

Michael Stamatelatos, 09:20 AM 2/3/2003 -0500, Re: Supporting Bryan on the Columbia Accident I

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

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"

smadir@lists.hq.nasa.gov, 05:55 PM 2/2/2003 -0500, Support for Bryan O'Connor on Columbia Ac

To: smadir@lists.hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Support for Bryan O'Connor on Columbia Accident Investigation Board (CAIB)
Cc:
Bcc:
Attached:

SMA Directors,

As you may know, Bryan O'Connor is the Ex-Officio member of the CAIB. Your help is needed. Bryan has asked that each of you think about what you would ask if you were on the CAIB. What issues would you want to investigate? You should e-mail your suggested questions or issues for investigation to Bryan (he has his laptop with him) and me; I will post the collection of questions/issues on the STS-107 PBMA work group site at:

<http://107team.intranets.com/login.asp?link=>

If you have not yet been invited to join this site, please let me know and I'll get an invitation sent to you.

Thanks,

Pete

, 09:23 AM 2/21/2003 -0500, Re: possible ET foam suggestion

Sender: pboellne@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 21 Feb 2003 09:23:40 -0500
To: Mark Kowaleski <mkowales@hq.nasa.gov>, Allan.K.Layne@msfc.nasa.gov,
Alex.C.Adams@msfc.nasa.gov
From: Paul Boellner <pboellne@hq.nasa.gov>
Subject: Re: possible ET foam suggestion
Cc: jolansen@ems.jsc.nasa.gov, mark.d.erminger1@jsc.nasa.gov,
pboellner@hq.nasa.gov, prutledg@mail.hq.nasa.gov,
Amanda.Goodson@msfc.nasa.gov, yolanda.y.marshall@nasa.gov,
wbihner@mail.hq.nasa.gov

Also, how about the plastic mesh imbedded in the ET foam in a near outer layer, like they use to wrap Christmas trees and poultry?

At 09:12 AM 2/21/2003 -0500, Mark Kowaleski wrote:
Hi Alex & Keith,

Here is an interesting ET foam suggestion. Credit goes to Code Q's Paul Boellner.

Is it feasible to reinforce the ET's foam, or at least in the bipod area, with some type of mesh material? Kind of like the way concrete is reinforced with steel mesh or automotive windshields are layered to prevent it from shattering. Maybe wire mesh, mesh fiberglass sheets, carbon mesh, wire cloth, Kevlar, etc. ??? At first glance this seems like something of interest? What about wire-wrapping the foam at set intervals after foam application - especially on the bipod area or at least on the Orbiter side of the ET?

Any history of having looked at this concept of reinforcing the foam?

Thanks,

Mark

NASA Headquarters
Office of Safety and Mission Assurance
Resources Analyst
Code Q
Phone: (202) 358-0548
Fax: (202) 358-2779

Mark Kowaleski, 09:12 AM 2/21/2003 -0500, possible ET foam suggestion

X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 21 Feb 2003 09:12:16 -0500
To: Allan.K.Layne@msfc.nasa.gov, Alex.C.Adams@msfc.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: possible ET foam suggestion
Cc: yolansen@ems.jsc.nasa.gov, mark.d.erminger1@jsc.nasa.gov,
pboellner@hq.nasa.gov, prutiedg@mail.hq.nasa.gov,
Amanda.Goodson@msfc.nasa.gov, yolanda.y.marshall@nasa.gov,
wbihner@mail.hq.nasa.gov

Hi Alex & Keith,

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Any history of having looked at this concept of reinforcing the foam?

Thanks,

Mark

Mark Kowaleski, 08:21 AM 2/20/2003 -0500, Re: Role of Safety and Mission Assurance (SMA) in C

X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Thu, 20 Feb 2003 08:21:39 -0500
To: James Lloyd <jlloyd@hq.nasa.gov>, mark Kowaleski <mkowales@hq.nasa.gov>, pphillip@mail.hq.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Re: Role of Safety and Mission Assurance (SMA) in COFR and Flight Readiness Process.
Cc: prutledg@hq.nasa.gov

Jim, I have not received any further comments from the center SMA POCs. Therefore, I believe we are good to go.

Mark

At 03:53 PM 2/14/2003 -0500, James Lloyd wrote:
Mark and Pepper,

I have gone through and accepted all the suggested changes including my own on the most recent version (rev. 4) and I have renamed this document as a final draft.

Rather than accept it as the final definitive report I want to wait until you have had feedback from your counterparts.

This is very descriptive and complete now and documents the participation by SMA in the decision processes; I will look to match this in the future with how the program developed their positions. Thanks for the work; it will serve well as a reference resource in the future.

Jim

James Lloyd, 11:47 AM 2/7/2003 -0500, Fwd: Analysis for the CAIB's Consideration

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 07 Feb 2003 11:47:26 -0500
To: hcat@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Fwd: Analysis for the CAIB's Consideration
Cc: boconnor <boconnor@hq.nasa.gov>, prichard@hq.nasa.gov,
pete Rutledge <prutledg@hq.nasa.gov>, jlemke <jlemke@hq.nasa.gov>,
a.h.phillips@larc.nasa.gov

Please read soon this very interesting analysis that should provoke some thinking. It has been passed forward from Langley.

X-Sender: a.h.phillips@pop.larc.nasa.gov
Date: Fri, 7 Feb 2003 11:06:30 -0500
To: Pete Rutledge <prutledg@hq.nasa.gov>
From: "Alan H. Phillips" <a.h.phillips@larc.nasa.gov>
Subject: Analysis for the CAIB's Consideration
Cc: Jim Lloyd <Jlloyd@hq.nasa.gov>, Faith Chandler <fchandle@hq.nasa.gov>


Enclosed is an observational analysis that one of our employees has offered for consideration. Please forward to the responsible parties for their use.

Thanks.

Alan

Alan H. Phillips
Director, Office of Safety and Mission Assurance
NASA Langley Research Center
5A Hunsaker Loop
Building 1162, Room 112C
Mail Stop 421
Hampton, VA 23681

(757)864-3361 Voice
(757)864-6327 Fax

 MazanekMemo1.pdf

Jim

To: Cindy Lee <C.C.LEE@larc.nasa.gov>

Hi Cindy,

I would like to offer several observations regarding the theory that debris damaged Columbia's left wing during launch on January 16, 2003. I would like to be able to discuss these ideas during an appropriate Columbia accident investigation meeting here at LaRC.

1. The video footage (apparently provided by the KSC Ice & Debris Team) appears to show that the debris, assumed to be polyisocyanurate foam from the external tank (ET), may not have originated from the ET. In the first few frames of the video sequence, the debris appears to come from a location obscured by the orbiter and ricochets off the ET. The origin of debris still could be from the ET, or possibly the underside of the orbiter. After contacting the ET, the debris fragments into two visible pieces. The first, apparently smaller, debris fragment produces a small shower of particles that can be seen at the trailing edge of the left wing. The second, larger piece of debris appears to result in a much larger impact on the trailing edge of the left wing. The debris may have been made of ice or some other material(s) and could be much more massive than the calculated 1.211 kg (2.67 lb.). If the photogrammetric measurements accurately measured the debris to be 0.508 x 0.406 x 0.152 meters (20 x 16 x 6 inches), and it was made of solid ice, the mass could be approximately 28.7 kg (63.4 lb). The energy released from this impact could be almost 25 times greater than estimated. Other dense materials, such as aluminum, would make this impact even more damaging. I would like to suggest a re-examination of the debris impact video footage to determine if the fragment(s) could have originated from another location, possibly an ice buildup somewhere under the orbiter. As a reference, if the debris was 1.211 kg. and assuming a conservative relative impact velocity of 457.2 m/s (2 x 750 fps used in the JSC analysis), the kinetic energy would have equivalent to a 500 lb safe impacting at 75 mph. If the debris was 28.7 kg, that would be the equivalent of a 500 lb safe hitting the wing at 365 mph.

2. If the observation in #1 above can proven to be incorrect, and it can be definitively determined that the debris was foam insulation from the ET, there still appears to be an issue regarding its thickness. It has been estimated that the debris was 0.152 meters (6 inches) thick. Several sources that I have found indicate that the insulation is sprayed on the ET to a thickness of 1-2 inches. It is certainly possible that certain locations on the ET may have insulation that is 6 inches in depth, but how thick was the insulation at the point where it is believed to have separated? How accurately is this location known? I assumed that the volume of ET insulation can be approximated by a thin walled cylindrical body with flat, circular plates on each end. I assumed that the ET was 46.8 meters (153.8 ft) in length, 8.412 meter (27.6 ft) in diameter. I used a density of 38.63 kg/m³ (calculated from the mass and size of the foam debris assumed in #1 above).

