to Tools > Member Options at the left of your intranet site.

To change any of the personal information you entered during registration, read the details at:
http://107team.intranets.com/help/us/to.asp?page=mem.html&section=edit

We are constantly updating the applications and features in our intranet service, and we welcome member feedback to guide us in these efforts. If you have suggestions for new or improved service features, please click the Tell Us link at the bottom of your intranet home page and

tell us what you think!

Regards,

Steve Newman, PBMA Leader

From: "welcome@intranets.com" <welcome@intranets.com>
To: John Lemke <jlemke@hq.nasa.gov>
X-for-your-own-intranet: http://pbma.hq.nasa.gov/index2.html
X-for-help-with-Intranets: mailto:support@intranets.com
Date: Sun, 02 Feb 2003 02:43:16 GMT
X-mailer: AspMail 4.0 4.03 (SMT412E7EF)
Subject: Welcome to 107team.intranets.com
X-OriginalArrivalTime: 02 Feb 2003 02:43:16.0355 (UTC) FILETIME=[D6786530:01C2CA64]

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http://107team.intranets.com/forgot.asp

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when you were first invited to join.

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J. Steven Newman.

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To change any of the personal information you entered during registration, read the details at:
http://107team.intranets.com/help/us/to.asp?page=mem.html&section=edit

We are constantly updating the applications and features in our intranet service, and we welcome member feedback to guide us in these efforts. If you have suggestions for new or improved service features, please click the Tell Us link at the bottom of your intranet home page and

tell us what you think!

Regards,

Steve Newman, PBMA Leader

Date: Fri, 7 Feb 2003 15:07:50 -0500
From: '
Reply-To: <
To: <bill.loewy@hq.nasa.gov>
Subject: Shuttle disaster causative scenario
X-Mailer: <IMail v7.13>

Bill,
Based on my experience with sol-gel methods for producing high purity glasses and ceramics, I envisioned a ground-based scenario which could have caused the shuttle disaster. I've communicated this to your security organization, your Washington HQ, and asked an associate of mine at DARPA to forward the information.

I'm writing you because of something the gentleman in your security org said to me. He suggested that what I submitted would be investigated after the pieces of Columbia have been collected; This may be too late, as these materials may tend to evaporate.

Scenario

Alkoxide precursors of gels of low-melting-point glasses would be introduced into chemically water-free, dry solvent liquids which could be applied either to the outside of shuttle tiles, or infused into the interior of the tiles, either for cleaning or to repel moisture.

Once dry, the gel residue left on the tile material would be inert until re-entry. At that point the gel would convert into a low-melting glass, which would act by diffusion to lower the melting-point of adjacent tile material, which might then melt, likely forming holes in the tiles and exposing the bonding agent to re-entry heat.

While I fervently hope that no-one with physical access to the shuttle would have intentionally done such an act of sabotage, the coincidence of the shuttle carrying an Israeli astronaut, combined with our war on terrorism, as well as the physical ease with which the act could have been perpetrated, all make it a priority for me to do what I can to see that this avenue of investigation is followed sooner rather than later.

Again, I hope I'm writing Sci-Fi here, but that's something for NASA to determine.

Warfighter Systems Design
7000 E. Interstate 20
Suite 34
Aledo TX 76008-3106

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 07 Feb 2003 12:35:40 -0500
To: HCAT@hq.nasa.gov
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: UPDATE:Subject Rotation of Emergency Operations Staff:
Cc: whill@hq.nasa.gov

Subject Rotation of Emergency Operations Staff Barksdale Air Force Base (BAFB)
Mr. Wayne Kee will be rotating back to the Kennedy Space Center on February 7, 2003 from the Emergency Operations Center at (BAFB).
He has been relieved by James O. Cheek, available at 318-456-7261.Barksdale Air Force Base Command Center.
Mr. James O. Cheek can also be reached at (
His Email is james.o.cheek@usago.ksc.nasa.gov .
Please update your contact roster.

Regards, Jon

Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

From: "NAKAMURA, STACEY T. (JSC-NS) (NASA)" <stacey.t.nakamura@nasa.gov>
To: "'Mullin, Jon (Code QS)'" <Jonathan.B.Mullin@hq.nasa.gov>,
"'Lloyd, James (Code QS)'" <jlloyd@mail.hq.nasa.gov>,
"'Lemke, John (HQ)'" <jlemke@hq.nasa.gov>, tom.whitmeyer@hq.nasa.gov,
"HOLSOMBACK, JERRY B. (JSC-OE) (NASA)" <jerry.b.holsomback@nasa.gov>,
"ERMINGER, MARK D. (JSC-NC) (NASA)" <mark.d.erminger@nasa.gov>,
"MARSHALL, YOLANDA Y. (JSC-NA) (NASA)" <yolanda.y.marshall@nasa.gov>,
"JOHNSON, GARY W. (JSC-NA) (NASA)" <gary.w.johnson@nasa.gov>
Subject: FW: IRIS Data Request
Date: Wed, 19 Feb 2003 09:34:49 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

Hi Jon, et al,

Here is the request I received (Sharla works for United Space Alliance and has been tasked by Bill Harris, Shuttle Program Office - Bill has been assigned this task by the Task Force through the MRT).

Bill Harris, is the Gov't "official" associated with this task. I will help out with sanity checks where I can.

Yes, we discussed the "below $1000" threshold. If we do that, it will be a second order sweep. For now, we will do the "first order, one layer deep" sweep.

will keep you posted.

Regards,
Stacey

-

Stacey T. Nakamura
Phone: (281) 483-4345
Fax: (281) 483-6275

-----Original Message-----
From: Ostrowski, Sharla J [mailto:Sharla.J.Ostrowski@USA.HQ.UnitedSpaceAlliance.com]
Sent: Wednesday, February 19, 2003 8:59 AM
To: NAKAMURA, STACEY T. (JSC-NS) (NASA); 'Lorraine.K.Raby@msfc.nasa.gov'; 'David.Barker-1@nasa.gov'
Cc: Green, Mark D; Beagley, Richard C; Lovell, Craig L; HARRIS, WILLIAM J. (JSC-MA) (NASA)
Subject: IRIS Data Request

Per Bill Harris' request, we need the following information pulled from the IRIS database for Space Shuttle Program mishaps:

Scope:

- All Type A, B, C mishaps (people and property)
- Space Shuttle Program only (if possible)
- Timeframe: 1993 - 2003 at a minimum, back to Challenger if possible

Requested Fields:

- Center / Site
- Fiscal Year
- Case #
- Case Category (A, B, C) -- or is this the same as Impact Summary?
- Contract #
- Description of Event
- Impact Summary -- or is this the same as Case Category?
- Class of Equipment Damaged (Flight Hardware, GSE, Facility, Pressure Vessel, Motor Vehicle, Aircraft, Other)
- Final Damage Amount
- Actions Taken

/e would prefer the data be dumped into Excel so that we can expeditiously manipulate the data. We also eed the data as soon as you can provide it. If I have misrepresented any of the data fields or have asked for omething that is not in the system, please let me know. Feel free to call me if you have any questions. hank you for your willingness to support this important action.

harla Ostr wski
nited Space Alliance
orporate Environmental, Safety, & Health
hone: 281.280.6593

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 07:30:31 -0500
To: gary.w.johnson@nasa.gov, jerry.b.holsomback@nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: PAR/FRR Decision Process (SMA Role) (Updated)
Cc: yolanda.y.marshall@nasa.gov, pete Rutledge <prutledg@hq.nasa.gov>,
prichard@hq.nasa.gov

Jerry and Gary,

I talked with Mark Kowaleski last evening after sending this and I think we are OK; we just need to make sure we have everything that SMA has direct control over. When Mark settles in this morning I'll get an update from him. Thanks for the support. I think testimony has been moved to Wednesday next week.

