

James Lloyd, 11:06 AM 2/8/2003 -0500, Video Footage in Public Domain

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X-Sender: jlloyd@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Sat, 08 Feb 2003 11:06:47 -0500  
To: hcat@hq.nasa.gov  
From: James Lloyd <jlloyd@hq.nasa.gov>  
Subject: Video Footage in Public Domain  
Cc: pruttedg@hq.nasa.gov, mcard@hq.nasa.gov, rpatrican@hq.nasa.gov,  
mark Kowaleski <mkowales@hq.nasa.gov>

Florida Today has some video footage of the foam strike (I believe this is what we have seen many times in the news already). I have asked Mike Card to send you a message with the web link and would like to conference in a person who has seen an object of interest coming off the leading edge at a peculiar angle in several frames of the video. After you receive Mike's email and the MRT teleconference has completed we would suggest that we conference in this former NASA employee who has brought this to our attention and walk through the frames.

Let us know when you'd like to do this.

Jim

Richardson, Pamela, 05:46 PM 2/6/2003 -0500, Fwd: IV&V ISS Team request by Columbia ASCB

To: Richardson, Pamela  
From: Pete Ruffedge <pruffledg@hq.nasa.gov>  
Subject: Fwd: IV&V ISS Team request by Columbia ASCB  
Cc:  
Bcc:  
Attached:

Pam,

This is a task the IV&V facility is working on--they are sort of related to us, they were nice enough to let us know, so you might add it to the task list in a special IV&V section.

Pete

X-Sender: keeler@orion.ivv.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 5.1  
Date: Thu, 06 Feb 2003 17:14:50 -0500  
To: pruffledg@mail.hq.nasa.gov  
From: Nelson Keeler <Nelson.H.Keeler@nasa.gov>  
Subject: IV&V ISS Team request by Columbia ASCB  
Cc: jbruner@pop500.gsfc.nasa.gov

Pete:

The IV&V ISS team is responding to the following request:

As a result of the Columbia loss, IV&V is preparing an assessment, for the ASCB, to identify any potential software risks should Shuttle flights be delayed for an extended period.

Ned

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

Nelson Keeler, 05:14 PM 2/6/2003 -0500, IV&V ISS Team request by Columbia ASCB 5

X-Sender: keeler@orion.lvw.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 5.1  
Date: Thu, 06 Feb 2003 17:14:50 -0500  
To: prutledg@mail.hq.nasa.gov  
From: Nelson Keeler <Nelson.H.Keeler@nasa.gov>  
Subject: IV&V ISS Team request by Columbia ASCB  
Cc: jbruner@pcp500.gsfc.nasa.gov

Pete:

The IV&V ISS team is responding to the following request:

As a result of the Columbia loss, IV&V is preparing an assessment, for the ASCB, to identify any potential software risks should Shuttle flights be delayed for an extended period.

Ned

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

James Lloyd, 08:25 AM 2/6/2003 -0500, Debris Tracking Form by State County2.xls

X-Sender: jlloyd@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Thu, 06 Feb 2003 08:25:22 -0500  
To: hcat@hq.nasa.gov  
From: James Lloyd <jlloyd@hq.nasa.gov>  
Subject: Debris Tracking Form by State County2.xls  
Cc: prichard@hq.nasa.gov, jlemke <jlemke@hq.nasa.gov>, prutledg@hq.nasa.gov,  
boconnor@mail.hq.nasa.gov, jmullin@mail.hq.nasa.gov

More refined table containing debris counts by state subdivided by county. I suspect someone may be recording this to a "pin" map but do not know for sure.



Debris Tracking Form by State County21.xls

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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

0203-537	Total County Reports	AL	ALBAMA	1
0204-304	Total County Reports	AL	Henry	1
0204-09	None	AL	unknown	1
0204-166	Total County Reports	AR	Crawford	7
2041041N3343.083	Total County Reports	AR	Hembslead	1
0204-28	None	AR	unknown	1
0204-174	Total County Reports	AZ	Maricopa	15
0203-820X	Total County Reports	AZ	Mohave	5
0204-157	Total County Reports	AZ	Tucson	3
0204-30	None	AZ	unknown	1
0203-877D	Total County Reports	CA	Sacramento	30
0204-25	None	CA	unknown	2
0204-35	25:839837	FL	unknown	14
204229	Total County Reports	GA	unknown	7
0204-276	Total County Reports	IL	Champaign	5
204107	Total County Reports	KS	Union	1
0204-56	None	KY	unknown	1
204225	Total County Reports	LA	Beauregard	2
0302-864D	Total County Reports	LA	DESOTO	1
0203-865D	Total County Reports	LA	unknown	1
0204-44	None	LA	unknown	2
0203-513	Total County Reports	MI	unknown	45
0204-07	None	MO	St. Louis	1
0204-527	38:89833	MO	unknown	1
0203-868F	Total County Reports	MS	CHICASAW	4
204100	Total County Reports	MS	Pearl River	1
0203-109	Total County Reports	NC	unknown	11
0204-520	None	ND	unknown	3
0204-282	Total County Reports	NM	unknown	1
0203-545	Total County Reports	NV	unknown	8
204100	Total County Reports	OK	Maclean	3
0203-510	Total County Reports	OK	unknown	1
0204-284	Total County Reports	OR	unknown	5
0204-31	None	SC	unknown	1
Total County Reports				3

Account Number	Description	TX	CR	Balance	TX	CR	Balance
0204-500	None			None			Unknown
Total County Reports							
0204-146		TX					Anderson
204212		TX					Anderson &
Total County Reports							96
204234		TX					Adellina
Total County Reports							15
0204-506	None	TX		None			Austin
Total County Reports							3
0203-870A		TX					Baylor
Total County Reports							1
0204-49	None	TX		None			Bell
Total County Reports							2
0204-53	none	TX		None			Bosque
Total County Reports							2
0203-738-Q7		TX					Bowie
Total County Reports							1
0203-839		TX					BRAZORIA
Total County Reports							1
0203-840M	30388N	TX		96.73W			BRAZOS
Total County Reports							1
0203-425		TX					BROWN
Total County Reports							1
0203-845	N20 06.554 W 097.23.933	TX					CAMERON
Total County Reports							1
0203-146	N 97.23.933	TX					Cameron
Total County Reports							49
0204-509	None	TX		None			Coleman
Total County Reports							1
0204-161		TX					Collin
Total County Reports							16
0204-298		TX					Comanche
Total County Reports							3
0203-673		TX					Cooke
Total County Reports							2
204376		TX					Crosby
Total County Reports							1
0203-864V		TX					DALLAS
Total County Reports							73
0203-644		TX					Denbigh
Total County Reports							15
0203-869L		TX					EL PASO
Total County Reports							1
0204-292		TX					Ellis
Total County Reports							22
0204-297		TX					Erath
Total County Reports							1
204106 N31:22281 W96:796380		TX					Falls
Total County Reports							1
0204-10		TX					Fayette
Total County Reports							2
0204-165		TX					Fort Worth
Total County Reports							1
0203-870Y		TX					Franklin
Total County Reports							3
0203-832		TX					FREESTONE
Total County Reports							4
0203-179		TX					FT. BEND
Total County Reports							1
0203-836C		TX					GRAYSON
Total County Reports							1
0203-811		TX					GREGG DR RUSK
Total County Reports							8
0203-582		TX					Grimes
Total County Reports							2
0204-146		TX					Hardeman
Total County Reports							1
0203-26		TX					Hardin
Total County Reports							8

0203-471	Total County Reports	HARRIS	17
0203-876	Total County Reports	Harrison	12
0203-833	Total County Reports	HASKELL	1
0203-659R	Total County Reports	Henderson	14
20474	Total County Reports	Hill	1
0202-27	Total County Reports	HOOD	4
20476 N31.28.876 W.95.29.112	Total County Reports	Houston	1
20481	Total County Reports	Hunt	2
204209	Total County Reports	Jack	12
0203-177	Total County Reports	JASPER	2
0203-539	Total County Reports	JAY	19
0203-843A5	Total County Reports	KAUFMAN	1
0203-178	Total County Reports	LAMB	5
20489	Total County Reports	Leon	1
0203-842C	Total County Reports	LIBERTY	2
0203-504	Total County Reports	Limestone	6
203423 N32.46.6 W94.37.87	Total County Reports	Marion	3
0203-541	Total County Reports	MATAGORDA	1
0203-940	Total County Reports	MCLENNAN	1
0203-852A	Total County Reports	MILAM	9
20467	Total County Reports	Montgomery	2
0202-19	Total County Reports	MORRIS	2
0203-795	Total County Reports	MORRIS	2
204233	Total County Reports	Nacogdoches	153
0203-779-09	Total County Reports	Navarro	17
0203-439	Total County Reports	NEWTON	3
0203-574	Total County Reports	Palesine	1
0203-108	Total County Reports	PALO PINTO	1
0203-502	Total County Reports	pandla	1
0203-589	Total County Reports	Parker	1
0203-675-K4	Total County Reports	Polk	17
204111	Total County Reports	Red River	2
0203-175	Total County Reports	ROCKWALL	2
32.53 613N.96 17.83W	Total County Reports	Rusk	5
0203-849E	Total County Reports	Sabine	13
0203-756-18	Total County Reports		





0203-126	ST DEBT	33 DEBT
0203-127	ST DEBT	33 DEBT
0203-128	ST DEBT	33 DEBT
0203-129	ST DEBT	33 DEBT
0203-130	ST DEBT	33 DEBT
0203-840J	ST DEBT	33 DEBT
0203-530	ST DEBT	33 DEBT
0203-870A2	ST DEBT	33 DEBT
0203-987	ST DEBT	33 DEBT
0203-586	ST DEBT	33 DEBT

36 41 622h 86 29.344 W

Doug Arbuckle, 10:56 AM 2/5/2003 -0500, Re: Fwd: On-orbit tile repair

To: Doug Arbuckle <p.d.arbuckle@larc.nasa.gov>  
From: Pete Rutledge <prutledg@hq.nasa.gov>  
Subject: Re: Fwd: On-orbit tile repair  
Cc: prichard@hq.nasa.gov  
Bcc:  
Attached:

Thank you very much. This is certainly relevant material at this time and probably as we move forward.