Using a uniform thickness of 0.152 meters (6 inches), I estimate the total mass of the insulation to be 8080 kg (17,813 lb). This is 3.7 times greater than the 2187 kg (4823 lb) that is stated on the NASA Human Space Flight Shuttle Reference web page. A 0.0254 meter (1 inch) thickness results in a total mass of 1328 kg (2928 lb), and a 0.0508 meter (2 inch) thickness results in a total mass of 2664 kg (5873 lb). These totals are consistent with a thickness of 1-2 inches. It is possible that the numbers stated on the Space Flight web page are not very accurate, but I would not expect them to be that much off. I have not heard any discussion about variations in the insulation thickness, and I would like to understand how certain we can be that the debris was entirely made of foam.

3. Even if the damage to the tiles was not obviously visible, could this type of impact carve out a significant channel in the protective tiles? This channel

would then allow extreme heating to occur down the length of the wing. How many re-entries had the tiles in the area of the suspected damage been through? Is it possible that this area could have had "older" tiles that could be more easily loosened from the wing during impact, but only separated during re-entry or later during ascent? Could the impact result in a significant increase in the surface roughness of the tiles around the impact area, and could this result in a high turbulent heating that caused tiles to be shed during re-entry? Finally, it is reasonable that the impact could have multiple effects on the orbiter, such as damage to control surfaces.

Thanks very much for your attention to these observations. I hope that they are helpful in the investigation of this terrible loss for the astronauts and their families, NASA, and our country.

Dan

Daniel D. Mazanek

Spacecraft and Sensors Branch, ASCAC

8 Langley Boulevard

NASA Langley Research Center

Mail Stop 328

Hampton, VA 23681-2199

Phone: (757) 864-1739

Fax: (757) 864-1975

E-mail: d.d.mazanek@larc.nasa.gov


Alan H. Phillips, 11:06 AM 2/7/2003 -0500, Analysis for the CAIB's Consideration

X-Sender: a.h.phillips@pop.larc.nasa.gov
Date: Fri, 7 Feb 2003 11:06:30 -0500
To: Pete Rutledge <prutledg@hq.nasa.gov>
From: "Alan H. Phillips" <a.h.phillips@larc.nasa.gov>
Subject: Analysis for the CAIB's Consideration
Cc: Jim Lloyd <Jlloyd@hq.nasa.gov>, Faith Chandler <fchandle@hq.nasa.gov>

Enclosed is an observational analysis that one of our employees has offered for consideration. Please forward to the responsible parties for their use.

Thanks.

Alan

 MazanekMemo.pdf

Alan H. Phillips
Director, Office of Safety and Mission Assurance
NASA Langley Research Center
5A Hunsaker Loop
Building 1162, Room 112C
Mail Stop 421
Hampton, VA 23681

(757)864-3361 Voice
(757)864-6327 Fax

To: Cindy Lee <C.C.LEE@larc.nasa.gov>

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Thanks very much for your attention to these observations. I hope that they are helpful in the investigation of this terrible loss for the astronauts and their families, NASA, and our country.

Dan

Daniel D. Mazanek

Spacecraft and Sensors Branch, ASCAC

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NASA Langley Research Center

Mail Stop 328

Hampton, VA 23681-2199

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Robert Navarro, 07:43 AM 2/13/2003 -0800, Ideas for Bryan

X-Sender: mnavarro@mail.arc.nasa.gov
Date: Thu, 13 Feb 2003 07:43:21 -0800
To: Pamela Richardson<@mail.arc.nasa.gov>Pamela.Richardson@hq.nasa.gov.arc.nasa.gov
From: Robert Navarro <Robert.J.Navarro@nasa.gov>
Subject: Ideas for Bryan
Cc: Pete Rutledge<prutledg@mail.hq.nasa.gov>,
Alexis Flippen<aflippen@mail.arc.nasa.gov>

Pete,
Here are some additional ideas for consideration in support of Bryan's CAIB ex-officio role. These may not be unique or a repeat from others but wanted to pass them on. We will keep thinking about it.

*Rule out internal Shuttle risk contributors. Were there any internal failures/explosions that could have propagated/penetrated Spacehab and the Orbiter? The Ames payload utilized a small DOT pressure vessel which was successfully analyzed for control of penetration risks. Were there others?

*Tile failure uncertainties. Is the frequency of tile failure/degradation within the uncertainty bounds?

*Tile status & on-orbit maintenance. Previously PRA analyses recognized the potential need for a tile repair kit along with the use of the little robotic satellite to view the tiles in orbit. What drove the decision not to do this? Should this be revisited?

On-orbit sensor/visual detection of Orbiter integrity. Depending on which method(s) is more accurate and cost-effective, could a means be utilized to do on-orbit assessment of tiles, hydrazine leaks affecting the APU's, and other critical subsystems?

*Auxiliary Power Units. What about the APUs as a contributor, where the failure probability is predicted to increase with mission length (per previous PRA analyses) and where common cause failure due to loss of hydrazine is recognized?

*On-orbit corrective action - change angle of attack (major vs. minor arc re-entry). Had the crew known of a potential compromise in the tiles, could a different angle of attack have minimized the risk?

- With the nominal ~50 deg. angle, the leading edge heats up more quickly.

- A shallower angle might increase stresses, however a shallower angle at re-entry begun earlier would take longer but possibly minimize the heating.

*PRA model update. Will the PRA for re-entry need to be updated based on this failure?

Robert J. Navarro
Safety, Environmental and Mission Assurance
Deputy Director
NASA Ames Research Center
Code Q, Mail Stop 218-6
Voice: (650) 604-5640
Fax: (650) 604-6508

Mark Kowaleski, 08:21 AM 2/13/2003 -0500, Fwd: FW: Animated Oribter Wheel Well Viewer

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/OV103LHWheelWell.htm>
<<iPIX Java Viewer v3.22.url>>

 [iPIX Java Viewer v3.22.url](#)

Pamela Richardson, 02:59 PM 2/12/2003 -0500, 2/12/03 files

X-Sender: prichard@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 12 Feb 2003 14:59:34 -0500
To: Jim.Lloyd@hq.nasa.gov, Pete.Rutledge@hq.nasa.gov
From: Pamela Richardson <prichard@hq.nasa.gov>
Subject: 2/12/03 files

Jim and Pete --

Only one new question, a few new offers of assistance and no new actions.

Pam



21203delta.questionsforbryan.doc



questionsforbryan10.doc



Qactions7.doc



offersofassistance7.doc

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

Jonathan B. Mullin, 02:29 PM 2/12/2003 -0500, Fwd: Inquiries From General Public: Loss of Colour

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 12 Feb 2003 14:29:21 -0500
To: jllloyd@hq.nasa.gov
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: Fwd: Inquiries From General Public: Loss of Columbia and Its Crew
Cc: jlemke@hq.nasa.gov, mark.kowaleski@hq.nasa.gov, wharkins@hq.nasa.gov, william.bihner@hq.nasa.gov, prutledg@hq.nasa.gov, wfrazier@hq.nasa.gov, prichard@hq.nasa.gov

For your information, I called Ms. Grimes to ascertain if this process was available to all **NASA Centers.**

1. NASA has a problem. I found that this **Headquarters Process was not fully being worked at NASA Center level. Apparently the process may just be developing at the NASA Center level.**

2. Further **NASA Headquarters is not staffed to handle all of the potential Agency general public inquiries that may be posed to NASA Centers.**

3. Therefore, there will be no **"One NASA" response to inquiries from the general public.**

Recommendation:

a. I understand that Mark Kowaleski is the Code Q. Representative to this process, so perhaps he can give you further details.

b. Following the explanation of the process from the Code Q Point of Contact, Mark Kowaleske, pass this concern on to the SMA Directors as it may be of value for keeping SMA responses consistent.
Just some thoughts..

Regards, Jon

Date: Wed, 12 Feb 2003 11:50:23 -0500 (EST)

X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-headquarters using -f

Subject: Inquiries From General Public: Loss of Columbia and Its Crew

From: InfoCom <infocom@hq.nasa.gov>

Sender: owner-headquarters@lists.hq.nasa.gov

This message is being transmitted to all NASA HQ employees.
Point of Contact: Teresa Grimes, Code CIC, 358-1280.