Jim

Jerry and Gary,

I believe we are working with JSC SR&QA to obtain the documented information about the risks that were dispositioned during STS 113 readiness process from the previous flight with evidence of foam shedding (STS 112?).

By 1000 am EST (9 your time) can we close the loop on whether the official documented record for the PAR and the FRR for this flight is available for us to read or if not by when we may expect it? We are going to be asked about foam discussions and I would like the transcripts of that readiness process.

If this has been worked with Mark Kowaleski up here in Code QE then let me know that also. I tried to call Mark K. this evening to check status but was unable to reach him at home.

This is a part of a larger body of work that we are trying to assemble before the weekend so it can be used Saturday and Sunday to prepare the Administrator for his testimony next week.

Regards,

Regards,

****

James D. Lloyd (Jim)

Acting Deputy Associate Administrator
Office of Safety and Mission Assurance

Headquarters Room 5U11
desk phone 202-358-0557

fax 202-358-3104

"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 06 Feb 2003 10:03:17 -0500
To: prichard@hq.nasa.gov, pete Rutledge <prutledg@hq.nasa.gov>,
jlemke <jlemke@hq.nasa.gov>
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Fwd: RE: PAR/FRR Decision Process (SMA Role)

Here is some of the data.

From: "ERMINGER, MARK D. (JSC-NC) (NASA)" <mark.d.erminger@nasa.gov>
To: "H - Lloyd Jim (E-mail)" <james.d.lloyd@hq.nasa.gov>
Cc: "MARSHALL, YOLANDA Y. (JSC-NA) (NASA)" <yolanda.y.marshall@nasa.gov>,
"JOHNSON, GARY W. (JSC-NA) (NASA)" <gary.w.johnson@nasa.gov>,
"HIMEL, MALCOLM J. (JSC-NX) (NASA)" <malcolm.j.himel@nasa.gov>,
"GLANVILLE, ROY W. (JSC-NC) (NASA)" <roy.w.glanville@nasa.gov>,
"JOHNSON, M. S. (SCOTT) (JSC-NC) (NASA)" <m.s.johnson@nasa.gov>,
"H - Kowaleski Mark (E-mail)" <mkowales@mail.hq.nasa.gov>,
"M - Adams Alex (E-mail)" <Alex.Adams@msfc.nasa.gov>,
"M - Mullane Dan (E-mail)" <Daniel.J.Mullane@msfc.nasa.gov>
Subject: RE: PAR/FRR Decision Process (SMA Role)
Date: Thu, 6 Feb 2003 08:53:50 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

The PAR Home Page address is:

http://wwwsrqa.jsc.nasa.gov/PAR/

The STS-113 PAR charts are posted on this link

http://wwwsrqa.jsc.nasa.gov/PAR/STS-113.htm

We had a presentation at the FRR Tag-Up on STS-112 ET Bi-Pod Foam loss

http://wwwsrqa.jsc.nasa.gov/PAR/DOCS/PARWEB/STS-113,%2011A%20JFRR/Overview/M-TDC-STS112BipodFoamLoss.ppt

-----Original Message-----
From: JOHNSON, GARY W. (JSC-NA) (NASA)
Sent: Thursday, February 06, 2003 7:17 AM
To: HIMEL, MALCOLM J. (JSC-NX) (NASA); ERMINGER, MARK D. (JSC-NC) (NASA); GLANVILLE, ROY W. (JSC-NC) (NASA); JOHNSON, M. S. (SCOTT) (JSC-NC) (NASA)
Cc: MARSHALL, YOLANDA Y. (JSC-NA) (NASA)
Subject: FW: PAR/FRR Decision Process (SMA Role)

Importance: High

FYI
-----Original Message-----
From: James Lloyd [mailto:jlloyd@hq.nasa.gov]
Sent: Wednesday, February 05, 2003 7:30 PM
To: JOHNSON, GARY W. (JSC-NA) (NASA); HOLSOMBACK, JERRY B. (JSC-OE) (NASA)
Cc: MARSHALL, YOLANDA Y. (JSC-NA) (NASA); pete Rutledge; prichard@hq.nasa.gov
Subject: PAR/FRR Decision Process (SMA Role)
Importance: High

Jerry and Gary,

I believe we are working with JSC SR&QA to obtain the documented information about the risks that were dispositioned during STS 113 readiness process from the previous flight with evidence of foam shedding (STS 112?).

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This is a part of a larger body of work that we are trying to assemble before the weekend so it can be used Saturday and Sunday to prepare the Administrator for his testimony next week.

Regards,

Regards,

****
James D. Lloyd (Jim)

Acting Deputy Associate Administrator
Office of Safety and Mission Assurance
Headquarters Room 5U11
desk phone 202-358-0557

fax 202-358-3104

"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

Jim

James Lloyd, 08:29 PM 2/5/2003 -0500, PAR/FRR Decision Process (SMA Role)

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 20:29:50 -0500
To: gary.w.johnson@nasa.gov, jerry.b.holsomback@nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: PAR/FRR Decision Process (SMA Role)
Cc: yolanda.y.marshall@nasa.gov, pete Rutledge <prutledg@hq.nasa.gov>,
prichard@hq.nasa.gov

Jerry and Gary,

I believe we are working with JSC SR&QA to obtain the documented information about the risks that were dispositioned during STS 113 readiness process from the previous flight with evidence of foam shedding (STS 112?).

By 1000 am EST (9 your time) can we close the loop on whether the official documented record for the PAR and the FRR for this flight is available for us to read or if not by when we may expect it? We are going to be asked about foam discussions and I would like the transcripts of that readiness process.

If this has been worked with Mark Kowaleski up here in Code QE then let me know that also. I tried to call Mark K. this evening to check status but was unable to reach him at home.

This is a part of a larger body of work that we are trying to assemble before the weekend so it can be used Saturday and Sunday to prepare the Administrator for his testimony next week.