Pete

At 09:13 AM 2/5/2003 -0500, you wrote:  
Dr Rutledge--

Mr John Gleason is currently an aircraft maintenance technician assigned to the Airborne Systems Competency. Many years ago he was a technician assigned to the Structures and Materials Competency, during which time he apparently participated in the studies that you describe.

LaRC's experts in this subject, and most matters relating to Orbiter tiles, are in the Structures and Materials Competency. To assure that LaRC provides the most-informed and most-timely product to Code Q, Mr Gleason will be assigned to pull together what information he has in hand and provide it to the Structures and Materials Competency as soon as possible. Mark Stuart, Director of the Structures and Materials Competency, will be responsible for the final product delivery to Code Q.

LaRC personnel stand ready to provide whatever expertise we have to support the Columbia mishap investigation.

Feel free to contact me at 757-864-1718 if you or Pamela have any questions.

Doug Arbuckle, Director  
Airborne Systems Competency

X-Sender: prutledg@mail.hq.nasa.gov  
Date: Tue, 04 Feb 2003 13:21:41 -0500  
To: Tony.L.Trexler@nasa.gov  
From: Pete Rutledge <prutledg@hq.nasa.gov>  
Subject: On-orbit tile repair  
Cc: prichard@hq.nasa.gov

Tony,

Pamela Richardson of my staff has informed me that Mr. John Gleason of your staff has knowledge of historical studies at the NASA Langley Research Center regarding Shuttle on-orbit tile repair. This has been the subject of recent discussions here and was the subject of a memo from John Young at JSC just a couple of months ago. This subject is even more important as a result of the Columbia mishap. Could you please authorize time for Mr. Gleason to search for this information and forward it as soon as possible to:

Pamela Richardson  
NASA Headquarters, Code QE  
300 E Street SW  
Washington, DC 20546

I can be reached at 202-358-0579 if you have any questions.

Thank you very much,

Pete

Doug Arbuckle, 10:56 AM 2/5/2003 -0500, Re: Fwd: On-orbit tile repair

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](mailto:pete.rutledge@hq.nasa.gov)

Mission Success Starts with Safety!

Tony L. Trexler  
Head, Aircraft Systems Branch  
Airborne Systems Competency  
NASA Langley Research Center

Bldg. 1244, MS 255  
6 E. Taylor St.  
Hampton, Va. 23681-2199  
Phone 757-864-3922  
Fax 757-864-8294

Alan H. Phillips, 07:32 AM 2/7/2003 -0500, CAIB/HCAT/MRT/MIT Wiring Diagram with Names

X-Sender: a.h.phillips@pop.larc.nasa.gov  
Date: Fri, 7 Feb 2003 07:32:29 -0500  
To: "Dr. J. Steven Newman" <snewman@hq.nasa.gov>  
From: "Alan H. Phillips" <a.h.phillips@larc.nasa.gov>  
Subject: CAIB/HCAT/MRT/MIT Wiring Diagram with Names  
Cc: prutiedg@hq.nasa.gov

Gentlemen:

I received a copy of this from our external affairs folks yesterday. It may not be quite current, but it was better than anything I had. For your use, posting, dissemination as applicable.

Alan

PS -- You guys may want to try to buy an HP-Digital Sender for document scanning/dissemination up there. They cost about \$2500, and can scan paper (about 10 - 15 ppm) and automatically converts into a pdf file and you can e-mail to individuals/groups all with the push of 1 button.

Alan



CAIBWir Dia.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  
\*\*\*\*\*

# Columbia Accident Investigation Board

Chair: Adm (retired) Harold Gehman

Headquarters Contingency Action Team

Chair: Mr. Michael Kostelnik

Mishap Response Team

Chair: Ms. Linda Ham

Membership: Mission Management Team (MMT)

Flight Crew Operations  
Mission Operations  
Engineering  
System Integration  
Payloads & Cargo  
MSFC Projects  
Space & Life Sciences  
Prime Contractors

Mishap Investigation Team

Chair: Mr. David Whittle

Orbiter

Chair: Mr. Ralph Roe

See Attached for Orbiter  
Organization Details

Emergency Operations  
Center

Manager: Mr. Bill Roeh

Data & Record Handling  
Team

Chair: Mr. Bob Heselmeier

MSFC Projects

Chair: Mr. Alex McCool

External Tank Project

Proj. Mgr: Mr. Jerry Smelser

Space Shuttle Main Engine  
Project

Proj Mgr: Mr George Hopson

Reusable Solid Rocket  
Motor Project

Proj Mgr: Ms. Jody Singer

Solid Rocket Booster Project

Proj Mgr: Mr. David Martin

See attached for MSFC Working Groups supporting the projects

## Team Responsibilities Description

Columbia Accident Investigation Team— Outside Independent team to investigate the accident involving the loss of the STS 107 crew and vehicle.

Headquarters Contingency Action Team— Oversight of all NASA activities supporting the investigation into the loss of STS 107. Includes coordination with the White House and Congress, inter-agency coordination, public affairs, legal counsel.

Mishap Response Team— Space Shuttle Program oversight activities to coordinate internal NASA investigation of the loss of STS 107. Procedures conducted consistent with NSTS 07700, Vol. VIII, Appendix R.

Mishap Investigation Team— Team responsible for the capture and retention of human remains and hardware debris. Operating under established guidelines for NASA and Space Shuttle Program mishap investigations.

Orbiter Team— Includes the propulsion and power; navigation, control & aeronautics; avionics & software; structures & mechanics; crew & thermal systems; photo & television analysis; and flight timelines working group activities.