INQUIRIES FROM THE GENERAL PUBLIC:

The Loss of Columbia and Its Courageous Crew

In response to NASA's loss of the courageous STS-107 crew and of Space Shuttle Columbia, the general public is expressing their concerns and seeking information regarding this terrible tragedy.

The Public Inquiries Management Office (PIMO), Code CIC, is coordinating official Agency responses with the newly created Columbia Action Center.

HQ employees receiving e-mail, paper mail, and telephone calls from the general public should forward these inquiries immediately upon receipt to the PIMO. Send e-mails to public-inquiries@hq.nasa.gov and paper mail to Code CIC, room 9Q42. Redirect incoming telephone calls to Bridget Fenner, Team Lead, Public Inquiries Service Center, 358-0909.

This "Special Notice" is being transmitted by InfoCom, Code CI-3, HQ Information Technology & Communications Division. For more information on InfoCom services, call 358-2299 or 358-4817, or visit the InfoCom web page at <http://www.hq.nasa.gov/hq/infocom>
Jonathan B. Mullin

Jonathan B. Mullin, 02:29 PM 2/12/2003 -0500, Fwd: Inquiries From General Public: Loss of Color

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"

Pamela Richardson, 06:42 AM 2/12/2003 -0500, Re: Fwd: columbia sensor wire locations Rev 1.ppt

X-Sender: prichard@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 12 Feb 2003 06:42:33 -0500
To: Pete Rutledge <prutledg@hq.nasa.gov>
From: Pamela Richardson <prichard@hq.nasa.gov>
Subject: Re: Fwd: columbia sensor wire locations Rev 1.ppt

Pete --

I think this is their original powerpoint presentation (I think the black and white version ended up on the HQ website). They haven't quite color-coded it like I have to show more sequential failures and whys. I stand by mine as the best to date! (even though it is done with magic marker and not a computer!) However, now that I DO have a powerpoint file, I can apply my coloring method!!!!

:-)

Pam

At 03:14 PM 2/11/2003 -0500, you wrote:

Pam, I don't know if you gave them the idea, but check out the attachment!!

Pete

X-Sender: rpatrica@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Tue, 11 Feb 2003 13:53:49 -0500
To: jlloyd@hq.nasa.gov, prutledg@hq.nasa.gov, mkowales@hq.nasa.gov
From: Richard Patrican <rpatrica@hq.nasa.gov>
Subject: columbia sensor wire locations Rev 1.ppt

Summary of sensors on Left wing and chronology of failure - FYI. From the HCAT.

Rich Patrican
Manager, International Space Station
Office of Safety and Mission Assurance
Headquarters Office 5X35
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Mission Success Starts with Safety!

Pamela F. Richardson
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"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

JOHNSON, GARY W. (JSC-NA) (NASA), 07:47 AM 2/8/2003 -0600, FW: meeting mins. from 2/3 S&M

From: "JOHNSON, GARY W. (JSC-NA) (NASA)" <gary.w.johnson@nasa.gov>
To: "Pete Rutledge" <prutledg@hq.nasa.gov>,
"Lloyd, James (Code Q)" <jlloyd@hq.nasa.gov>,
"Newman, Steve (CodeQ)" <snewman@hq.nasa.gov>
Cc: "PATTERSON, DESIREE C. (JSC-NT) (NASA)" <desiree.c.patterson@nasa.gov>
Subject: FW: meeting mins. from 2/3-S&MA mtg
Date: Sat, 8 Feb 2003 07:47:41 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

- In checkin I am not sure that you received these minutes.

> <<S&MAMeeting020312a.doc>>

>
>



S&MAMeeting020312a.doc

S&MA Telecon

February 3, 2003

12 noon

HQS/Pete Rutledge and Jim Lloyd
JSC/Yolanda Marshall, Bill Harris, et. al.
MSFC/Amanda Goodson
KSC/Bert Garrido and Dr. Barry
LaRC/Alan Phillips
ARC/Laura Doty
SSC/John Stealey
GSFC/ Anthony Foster

Pete Rutledge: HQS has been working on compiling the investigative questions for Bryan O'Connor as well as compiling a listing of names of experts that may be required by the Accident Investigation Board. Mr. Rutledge also reminded the S&MA Directors that he was still taking questions for Bryan O'Connor. Mr. O'Connor has been in touch via e-mail communications. He has reported to Code Q that he is very impressed with the people at Barksdale AFB.

In a meeting with Fred Gregory, Mr. Gregory was very complimentary of the NASA people engaged in the investigation – “Most professional group of patriots.” He also mentioned the interagency cooperation – NASA, FEMA and others. Mr. Gregory stated that NASA would get to the bottom of the mishap and move on. He feels like NASA is doing better this time, compared to Challenger. Mr. Gregory believes the TV publicity has been positive. NASA and its openness are very good. It was also mentioned that the President's Budget is being released today. Mr. Gregory also reported that Mr. O'Keefe was working over the weekend to ensure NASA will proceed with the independent board concept – as opposed to Roger's Commission with Challenger. HQS Contingency Action Center – It is a single point of contact for all inquiries in and out of NASA on a 24/7 basis. HCAT@hqs.nasa.gov

Mr. O'Keefe and/or Fred Gregory will do a NASA employee broadcast. There is a memorial service tomorrow, February 4, at JSC 12CST., the President +VIPs. There will be a Thursday memorial service at the National Cathedral at 1p EST. HQS people who wish to attend are encouraged to do so:

Dr. Rich Williams, Chief Medical Officer : We all need to be concerned about our people in the field. About people in our buildings who are working long hours. He warned that burn out could be a problem. He also stressed that we should keep people informed and involved.

Jim Lloyd: White House Question: Stemming from a letter from Don Nelson to the President -- Could there have been an escape system incorporated into the orbiter?

Frank Culbertson: A capsule is required and would require a total redesign of the orbiter. Basically it would require two re-entry vehicles. Mr. Culbertson also said that any vehicle has flight regimes you cannot safely escape from.

Jim Lloyd: Second White House Question: "Crew Escape systems may not necessarily increase the overall safety of the launch vehicle." One-two page summary of things that have been assessed - and anything that may be currently being assessed or future concepts.

Jim Lloyd: O'Keefe said that the priorities are 1) people, 2) facts, and 3) future. HQS attendees for the JSC Memorial have been selected. There is every effort to keep the number at a minimum. O'Keefe receiving accolades from all corners of the Government on his leadership through this contingency. There has been no confusion detected from outside of NASA from those who notice such things. Condoleezza Rice, U.S. National Security Advisor was very complimentary.

JSC/Stacey Nakamura sent out a good stress management website link. Jim Lloyd forwarded the weblink to the S&MA Directors email distribution. HQS S&MA people should look for stress in their employees and help where they can. People are working longer hours. O'Keefe is concerned that severe staff stress could lead to additional accidents, not only at HQS but also at all locations. People working with hazardous materials and operations within need to stay vigilant. NASA Agency EAP Hotline is 808-807-7997

Jim Lloyd: Indicated that we are just in the middle of the process for getting to the bottom of this. Does anyone have any theories that are different? No stone will be left unturned. Mr. O'Keefe has asked that he be given the privilege and opportunity to review any alternative possible causes of the accident. Mr. Lloyd said that the preferred route would be one that is currently in place.

We must continue to look to the future - Shuttles are still being processed - although one is on hold to go to the pad. We are doing the right things within the NASA community.

An organizational chart detailing the investigation working group has been e-mailed to Jim Lloyd.

GSEC: Waiting for direction on impounded data. Yolanda Marshall reported that at 4p meeting today Bob Heselmeyer would provide direction on behalf of Ron Dittmore. Bob Heselmeyer (281-483-0593 or 281-483-1292). GSEC has not received any requests for data (Mishap Investigation Dave Whittle team /Debris collection - Columbia Accident Investigation board.)

Jim Lloyd: In response to Mr. Lloyd's earlier question, Yolanda Marshall suggested that Jim Lloyd take a look at the Presidential Commission document (page 182) on crew escape options.

Bill Harris – we need to be cautious. If a study were conducted it would be appropriate for the people who did the study to give the briefing. In addition, Mr. Harris does not want to imply just because a briefing was given that it was agreed and accepted by NASA.

Jim Lloyd: There are charts but not necessarily sanctioned. NASA takes concepts into consideration.

Jim Lloyd: There will not be a S&MA Telecon tomorrow because of the Houston memorial service. He would also like to expand the telecon participants to include all S&MA Directors. Ms. Marshall took the action to include all S&MA Directors in the telecon. NOTE: Anyone on the "SMADIR" list has privileges to send email to that list (SMADIR@lists.hq.nasa.gov).