Regards,

Regards,

****
James D. Lloyd (Jim)

Acting Deputy Associate Administrator
Office of Safety and Mission Assurance
Headquarters Room 5U11
desk phone 202-358-0557

fax 202-358-3104

"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

James Lloyd, 08:29 PM 2/5/2003 -0500, PAR/FRR Decision Process (SMA Role)

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 20:29:50 -0500
To: gary.w.johnson@nasa.gov, jerry.b.holsomback@nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: PAR/FRR Decision Process (SMA Role)
Cc: yolanda.y.marshall@nasa.gov, pete Rutledge <prutledg@hq.nasa.gov>,
prichard@hq.nasa.gov

Jerry and Gary,

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"Mission success stands on the foundation of our unwavering commitment to safety"
Administrator Sean O'Keefe January 2003

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Sat, 01 Feb 2003 18:27:41 -0500
To: robert.t.gaffney1@jsc.nasa.gov, wayne.kee-1@ksc.nasa.gov,
michael.stevens-2@ksc.nasa.gov
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: Points of Contact Emergency Preparedness "Columbia"
Cc: cathy.miller@msfc.nasa.gov, clyde.dease@ssc.nasa.gov,
Stephen.A.Turner@maf.nasa.gov

Corrected copy in BOLD. Thanks, Jon
X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Sat, 01 Feb 2003 17:39:44 -0500
To: robert.t.gaffney1@jsc.nasa.gov, wayne.kee-1@ksc.nasa.gov,
michael.stevens-2@ksc.nasa.gov
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: Points of Contact Emergency Preparedness "Columbia"
Cc: james.duffer@fema.gov, boconnor@hq.nasa.gov, jlloyd@hq.nasa.gov,
snakamur@ems.jsc.nasa.gov

The purpose of this message is to advise all Emergency Preparedness Coordinators, that Mr. David Whittle, NASA Mishap Investigation Team leader will be the person who directly requests resources from FEMA Region 6, Region 6 Director, Mr. Ron Castleman.

Points of contact are Mr. Whittle-728
Mr. Ron Castleman (940) 898-5433 and his Deputy Mr. Moises Dugan (940) 898-5433

FEMA Headquarters - Mr. Dave Duffer- Operations Director (202)- 646-2430,

FEMA Headquarters Emergency Support Teams (EST) Mr. Matt Bettridge, (202) 646-2430.

Kennedy Space Center Emergency Operations Center 321-867-7575
Mr. Wayne Kee, On Site-NASA Emergency Preparedness or Mr. **Roger langevin**

Please keep these numbers under control.

Regards, Jon

Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589

FAX (202) 358-3104
"Mission Success Starts with Safety"
Jonathan B. Mullin
Manager Operational Safety
Emergency Preparedness Coordinator
Headquarters National Aeronautics and Space Administration
Phone (202) 358-0589
FAX (202) 358-3104
"Mission Success Starts with Safety"

From:
To: "'bill.loewy@hq.nasa.gov" <bill.loewy@hq.nasa.gov>
Subject: Urgent! Fox News Channel: New York Times article
Date: Mon, 3 Feb 2003 10:26:52 -0500
X-Mailer: Internet Mail Service (5.5.2653.19)

Hello,

The New York Times today reported that there were 5 panel members and 2 consultants fired from the Aerospace Safety Advisory Panel. I am trying to find the names of the individuals removed from the panel.

Thank you,

Fox News Channel
1211 Avenue of the Americas
New York New York 10036

From:
To: bill.loewy@hq.nasa.gov
Subject: question for a daily news story
Date: Fri, 14 Feb 2003 11:05:55 -0500
X-Mailer: Internet Mail Service (5.5.2653.19)

Mr. Loewy:
I've been tasked to find out the budget for the Office of Safety and Mission Assurance since its founding. I was wondering if you or someone else can send to me the overall budget for the OSM for each year. I need this for a daily news story so I'm hoping someone can help me today.
Thanks in advance.

2730 Enterprise Road, Suite A
Orange City, Fla. 32763

Date: Wed, 26 Feb 2003 18:35:13 -0800 (PST)
From
Subject: i have a question...
To: bill.loewy@hq.nasa.gov

why do all of our space shuttles get launched from Florida. some friends & i were discussing this & some of the reasons were : 1) weather... more window of oportunity 2) equatorial pull = less gas ? 3) fall outs & aborts can go into the ocean.

another question raised was : do any launches go over the United States? we do not believe so, again due to fall outs & aborts.

Thank you for your time & consideration.

Wayne R. Frazier, 12:31 PM 2/10/2003 -0500, Question from Paul Pastorek:

X-Sender: wfrazier@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 12:31:33 -0500
To: Laura Giza <lgiza@mail.hq.nasa.gov>,
Puma Salgado <vsalgado@mail.hq.nasa.gov>
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>
Subject: Question from Paul Pastorek:
Cc: jlemke@hq.nasa.gov, jmullin@hq.nasa.gov, prutledg@hq.nasa.gov,
jlloyd@hq.nasa.gov

Our final version after review by our Directors.


Question from Paul Pastorek1.doc

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Wayne R. Frazier
NASA Headquarters - Code QS
Office of Safety and Mission Assurance
Washington,DC 20546-0001
Ph: 202 358-0588 Fax: 202 358-3104

~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~

"Mission success starts with safety"

Question from Paul Pastorek:

What was the genesis of the MAB (i.e., CAIB)?

One of the major organizational response lessons learned from 51-L was that NASA had no top-level integrated agency response plan for a major shuttle program disaster. The Rogers Commission report was critical of NASA's slow response.

Prior to 51-L, each element (e.g. booster, main engine, external tank) had their own response plan. What was lacking was a top level coordinated Agency contingency process. As part of the Agency response to 51-L, the Office of Space Flight developed a top-level contingency response plan plan now called the "Agency Contingency Action Plan (CAP) for Space Flight Operations (SFO)." . This plan defined the Agency's response to major program contingencies.

One of the responses to an accident is the need to quickly form an investigation team. The contingency plan and its implementing Shuttle program-level documents establishes an interim quick response team called the Mishap Investigation Team (MIT). The MIT's job is to serve as a rapid response team to arrive on site quickly and began to preserve evidence, collect statements, and protect the site.

The contingency plan pre-designates a top-level, administrator appointed board that is independent of NASA to investigate the facts of a major space flight program mishap. The board is independent of NASA to blunt post-Challenger criticism that NASA was investigating itself. This board is composed of senior military and civilian persons experienced in safety and accident investigation, and who have the ability to bring resources from their respective organizations to support the independent investigation. NASA notifies pre-selected board members of their prospective role to support an independent investigation and gives them training on a periodic basis. That standing board is called "International Space Station and Space Shuttle Mishap Interagency Investigation Board". That board with several additions, (Adm Gehman, Roger Tetrault) became the CAIB.

MSFC Contingency Working Groups

ernal Tank
lunafo, Chairperson
fice 256-544-2566
12
tte, Alternate
fice 256-544-7231

ster, Dynamics
tley, Electrical
ettel, Ex-Officio
nelser, Ex-Officio
ayton, Integration
ntz, Materials
arks, Materials
rtis, Orbiter
eckhoff, Photo Analysis
lmes, Project/TPS
neycutt, Propulsion
mecek, S&MA
ek, Secretary
gers, Structural
van, Thermal

ng Room:
C Room A209
544-8056
MSR

Solid Rocket Booster

P. Rodriguez, Chairperson
Office 256-544-7006

J. Lusk, Alternate
Office 256-544-1907

G. Story, BSM's
M. Meadows, Electrical/Instrumentation
T. Malone, Materials
T. Rieckhoff, Photo Analysis
J. Davis, Pyro
R. Tucker, S&MA
J. Gentry, Structural
J. Townsend, Systems Analysis
D. Davis, Thermal
B. Pagan, TVC