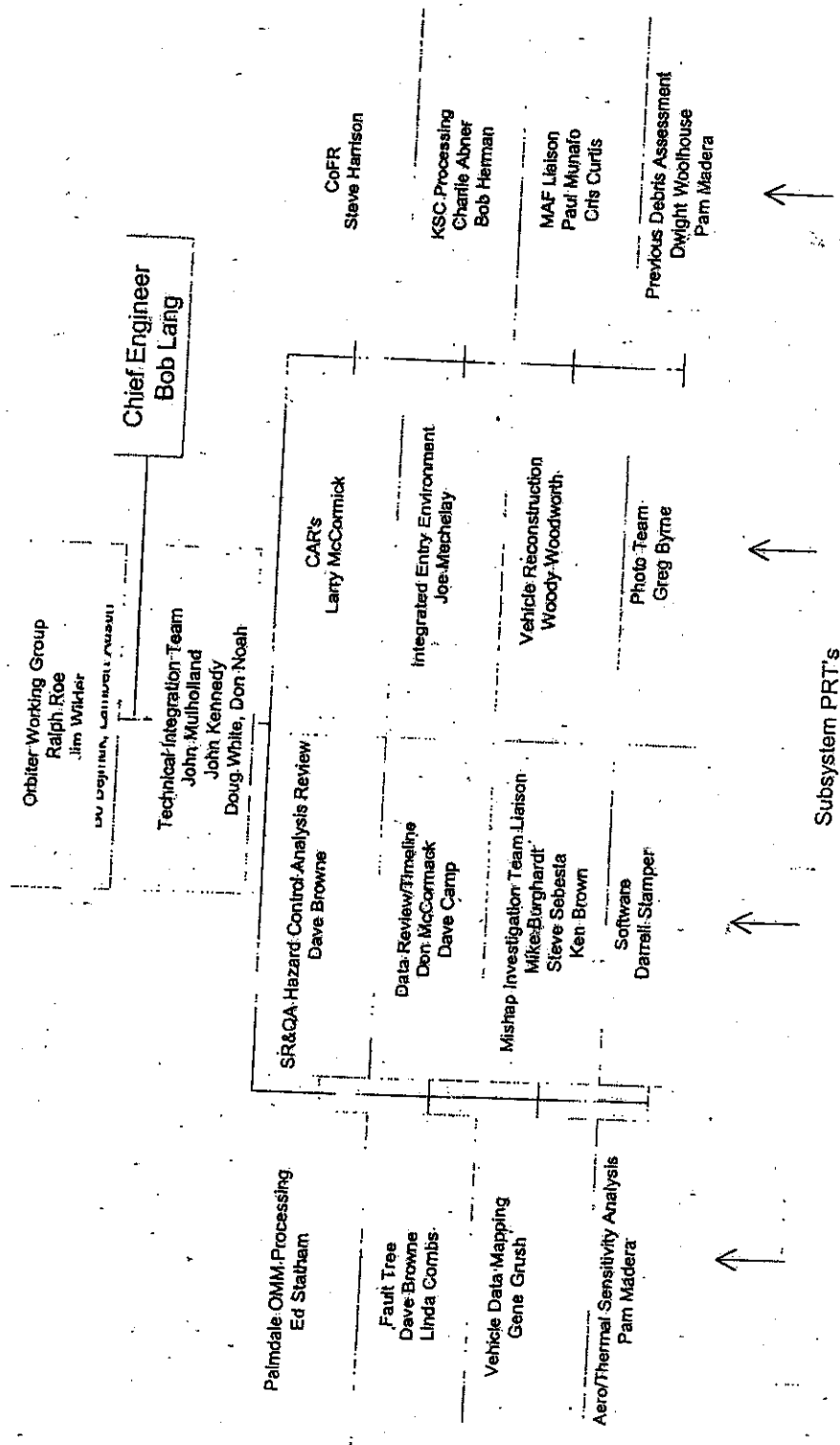
## Team Responsibilities Description

the public and external organizations. The EOC is located at the Johnson Space Center.

**Data & Record Handling--** Responsible for all data associated with the accident investigation. Includes administration of impounded data. Also includes organization and cataloging of data from sources outside of NASA.

**MSFC Projects--** Includes the following Project Offices: External Tank, Space Shuttle Main Engine, Reusable Solid Rocket Motor, and Solid Rocket Booster.

# ORBITER WORKING GROUP



2/6/03 08:17



# MSFC Space Shuttle Contingency Working Groups

External Tank Working  
Group

Chair: Paul Munafa

Solid Rocket Booster  
Working Group

Chair: P. Rodriguez

Reusable Solid Rocket Motor  
Working Group

Chair: P. McConnaughey

Space Shuttle Main Engine  
Working Group

Chair: H. McConnaughey

Space Shuttle Systems  
Working Group

Chair: J Brunty

Pamela Richardson, 12:31 PM 2/4/2003 -0500, Fwd: On Orbit Repair

X-Sender: prichard@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Tue, 04 Feb 2003 12:31:59 -0500  
To: Pete.Rutledge@hq.nasa.gov  
From: Pamela Richardson <prichard@hq.nasa.gov>  
Subject: Fwd: On Orbit Repair

Pete --

Here are some words to send to Mr. Trexler:

Tony --

Pamela Richardson of my staff has informed me that Mr. John Gleason of your staff has knowledge of historical studies at the NASA Langley Research Center regarding Shuttle on-orbit tile repair. As part of the investigation into the Columbia mishap, could you please authorize time for Mr. Gleason to search for this information and promptly forward it to:

Pamela Richardson  
NASA Headquarters, Code QE  
300 E Street SW  
Washington, DC 20546

I can be reached at 202-358-0579 if you have any questions.

Thank you,

Pete Rudledge, Director  
Enterprise Safety and Mission Assurance Division

X-Sender: j.r.gleason@pop.larc.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 5.0.2  
Date: Tue, 04 Feb 2003 11:11:24 -0500  
To: Pamela Richardson <prichard@hq.nasa.gov>  
From: "John R. Gleason" <j.r.gleason@larc.nasa.gov>  
Subject: On Orbit Repair  
Cc: c.c.chandler@larc.nasa.gov, t.i.trexler@larc.nasa.gov

Pam,

As per our telecon, please send a request for my pursuing the Shuttle On Orbit Tile Repair history to Tony Trexler, (t.i.trexler@nasa.gov.) Head Aircraft Systems Branch, LaRC.

JRG

---

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

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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

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James Lloyd, 12:37 PM 2/4/2003 -0500, Fwd: Re: Old shuttle risk study by Pate-Cornell (re: files o

X-Sender: jlloyd@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Tue, 04 Feb 2003 12:37:20 -0500  
To: hcat@hq.nasa.gov  
From: James Lloyd <jlloyd@hq.nasa.gov>  
Subject: Fwd: Re: Old shuttle risk study by Pate-Cornell (re: files on Orbiter)  
Cc: pritchard@hq.nasa.gov, prutledg@hq.nasa.gov, mark Kowaleski <mkowales@mail.hq.nasa.gov>, mgstamatelatos <mstamate@mail.hq.nasa.gov>, stacey.t.nakamura1@jsc.nasa.gov

An item for your consideration. We will have this information available today if you need it also.

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.

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

\*\*\*\*\*

Dr. Michael Stamatelatos  
Manager, Agency Risk Assessment Program  
NASA Headquarters - Mail Code QE  
Office of Safety and Mission Assurance

James Lloyd, 12:37 PM 2/4/2003 -0500, Fwd: Re: Old shuttle risk study by Pate-Cornell (re: files o

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"

Jim

**Lawrence Davis, 02:49 PM 2/4/2003 -0500, CAIB**

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X-Sender: lawrence\_davis@mail.dfrc.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 5.0.2  
Date: Tue, 04 Feb 2003 14:49:00 -0500  
To: Pete Rutledge <prutledg@hq.nasa.gov>,  
"Bryan O'Connor" <boconnor@mail.hq.nasa.gov>  
From: Lawrence Davis <lawrence.davis@dfrc.nasa.gov>  
Subject: CAIB

Here's three report titles that were written by DFRC personnel. They are in the public domain and the Denver Post and New York Times have both been asking for information. One article appeared in the LA Times with statements from, Robert Quinn, a retiree. His statement was this disaster could have been triggered by the loss of one tile. These studies were done on the left wing of the Columbia so are attracting more interest.

NASA Technical Paper 2657, Dec 1986, Finite-Element Reentry Heat-Transfer Analysis of Space Shuttle Orbiter, William L. Ko, Robert D. Quinn and Leslie Gong

NASA Technical Memorandum 88286, Oct 1987, Thermal Stress Analysis of Space Shuttle Orbiter Subjected to Reentry Aerodynamic Heating, William L. Ko and Roger A. Fields

NASA Technical Memorandum 88278, Nov 1987, Comparison of Flight-Measured and Calculated Temperatures on the Space Shuttle Orbiter, Leslie Gong, William L. Ko, Robert D. Quinn and W. Lance Richards

I hope all this is helpful. Lawrence

Eric C Raynor, 02:58 PM 2/4/2003 -0500, 1) Role of the NSRS in the Columbia Accident Investigation

X-Sender: eraynor@mail.hq.nasa.gov

X-Mailer: QUALCOMM Windows Eudora Version 4.3.2

Date: Tue, 04 Feb 2003 14:58:12 -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.i.rine@larc.nasa.gov,  
alan.clark@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: 1) Role of the NSRS in the Columbia Accident Investigation,  
and 2) Close Out of the NASA IG NSRS Audit

Cc: mhulet@mail.arc.nasa.gov, rreamy@pop300.gsfc.nasa.gov,  
stacey.t.nakamura1@jsc.nasa.gov, ebinns@tutron.com, jlemke@hq.nasa.gov,  
jloyd@hq.nasa.gov, prutledg@hq.nasa.gov, wharkins@hq.nasa.gov,  
whill@hq.nasa.gov, mkowales@hq.nasa.gov, wfrazier@hq.nasa.gov,  
prichard@hq.nasa.gov


NASA Safety Reporting System (NSRS) Technical Advisory Group (TAG) Representatives:

Although the NSRS is primarily viewed as a preventative safety reporting channel, it is also well-suited to serve as a post-accident reporting channel. In recent NASA press briefings on the loss of Columbia and her crew, several senior NASA managers have mentioned the NSRS as an available means to anonymously report any information which might be of help in the investigation into the Columbia accident. In light of these announcements, please take appropriate steps to ensure that the NSRS program remains visible and accessible to personnel at your installation. Please be sure to check your on-site displays to ensure they are well-stocked with NSRS brochures and report forms. If you need additional supplies, please let me know.

Also, please be advised that the NASA Office of the Inspector General has concluded its investigation into the NSRS process, and copies of their findings and NASA's response can be found in the enclosed PDF file attachments.

If you have any questions, please let me know.