JSC/Bill Harris – [On the topic of impounded data.] We need to maintain the integrity of the information. We are making copies and working from copies.

Jon Mullin: A report from FEMA indicates debris SSW of Atlanta – and in Bartow county which is north of Atlanta. This is the first such report in the state of Georgia.

JSC: The SR&QA people are becoming integral team members in the areas of software, fault tree, etc. Fire protection staff is working with the secret service – we have received two requests for ground safety team members to accompany debris teams in Houston. We have hazard awareness issue: NBC News SUV stopping for a pedestrian hit the back-end of car. SR&QA is continuing to be solicited for help. JSC EOC has asked for help on photo sorting.

IV&V facility – the facility is in the process of locking down information; there was no one there over the weekend to begin the lockdown process.

Stennis: Gathering questions, expertise, and volunteers that was requested by HQS. Will submit by the end of the day.

ARC: Handling various issues including group sessions with counselors, impounding documents, and compiling an expert list.

KSC: We are sending 55-60 people today focusing on other ground operations – not on the recovery area; reporting to JSC and Ralph Roe's team. Trying to keep employees busy. Export control approval can be obtained from John T. James at JSC 281-483-7122.

STS-109 (Columbia's previous mission) possibly impounded? Response -- Nothing at HQS on that. KSC/Mark Gordon 867-5962

John Golbert – Payload status – consolidated in one area. Word on how soon we can begin releasing GFE. HCAT@hq.nasa.gov

MSFC : Amanda Goodson - There will not be an S&MA Telecon tomorrow because of the JSC Memorial Service. Memorial service scheduled for Wednesday at MSFC. Art Stephenson conducted all-hands with employees - keeping busy managing stress. We're working on a process to release data that doesn't require impounding. Stopped hardware work in the plants and the employees need a place to go; approximately 200 people. SRB continuing to work today, no changes from yesterday; SSME continues to work... RSRM contingency group flying to KSC. Mark Erminger sending e-mail on some California expertise. U.S. Army has volunteered 300 search personnel. The group specializes in searching a large area for small objects - with associated equipment. Dave King will decide if he wants to use these people. Tanner, AL gentleman found unrecognizable 18-20 inches of black rubber. Authorities bagged up and brought to controlled area along w/photos. MSFC EAP retained services of local support people. Some employees are stressed.

GSFC: We have impounded data. Employee assistance effort is underway.

HQS reports that the new reorganization has been placed on hold -- there are currently two divisions: QE/QS.

KSC: MER data impounded for SPACEHAB? Yes it was impounded, per JSC/Gary Johnson. SPACEHAB folks were here and supporting the MER. KSC and MSFC have impounded SPACEHAB data.

Wednesday 1 ET next telecon.

Garrido-1, Humberto (Bert), 05:32 PM 2/10/2003 -0500, STS-107 Questions- Feb.10

From: "Garrido-1, Humberto (Bert)" <Humberto.T.Garrido@nasa.gov>
To: "prichard@hq.nasa.gov" <prichard@hq.nasa.gov>
Cc: Toledo-1 Oscar <Oscar.Toledo-1@nasa.gov>
"Lebron-1, Edmundo (Eddie)" <Edmundo.J.Lebron@nasa.gov>,
"Tilley-1, Randall" <Randall.W.Tilley@nasa.gov>,
"prutledg@hq.nasa.gov" <prutledg@hq.nasa.gov>,
"jlloyd@hq.nasa.gov" <jlloyd@hq.nasa.gov>
Subject: STS-107 Questions- Feb.10
Date: Mon, 10 Feb 2003 17:32:15 -0500
X-Mailer: Internet Mail Service (5.5.2653.19)

<<questions021003.doc>>
Pam-

Here are KSC's unedited questions for February 10th.

Have a good day.

Bert



questions021003.doc

Jonathan B. Mullin, 04:48 PM 2/10/2003 -0500, AIR Force Request.

X-Sender: jmullin@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 10 Feb 2003 16:48:53 -0500
To: jlemke@hq.nasa.gov
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>
Subject: AIR Force Request
Cc: jllloyd@hq.nasa.gov, prichard@hq.nasa.gov, prutledg@hq.nasa.gov,
wfrazier@hq.nasa.gov

Code QS got a call from AF Space Command Major Robert Ramey, Legal Office. He wanted to know if the NASA DOD Agreement was being used as a citation for the Columbia Investigation. MR. Fraizler and I responded that the Space Act was being used as the authority. Major Ramey can be reached at 719-554-5494. His FAX is 719-554-9095 and email is robert.ramey@peterson.af.mil
Major Ramey indicated he would like a copy of the appointment letter, which QS replied we could should send it through our NASA Liason at Peterson AFB, Mr. Newbury.
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"

Eric C Raynor, 04:01 PM 2/10/2003 -0500, NSRS Reports Pertaining to Shuttle

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: jllloyd@hq.nasa.gov, jlemke@hq.nasa.gov, pruttedg@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

Lynne Loewy, 03:53 PM 2/2/2003 -0500, Notes from Safety and Mission Assurance (SMA) Director

X-Sender: lloewy@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Sun, 02 Feb 2003 15:53:03 -0500
To: Pete Rutledge <prutledg@hq.nasa.gov>
From: Lynne Loewy <lloewy@hq.nasa.gov>
Subject: Notes from Safety and Mission Assurance (SMA) Directors Telecon

Pete:
Here are the notes. In red italic are a couple of points I didn't quite get, usually who was talking on the net.
Lynne



2-2-03 notes.doc

Notes from Safety and Mission Assurance (SMA) Directors Telecon
February 2, 2003, 1:00 p.m.

Lead participants:

HQ/P. Rutledge, J. Lloyd
ARC/L. Doty
JSC/Y. Marshall, M. Erminger
KSC/B. Garrido, O. Toledo
MSFC/A. Goodson, B. Harris
LaRC/A. Phillips
SSC/M. Smiles, J. Staley

P. Rutledge discussed an issue that had surfaced yesterday regarding the statement to witnesses. There had been some discussion with the General Counsel about making some changes to this statement (ref. NPG 8621.1, NASA Procedures and Guidelines for Mishap Reporting, Investigating, and Recordkeeping, Appendix E-1). The final determination was that no changes would be made to the statement.

P. Rutledge updated the group with information he had received since the last telecon.

- There are 2 FEMA POC's working with Dave Whittle, Roy Casselman and Scott Wells
- The Mishap Investigation Board would be referred to as the Columbia Accident Investigation Board (CAIB)
- Ralph Roë at JSC is setting up a subgroup to support the CAIB. The group will be doing an engineering (Orbiter and Shuttle) assessment to gather data to support the activity.
- Jeff Williams is working on debris field mapping
- MSFC folks are building fault trees.
- Administrative announcements: Supplier Symposium @ KSC has been cancelled.
- NASA Public Affairs has put out a press release telling the public how it can provide information. Telephone reports should be directed to the following number: 281/483-3388; Text reports and images should be e-mailed to: nasamitimages@jsc.nasa.gov; the e-mail address is: columbiaimages@nasa.gov

P. Rutledge discussed Bryan O'Connor's role as ex officio for the CAIB. Mr. O'Connor specifically asked the SMA community to do the following:

- SMA community should try to penetrate the subgroups that are supporting the CAIB.
- SMA Directors should provide Mr. O'Connor with a list of questions that they believe should be asked, and to identify what types of data should be reviewed. In other words, what would they ask if they were in Bryan's position? The SMA community has a unique perspective from the program, and may be able to surface issues that might not be reviewed otherwise.
- Support OSMA as necessary. OSMA is compiling a list of subject matter experts to support Mr. O'Connor. During the discussion of this item, several Centers asked questions about how they could make sure they conveyed their lists of subject matter experts to someone who could make sure the subgroups and CAIB knew that talent

existed and could be used. Y. Marshall promised to keep her ears to the groups and let the SMA community know if there were skills that were needed. P. Rutledge asked all the SMA directors to send their lists of subject matter experts to S. Newman (sneman@hq.nasa.gov) so that he could post the list on the PBMA website that has been set up.

S. Newman provided an update on the PBMA site setup. He has 93 members loaded and 68 members in work. He is working with GRC to provide additional security for the site. The site is currently behind the GRC firewall. In approximately 48 hours, he hopes to have SSL and 2 factor strong encryption behind the GRC firewall

M. Card reminded everyone of the importance of maintaining security and confidentiality of all information. Much of the data is ITAR and Export Control sensitive. Our friends and enemies will try to use the tragedy as an opportunity to try to break into our systems and access our data. We must remain vigilant and be mindful of security concerns.