Working Room:
HOSC Room A284
(256) 544-6991

Reusable Solid Rocket Motor

P. McConnaughey, Chairperson
Office 256-544-1599

D. Moore, Alternate
Office 256-544-2598

A. Schorr, Alternate
Office 256-544-5837

T. Nesman, Dynamics
L. Semmel, IRE/Explosion
J. Townsend, Loads
T. Lawrence, Materials
T. Rieckhoff, Photo Analysis
C. Cianciola, S&MA
P. Lampton, Solid Propulsion
J. Hawkins, Structural
L. Clayton, Thermal

Working Room:
HOSC Room A201A
(256) 544-2118

Space Shuttle Main Engine

H. McConnaughey, Chairperson
Office 256-544-1165

H. Tepool, Alternate
Office 256-544-1224

T. Fiorucci, Dynamics
L. Maddux, Engine Systems
R. Lambdin, Materials
T. Rieckhoff, Photo Analysis
R. Patrick, S&MA
C. Horne, Software and Controls
P. Aggarwal, Stress

Working Room:
HOSC Room A261
(256) 544-6599

Shuttle Systems

J. Brunty, Chairperson
Office 256-544-1489

J. Townsend, Alternate
Office 256-544-1499

C. Hall, Dynamics
G. Dukeman,Trajectory and Thrust
W. Bordelon, Aerodynamics
J. Eldridge, Structural
K. Choinacki, Timeline Reconstruction
D. Johnson, Atmospheric Environments
D. Mullane, S&MA
T. Rieckhoff, Photo Analysis
R. Sheppard, MPS

Working Room:
HOSC Room A280
(256) 544-2184

02/6/03, 2:00 PM

Questions and issues submitted to NASA Headquarters Office of Safety and Mission Assurance for consideration by Bryan O'Connor.

Questions are listed in the chronological order in which they were received and the author is noted.

02/03/03, 13:18 PM, John Castellano, Code QE

1. A possible area of review and assessment could be in the performance of the two ET configurations (LWT and SLWT) . Specifically looking at post-flight orbiter tile damage vs. the ET used for the flight. Further an evaluation of ambient atmospheric conditions (temp, dew point) at time of launch plotted against tile damage and ET might also be informative. This sort of assessment was extremely useful in the Challenger investigation showing a definitive relationship between O-ring blow by and temperature (greater blow by as the temperature was lower).

02/03/03, 3:40 PM, Lawrence Davis, OSMA, DFRC

2. It seems like the astronomer that has photos of a possible event near Bishop, California may provide a time and impact prediction that should be scoured for the earliest clues. It will be worse than a needle in a haystack but again, a tile could have survived and landed in a remote area that could be easily seen from an aircraft or ground vehicle. Much of that area is restricted to the public and I have had some access previously that might be easier to activate, if an impact area may prove to be inside these areas.
3. A Pereto should be done to establish trend information on tile damage.
4. We understand the LOX tank was an older model. The age and condition of that tank should be investigated and data impounded.
5. The APU's should be investigated since they are critical to powering the flight controls.
6. The Dryden Range Safety personnel in association with the AFFTC have a software prediction algorithm to predict the profile of an object falling through the atmosphere. Larry Schilling has volunteered to help with that analysis, even backtracking through any photos to intersect the positional data. Variations in estimates of anything that might have fallen free will provide a larger footprint but at least it will be limited somewhat. We used this capability to find the ER-2 hatch a while ago and it led us directly to the hatch.
7. The Range here collected data from the Columbia as it traveled north of our position, although not tasked to do so. We have impounded that data. We have that data, if you need it. We were at work supporting a UCAV mission, anyway. Analog tracking radar such as recorded here may provide a secondary return enabling establishment of actual separation events with size, velocity and time.

8. Bill Shelton, AFFTC, and our Range personnel also are pursuing working with the doppler FAA radars to correlate any secondary returns in the re-entry path with our radar tracking data.
9. NORAD may have data to establish space debris patterns.

02/03/03, 6:27 PM, Frank Robinson, SATD, GRC

10. Assembling GRC payload safety staff to independently assess the hazards of the GRC payloads on STS-107 and their potential for having caused a problem with the orbiter.

02/04/03, 7:40 AM, Alan Phillips, OSMA, LaRC

11. Has corrosion of Orbiter components (from an aging aircraft perspective) been addressed and eliminated as a primary or contributing cause of the mishap?
12. Have inspections or maintenance activities identified any concerns?
13. What, if any, areas of the Orbiter do the current inspection plans not cover?

02/04/03, 8:00 AM, Bill Wessel, SATD, GRC

14. The construct on the event mishap sequence timeline probably only is looking at re-entry to vehicle loss initially. Probably has been accomplished but can lead to real insight when placed against the 100 plus data points of a successful vehicle return. Then, of course, the tougher issue is the finalization of the set of failure events for the fault trees and MORT diagrams. (Bill and his staff will provide more questions in a few days).

02/04/03, 8:11 AM, Faith Chandler, Code QE

15. The foam insulation could have produced damage for a number of reasons. One possibility is that the foam was denser than originally believed, consequently making the analysis inaccurate. The materials could have been denser/harder than originally believed due to some of the following:
    a. Problems with the quality/age of the material used (perhaps the materials used to produce the foam insulation were not the type, chemical composition, or quality that were required).
    b. Changes/errors in the manufacturing process.
    c. Problems with the quality, age, or type of adhesive materials used (if any).
    d. Changes/errors in applying the foam.
    e. Changes/errors in preparing the ET surface (Perhaps paint or other came off the ET when the foam came off during launch).
    f. Debris (e.g., FOD or other material) intentionally or unintentionally placed under the foam.
    g. Changes/errors in final preparation of the outer foam surface after application.
    h. Ice build up on the foam.

i. Another possibility is that other debris was flying in the same air stream as the foam (perhaps behind it) and this (which may not have been visible to the camera because the foam blocked the view) may have caused significant damage.

02/04/03, 8:27 AM, Steve Newman, Code QE

16. **External Tank Blowing Agents** – Main ET acreage blowing agent CFC-11 replaced with HCFC-141B. Other blowing agents for closeout items at the Cape also replaced (I am researching/finding old files). Re-qualification of new materials and processes was obviously a critical concern. At some point the materials branch of the Fault Tree will want to closely examine this issue.
17. **External Tank Precision Cleaning Agents** – Even more critical in both the ET and especially the SRM is surface preparation (precision cleaning) of metal pre-bonding. Any separation of material from a metallic substrate raises questions related to the PROCESS branch of Fault Tree. In this case it is a process and a material question. The SSP, prior to the phase-out used copious amounts of Freon 113 (CFC-113) and a material called 1,1,1, TCA for precision cleaning prior to bonding operations. Need to investigate and identify the current surface preparation process for Orbiter bi-pod attach struts.
18. **Method of Evaluation in Moving From the What to the Why** – It may be useful to take a process failure perspective. For example, if we identify the triggering event as foam breaking off the Orbiter bi-pod and hitting the Orbiter we will want to pursue:
19. **Potential Process Failures:**
    a. Bi-pod foam material integrity
    b. Bi-pod foam application/surface prep process
    c. Bi-pod foam application process human error, etc.
20. **In-Line Critical Process Controls** – Critical importance to identify in-place control processes for each critical sub-process involved. Why did control fail?
21. **External (independent assessment) controls over critical process** -- What external independent control processes were operative? (DCMA, NASA QA, USA second set of eyes?)
22. **Resource/Requirements Balance enabling the critical process** – Critical process integrity, water pressure, staffing, time factors, etc.
23. **Independent reviews of USAGO** – Please note that we have three recent (in last four years) independent assessment reports on various aspects of SSP/USAGO processes, including a workforce survey of 72 wrench turners. These may become important later.