-Eric

 IG NSRS Closure Letter.pdf

 Code Q NSRS Audit Closure Response.pdf

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://llis-pbma-kms.intranets.com>

GIDEP: <http://www.gidep.org>

GIDEP Intranet: <http://gidep-pbma-kms.intranets.com>

Eric C Raynor, 02:58 PM 2/4/2003 -0500, 1) Role of the NSRS in the Columbia Accident Investigati

SOLAR: <https://solar.msfc.nasa.gov>

Code Q Homepage: <http://www.hq.nasa.gov/office/codeq>

---

James Lloyd, 03:34 PM 2/4/2003 -0500, Re: Fwd: Re: Old shuttle risk study by Pate-Cornell

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 anticipated 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 fit 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"



James Lloyd, 03:34 PM 2/4/2003 -0500, Re: Fwd: Re: Old shuttle risk study by Pate-Cornell

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](mailto: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"

Jim

jilloyd@mail.hq.nasa.gov, 07:07 PM 2/4/2003 -0500, FW: Former Head of ASAP Sets the Record Str

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

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

X-Originating-IP: 68.100.166.170

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

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

To: hc@hq.nasa.gov, Code-Q@hq.nasa.gov

Cc: gary.w.johnson@nasa.gov

Subject: FW: Former Head of ASAP Sets the Record Straight

Date: Tue, 4 Feb 2003 19:07:22 -0500

X-OriginalArrivalTime: 05 Feb 2003 00:07:22.0183 (UTC) FILETIME=[8E304570:01C2CCAA]

X-MIME-Autoconverted: from quoted-printable to 8bit by spinoza.public.hq.nasa.gov id TAA17347

Sender: owner-code-q@lists.hq.nasa.gov

>From Gary Johnson at JSC; kind of restores ones faith in people's integrity and sense of fairness. Kind of a shame that Richard was out of the country when the media took off in this direction.

Original Message:

From: JOHNSON, GARY W. (JSC-NA) (NASA) gary.w.johnson@nasa.gov

Date: Tue, 4 Feb 2003 16:10:51 -0600

To: ronald.d.dittemore@nasa.gov, linda.j.ham@nasa.gov,

william.j.harris@nasa.gov, mark.d.erminger@nasa.gov,

frank.l.culbertson1@jsc.nasa.gov, jilloyd@hq.nasa.gov,

john.w.young@nasa.gov, jerry.b.holsomback@nasa.gov

Subject: FW: Former Head of ASAP Sets the Record Straight

Glad to see Richard's trying to do the right thing.

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

> From: HASHIMOTO, RICK (REMOTE-JSC)

> Sent: Tuesday, February 04, 2003 3:59 PM

> Subject: Former Head of ASAP Sets the Record Straight

> Former Head of NASA Safety Panel Sets the Record Straight

> By Brian Berger

> Space News Staff Writer

> 03:00 pm ET

> 04 February 2003

> WASHINGTON -- Much has been made since Saturday of a comment a member of NASA's Aerospace Safety Advisory Panel made during an April 18 hearing before the House Science space and aeronautics subcommittee.

> The member, Richard Blomberg, the former chairman of the panel, told lawmakers that he had "never been as concerned for space shuttle safety as I am right now."

> Less is being made of what he then went on to say:

> "That concern is not for the present flight or the next or perhaps the one after that. In fact, one of the roots of my concern is that nobody will know for sure when the safety margin has been eroded too far. All of my instincts, however, suggest that the current approach is planting the seeds for future danger."

> Blomberg told Space-News in a Feb. 4 telephone interview that he felt his comments had been taken out of context by some media organizations.

- > "I clearly was not talking about immediate flight risks," he
- > said. "I was talking about the long term planning and the fact
- > that the planning horizon was not realistic if the shuttle was
- > not going to be replaced any time soon.
- >
- > Blomberg was in London when the shuttle Columbia disintegrated on
- > reentry Feb. 1. When he returned home Monday night, he was
- > chagrined to see that his comments had been taken out of context
- > by a host of media outlets.
- >
- > Blomberg has since been trying to set the record straight and has
- > been deluged with phone calls and interview requests from the
- > media.
- >
- > Blomberg also told Space News that he doesn't believe that the
- > loss of Columbia is due to NASA or its contractors shirking their
- > commitment to safety.
- >
- > "The safety processes were, if anything, more robust than ever,"
- > he said.
- >
- > Congressional staffers present at the April 18 hearing also said
- > they felt Blomberg's comments had been largely misconstrued. They
- > said lawmakers took from his comments that NASA is not
- > shortchanging safety today, but that if the agency wishes to
- > continue flying safely into the next decade, larger investments
- > need to be made in upgrades.
- >
- > By November 2002, NASA appeared ready to do just that. An
- > amendment to NASA's 2003 budget request sent to Congress by the
- > White House asked that an additional \$470 million be provided for
- > a space shuttle Service Life Extension Program.
- >
- > Asked if the request for additional funds was responsive to the
- > advisory panel's recommendations, Blomberg said: "I'm not a
- > budget expert, so I don't know whether that's adequate, too much
- > or too little - but its certainly in the right spirit".
- >
- > Blomberg also said he does not believe that NASA's dismissal of
- > advisory panel members in early 2002 had anything to do with the
- > group's conclusions. Blomberg, who resigned his position as
- > chairman of the panel April 1, 2001, said that while he did not
- > agree with NASA's conclusion that more turnover in the panel's
- > membership was needed, he said he does not believe NASA was
- > trying to silence dissenting opinions.
- >
- > "People in Washington know you don't silence people by letting
- > them go - it just loosens their tongues," he said.
- >
- > NASA spokesman Bob Jacobs said the decision to replace members of
- > the aerospace safety advisory panel dates back to a 1997 by the
- > U.S. space agency's Inspector General expressing concern about
- > the length of service of panel members.
- >
- > In 2001, Jacobs said, a NASA internal report came to the same
- > conclusion. He said the changes in the panel's composition were
- > unrelated to the panel's findings about the space shuttle
- > program.
- >
- > Robert Walker, chairman of the Wexler Group and the former chair
- > of the House Science Committee, said the additional money for
- > shuttle upgrades also reflected a decision by NASA in 2001 to
- > push back the projected retirement date for shuttle from 2012 to
- > 2020 or later.

Jlloyd@mail.hq.nasa.gov, 07:07 PM 2/4/2003 -0500, FW: Former Head of ASAP Sets the Record St

- >
- > Walker also said he felt Blomberg's testimony had been taken out
- > of context.
- >
- > "What he was concerned about was the talk that NASA was going to
- > continue using the shuttle out to 2020," Walker said. "A lot of
- > us who have looked at this program agreed that in order to have a
- > shuttle that operates that you, you are going to have to spend a
- > lot of money in upgrades to keep it flying safely."
- >
- > Walker said the perspective was different when NASA thought it
- > would phase out the shuttle around 2012. In that scenario, he
- > said, he makes more sense to focus investment on the new
- > technologies needed for the new vehicle.
- >
- > "I don't believe that agency was compromising safety by starving
- > [the shuttle program] for funds," he said. "I spent a year
- > looking at this stuff and I really don't think that's a
- > legitimate criticism."
- >
- > Walker served as chair of the Commission on the Future of the
- > U.S. Aerospace Industry. The commission's report, delivered to
- > the White House and Congress in late 2002, recommended an
- > increased investment in the crumbling ground infrastructure at
- > Kennedy Space Center and Cape Canaveral Air Station, the United
- > State's primary launch facilities.
- >
- > Lori Garver, a former NASA associate administrator for policy and
- > plans who now consults to the aerospace industry, agreed that too
- > much was being made of Blomberg's warnings by the media.
- >
- > "Blomberg did not say it was unsafe now, he said it would be in
- > 10 years if NASA didn't increase its investment," she said.
- >
- > "Every single time we fly we believe it is safe or we wouldn't do
- > it," Garver said.
- >
- > © 1999-2002 SPACE.com, Inc. ALL RIGHTS RESERVED.
- >

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

**InfoCom, 10:20 AM 2/4/2003 -0500, Auditorium, Conference Rooms Open to View STS-107 Memor**

Date: Tue, 4 Feb 2003 10:20:12 -0500 (EST)  
X-Authentication-Warning: spinoza.public.hq.nasa.gov: majordom set sender to owner-headquarters using -f  
Subject: Auditorium, Conference Rooms Open to View STS-107 Memorial  
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: Robert Jacobs, Code PM, 358-1600

---

**AUDITORIUM, CONFERENCE ROOMS OPEN TO VIEW STS-107 CREW MEMORIAL**

Today's memorial service for the crew of the Space Shuttle Columbia will be broadcast on NASA Television. The auditorium is open, but you should be aware that it also serves as a staging area for reporters. There is a chance members of the media will ask you for interviews and reaction.

If you would prefer not to face the possibility of reporters' cameras and questions, NASA Headquarters has opened MIC-3, starting at 12:30 p.m.

The ceremony may be viewed on NASA HQ Internal Channel 24, the HIT televisions throughout the building, and streamed off the Internet at <http://www.nasa.gov>

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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, 12:07 PM 2/5/2003 -0500, FW: updated version of the general guidelines for field**

X-Sender: jmullin@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Wed, 05 Feb 2003 12:07:11 -0500  
To: jlemke@hq.nasa.gov  
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>  
Subject: FW: updated version of the general guidelines for field team  
PPE

Cc: Wayne Kee <Wayne.Kee-1@ksc.nasa.gov>, whill@hq.nasa.gov,  
prutledg@hq.nasa.gov, Catherine.Angotti@hq.nasa.gov,  
willia3@mail.hq.nasa.gov, snakamur@ems.jsc.nasa.gov, HCAT@hq.nasa.gov,  
jlloyd@hq.nasa.gov, prichard@hq.nasa.gov, wfrazier@hq.nasa.gov,  
dan.thomas@hq.nasa.gov, dloyd@wstf.nasa.gov

John, for the NASA Record, the enclosed General Guidelines were issued by Code AM. Both Codes AM and QS are unsure of where the other, not attached to this correspondence, "one page guidance" came from to advise Public Service Personnel. The Code AM enclosed guidance is more reliable guidance to Public Service Personnel due to the fact that a "team of Industrial Hygienists" have developed this product.  
Regards, Jon

4 February 2003

>  
> **GENERAL GUIDELINES FOR PERSONNEL HEALTH PROTECTION FOR FIELD TEAMS  
DURING RECOVERY OF SHUTTLE DEBRIS**

>  
> The following recommendations are provided for personnel health protection for field teams assigned to pick up debris / materials associated with the Columbia accident. These protection guidelines are for activities including investigation, recovery, and cleanup operations. Additional guidelines may be provided for other downstream activities such as working in Shuttle debris staging areas and/or handling cataloged items.