J. Mullin asked for a status of how the SMA directors were coordinating with the Medical Community. JSC and KSC responded that they were working closely with the medical communities; JSC has offered training and provided good information for about coping with stress (<http://jscpeople.jsc.nasa.gov/columbia/>). [Jim Lloyd forwarded this website information to SMA directors via email]. MSFC and ARC were using the Employee Assistance Program and making sure that counselors would be available for their people. ARC's D. King has been in contact with AM/C. Angotti. All are mindful of the need to take care of employees.

J. Lyver asked if B. Garrido could forward the list of hazardous chemicals aboard the Shuttle in a format other than PDF. B. Garrido said he would look into it. S. Newman said he could post this list to the PBMA website, after the security enhancements had been made. Several on the net reiterated that the primary purpose of that list was to provide data to the White House to help them determine whether to invoke the Stafford Act. P. Rutledge agreed, and indicated that the information was indeed forwarded through the proper channels for this purpose. Posting it on the web would be an additional use to assist the CAIB.

B. Garrido also confirmed that the medical community had this list. F. Chandler reported that as of 10:00 p.m. last night, Dr. R. Williams at Headquarters was working on how first responders should handle debris; e.g., personal protective equipment and handling protocols. He was to work with JSC and get a message, via HQ Public Affairs (G. Mahone), to the proper communities. M. Erminger reported that this was the job of the MIT and that they sent the information out.

B. Garrido mentioned that he had seen in a local paper a picture of NASA astronauts picking up debris with only latex gloves, and indicated that there may be some fallout from this.

Y. Marshall reported that they were participating on the Orbiter Technical Integration Team, working on the mission evaluation timeline, providing lead for fault trees and corrective action reporting. A new team on software was starting that they would support. They were also looking at OMM processing in Palmdale and helping staff the JSC EOC. Now that the data are

impounded; they need to devise a process to release some data, on a need to know basis, to support ongoing missions (upcoming Shuttle missions and the ISS). They are working a strategy for controlled release of impounded data. The SMA IA database has been impounded. To get data, people need to log a request with justification. JSC will also support B. O'Connor while he is in Texas and continue to provide telecon setup and minutes for the daily SMA directors telecon.

At MSFC A. Goodson has SMA people on several subteams: ET, RSRM, SSME, SRB, and Systems.

All data has been impounded in security office. A. Goodson has a POC in security to work issues involving getting access to impounded data on a need to know basis. She has also set up a controlled data room within her organization. All relevant hardware and data at MSFC has been impounded. The ET team is reviewing foam liberation data. Orbiter team is looking at the hydraulics on the left wing. The Systems team is looking at what to do and how they can facilitate the work of other teams. She offered to provide her "Element Cheat Sheets" for the PBMA site.

B. Garrido reported that KSC is supporting JSC and they have people on site there working with the subgroups and also helping with recovery. He is ensuring that all data has been impounded. Spacehab has impounded data but is awaiting instructions from NASA.

Mark Gordon suggested that we get a status of pertinent meetings and schedules to help SMA better penetrate the subgroups. P. Rutledge said Headquarters would try to accommodate the request and mentioned the 3:00 p.m. telecon of the Headquarters Contingency Action Team today and an Interagency telecon at 7:00 p.m. central.

B. Garrido said he spoke to GSFC who is also impounding relevant data.

A. Phillips had nothing additional to add.

L. Doty reported that Scott Hubbard, ARC Center Director, would serve as a member of the CAIB and he had compiled a support team consisting of her, the ARC Chief Engineer, and Public Affairs to support the effort. P. Rutledge mentioned that the issue of S. Hubbard's independence from the mission had been mentioned. L. Doty replied that S. Hubbard believed he was objective enough to do the job.

M. Smiles reported that SSME data test data and records had been impounded. The SSC Center Director is offering the talent at SSC to help in any way that they can. J. Staley indicated that they were getting EAP support for an SSC all hands. M. Smiles asked about the status of the Safety and Health Directors' Meeting, the SMA Directors' Meeting, and the CQSDI conference. The first two are cancelled; T. Whitmeyer took an action to check on the CQSDI conference.

P. Rutledge reported that a press release announcing the appointment of Retired U.S. Navy Admiral Harold W. Gehman, Jr., to chair the CAIB.

J. Lloyd reported that he had just been asked to compile information on why the President did not need to appoint a Blue Ribbon Panel to investigate this accident. The most compelling reason is that NASA has been extremely aggressive about beginning the investigation. He reported that managers were still working on the organization of all the mishap investigation related activity; and that Mr. O'Connor was hoping that there would only be one NASA POC for the CAIB. He indicated that OSMA was being flexible to be ready to support Mr. O'Connor in this activity.

A. Goodson asked about the impact on SLEP.

The Stafford Review may be back on,

T. Whitmeyer will followup.

J. Lloyd indicated that we were going to continue Shuttle processing as much as possible, to minimize delay once flight is cleared. Mr. O'Keefe and Mr. Gregory have praised the NASA workforce on their aggressive response to this tragedy.

J. Lloyd concluded by saying that the SMA directors' 1:00 p.m. daily telecon would continue until no longer needed, and thanked JSC and Y. Marshall for taking the lead on setting up the meetings.

Garrido-1, Humberto (Bert), 05:06 PM 2/18/2003 -0500, KSC Questions

From: "Garrido-1, Humberto (Bert)" <Humberto.T.Garrido@nasa.gov>

To: "prichard@hq.nasa.gov" <prichard@hq.nasa.gov>

Cc: "Lebron-1, Edmundo (Eddie)" <Edmundo.J.Lebron@nasa.gov>,
Toledo-1 Oscar <Oscar.Toledo-1@nasa.gov>,
"jilloyd@hq.nasa.gov" <jilloyd@hq.nasa.gov>,
"prutledg@hq.nasa.gov" <prutledg@hq.nasa.gov>

Subject: KSC Questions

Date: Tue, 18 Feb 2003 17:06:14 -0500

X-Mailer: Internet Mail Service (5.5.2653.19)

Pam-

A few more undedited questions for Bryan from KSC.

Regards,

Bert

-----Original Message-----

From: Ackroyd-1, Linda

Sent: Tuesday, February 18, 2003 4:13 PM

To: Garrido-1, Humberto (Bert)

Subject: Questions

<<questions021703.doc>>



[questions021703.doc](#)

Garrido-1, Humberto (Bert), 11:45 AM 2/26/2003 -0500, CAIB Presentation#2

From: "Garrido-1, Humberto (Bert)" <Humberto.T.Garrido@nasa.gov>

To: "jilloyd@hq.nasa.gov" <jilloyd@hq.nasa.gov>,
"prutledg@hq.nasa.gov" <prutledg@hq.nasa.gov>,
"wfrazier@hq.nasa.gov" <wfrazier@hq.nasa.gov>,
"jlemke@hq.nasa.gov" <jlemke@hq.nasa.gov>

Cc: Toledo-1 Oscar <Oscar.Toledo-1@nasa.gov>,
"Wetmore-1, Mike" <Michael.E.Wetmore@nasa.gov>,
"Kennedy-1, James" <James.W.Kennedy@nasa.gov>,
"Lebron-1, Edmundo (Eddie)" <Edmundo.J.Lebron@nasa.gov>,
"Ackroyd-1, Linda" <Linda.J.Ackroyd@nasa.gov>,
"Tilley-1, Randall" <Randall.W.Tilley@nasa.gov>,
"Higgins-1, William" <William.C.Higgins@nasa.gov>

Subject: CAIB Presentation#2

Date: Wed, 26 Feb 2003 11:45:27 -0500

X-Mailer: Internet Mail Service (5.5.2653.19)

As you know, I will be presenting to the CAIB tomorrow (4:30p-to 6:00p) on the "CASA Headquarters Code Q Process and Functions." I appreciate all the assistance you have given me in preparing the enclosed presentation package. I would like to ask for your assistance one more time. Can you please review the attached power point presentation and send me any comments, suggestions or corrections you may have? Note that there are 24 slides in the file.

Call me at 321-867-1982 if you would like to discuss anything.

Thanks again,

Bert

> -----Original Message-----

> From: Ackroyd-1, Linda

> Sent: Wednesday, February 26, 2003 11:20 AM

> To: Garrido-1, Humberto (Bert)

> Subject: Presentation

>

> <<Bert2.ppt>>.