02/03/03, 10:27 AM, Pete Rutledge, Code QE

24. What is the failure mode of Shuttle tires overheated to the point of over-pressurization? Do they fail in a benign manner or do they explode? Could a small, survivable thermal leak into the wheel well have resulted in tire explosion, resulting in unsurvivable structural damage to the underside of the Orbiter?

02/04/03, 10:29AM, Mark Erminger, JSC

25. Outline of considerations for the MIB provided to Bryan O'Connor via e-mail. Attached file with reference e-mail printed and catalogued.

02/04/03, 10:47 AM, Pam Richardson, Code QE (no e-mail record)

26. Ron Dittemore mentioned yesterday the changes in temperature at various locations on the Orbiter during reentry. He called this evidence of a thermal event. If indeed a thermal event was happening and we have some concern that damage was done to the Orbiter on ascent, have we looked at the ascent data of the same sensors (and others) to see if we have any indication of thermal events (however slight) of those sensors on ascent?

02/04/03, 1:58 PM, Bert Garrido, SHIA, KSC

27. Given the fact that the crew did not have the capability to check tiles through an EVA, was the use of ground and/or satellite imaging was considered to check the condition of tiles?
    a. Assuming alternate methodologies of acquiring/assessing tile conditions exists, what actions (rescue, etc.) would have been taken with this data?
    b. Assuming that the condition of tiles was known early on to be a problem for reentry, what rescue options exist?

28. Is there any data to exonerate left main gear pyro from a possible premature firing to create or contribute to the abnormal wheel well conditions that might have resulted in excessive wing drag heating and loss of measurements?

29. Were the roles and responsibilities of Safety and Mission Assurance personnel and organizations clearly defined and understood prior to the mishap?

30. If NASA suspected inherent design weaknesses with external tank insulation (several past reviews indicated potential insulation separation issues), were any action taken to improve the design, material, and/or manufacturing?

31. Were the safety recommendations from the Roger Report and the McDonald Report properly addressed and disposition by NASA?

32. There were approximately 13 cylinders containing about 49 liters of a Hydrogen and Oxygen mixture (in addition to small methane and propane cylinders) in Space Hab. Pressures for the Hydrogen-Oxygen mixture varied from two 10-liter cylinders at 286-300 psi to three 0.73-liter cylinders at 1945 psi. Could these have contributed to the mishap?
    a. About how many of the Hydrogen-Oxygen cylinders remained after the mishap?

b. Since payload potentially dangerous materials required secondary and tertiary containment, what was the secondary and tertiary containment for these flammable pressurized containers if a leak provided?
c. When were the cylinders last used, and what is done with the "empty" cylinders? Could these have had any structural problems?

02/04/03, 3:43 PM, Michael Stamatelatos (provided to Pete Rutledge, 02/02/03, 8:00 AM), Code QE

33. A potential scenario for STS-107 that has not been considered in the Space Shuttle PRA is the following one:

a. A piece of insulation from ET de-bonding detaches and impacts the orbiter.
b. The impact causes removal or partial detachment of tile(s).
c. Alternately, the impact causes an indentation of significant size.
d. Damage progresses due to air loads and thermal heating during ascent but without great consequences due to decreasing atmosphere density.
e. During reentry, the mechanical and thermal loads from aerodynamic heating continue the damage to the orbiter that began during launch.
f. The aerodynamic heating and mechanical loads are exacerbated by the presence of local hot spots generated in the areas of damage.
g. Heating increases and propagates to the orbiter through conducting surfaces.
h. Fuel lines or cells become exposed to excessive heating and explosion occurs.
i. Important points of this scenario that were not considered in the Shuttle PRA are: damage incurred in the ascent phase continues in the reentry phase, and heating in damaged area causes hot spots, i.e., higher thermal and structural loads than heating of smooth surfaces.

02/04/03, 3:43 PM, Mac Himel, SR&QA, JSC

34. Pre-Launch Tile Evaluation and Acceptance
    a. What was the process used to evaluate and accept the STS-107 tiles for launch?
    b. What was the process used to evaluate and accept the External Tank foam insulation for launch?
35. Launch Debris Photography Evaluation
    a. What was the process used on the STS-107 launch and ascent photography to review, identify, and evaluate possible damage to the Columbia as a result of debris from the External Tank and other sources? Was there any telemetry data that could be used to add to the evaluation?
    b. What were the results from the **initial** photography evaluation?
    c. What was the expertise and experience of the individuals involved in the **initial** photography evaluation?

d. What were the results from the photography evaluation **after** "NASA declared an emergency?"
e. What was the expertise and experience of the individuals involved in the photography evaluation **after** "NASA declared an emergency?"

36. Launch Debris Risk Evaluation
    a. What was the process used on the STS-107 launch to model, evaluate, and determine quantitative risk to Columbia from the debris results?
    b. What were the quantitative risk results from the **initial** debris model evaluation?
    c. What was the expertise and experience of the individuals involved in the **initial** debris risk model evaluation?
    d. What were the quantitative risk results from the debris risk model evaluation performed **after** "NASA declared an emergency?"
    e. What was the expertise and experience of the individuals involved in the debris risk model evaluation **after** "NASA declared an emergency?"
    f. What was the SMA and SR&QA organization involvement in the debris risk model evaluation and acceptance of the risk to Columbia during reentry?
    g. What was the expertise and experience of the SMA and SR&QA individuals involved in the **initial** acceptance of the risk to Columbia during reentry?
    h. What was the process used by SMA and SR&QA organizations for reviewing, identifying, evaluating, and accepting risk to Columbia during on-orbit operations?
    i. What quantitative risk methodology was used in the SMA and SR&QA process?

02/04/03, 3:51 PM, John Castellano, Code QE

37. In status briefings, Ron D. mentioned that during re-entry the Orbiter Flight Control System saw excursions that exceeded the family of previous experience but within the system margins utilizing elevon and RCS attitude control. The cause of these excursions was attributed to drag on the left wing, possibly due to missing tiles. Additionally it has been reported that the temperature rises measured at various locations (wheel well, left fuselage etc.) were in the neighborhood of 40-50 F (*Pam note here, Dittemore has never said "Fahrenheit")* not high enough to represent a structural problem. Previous flights have come home with some very significant tile damage (dings) as well as some missing without causing a problem. Undoubtedly this previous experience is a factor in the analysis and belief that this mission (and potential damage) did not represent a threat to flight safety. If we postulate that elevated temperatures (up to the point of loss of vehicle) be ruled out as the factor (thus precluding a structural failure) and that the drag on the left side was due entirely to the progressive loss of tiles (un-zippering) then at some point in this un-zippering, the flight control system authority to safely maintain attitude and control will be become insufficient. Perhaps some of the Flight Control folks are already looking into running simulations to determine tile loss vs. margins since it seems intuitive

that at some point in tile loss that the attitude control system will be overwhelmed and unable to compensate.