>  
> The appropriate personal protective equipment (PPE) to be used by personnel will depend on the task to be performed and proximity to debris containing hazardous material. A tiered approach to protective clothing selection is provided to allow for ease of implementation. The proper protective clothing for preventing /minimizing potential personnel exposure to hazardous materials and adequate control areas should be coordinated with the on-site health and safety supervisor. Coordinate with the NASA Recovery Team Command Post if there are any questions with this guidance. The on-site NASA JBOSC Environmental Health/Industrial Hygiene Office (EH/IH) representative supporting the recovery team may be contacted through the NASA Recovery Team Command Post if additional technical guidance is requested.

>  
> a. Level A - This level of protection is to be used when exposure (potential for contact with Liquid Propellants) to hypergolic propellants (e.g. hydrazines and dinitrogen tetroxide) is a hazard. Only NASA/Contractor qualified employees should enter areas with hypergolic propellants present in EPA Level A equivalent protection with positive pressure SCBA suit/gloves made with hypergolic propellant protective /compatible materials or Propellant Handlers Ensemble (PHE),(SCAPE). Consult with NASA Recovery Team Command Post.

>  
> a. Level B - This level of protection can be used during entry into an area where potential exists for depleted oxygen levels or when ammonia, Freon, hypergolic vapor or other inhalation hazards are present.>

>  
> a. Level C1 - Personnel should use full face respirators equipped with High Efficiency Particulate Air (HEPA) filters, Disposable coveralls (hooded Tyvek suits over coveralls), Cut-resistant leather gloves, Disposable coverall sleeves should be taped over gloves to prevent fibers from lodging under clothing, Disposable booties or boot covers over safety shoes, and an article of clothing to protect neck area under face. Examples of these tasks would include uncontrolled inhalation hazard from dusty material (e.g. handling friable TPS materials or burned graphite composite in which dust is produced).

>  
> Note: Level C1 may be downgraded to Level C2 if dust is suppressed by using wetting agents or encapsulants, (e.g. spray-on floor wax and glue).

>  
> Level C2 - Personnel should use disposable respirators (HEPA, N100 or N95),

disposable coveralls (Tyvek suits), heavy leather gloves, disposable booties or boot covers over safety shoes, and safety glasses with side shields or goggles.

> Level C2 protection would be for tasks with less potential for disturbance of composite-containing debris. Examples of these tasks would include picking up larger pieces of wetted TPS debris or disturbing it in any other way.

> a. Level D - Personnel should use leather gloves and a disposable dust mask or N95 (optional). Level D protection would be for tasks with minimal potential for debris disturbance (dust unlikely). Examples would include picking up metal fragments or small pieces of TPS material.

> Proper protective clothing requirements should be coordinated with the on-site health and safety representatives on a daily basis. Under all circumstances, the disturbance of debris should be minimized to avoid creating airborne particulates.

> The following materials may pose potential health hazards when encountering Shuttle debris:

> 1. Metals

> \* Aluminum - Boron Truss

> \* These materials should be in a solid minimum hazard state.

> \* This material must be inhaled or ingested to exhibit toxic effects.

> \* Handle with leather gloves. Wash with soap and water if skin contact.

> \* Level D PPE is recommended.

> \* Epoxy-Boron Truss

> \* These materials should be in a solid minimum hazard state.

> \* This material must be inhaled or ingested to exhibit toxic effects.

> \* Handle with leather gloves. Wash with soap and water if skin contact.

> \* Level D PPE is recommended.

> \* Beryllium

> \* Found in windshield frame and external tank doors

> \* Must be inhaled or ingested to be a hazard

> \* Should be found in a solid minimum hazard state.

> \* Handle with leather gloves. Wash with soap and water if skin contact.

> \* Level D PPE is recommended. If material is oxidized, PPE level upgrade should be considered.

> 1. Hypergolic Propellants

> Debris suspected of containing hypergolic propellants should be examined upwind at a distance. Items potentially containing liquids or vapors of hypergolic propellants would probably be tubing, thrusters, piping, tubing/piping fittings, and vessels. If hypergolic propellants are present, the debris may be approached by NASA/Contractor qualified personnel in Level A or equivalent. Calibrated monitoring equipment should be used to determine hypergolic vapor concentrations. If no hypergolic vapors are detected, the site health and safety supervisor may downgrade PPE taking into consideration the pH of the material.

> Parts and materials contaminated with propellants that have been > "> bagged> "> may off-gas slowly in the bag or container used for storage and shipping. Caution should be used when opening bags known or suspected to have been contaminated with propellants. Open the bags under a laboratory fume hood, and/or with proper PPE.

> \* Hydrazine, monomethyl hydrazine, and Nitrogen tetroxide (Hypergolic Propellants)

> \* Forward and Aft reaction control system (RCS), Auxiliary Power Unit (APU), and Orbiter Maneuvering System (OMS)>

> \* > Only NASA/Contractor qualified employees should enter areas with hypergolic propellants present in OSHA Level A Protection with suit/gloves made with hypergolic propellant protective /compatible materials or Propellant Handlers Ensemble (PHE), (SCAPE)

> \* Valves are designed to fail closed, assume all tubing to be contaminated with hypergolic propellant.

> \* Appropriate control zones should be established to prevent exposure to unprotected personnel. Vessels under pressure should also be taken into consideration while establishing the control zone.

> \* 3. Cryogenics

- > \*
- > \* Liquid Hydrogen (LH2) and Liquid Oxygen (LO2)
- > \* Heavy leather gloves are appropriate PPE for handling.
- > \* See on-site Health and Safety supervisor for site-specific recommendations.
- > \*
- > \* 4. Refrigerants
- > \* Ammonia
- > \* - Orbiter coolant system. Ammonia vapors may be irritating to eyes and upper respiratory system.
- > \* Utilize Level B (Self-contained breathing apparatus and skin protection) for unknown concentrations during initial characterization.
- > \* Consult with on-site health and safety representative for appropriate PPE.
- > \* Dichloromonofluoromethane (Freon 21)
- > \* Orbiter coolant system. May displace oxygen in enclosed or poorly ventilated areas.
- > \* Utilize Level B (Self-contained breathing apparatus and compatible gloves) in enclosed areas.
- > \* Consult with on-site safety representative for appropriate PPE.
- > \*
- > \* 5. Thermal Protection System (TPS) Materials:
- > \* Silica and other refractory fibers may be found in Shuttle tiles, blankets used on exterior Shuttle surfaces and payload bay, gap fillers; thermal barriers, heat shields.
- > \* The principal acute hazards of TPS materials are eye, skin and upper respiratory (depending upon particle size) tract irritation. Irritation and abrasion, similar to that of glass fibers may occur.
- > \* The level of PPE should be based on the task being performed, friability of the material and environmental conditions. Coordinate proper selection with site health and safety supervisor.
- > \*
- > \* 5. Helium Pressure Systems
- > \* Forward and Aft Reaction Control System (RCS) 13 gallon helium tanks (6 tanks) and Orbiter Maneuvering System (OMS) 130 gal helium tanks (2 tanks)
- > \* See site health and safety supervisor for safety precautions.
- > \*
- > \* 5. Ordnance
- > \* Ordnance is located in the following areas of the Shuttle: Wheel well in main landing gear, Drag chute compartment, Main hatch, KU-Band Antenna, Emergency Egress Window, Fire extinguisher tanks
- > \* See site health and safety supervisor for safety precautions.
- > \*
- > \* 5. Other Chemicals
- > \*
- > \* Recovery teams should remember that various sizes of pressurized vessels used for Shuttle experiments may be present in the debris. These vessels, although small, may be highly pressurized, and should be handled with care. Coordinate with health and safety supervisor.
- > \*
- > \* GENERAL RECOMMENDATIONS:
- > \*
- > \* 1. Appropriate decontamination procedures must be followed to prevent transport of dusty debris from the work area. Donning/ doffing PPE should be performed in a clean area. Procedure to be posted at site.
- > \*
- > \* 2. If debris is contaminated with carbon/graphite fibers (burned graphite/composite), personnel exiting a controlled zone should use a wet/dry HEPA vacuum (if present) to decontaminate outer clothing prior to removal. Procedure to be posted at site.
- > \*
- > \* 3. Contaminated PPE should be disposed of in appropriate bags/containers.
- > \*
- > \* 4. Respirators should be wet wiped on the outside and wipes disposed of properly. Respirators may not be left in potentially contaminated areas. The inside of the respirator should not be exposed to composite materials. This could result in skin irritation around facial area. Additionally, gloves should not be left in potentially contaminated areas. Disposable respirators should be discarded in appropriate bags/containers. Follow normal respirator cleaning and disinfecting protocol.