>

>

>

 Bert2.ppt

Mark Kowaleski, 03:46 PM 2/28/2003 -0500, RE: RTQs to address role of SMA in decision to image

X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 28 Feb 2003 15:46:35 -0500
To: "JOHNSON, GARY W. (JSC-NA) (NASA)" <gary.w.johnson@nasa.gov>,
"Mark Kowaleski" <mkowales@hq.nasa.gov>,
"ERMINGER, MARK D. (JSC-NC) (NASA)" <mark.d.erminger@nasa.gov>,
"MARSHALL, YOLANDA Y. (JSC-NA) (NASA)" <volanda.y.marshall@nasa.gov>,
jiloyd@mail.hq.nasa.gov, "CARD, MIKE (JSC-REMOTE)" <mcard@hq.nasa.gov>,
prutledg@mail.hq.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: RE: RTQs to address role of SMA in decision to image Columbia
Cc: "CAZES, DAVID (JSC-NA) (SAIC)" <david.cazes1@jsc.nasa.gov>

Gary, unfortunately I won't be able to stay late because I'm heading out of town at 4:00 and I'm on another telecon right now. I don't think that there is any urgency that can't wait until Monday. I can rearrange my schedule anytime on Monday, if that works for you.

And I'd like to at least attempt to have Michael Card/Q participate in the discussion, since he is a principal with regard to interfacing with DOD.

Also, is it possible for JSC SR&QA to confirm with the Shuttle folks some of the assumptions (I talked to Mark about these).

Mark

At 01:30 PM 2/28/2003 -0600, JOHNSON, GARY W. (JSC-NA) (NASA) wrote:
Mark Kowaleski we will call you at 4 PM HQ time/3 PM JSC to discuss the writeup. I plan to have Mark Erminger & David Cazes on the telecon. We will call your number 202-358-0751.

-----Original Message-----

From: Mark Kowaleski [mailto:mkowales@hq.nasa.gov]
Sent: Friday, February 28, 2003 11:29 AM
To: JOHNSON, GARY W. (JSC-NA) (NASA); ERMINGER, MARK D. (JSC-NC) (NASA);
MARSHALL, YOLANDA Y. (JSC-NA) (NASA); jiloyd@mail.hq.nasa.gov; CARD,
MIKE (JSC-REMOTE); prutledg@mail.hq.nasa.gov
Subject: RTQs to address role of SMA in decision to image Columbia

Here is a draft.

Thanks everyone for your inputs.

I'm fuzzy on a few details, but I think it is a good start.

Maybe we could have a brief telecon to discuss?

Thanks,

Mark

Mark Kowaleski, 03:46 PM 2/28/2003 -0500, Code Q Columbia database to CAC

X-Sender: mkowales@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 28 Feb 2003 15:46:20 -0500
To: jlloyd@mail.hq.nasa.gov
From: Mark Kowaleski <mkowales@hq.nasa.gov>
Subject: Code Q Columbia database to CAC
Cc: prichardson@hq.nasa.gov, prutledg@mail.hq.nasa.gov

Jim,

As you know, I am on the Columbia Action Center (CAC) team, chaired by Michael Greenfield.

The CAC is now going to be a HQ-wide accessible database that will be all-inclusive of all Shuttle related data.

The CAC would like a copy of all the databases that each HQ code has generated including HCAT and Code Q.

This includes all RTQs, studies, white papers, copies of studies we have received - basically everything since the accident. All databases will be converted to PDF format and will be searchable. I have seen a sample of the CAC web-based database and it will be a very useful tool HQ-wide.

The end product will allow all of HQ to view all data available related to Columbia (HCAT, M, P, L, Q, B, etc.).

Would you approve all Code Q information generated for Columbia to be released (copied) to the CAC database?

Thanks,

Mark

James Lloyd, 03:23 PM 2/24/2003 -0500, Re: NSRS Mailbox checking...

X-Sender: jlloyd@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version: 4.3.2
Date: Mon, 24 Feb 2003 15:23:51 -0500
To: Eric C Raynor <eraynor@hq.nasa.gov>, jlemke <jlemke@hq.nasa.gov>, pboellne@hq.nasa.gov
From: James Lloyd <jlloyd@hq.nasa.gov>
Subject: Re: NSRS Mailbox checking...
Cc: wharkins@hq.nasa.gov, prutiedg@hq.nasa.gov

In a meeting just this morning the Administrator wants to keep all lines of communication open that will allow anyone to convey information on STS 107 or other related flights of interest. There is to be an 888-703-CAIB hotline number to the CAIB, a web site where one can submit information to be announced tomorrow. The IG piped up that he has a hot line and in the Enterprise Staff Meeting later this morning, Pete added that the NSRS is also an avenue. In view of that I would suggest that we keep the checking on a daily basis until further notice. Do we have to amend the contract to do this?

At 03:10 PM 2/24/2003 -0500, Eric C Raynor wrote:
John:

Erin has been checking the NSRS box daily since the loss of STS-107. Should she continue to do that, or should she revert back to the usual schedule of checking only Monday, Wednesday, and Friday? Please advise...

-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

Jim

jiloyd@mail.hq.nasa.gov, 11:19 AM 2/15/2003 -0500, Information Flow with Bryan

Reply-To: jiloyd@mail.hq.nasa.gov

X-Originating-IP: 68.100.166.170

X-URL: <http://mail2web.com/>

From: "jiloyd@mail.hq.nasa.gov" <jiloyd@mail.hq.nasa.gov>

To: prutledg@hq.nasa.gov, jlemke@hq.nasa.gov

Cc: boconnor@hq.nasa.gov

Subject: Information Flow with Bryan

Date: Sat, 15 Feb 2003 11:19:41 -0500

X-OriginalArrivalTime: 15 Feb 2003 16:19:41.0608 (UTC) FILETIME=[0B539280:01C2D50E]

X-MIME-Autoconverted: from quoted-printable to 8bit by bolg.public.hq.nasa.gov id LAA06146

Pete and John,

I spoke with Bryan Saturday morning just as he may have been arriving at MAF and he wants us to honor the protocol set by the CAIB -- requests will be processed thru the Task Force and if something is needed from Code Q explicitly it will most likely either be direct from Task Force (maybe thru Joe Ripma) or perhaps thru HQ via the HCAT.

We will continue to process information of interest that we feel the Program may not have by sending it to the HCAT.

We will also continue to process the probing questions we have been collecting to Bryan. Bryan will raise with the CAIB and it may come back to NASA thru the Task Force.

I will be off site (weather permitting) with the Administrator and SR Staff on Tuesday. Please communicate these groundrules to SMA Directors during teleconference on Tuesday at 1 PM.

Jim

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

Faith Chandler, 11:42 AM 2/12/2003 -0500, Question for Columbia Investiators

X-Sender: fchandle@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 12 Feb 2003 11:42:52 -0500
To: prutledg@hq.nasa.gov
From: Faith Chandler <fchandle@hq.nasa.gov>
Subject: Question for Columbia Investiators
Cc: prichard@hq.nasa.gov

Pete,

Here is a question/thought for the Columbia Accident Investigation Board.

Columbia underwent major modifications, which included changes to the leading edge of the wing. These are documented in reports on the following site.
<http://usago1.ksc.nasa.gov/usago/orgs/kscspi001/launch/previous/sts-109/109.htm>
See vehicle engineering report sts-109 (Columbia's return to flight after major upgrades).

What potential human errors during these modifications could have contributed to/caused this accident?

Faith Chandler

NASA Headquarters
Office of Safety and Mission Assurance
Code Q Rm 5x40
300 E Street, S.W
Washington, D.C 20546

202-358-0411
202-358-2778 (fax)

Nelson Keeler, 11:16 AM 2/7/2003 -0500, Fwd: Re: Fwd: IV&V Items related to STS-107

X-Sender: keeler@orion.ivv.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 5.1
Date: Fri, 07 Feb 2003 11:16:18 -0500
To: prichard@mail.hq.nasa.gov
From: Nelson Keeler <Nelson.H.Keeler@nasa.gov>
Subject: Fwd: Re: Fwd: IV&V Items related to STS-107
Cc: Pete Rutledge <prutledg@hq.nasa.gov>, jbruner@pop500.gsfc.nasa.gov,
raque@ivv.nasa.gov, gatto@ivv.nasa.gov

Pam:

Thanks for the call this morning. The ASCB stands for the Avionics Software Control Board. It is part of the International Space Station program and chaired by Bill Painter at JSC.