02/04/03, 4L31 PM, Martha Wetherholt, Paul Boldon, Code QE, Sharyl Butler, JSC, and the IV&V Center

38. Telemetry:
    a. Comparison of this flight's telemetry to previous flights during re-entry
    b. What telemetry is there?
    c. Was the order of anomalies significant? Had any such scenarios been seen before? Are there any software checks or possible control changes possible based on any of these or other telemetry readings? – i.e. how flexible is the software to detecting flight, control surface, anomalies and reacting to them?
    d. Is there a need for new/additional telemetry for determining and reacting to detected anomalies? What could some of these be? What would be the added cost vs. benefit?
    e. What of the nose cone camera? Was it on this mission? Why not?
    f. Will we need to always assure a means to review tiles on orbit for damage (micro meteoroid, launch damage, on orbit collision with other vehicles, debris, etc.)?
39. Tile Condition DB:
    a. Are there records/database of each of the tiles' condition for each shuttle at time of launch?
    b. Is there any mapping of these data points from one service to the next or is each time the shuttle checked as it stands, zero based analyses & checkout, with no comparison to prior service issues? If this is done, what, if any comparisons, changes, minor anomalies exist?
40. External Tank:
    a. Are there records of the External tank foam condition and how it was determined? Manufacturing and application process?
    b. Is any of this software controlled?
    c. If so, are there records of the software used and if it had been recently "calibrated."
    d. Where are these records if they exist? Michoud?
41. Software /Telemetry:
    a. What changes were made to the shuttle software for this mission?
    b. Are these changes upgrades made to all shuttles?
    c. What were the reported concerns at the FAR and PAR for this mission for software?
    d. What was done about them?
    e. What Check out and launch procedures (LPS) were used to verify the software, the telemetry, the control?
    f. Are the simulators and models used to test flight software up to date?
        - What do they check for?
        - How are they used?

- Can they be used to run thru various de-orbit/landing maneuvers with various fault scenarios?

g. How complete was the testing for the software for this flight? Where are the records? Again, were any changes for weight and the distribution of that weight?
h. Can the telemetry detect a weight shift within the payload areas?
i. Can telemetry detect structural changes to the outside of the shuttle particularly to the control surfaces?

42. Software Control of Reentry
    a. What, if any, software is used during the reentry maneuvers?
        - What is the status of that software?
        - What version was used?
        - What are the more recent changes to orbiter control software and why were they made – what is the record of testing for this software?
    b. Were there any data changes for the weight and configuration of this flight of the shuttle?
        - How were these configuration managed and how were they verified?
    c. Were any software control or data anomalies noted:
        - During on orbit maneuvers?
        - During translation to de-orbit?
        - During decent?
        - Is there a software simulation that these could be checked out on? If not should we make one?

43. Payload interactions
    a. What payloads were still active?
    b. How/what connections (electronic/mechanical/etc.) between the shuttle and the experiments? The SpaceHab?
    c. Could any loose object within the payload areas cause damage? What could come loose? What could shift?

44. Other:
    a. Could we tell if there was micro meteoroid/atmospheric damage on orbit or on decent? What level of penetration, when, and where could cause the loss of tiles?
    b. Shortcuts on inspection and fixes are at times approved and appropriate but a combination of them may lead to a problem when the right set of actions and reactions are set in motion by what seems to be an unexpected or innocuous event and response.
    c. What were open software problem reports (SPR) for this flight?
    d. Can any of the open SPRs be linked to the Columbia accident scenario?
    e. Are there any shuttle hazard reports that identify software controls during reentry that would pertain to the Columbia accident scenario?

45. Palmdale:
    a. Call former SMA from Palmdale Space Shuttle who can comment on workmanship, MRB activities, open paper, successes, schedules, etc. during Orbiter upgrades and maintenance.
    b. Consider requesting lists of Federal and Contractors who have worked on NASA Resources.
    c. Provide all DRLs, contracts, and formal reviews.
    d. Records of NASA Headquarters (Code Q) oversight of this location.

02/05/03, 11:54 AM, Wayne Frazier, Code QS

46. I surmise that at the altitude where thermal escapes within the wing and fuselage structure were first noted, that there is not enough O2 in the atmosphere to support combustion. Therefore oxydizers would have to be present (if it was a chemical-based fire) to support combustion, i.e. a leak in an O2 line. I am sure the teams will look at the LOX tanks and lines in the wing root structure and fuselage for signs of leakage, loss of pressure, etc. What is the certification on those tanks and lines? What about their cycle life?

02/05/03, 3:01 PM, Roy Malone/Tom Hartline, SMA, MSFC

47. Has the shape of the debris field been examined to determine if there is an initial distribution area, followed by a larger distribution area? Whatever component initially departed the vehicle (possibly a wing section), it would have a different debris field, possibly at a slightly different angle than the reentry angle. This could give you a clue of where the initial failure occurred on the vehicle.

48. One of the key pieces of evidence used in mishap investigations is the different types of fracture surfaces based on how the structure failed. Whether the fracture surface was ductile overload, or fatigue failure could determine which components failed from the initiating event, which failed from subsequent breakup and which failed due to ground impact. However, with the high temperatures encountered during the reentry phase as breakup was occurring, the fracture surfaces may not have the normal fracture surfaces encounter in a typical aircraft investigation. Has any testing been done to try to determine what the different fracture surfaces would look like after exposure to high reentry temperatures? Although much of the fracture surface details may be lost, it is possible that some evidence may remain. Photos or samples of these tests may be useful to the on-site Investigation Team to help determine which debris components could have been involved in the initiating event.

49. Does the MIT have personnel with significant experience in the Space Shuttle Main Engine hardware, able to aid in identifying recovered SSME components? Much of the SSME turbine hardware may survive the high temperatures of reentry. Although items such as turbine blades might be obvious, items such as inter-turbine coolant tubes, may not be.

50. Are there plans to do impact tests (aviation chicken gun) with material of the size and density of the ET insulation to determine:
    a. Could the foam crack the reinforced carbon-carbon (RCC) leading edge?
    b. Could it impact the tiles to cause cracks or failure of the tiles?
    c. Could it impact tiles with a glancing blow and weaken the tile bonding, causing tile loss when encountering reentry forces?

51. If there was a loss of thermal integrity on the left wing, which caused internal heating, is it possible that heating of the aero-surface hydraulic systems would have caused an incorrect mechanical output to the elevons to the point where the orbiter departed from controlled flight, causing the catastrophic breakup? Could this have resulted in the loss of the orbiter without having an initial structural failure being the initiating event?

02/05/03, 4:01 PM, Bill Wessel and SATD staff, SATD, GRC

52. Somewhere throughout the media (I don't remember where) I read there were 200+ modifications to the Columbia since its last mission. There was a lot of coverage about replacing the H2 fuel lines. My position on mishaps is that they are usually caused by changes to a system that were not properly evaluated. In the chemical industry, this is especially true with so called "temporary" changes. I would hope someone is carefully scrutinizing the associated documentation with ALL of the changes (even those considered replacement in kind) to the Columbia since it last flew (or maybe prior to that). They (mishap team) need to confirm that changes were properly evaluated for safety concerns. This would include a review of the hazards analysis, and the follow-up to any action items that were generated from those hazards analysis. They would even have to question if the personnel in the hazards analysis (assuming they do them) were qualified to make safety/mission related judgments on those changes. Changes could be hardware, software, procedures, or personnel related.