>  
> 5.> > Personnel should wash their hands and face when leaving a controlled work area and should wash their hands, forearms, and face prior to eating, drinking, or > smoking. Personnel should shower prior to going home when possible. Where possible a portable eyewash providing fifteen minutes of flow should be on site.

>  
> 6. Respirator filters should be replaced whenever they are damaged, soiled, or causing noticeably increased breathing resistance (e.g., causing discomfort to the wearer). Use of protective clothing, including respiratory protection, must be used in accordance with the manufacturer's recommendations. Use of respiratory protection must be in accordance with 29 CFR 1910.134. If other respiratory protection such as organic vapor, ammonia, or other applications are needed consult with an industrial hygienist.

>  
>  
> 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"



Guidelines for Shuttle Columbia Recovery team health protection 1.doc

Wayne R. Frazier, 10:08 AM 2/5/2003 -0500, Defense Intelligence offer

---

X-Sender: wfrazier@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Wed, 05 Feb 2003 10:08:32 -0500  
To: hcat@hq.nasa.gov  
From: "Wayne R. Frazier" <wfrazier@hq.nasa.gov>  
Subject: Defense Intelligence offer  
Cc: whill@hq.nasa.gov, prichard@hq.nasa.gov, jllloyd@hq.nasa.gov,  
jlemke@hq.nasa.gov, prutledg@hq.nasa.gov, jrmullin@hq.nasa.gov

This date received an offer from DIA (Bill Hungate through a third party) at Patrick AFB to offer DIA services to overfly the crash site with a hyperspectral scanner that has 3" resolution for hard objects in vegetation. Passed to Jon Mullin in Code QS who called FEMA EST rep Justin Tillman (646.2461) who called back and recommended we have DIA Patrick call Mr. Wayne Farley at the Lufkin DFO at 318.456.7238. Called DIA back at 0950 Feb 5 and talked to LTC Jeff Grantham (321.494.6240) who will contact Lufkin DFO.

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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"Mission success starts with safety"



Faith Chandler, 09:32 AM 2/4/2003 -0500, Re: Fwd: Data systems support for wreckage recovery a

FILETIME=[2645A810:01C2CBBA]

As I indicated in our conversation, there is an urgent need to quickly implement a database to capture information pertinent to each piece of wreckage that is recovered from Columbia. I believe that the Investigation Organizer that Tina Panontin and her group at Ames have developed provides the proper infrastructure to accomplish this.

The most important immediate need is to implement a procedure to associate a unique identifier to each recovered piece (or collection of pieces) along with a basic set of descriptive information. It is my understanding that the MIT has implemented a tagging system that uses the name of the recovery team leader and a sequential number to uniquely identify each part, and records the following information:

- \* Lat/long
- \* Date tagged
- \* Rough description
- \* Hazardous material (yes/no)
- \* Photo # (will need to be tied to whatever photo db is established)
- \* Part Number (if present)
- \* Batch identifier for small parts.

Obviously we can broaden this set of variables if appropriate. It will also be important to provide hooks to other datasets, such as radar target tracks, etc.

I intend to fly to Shreveport in the morning. I would suggest that you launch two or three people from NASA Ames and that we tag up in the morning. I will let you know when I have found a place to stay. I assume that we will have facilities available at Barksdale and will try to work that out with our folks on the ground there (Benzon and Hilldrup) before I head out.

I would suggest that the Ames people bring along whatever hardware they need to set up the data system and provide for data entry. We will probably need to anticipate training people to do data entry.

Please let me know if there are any difficulties with this plan. Thanks.

Vern Ellingtad

---

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

NASA Headquarters  
Office of Safety and Mission Assurance  
Code Q Rm 5x40

Faith Chandler, 09:32 AM 2/4/2003 -0500, Re: Fwd: Data systems support for wreckage recovery a

X-Sender: fchandle@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Tue, 04 Feb 2003 09:32:24 -0500  
To: Pete Rutledge <prutledg@hq.nasa.gov>  
From: Faith Chandler <fchandle@hq.nasa.gov>  
Subject: Re: Fwd: Data systems support for wreckage recovery at Barksdale

Pete,

FYI...

I also recommended this to Bryan.  
He and I spoke about it on Sunday.

At 09:29 AM 2/4/2003 -0500, you wrote:  
Yuri,

Yes, in fact we (Pat Martin) had gone to Theron Bradley (on Saturday) and asked if, based on his CONTOUR experience with IO, he would want us to call on ECS to support the Columbia AIB. He suggested we hold off a decision on that. We mentioned it to Bryan, as well, as a useful option, so it was on his mind, as well. I'm glad that connection ended up being made one way or the other. I think IO will be a valuable tool for the board.

Pete

At 09:14 AM 2/4/2003 -0500, you wrote:  
Pete,

Just to give you a heads up we've sent a team down to Shreveport last night to support Vern and his folks. We've also assembled a tiger team at ARC to work some of the scaling and interface issues of IO based on the initial feedback from the CONTOUR mishap.

I'll keep you posted as events warrant.

tx, -yuri

-----  
Vern,

be advised that James Williams and Ian Sturken from NASA Ames will arrive in Shreveport late tonight and will contact you on your cell in the morning.

They are bringing laptops that with web access will provide access to InvestigationOrganizer on the Ames server. They will also bring a copy of the software that can be loaded onto a local machine if necessary. They are ready to work with you and others to structure the data fields and data relationships to meet the requirements of the investigation. We can then work out the procedures and resources for training and data entry.

I'll be in contact with them throughout the days but feel to contact me directly as well.

take care,  
Tina

-----  
From: Ellingstad Vern <Ellingv@ntsb.gov>  
To: "Yuri Gawdiak (E-mail)" <ygawdiak@mail.arc.nasa.gov>  
Cc: "Tina L Panontin (E-mail)" <Tina.L.Panontin@nasa.gov>,  
"whill@hq.nasa.gov" <whill@hq.nasa.gov>,  
Benzon Robert  
<BENZONR@ntsb.gov>, Hilldrup Frank <HILLDRF@ntsb.gov>,  
"Richard.M.Keller@nasa.gov" <Richard.M.Keller@nasa.gov>,  
Clark John  
<clarkj@ntsb.gov>  
Subject: Data systems support for wreckage recovery at Barksdale  
Date: Mon, 3 Feb 2003 14:35:18 -0500  
X-OriginalArrivalTime: 03 Feb 2003 19:26:28.0625 (UTC)

Faith Chandler, 09:32 AM 2/4/2003 -0500, Re: Fwd: Data systems support for wreckage recovery a

300 E Street, S.W  
Washington, D.C 20546

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

---

Doug Arbuckle, 09:13 AM 2/5/2003 -0500, Re: Fwd: On-orbit tile repair

---

X-Sender: p.d.arbuckle@express.larc.nasa.gov  
Date: Wed, 5 Feb 2003 09:13:14 -0500  
To: prutledg@mail.hq.nasa.gov, prichard@mail.hq.nasa.gov  
From: Doug Arbuckle <p.d.arbuckle@larc.nasa.gov>  
Subject: Re: Fwd: On-orbit tile repair  
Cc: d.c.freeman@larc.nasa.gov, d.l.dwoyer@larc.nasa.gov,  
m.j.shuart@larc.nasa.gov, a.h.phillips@larc.nasa.gov,  
fchandle@hq.nasa.gov

Dr Rutledge--

Mr John Gleason is currently an aircraft maintenance technician assigned to the Airborne Systems Competency. Many years ago he was a technician assigned to the Structures and Materials Competency, during which time he apparently participated in the studies that you describe.

LaRC's experts in this subject, and most matters relating to Orbiter tiles, are in the Structures and Materials Competency. To assure that LaRC provides the most-informed and most-timely product to Code Q, Mr Gleason will be assigned to pull together what information he has in hand and provide it to the Structures and Materials Competency as soon as possible. Mark Shuart, Director of the Structures and Materials Competency, will be responsible for the final product delivery to Code Q.

LaRC personnel stand ready to provide whatever expertise we have to support the Columbia mishap investigation.

Feel free to contact me at 757-864-1718 if you or Pamela have any questions.

Doug Arbuckle, Director  
Airborne Systems Competency

X-Sender: prutledg@mail.hq.nasa.gov  
Date: Tue, 04 Feb 2003 13:21:41 -0500  
To: Tony.L.Trexler@nasa.gov  
From: Pete Rutledge <prutledg@hq.nasa.gov>  
Subject: On-orbit tile repair  
Cc: prichard@hq.nasa.gov

Tony,

Pamela Richardson of my staff has informed me that Mr. John Gleason of your staff has knowledge of historical studies at the NASA Langley Research Center regarding Shuttle on-orbit tile repair. This has been the subject of recent discussions here and was the subject of a memo from John Young at JSC just a couple of months ago. This subject is even more important as a result of the Columbia mishap. Could you please authorize time for Mr. Gleason to search for this information and forward it as soon as possible to:

Pamela Richardson  
NASA Headquarters, Code QE  
300 E Street SW  
Washington, DC 20546

I can be reached at 202-358-0579 if you have any questions.