I've also forwarded you the message I was referencing with respect to input we have provided to the Shuttle program. That action was completed by COB on 4 February 2003. By the way, the Shuttle has a similar board to the one above, SASCB, the Shuttle Avionics Software Control Board and it is chaired by Darrell Stamper (name referenced in email that data was delivered to).

I have one additional concern that I think someone should be working or preparing for a question about. It stems from the following 2/5/03 Computerworld article:

NASA seeks clues to on board computer actions

NASA investigators are questioning whether adjustments made by the Columbia's on board control computers could have played a role in the Feb. 1 disaster.

<http://computerworld.com/newsletter/0%2C4902%2C78201%2C0.html?nlid=AM>

When you work through the article and its companion articles it states that there is a 1999 GAO report that faults NASA for not having an IV&V software capability on Shuttle. It tries to use this to support its contention that the on board computers could have been part of the problem. The actual GAO report was written in 1991 (not 1999 as improperly sited) and is one aspect that led to the implementation of IV&V on the Shuttle program and the creation of the IV&V Facility. There is IV&V done on the Shuttle software today contrary to the contention of the article and it is managed by the Facility.

Hope this helps.

Ned

X-Sender: prutledg@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Mon, 03 Feb 2003 17:52:00 -0500
To: Nelson Keeler <Nelson.H.Keeler@nasa.gov>
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Re: Fwd: IV&V Items related to STS-107

Thanks for closing the loop, Ned.

Pete

At 04:56 PM 2/3/2003 -0500, you wrote:
Pete:

As discussed Sunday, we have impounded all our Shuttle data, particularly as associated with STS-107, both by our contractors at JSC and all of us at the Facility. We have backed up all the soft copies and made additional copies of the hard copies.

Please note Steve Rague's email below. We have been asked to forward some of our data to Darrell Stamper at JSC. As I understand it, this is a proactive request and not the result of a request from one of the investigative boards.

Ned

Nelson Keeler, 11:16 AM 2/7/2003 -0500, Fwd: Re: Fwd: IV&V Items related to STS-107

X-Sender: raque@orion.ivv.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 5.1
Date: Mon, 03 Feb 2003 13:51:29 -0500
To: "Stamper, Darrell" <darrell.e.stamper1@jsc.nasa.gov>
From: Steven Raque <Steven.M.Raque@nasa.gov>
Subject: IV&V Items related to STS-107
Cc:
"Keeler, Nelson" <Nelson.H.Keeler@ivv.nasa.gov>

Darrell,

Just a note to ensure we understood what to deliver to you regarding STS-107. We will have hard copies of the following items to you by 4:00 pm CST tomorrow (Feb 4).

1. SRR reports and presentations for both the initial STS-107 SRR on 6/20/2002 and the final one on 12/12/2002
2. Final SIRs related to STS-107 that were delivered with other SRR reports
3. All other SRR reports and presentations, and their related SIRs for OI-29.
5. TIMs related to STS-107 and OI-29
6. For analyst notes, tool reports, and preliminary SIRs, we will look for any information (especially entry related) that surfaced in these items that we feel should be noted to you as significant.

If I captured any of this incorrectly, please let me know.

-Steve

Steven M. Raque
NASA IV&V Facility
100 University Drive
Fairmont, WV 26554
Phone: 304-367-8216
Fax: 304-367-8203

Nelson (Ned) H. Keeler
Director, NASA IV&V Facility
(304) 367-8201

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!

Nelson (Ned) H. Keeler
Director, NASA IV&V Facility
(304) 367-8201

Garrido-1, Humberto (Bert), 06:00 PM 2/28/2003 -0500, CAIB Presentation

From: "Garrido-1, Humberto (Bert)" <Humberto.T.Garrido@nasa.gov>
To: "Zeitler-1, Pam" <Pamela.S.Zeitler@nasa.gov>
Cc: "jloyd@hq.nasa.gov" <jloyd@hq.nasa.gov>,
"prutledg@hq.nasa.gov" <prutledg@hq.nasa.gov>,
"jlemke@hq.nasa.gov" <jlemke@hq.nasa.gov>,
"wfrazier@hq.nasa.gov" <wfrazier@hq.nasa.gov>,
"yolanda.y.marshall1@jasc.nasa.gov" <yolanda.y.marshall1@jasc.nasa.gov>,
"amanda.goodson@msfc.nasa.gov" <amanda.goodson@msfc.nasa.gov>,
"michael.smiles@ssc.nasa.gov" <michael.smiles@ssc.nasa.gov>,
"mark.d.erminger@hq.nasa.gov" <mark.d.erminger@hq.nasa.gov>,
Toledo-1 Oscar <Oscar.Toledo-1@nasa.gov>,
"Katnik, Greg" <Gregory.N.Katnik@nasa.gov>,
"Bridges-1, Roy" <Roy.Bridges@nasa.gov>,
"Kennedy-1, James" <James.W.Kennedy@nasa.gov>,
"Lebron-1, Edmundo (Eddie)" <Edmundo.J.Lebron@nasa.gov>,
"Delgado-1, Hector" <Hector.N.Delgado@nasa.gov>,
"Tucci-1, Larry" <Larry.R.Tucci@nasa.gov>,
"Tilley-1, Randall" <Randall.W.Tilley@nasa.gov>,
"Boutin-1, Richard" <Richard.A.Boutin@nasa.gov>,
"Huet-1, Sharolee" <Sharolee.A.Huet@nasa.gov>,
"Haddad-1, Michael" <Michael.E.Haddad@nasa.gov>,
"Gordon-1, Mark" <Mark.W.Gordon@nasa.gov>,
"Gordon-1, Joseph" <Joseph.P.Gordon@nasa.gov>,
"Wetmore-1, Mike" <Michael.E.Wetmore@nasa.gov>,
"Higgins-1, William" <William.C.Higgins@nasa.gov>

Subject: CAIB Presentation

Date: Fri, 28 Feb 2003 18:00:05 -0500

X-Mailer: Internet Mail Service (5.5.2653.19)

<<Bert2.ppt>>

Here is the material presented to Group 2 of the CAIB yesterday. Note that there are 25 charts.

Bert

 Bert21.ppt

Pepper Phillips, 05:42 PM 2/5/2003 -0500, Re: Fwd: RE: HCAT Question

To: Pepper Phillips <pPhillip@hq.nasa.gov>
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Re: Fwd: RE: HCAT Question
Cc:
Bcc:
Attached:

Pepper,

The answer provided by Jan Railsback is fine.

Pete

At 03:33 PM 2/5/2003 -0500, you wrote:
Pete/Jim,

I would like to forward this answer to the HCAT for action closure...OK?

Pepper

X-Sender: mstamate@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 05 Feb 2003 15:27:18 -0500
To: Pepper Phillips <pPhillip@hq.nasa.gov>
From: Michael Stamatelatos <mstamate@hq.nasa.gov>
Subject: Fwd: RE: HCAT Question
Cc: pete.rutledge@hq.nasa.gov

Pepper:

Jan Railsback is the current acting Shuttle PRA project manager.
His answer is given below.

Michael

From: "RAILSBACK, JAN (JSC-NX) (NASA)" <jan.railsback-1@nasa.gov>
To: "Michael Stamatelatos" <mstamate@hq.nasa.gov>
Cc: "BOYER, ROGER L. (JSC-NC) (SAIC)" <roger.l.boyer1@jsc.nasa.gov>, "Dennis Moore (E-mail)" <Dennis.R.Moore@msfc.nasa.gov>
Subject: RE: HCAT Question
Date: Wed, 5 Feb 2003 13:51:11 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

Michael,

The answer is, yes, we do consider the probability of Foreign Object Debris hits to the Orbiter TPS, but we make no distinction regarding where the debris came from. The debris could come from anywhere on the vehicle during ascent, micrometeoroid and orbital debris (MMOD) from on-orbit, and debris from the runway during Landing/Deceleration.

We also have a model for the probability of loss of External Tank (ET) insulation, but only in regards to overheating of the ET due to the loss of insulation. This is a MSFC model.

If you need a more in-depth answer, let me know.

Jan W. Railsback
Lead Analyst
Safety, Reliability, and Quality Assurance
Advanced Programs and Analysis Division
Ph: 281-483-7265

Fax: 281-244-2318

jan.railsback-1@nasa.gov

-----Original Message-----

From: Michael Stamatelatos [mailto:mstamate@hq.nasa.gov]

Sent: Wednesday, February 05, 2003 1:06 PM

To: RAILSBACK, JAN (JSC-NX) (NASA); BOYER, ROGER L. (JSC-NC) (SAIC)

Subject: Fwd: HCAT Question

Importance: High

Jan/Roger:

HCAT is asking the following question:

"Was the potential of Foreign Object Debris impact damage considered in the existing PRA model?"