53. I would be interested in the last mechanical integrity/structural review and inspections for the Challenger. Were there any action items generated from that? How do the Challenger inspections and resulting quality data stack up against the others in the fleet?

54. Request the left side thermocouple data for all of the Shuttle flights during landing approach (including the Columbia's previous missions) to determine whether the reported rise in the left side temperatures were typical or an anomaly.

55. Examine the left side temperature data during lift-off to ascertain if any unusual rise in temperatures took place which may indicate that a thermal tile had become loosened as a result of the reported impact of the tank insulation hitting the Shuttle. This assessment will require comparison of temperature data with other Shuttle flights where no such event occurred.

56. Were the computerized flight commands typical of previous landings? Did the thermal histories of the vehicle during the last flight maneuvers show any evidence of unusual behavior as evident by comparing the flight commands with the temperature data on a comparable time scale?

57. The debris that hit one of the orbiter wings during launch could have done some internal damage to the mechanical/electrical systems regardless of the impact point not being on the heat shielded side of the wing. A gash in the wing's surface could have occurred leaving an entry point for intense heat to penetrate the hull.

58. The Commander, Rick Husband, had only one previous flight (STS-96) to draw his experience upon. The Pilot, Bill McCool, was making his maiden trip. I question the combined experience of these two individuals. USAF jets and the orbiters are not the same type of aviation machines. If the orbiter was on auto-pilot at the time of the accident, or if the commander and pilot attempted to correct the flight aberration at the time of accident, will have to be resolved through the continuing investigation process.

59. It appears to me that a combination of missing tiles, damage to the wing, the rolling/yawing of the orbiter during reentry created a heat spike that penetrated the normal protective capabilities of the orbiter's hull.

60. Is there any historical data for temperature rise, both rate and total, for any past shuttle area that had lost or damaged tiles? If so, how does the Columbia data compare with it?

61. What is the comparison between the aerodynamic data for previous flights with damaged or lost tiles and the Columbia's?

62. What long-term effects are there from the material used to bond the tiles to the aluminum skin of the shuttle? How and how often is the skin inspected to ensure no damage?

63. Was there a temperature climb on the left forward wing box that would correspond to that shown at the wheel well and on the mid-fuselage?

64. Are there any motion or movement detection devices on the wings or at the attachment points on the mid-fuselage?

65. Would a loosening wing give an indication on any instrumentation prior to catastrophic failure of the wing attachment and how far ahead?

66. Could the drag be the result of a partial loss of the carbon leading edge?

67. Was the Columbia retrofitted for the wing modifications made for the Discovery and Atlantis? If so, could this have been a factor in wing loss?

68. Could damage have occurred to the Orbiter prior to re-entry such as coming in contact with debris large enough to damage the tiles?

69.

70. Was the Columbia in a favorable position to intercept the landing approach corridor at the correct altitude, speed, and angle of attack?

71. Did data indicate attempt of the pilot to override the auto pilot system at the time of the last communication?

72. Were there any discrepancies noted during Columbia's most recent inspection of the wing spars and stiffeners?

73. How was configuration control handled for Columbia upgrades?

74. What records were kept of Shuttle wing incident during launch?

75. Who made the decision that the Shuttle was safe after losing tile?

76. Are there similarities of tile damage on other Shuttles?

77. Were there any indications of problems with tiles while Shuttle was in space?

78. Where is list of data reporting requirements?

79. List and interview all relevant personnel who physically worked on Shuttle.

80. List and interview of all eyewitnesses.

81. Review all NASA management decision hierarchy.

82. Any manufacturing changes in tile? Check with company officials.

83. Based upon what I heard from the media coverage this weekend, it sounds like debris take-off on at least six other launches had been noted but did not cause any damage. I would want to investigate all of the incidents, type of debris, why it could not be controlled during take-off knowing that, although it may not have caused damage on any given launch, it might have the potential to.

84. While it is too early to know the cause of this catastrophe, I have to assume that any time there was debris hitting the shuttle on take-off, they did fully investigate the causes and ways to control it; and that controls were tried.

85. Has any type of escape mechanism been considered for astronauts? If not, are there reasons/facts that would make death unavoidable for the shuttle occupants, if any failure occurred?

86. In support of your request, in light of the "insulated material striking the left wing," were national technical means (imaging satellites, GEODSS, or some similar system) used in determining if the tiles under the left wing or landing gear doors had been knocked off? A search of ground/sea areas, in the vicinity of where the shuttle was when the "insulated material" came off, would be in order to see if any tiles were removed.

87. Even if the tiles were intact, could deformation of the leading edge of the wing (caused by material strike) result in instability at high speeds or uneven heat distribution?

88. Could the same deformation cause an increase in internal (structural) stress (from vibration) thus create a failure at high speeds?

89. From media coverage, it seems that the focus is on damage to the wing from a piece of insulation. My question is this: Could the accident have been caused by an experiment on board that was either not secured or that had a catastrophic failure (relief device, etc.)? It is my understanding that the last signal received was that of loss of tire pressure. Could this have been the first evidence of a multi-stage catastrophic event?

90. From what I have read and heard, there was a temperature variance in the left wing areas during the time of the accident. My questions are: Were the sensors reading nominally during the accent of Columbia before SRB separation and before Main Tank separation? Was there any indication of stress of or trauma to the left wing empennage?

91. What is the highest expected tile temperature during shuttle re-entry? (Degrees F)

92. What is the temperature gradient across the tiles? (Degrees F)

93. At what temperature are the tiles no longer functional? (Degrees F)

94. How many original tiles were still on this shuttle? Which tiles were replaced on the shuttle before this launch and where?

95. The shuttle is supposed to carry a tile repair kit to do temporary fixes to the shuttle before re-entry? Did the shuttle have one of these kits, if not, why?

96. Why wasn't an EVA done on orbit to visually inspect the shuttle?

97. Was there an EVA suit available on the shuttle for the astronauts to use to visually inspect the shuttle for damages?

98. The article I was quoting earlier came out of an Associated Press Release quoting Ron Dittemore from JSC. He indicated that the Columbia wing had been damaged in a 1992 flight. I wonder if this was in any way taken under consideration when they were analyzing the recent impact by the foam insulation.

99. Could Group Think create a problem with reviewing safety of flight concerns? This came to light Saturday when the Shuttle Project Manager was questioned by the media. He commented on the passion people at JSC had for the space program and they were all one family in this passion. The flag that came up for me was during the multiple reviews of the insulation coming from the tank and hitting the Shuttle. Could this "one family passion" cloud the review process? Were the multiple reviews all done from one Center? How many serving on the review panel were outside of the reviewing Center and possibly outside of NASA? If there truly was a unanimous agreement from the multiple reviews that this was not a safety of flight issue that in of itself would have raised many red flags.