Thank you very much,

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

Doug Arbuckle, 09:13 AM 2/5/2003 -0500, Re: Fwd: On-orbit tile repair

---

NASA Headquarters, Code QE, Washington, DC 20546

ph: 202-358-0579

FAX: 202-358-2778

e-mail: [pete.rutledge@hq.nasa.gov](mailto:pete.rutledge@hq.nasa.gov)

Mission Success Starts with Safety!

Tony L. Trexler  
Head, Aircraft Systems Branch  
Airborne Systems Competency  
NASA Langley Research Center

Bldg. 1244, MS 255  
6 E. Taylor St.  
Hampton, Va. 23681-2199  
Phone 757-864-3922  
Fax 757-864-8294



Faith Chandler, 08:49 AM 2/5/2003 -0500, Fwd: Re: presentations

---

X-Sender: fchandle@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Wed, 05 Feb 2003 08:49:07 -0500  
To: prutledg@hq.nasa.gov  
From: Faith Chandler <fchandle@hq.nasa.gov>  
Subject: Fwd: Re: presentations

Pete,

FYL...

X-Sender: mkicza@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Wed, 05 Feb 2003 08:39:56 -0500  
To: Faith Chandler <fchandle@hq.nasa.gov>  
From: Mary Kicza <mkicza@hq.nasa.gov>  
Subject: Re: presentations

Faith,

I think what our people will be looking for is simply a general, top-level overview of the mishap process, and then an understanding of the teams that are in place for the 107 mishap. So it's a combination of the two presentations you show, but not with all of the detail (i.e. how to conduct an interview, etc.), plus information about the actual boards that have been formed for this particular investigation.

Thanks!

Mary

At 08:26 AM 2/5/2003 -0500, you wrote:  
Mary,

Here are two presentations that have been prepared recently.

One is for the Enterprises .... to give them an overview of how the HCAT - MRT - and field investigators are working together.

The other is a briefing that was prepared for the Columbia Accident Investigation Board at the request of Bryan... to provide them with some refresher information on investigation.

I am not sure what you are looking for.  
Perhaps one or a combination of these would serve you.

If you have an opportunity, please mark the slides you are interested in. I can put together a custom presentation to meet your specific information needs.