I need an official answer ASAP.

Thanks,

Michael

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"

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"

JOHNSON, GARY W. (JSC-NA) (NASA), 11:24 AM 2/6/2003 -0600, FW: EOC is Designated as Centr

From: "JOHNSON, GARY W. (JSC-NA) (NASA)" <gary.w.johnson@nasa.gov>
To: "'Newman, Steve (CodeQ)'" <snewman@hq.nasa.gov>
Cc: "'Lloyd, James (Code Q)'" <jlloyd@hq.nasa.gov>, "Pete Rutledge" <prutledg@hq.nasa.gov>, "THELEN, DAVID F. (JSC-NT) (NASA)" <david.f.thelen@nasa.gov>, "MARSHALL, YOLANDA Y. (JSC-NA) (NASA)" <yolanda.y.marshall@nasa.gov>, "OWENS, CHARLOTTE D. (JSC-NA) (NASA)" <charlotte.d.owens@nasa.gov>

Subject: FW: EOC is Designated as Central Collection. Point for STS 107 Information, Photos, Videos.

Date: Thu, 6 Feb 2003 11:24:02 -0600

X-Mailer: Internet Mail Service (5.5.2653.19)

Steve this might be a good thing to add to the web site/PBMA. Since others Centers may getting photos/video.

> -----Original Message-----

> From: HR E-Mail Notification System
> Sent: Wednesday, February 05, 2003 6:04 PM
> To: DL JSC Civil Servants; DL JSC Contractors
> Subject: EOC is Designated as Central Collection Point for STS 107 Information, Photos, Videos.

> If you have information, photos or video footage relevant to the STS-107 investigation, the Emergency Operations Center is the central collection point. The EOC will track the information and initiate its distribution to the proper investigation teams. If you have media in hand, please bring it directly to the EOC in Building 30, room 3100.

> The contact information for the Emergency Operations Center is:

> Phone: 281-483-3388

> Email: columbiainages@nasa.gov

> Mail: Columbia MIT/ JA17

> 2101 NASA Road 1
> Houston, TX 77058

smadir@lists.hq.nasa.gov, 10:40 AM 2/6/2003 -0500, Safety Reports--Shuttle safety studies needed

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
Bcc:
Attached:

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 Paté-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

Greenfield Michael, 02:48 PM 2/4/2003 -0500, Fwd: COFR and PRACA

To: Greenfield Michael
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Fwd: COFR and PRACA
Cc: Lloyd_Jim
Bcc:
Attached: C:\Documents and Settings\prutledg\My Documents\Data\attach\PRACA.doc; C:\Documents and Settings\prutledg\My Documents\Data\attach\Certificate of Flight Readiness Process.doc;

Michael,

In response to your earlier conversation with Jim on CoFR, here is what Mark got from JSC and gave to the HCAT on Sunday.

Pete

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.gov, 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.kokosz1@jsc.nasa.gov, sjohnson, merminder, "JOHNSON, M. S. (SCOTT) (JSC-NC) (NASA)" <m.s.johnson@nasa.gov>, "CAZES, DAVID (JSC-NA) (SAIC)" <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.

prichard@hq.nasa.gov, 03:43 PM 2/4/2003 -0500, Fwd: INFO: Columbia Accident Investigation Board

To: prichard@hq.nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Fwd: INFO: Columbia Accident Investigation Board Questions
Cc:
Bcc:
Attached: C:\Documents and Settings\prutledg\My Documents\Data\attach\Bryan Columbia Accident Investigation Board.doc;

Pam, These are on behalf of Yolanda Marshall from JSC.

Pete

From: "HIMEL, MALCOLM J. (JSC-NX) (NASA)" <malcolm.j.himel@nasa.gov>
To: "'boconnor@mail.hq.nasa.gov'" <boconnor@mail.hq.nasa.gov>, "prutledg@hq.nasa.gov" <prutledg@hq.nasa.gov>
Cc: "MARSHALL, YOLANDA Y. (JSC-NA) (NASA)" <yolanda.y.marshall@nasa.gov>, "HOLSOMBACK, JERRY B. (JSC-OE) (NASA)" <jerry.b.holsomback@nasa.gov>, "rpatrica@hq.nasa.gov" <rpatrica@hq.nasa.gov>
Subject: INFO: Columbia Accident Investigation Board Questions
Date: Tue, 4 Feb 2003 14:10:57 -0600
X-Mailer: Internet Mail Service (5.5.2653.19)

<<Bryan Columbia Accident Investigation Board.doc>>

Bryan/Pete, per your request, attached are a set of very preliminary questions that I worked last night. We will continue to work on other questions for your use with the CAIB.

Regards,

Mac Himel/NA
JSC IA Manager
281 483-4086

Pamela Richardson, 03:14 PM 2/12/2003 -0500, Fwd: Question for Columbia Investiators

To: Pamela Richardson <prichard@hq.nasa.gov>
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: Fwd: Question for Columbia Investiators
Cc:
Bcc:
Attached:

Pam,

For the questions/issues list for Bryan.

Pete

X-Sender: fchandle@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Wed, 12 Feb 2003 11:42:52 -0500
To: prutledg@hq.nasa.gov
From: Faith Chandler <fchandle@hq.nasa.gov>
Subject: Question for Columbia Investiators
Cc: prichard@hq.nasa.gov

Pete,

Here is a question/thought for the Columbia Accident Investigation Board.

Columbia underwent major modifications, which included changes to the leading edge of the wing. These are documented in reports on the following site.

<http://usaqo1.ksc.nasa.gov/usaqo/brgs/kscspi001/launch/previous/sts-109/109.htm>

See vehicle engineering report sts-109 (Columbia's return to flight after major upgrades).

What potential human errors during these modifications could have contributed to/caused this accident?

~~~~~  
Faith Chandler

NASA Headquarters  
Office of Safety and Mission Assurance  
Code Q Rm 5x40  
300 E Street, S.W  
Washington, D.C 20546

202-358-0411  
202-358-2778 (fax)  
~~~~~


Phillips@nasa.gov, 10:32 AM 2/7/2003 -0500, HCAT and CAC

To: Alan.H.Phillips@nasa.gov
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: HCAT and CAC
Cc: Lloyd_Jim
Bcc:
Attached:

Alan,

Jim Lloyd mentioned your request for info. The CAC charter is on the PBMA 107 work group area--its under Documents, in a folder named Investigation Teams.

Trying to locate charter for the HCAT; will get back to you.

Pete

Garrido-1, Humberto (Bert), 02:42 PM 2/4/2003 -0500, RE: Questions for Brian O'Connor's consid

To: "Garrido-1, Humberto (Bert)" <Humberto.T.Garrido@nasa.gov>
From: Pete Rutledge <prutledg@hq.nasa.gov>
Subject: RE: Questions for Brian O'Connor's consideration:
Cc:
Bcc:
Attached:

That will be most welcome.

Pete

At 02:12 PM 2/4/2003 -0500, you wrote:
Pete-

We will be preparing a second set.

Bert

-----Original Message-----

From: Pete Rutledge [mailto:prutledg@hq.nasa.gov]
Sent: Tuesday, February 04, 2003 2:06 PM
To: Garrido-1, Humberto (Bert)
Subject: Re: Questions for Brian O'Connor's consideration:

Thanks, Bert. These will go in tomorrow's e-mail shipment to Bryan. We just sent him a first batch.

Pete

At 01:58 PM 2/4/2003 -0500, you wrote:

> <<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

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!

Faith Chandler, 03:42 PM 2/7/2003 -0500, CAC meeting notes

X-Sender: fchandle@mail.hq.nasa.gov
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2
Date: Fri, 07 Feb 2003 15:42:46 -0500
To: Mkwales@hq.nasa.gov, jloyd@hq.nasa.gov, prutledg@hq.nasa.gov
From: Faith Chandler <fchandle@hq.nasa.gov>
Subject: CAC meeting notes
Cc: Pepper Phillips <pPhillip@mail.hq.nasa.gov>

Here are the notes that I took during the Friday (2-7-03) Columbia Action Committee meeting (CAC).

Note the CAC will meet each day at 2:00.



Columbia Action Committee.doc

Faith Chandler

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