02/05/03, 5:30 PM, Bert Garrido and team, SHIA, KSC

100. We used to use chase planes - granted this was too high, but possibly they could have cameras that downlink real-time. This is probably cost prohibitive since we haven't done it in years.
101. We should use either video or digital cameras more. We could have seen the ET condition before landing and retrieving films.
102. Does the video show ET foam striking the forward bi-pod before striking the Orbiter? (to me it looks like a small piece then increasing in size as it went by the bi-pod - i.e. any bi-pod hardware affected as well)
103. Were there any plans to do a mockup of the impact, i.e. instead of just more analysis?
104. I understand they did not take images of the underside (they said due to it not be very valuable from an imaging standpoint) but couldn't that be used as more supporting data anyways?
105. Could a small burn through in the right place cause control failure and/or bad information to control systems?
106. Did the orbiter lose control because attitude control was at max compensation and still was not sufficient?
107. Was tile analysis/concern talked about to the MMT?

108. Was this ET stacked, and then de-stacked before? (Could that have stressed foam adhesive?)
109. What is the official number of times ET foam has come off during ascent?
110. Could internal failure of main landing gear system caused increased drag/tile damage?
111. Was all the wiring in question area replaced as part of the Orbiter wire rework?
112. Any tile problems in that area during Orbiter preps for flight?
113. ET-93, used on STS-107, was 1 of 2 remaining "lightweight" tanks. How long had this ET been in the inventory? Could the foam adhesive degrade over time? Is there a recommended shelf life?
114. ET-93 was integrated onto the SRB's for STS-107, and was later de-integrated. ET-116 (Super Lightweight Tank) was installed in its place to support STS-113. Could the integration, de-integration and then re-integration of ET-93 onto the SRB's contributed to the loss of Tank insulation at launch?
115. In July/August 2002, there was a concern with GOX Vent Arm Duct Tip ice formation and its elimination. What was the final outcome of this? Were steps in place to address this concern on the STS-107 hardware? Could this be a contributing factor to the release of FOD from the tank?
116. Were any inspections performed in space to validate the ground decision associated with "No safety of flight" concern due to falling debris during ascent?
117. Were there any processing issues associated with the landing gear doors or emergency pyro circuits (e.g. did the doors close easily or bind or interfere with tile)?
118. Were there any changes in the pre-launch pad walk down processes (like when the platform pin was found on a strut)?
119. Would any "normally seen re-entry damage" scenario lead to computer malfunction or inadvertent pyro (emergency landing gear) firing?
120. Did the tile crew or ET foam crew have an unusual amount of overtime?
121. Were there any ET processing issues or changes that would affect foam adhesion (tank surface must be clean and not have silicon residue from other ablative and insulating materials used on the tank)?
122. Were there previous ET MRBs or debris assessments that could relate to this mission?
123. Is there a clear understanding of NASA versus Contractor responsibilities for:
    a. Quality buys of tile work and ET foam work
    b. Safety of flight decision
    c. Checks and balances between them (is NASA and contractor thinking too close or blurred)?
124. Is there a limited-life timeframe or periodic replacement of tile requirement? If so, did any tiles go beyond some due date? Did the landing gear have plenty of cycles left?
125. Were wheel-well readings nominal or abnormal in ascent and descent?
126. Were all PRP requirements met for personnel who entered the vehicle during ground processing, especially aft compartment closeout at pad and bay/aft entry in OPF?

127. Were APU and fuel cell readings OK just before loss of communication?
128. Can orbital and atmospheric debris be ruled out?
129. Were there adverse contractor layoffs during Columbia processing?
130. Can structural inspections really see adequacy of joint integrity (e.g. would the boroscope see corrosion in critical joints)?
131. Is there a clear distinction in life-limits between use and time given the environments seen by Columbia (e.g. some items degrade with time, especially in corrosive atmospheres or accelerated environmental conditions, regardless of use)?
132. Is it clearly understood where vehicle burn through is acceptable and where it is not? (We've had flap damage)
133. Was there any pad construction work that could have left FOD?
134. Was there any crew intervention with flight controls or escape system during re-entry?
135. Did a Shuttle window blow out and strike the wing?
136. Did the SPACEHAB dent that was documented and approved on a flight Noncompliance Report rupture and contribute to the mishap?
137. Were there any issues with the SPACEHAB pressurization valves?
138. Was there a change in the ET foaming processing (new material, new employees, new tools, etc)?
139. Did Columbia return at a higher rate of speed, higher trajectory, and longer OMS burn?
140. Did all of the sensors in question have anything mechanical or electrical in common? For example were they all in the same wire bundle (harness) or did each sensor have its own path back to some type of bulkhead connector?
141. Was there a larger scale failure in a harness that serviced many sensors, or at some other transition point such as a connector bulkhead that could falsely point to multiple sensor failure as opposed to a problem somewhere else in the electrical path back to the instrumentation?
142. Did the landing gear door fall off?
143. Are Cola runs routinely performed for Shuttle re-entry?
144. Was one preformed for Columbia's landing?
145. How soon before de-orbit burn?
146. What are the Cola specifications for Shuttle re-entry?
147. Were the Cola runs acceptable for the Columbia landing? What were the Margins?
148. Was there ever a process for doing hazard assessment and contingency planning for various repairs in space based on possible launch hazards? Are there any contingency EVA plans generated from accepted launch risks or on-orbit accepted risks?
149. How is drag measured at such high altitudes and do the sensors for this purpose report pressures throughout the whole flight (take-off to landing)? The reason I bring this up is because had the left wing surface experienced some damage from the foam insulation, one would expect to see a drag differential (side to side) almost immediately. Even if there were not a substantial affect at the time

of the incident, you would expect to see something once the boosters were jettisoned.

150. Another area worthy of investigation is how the wiring is connectorized. There are many ways to attach wire to the pins on a connector. Most high reliability military series connectors use a radial-type crimping method. If stranded wire is used, it is essential that none of the individual strands are cut since that would compromise the integrity of the crimp. If a ground connection became compromised, and that ground was common to more than one sensor, that would lead to multiple sensors cutting out. I highly doubt it but if connections were made using some type of solder, or solder paste; temperature would definitely have an affect since different solder alloys are formulated to melt at different temperatures. There is also the possibility that solder connections are used in some of the sensors.

151. After award of LOD to DCMA for S&MA tasks, is Insight/Oversight by NASA adequate to provide sufficient management of delegated activities? Does NASA management efforts for these tasks consist basically of reviews of submitted weekly/monthly Activity Reports, or do regular field visits occur? How frequent are these field visits?

152. (Since the focus of the investigation appears to be shifting to the ET as the Root Cause, I think that these are very significant issues. I personally believe that we, NASA, rely too much on reviewing the submitted reports. On a side note, this was to be a Follow-on to the initial Effectiveness and Level of Insight provided by DCMA for NASA.)

153. Recent changes at KSC have significantly reduced and/or eliminated the amount of Insight/Oversight provided by the NASA S&MA community during Shuttle Processing activities. As a result of this, the majority of the critical processing decisions are made by the contractor, which as a private industry is in the business of making a profit. Has this shift in policy contributed to a perceived complacency by the contractor during processing activities? Are the decisions made based solely on Risk, or does the requirement to make a profit add a cloaked influence in the Risk Decision process? Does the removal of NASA S&MA from tasks other than MIPs, contribute to a less than desirable influence in the process?

154. (KSC 2000 and the new SPC have created an environment where NASA S&MA, particularly QA, have been essentially removed from the overall process. Elimination and/or reduction of these disciplines can only contribute to a serious degradation in hardware processing, and nonconformance reporting and correction efforts.)