Thanks.  
Faith

~~~~~  
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

Faith Chandler, 08:49 AM 2/5/2003 -0500, Fwd: Re: presentations

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202-358-2778 (fax)

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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)

-----

**Jonathan B. Mullin, 10:48 AM 2/5/2003 -0500, 107 Board Questions**

---

X-Sender: jmullin@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Wed, 05 Feb 2003 10:48:09 -0500  
To: jlemke@hq.nasa.gov  
From: "Jonathan B. Mullin" <jmullin@hq.nasa.gov>  
Subject: 107 Board Questions  
Cc: tom.whitmeyer@hq.nasa.gov, prutledg@hq.nasa.gov, prichard@hq.nasa.gov

Consider the following for SMART Investigation Questions:

Palmdale:

1. Call former SMA from Palmdale Space Shuttle who can comment on workmanship, MRB activities, open paper, successes, schedules, etc. during Orbiter upgrades and maintenance.

2. Consider requesting lists of Federal and Contractors who have worked on NASA

Resources.

3. Provide all DRLs, contracts, and formal reviews.

4. Records of NASA Headquarters (Code Q) oversight of this location.

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"

Michael Stamatelatos, 08:41 AM 1/21/2003 -0500, Fwd: STS-107

X-Sender: mstamate@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Tue, 21 Jan 2003 08:41:44 -0500  
To: prutledg@hq.nasa.gov  
From: Michael Stamatelatos <mstamate@hq.nasa.gov>  
Subject: Fwd: STS-107

Pete:  
Has my invitation to this launch been approved?  
Michael

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

X-Sender: gtemplet@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Tue, 21 Jan 2003 08:24:21 -0500  
To: code-q@lists.hq.nasa.gov  
From: Geoffrey Templeton <gtemplet@hq.nasa.gov>  
Subject: STS-107  
Sender: owner-code-q@lists.hq.nasa.gov

STS-107 is scheduled for March 1. If you send me names earlier, they will received invitations. If you wish to have anyone else witness the launch, please let me know by January 29, 2003. Remember, I need full names, titles, and occupation of the principal, and the full names of all those in the party. Thanks. Geoff

Geoffrey B. Templeton  
Director, George M. Low Program/CI  
NASA Headquarters, Code Q  
Washington, DC 20546-0001

Phone: 202.358.2157  
Facsimile: 202.358.2779  
E-Mail: gtemplet@hq.nasa.gov

\*\*\*\*\*  
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"

Geoffrey Templeton, 08:24 AM 1/21/2003 -0500, STS-107

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

X-Sender: gtemplet@mail.hq.nasa.gov

X-Mailer: QUALCOMM Windows Eudora Version 4.3.2

Date: Tue, 21 Jan 2003 08:24:21 -0500

To: code-q@lists.hq.nasa.gov

From: Geoffrey Templeton <gtemplet@hq.nasa.gov>

Subject: STS-107

Sender: owner-code-q@lists.hq.nasa.gov

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If you wish to have anyone else witness the launch, please let me know by January 29, 2003.

Remember, I need full names, titles, and occupation of the principal, and the full names of all those in the party. Thanks. Geoff

Geoffrey B. Templeton

Director, George M. Low Program/CI

NASA Headquarters, Code Q

Washington, DC 20546-0001

Phone: 202.358.2157

Facsimile: 202.358.2779

E-Mail: gtemplet@hq.nasa.gov

Vernon W Wessel, 01:40 PM 1/14/2003 -0500, Re: Fwd: STS-107 PMMT SMAR

X-Sender: rqwess@popserve.grc.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 5.1.1  
Date: Tue, 14 Jan 2003 13:40:57 -0500  
To: Pete Rutledge <prutledg@hq.nasa.gov>  
From: Vernon W Wessel <Vernon.W.Wessel@grc.nasa.gov>  
Subject: Re: Fwd: STS-107 PMMT SMAR

Thank you Pete - I'll read and Jim noted that Michael S might be a good person to talk with.

Bill

At 12:53 PM 1/14/2003 -0500, you wrote:

Bill, Jim said you were looking for info on the Shuttle. Attached is the latest I have access to. Hope this helps.

Pete

X-Sender: wbihner@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Mon, 13 Jan 2003 15:33:37 -0500  
To: prutledg@hq.nasa.gov, jlloyd@hq.nasa.gov, mgreenfi@hq.nasa.gov, boconnor@hq.nasa.gov, wreaddy@hq.nasa.gov, mkosteln@hq.nasa.gov, mcard@hq.nasa.gov, wfrazier@hq.nasa.gov, rpatrica@hq.nasa.gov, Amanda.Goodson@msfc.nasa.gov, bob.peercy@west.boeing.com, john.branard@kmail.ksc.nasa.gov, lbriscoe@ems.jsc.nasa.gov, jmullin@hq.nasa.gov, rglanvil@ems.jsc.nasa.gov, young@ems.jsc.nasa.gov, dwhittle@ems.jsc.nasa.gov, judith.hooper-1@ksc.nasa.gov, charlie.chesser@msfc.nasa.gov, steve.turner@maf.nasa.gov, merminge@ems.jsc.nasa.gov, Gregory.R.Lain@maf.nasa.gov, Alex.C.Adams@msfc.nasa.gov, Daniel.J.Mullane@msfc.nasa.gov, David.J.Spacek@msfc.nasa.gov, William.Higgins-1@ksc.nasa.gov, Shannon.Bartell-1@ksc.nasa.gov, william.j.harris1@jsc.nasa.gov, Roy.Malone@msfc.nasa.gov, fgregory@hq.nasa.gov, Humberto.Garrido-1@ksc.nasa.gov, dominic.l.gorie1@jsc.nasa.gov, len.sirota@hq.nasa.gov, spitoffi@mail.hq.nasa.gov, yolanda.y.marshall@nasa.gov, ronald.d.dittemore@nasa.gov, linda.j.ham@nasa.gov, Craig.B.Clokey@USAHQ.UnitedSpaceAlliance.com, mkowales@mail.hq.nasa.gov, pcounts@hq.nasa.gov, bwatkins@hq.nasa.gov, whill@hq.nasa.gov, dwhitehe@hq.nasa.gov, sortega@hq.nasa.gov, awest@hq.nasa.gov

From: Bill Bihner <wbihner@hq.nasa.gov>  
Subject: STS-107 PMMT SMAR  
Cc: Roy.Bridges-1@ksc.nasa.gov, Jefferson.D.Howell1@jsc.nasa.gov, Arthur.G.Stephenson@nasa.gov, William.Parsons@ssc.nasa.gov

Good Afternoon,

Attached please find the Code Q Pre-Launch Mission Management Team Edition of the Safety and Mission Assurance Report (SMAR) for STS-107.

NOTE that the only change to this document from the FRR version is the update to the BSTRA ball status based on a special PRCB meeting on Sunday, January 12. OV-102 has been cleared to fly one additional mission, STS-107. Actions assigned by the Shuttle Program Manager will determine the longer term solution(s) to the BSTRA issue.

If there are any questions, please give me a call.

Thanks,

Bill

William J. Bihner, Jr.  
NASA/QE  
(202) 358-4441

Vernon W Wessel, 01:40 PM 1/14/2003 -0500, Re: Fwd: STS-107 PMMT SMAR

---

-----  
Peter J. Rutledge, Ph.D.  
Director, Enterprise Safety and Mission Assurance 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](mailto:pete.rutledge@hq.nasa.gov)

Mission Success Starts with Safety!

Vernon W. (Bill) Wessel  
Director, Safety and Assurance Technologies Directorate

National Aeronautics and Space Administration  
John H. Glenn Research Center  
Mail Stop: 3-6  
21000 Brookpark Road  
Cleveland, Ohio 44135

Phone: (216) 433-2350  
FAX: (216) 977-7005  
E-Mail: [Vernon.W.Wessel@grc.nasa.gov](mailto:Vernon.W.Wessel@grc.nasa.gov)

Mission Success Starts With Safety

James Lloyd, 01:12 PM 1/14/2003 -0500, Re: Fwd: STS-107 PMMT SMAR

X-Sender: jlloyd@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Tue, 14 Jan 2003 13:12:23 -0500  
To: Pete Rutledge <prutledg@hq.nasa.gov>  
From: James Lloyd <jlloyd@hq.nasa.gov>  
Subject: Re: Fwd: STS-107 PMMT SMAR

Thanks Pete, I knew I saw something somewhere on the problem but I couldn't recall where.

At 12:53 PM 1/14/2003 -0500, Pete Rutledge wrote:  
Bill, Jim said you were looking for info on the Shuttle. Attached is the latest I have access to.  
Hope this helps.

Pete

X-Sender: wbihner@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Mon, 13 Jan 2003 15:33:37 -0500  
To: prutledg@hq.nasa.gov, jlloyd@hq.nasa.gov, mgreenfi@hq.nasa.gov,  
boconnor@hq.nasa.gov, wready@hq.nasa.gov, mkosteln@hq.nasa.gov,  
mcard@hq.nasa.gov, wfrazier@hq.nasa.gov, rpatrica@hq.nasa.gov,  
Amanda.Goodson@msfc.nasa.gov, bob.peercy@west.boeing.com,  
john.branard@kmail.ksc.nasa.gov, lbriscoe@ems.jsc.nasa.gov,  
jmullin@hq.nasa.gov, rglanvil@ems.jsc.nasa.gov,  
jyoung@ems.jsc.nasa.gov, dwhittle@ems.jsc.nasa.gov,  
judith.hooper-1@ksc.nasa.gov, charlie.chesser@msfc.nasa.gov,  
steve.turner@maf.nasa.gov, meringe@ems.jsc.nasa.gov,  
Gregory.R.Lain@maf.nasa.gov, Alex.C.Adams@msfc.nasa.gov,  
Daniel.J.Mullane@msfc.nasa.gov, David.J.Spacek@msfc.nasa.gov,  
William.Higgins-1@ksc.nasa.gov, Shannon.Bartell-1@ksc.nasa.gov,  
william.j.harris1@jsc.nasa.gov, Roy.Malone@msfc.nasa.gov,  
fgregory@hq.nasa.gov, Humberto.Garrido-1@ksc.nasa.gov,  
dominic.l.gorie1@jsc.nasa.gov, len.sirota@hq.nasa.gov,  
spitotti@mail.hq.nasa.gov, yolanda.y.marshall@nasa.gov,  
ronald.d.dittemore@nasa.gov, linda.j.ham@nasa.gov,  
Craig.B.Clokey@USAHQ.UnitedSpaceAlliance.com;  
mkowales@mail.hq.nasa.gov, pcounts@hq.nasa.gov, bwatkins@hq.nasa.gov,  
whill@hq.nasa.gov, dwhitehe@hq.nasa.gov, sortega@hq.nasa.gov,  
awest@hq.nasa.gov

From: Bill Bihner <wbihner@hq.nasa.gov>

Subject: STS-107 PMMT SMAR

Cc: Roy.Bridges-1@ksc.nasa.gov, Jefferson.D.Howell1@jsc.nasa.gov,  
Arthur.G.Stephenson@nasa.gov, William.Parsons@ssc.nasa.gov

Good Afternoon,

Attached please find the Code Q Pre-Launch Mission Management Team Edition of the Safety and Mission Assurance Report (SMAR) for STS-107.

NOTE that the only change to this document from the FRR version is the update to the BSTRA ball status based on a special PRCB meeting on Sunday, January 12. OV-102 has been cleared to fly one additional mission, STS-107. Actions assigned by the Shuttle Program Manager will determine the longer term solution(s) to the BSTRA issue.

If there are any questions, please give me a call.

Thanks,

Bill

William J. Bihner, Jr.  
NASA/QE  
(202) 358-4441



Peter J. Rutledge, Ph.D.  
Director, Enterprise Safety and Mission Assurance 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](mailto:pete.rutledge@hq.nasa.gov)

Mission Success Starts with Safety!

Jim

Mark Kowaleski, 04:07 PM 1/7/2003 -0500, Re: STS-107 FRR SMAR

---

X-Sender: mkowales@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Tue, 07 Jan 2003 16:07:57 -0500  
To: Bill Bihner <wbihner@hq.nasa.gov>  
From: Mark Kowaleski <mkowales@hq.nasa.gov>  
Subject: Re: STS-107 FRR SMAR  
Cc: prutledg@mail.hq.nasa.gov

Bill, totally awesome job! Thanks for your hard work in pulling this together.

Mark

At 03:34 PM 1/7/2003 -0500, you wrote:  
Good Afternoon,

Attached please find the Code Q FRR-Edition Safety and Mission Assurance Report (SMAR) for STS-107.

If there are any questions, please give me a call.

Thanks,

Bill

William J. Bihner, Jr  
NASA/QE  
(202) 358-4441

**Bill Loewy, 12:55 PM 1/7/2003 -0500, Fwd: STS-107 FRR Tagup Action Item**

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

X-Sender: bloewy@mail.hq.nasa.gov

X-Mailer: QUALCOMM Windows Eudora Version 4.3.2

Date: Tue, 07 Jan 2003 12:55:32 -0500

To: hqpar@lists.hq.nasa.gov

From: Bill Loewy <bloewy@hq.nasa.gov>

Subject: Fwd: STS-107 FRR Tagup Action Item

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

>  
>Subject: STS-107 FRR Tagup Action Item

>Date: Tue, 7 Jan 2003 11:14:33 -0600

>X-Mailer: Internet Mail Service (5.5.2653.19)

>> The following topic is planned for the STS-107 PMMT Tag-up:

>>

>> JSC

>> 1. BSTRA Crack

>>

>> The following action was assigned at the STS-107 FRR Tag-up

>> held on Tuesday, January 07, 2003:

>>

>> Action # 010703-1

>> Actionee: JSC-Hugo Martinez

>> Action: How many BSTRA balls failed the ATP nitrogen

>> immersion test?

>>

>>

>>

\*\*\*\*\*

Bill Loewy

NASA Headquarters

Code QS

Office of Safety and Mission Assurance

Washington DC 20546

Bill.Loewy@hq.nasa.gov

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"Mission success starts with safety"

**boconnor, 04:02 PM 1/6/2003 -0500, Re: STS-107 Code Q logistics**

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X-Sender: boconnor@mail.hq.nasa.gov  
X-Mailer: QUALCOMM Windows Eudora Version 4.3.2  
Date: Mon, 06 Jan 2003 16:02:00 -0500  
To: Mark Kowaleski <mkowales@hq.nasa.gov>  
From: boconnor <boconnor@hq.nasa.gov>  
Subject: Re: STS-107 Code Q logistics  
Cc: wbihner@mail.hq.nasa.gov, prutledg@mail.hq.nasa.gov

Mark,

No problem.

By the way, I suggested to Rich in this morning's Code Q staff meeting that the SMAR should be something the SMA Directors at the Centers share with their Center Directors so they are a little smarter about issues the other centers are working before they show up for the FRR. He thinks the ones needing it the most would probably be Parsons and Bridges because JSC and MSFC CDs get pretty comprehensive briefings before the FRR.

Best,  
O'C

At 03:51 PM 1/6/2003 -0500, Mark Kowaleski wrote:

Bryan,

Only Bill Bihner will be attending the STS-107 FRR (I felt it was a waste for two people to go to the FRR). Bill has attended a lot of FRRs during his Code M days, so he is comfortable with the process.

Bill has taken the lead on STS-107 Code Q activities and he has put together the STS-107 Safety and Mission Assurance Report (SMAR). The product is exactly like what you are used to seeing. It will be distributed tomorrow after the latest BSTRA updates have been incorporated from today's special BSTRA PRCB.

Both Bill and I will support the launch operations next week in the LCC. This will get him up-to-speed on the launch process in the LCC and Code Q's role in the launch count.

Please let us know if you need anything.

Thanks,

Mark