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"STS-121 Post Flight Readiness Review Briefing"

SPEAKERS:

MICHAEL GRIFFIN, NASA Administrator
BILL GERSTENMAIER, Associate Administrator
for Space Operations
WAYNE HALE, Space Shuttle Program Manager
MIKE LEINBACH, NASA Launch Director

[Moderated by Dean Acosta, NASA Press Secretary]

2:40 p.m. through 3:30 p.m., EST
Saturday, June 17, 2006

Kennedy Space Center

[TRANSCRIPT PREPARED FROM A NASA TV WEBCAST RECORDING.]

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1 P R O C E E D I N G S

2 MR. ACOSTA: Good afternoon, and welcome to the
3 Post Flight Readiness Review press conference. I am Dean
4 Acosta. We are here to talk about the last days and talk
5 about our launch date, and we will get started with that
6 shortly.

7 To my left is the Administrator of NASA, Dr.
8 Michael Griffin; to his left, Associate Administrator for
9 Space Operations Bill Gerstenmaier; to his left, we have
10 Shuttle Program Manager Wayne Hale; and to his left, we
11 have NASA Launch Director Mike Leinbach.

12 We will have some opening remarks, and then I
13 will ask that we go around the room and have some questions
14 and answers. I ask that you identify yourselves and who
15 you are asking your question too, and also at the end of
16 the press conference, that that will be the end of the
17 press conference, and ask that you respectfully not come up
18 and continue the press conference, so appreciate that.

19 All right. We will go ahead and start with
20 opening remarks from the administrator.

21 ADMINISTRATOR GRIFFIN: Well, thanks, Dean, and
22 thanks all of you for being here today.

1 We had fully 2 days of a very intensive Flight
2 Readiness Review for STS-121. I am sure you knew that it
3 would be and that it would be a very intensive and spirited
4 exchange, and that is what we had, of course, following
5 last year's mission when we had certainly an unplanned loss
6 of a large piece of foam and we've spent a year since that
7 time almost getting ready for this flight, trying to
8 understand even better what caused this foam to come off
9 and how we can keep it from coming off.

10 You will hear that there were many different
11 viewpoints on the issue of whether we were ready to fly or
12 not. We have decided that we are. Gerst will tell you all
13 about that, but it was one of the most open and yet
14 non-adversarial sets of discussions that I have seen since
15 returning to NASA. It is the way we should function, and
16 it is the way we did function. I am very proud of the
17 people who pulled all this together, and I am very pleased
18 that I was able to be part of it.

19 MR. ACOSTA: Okay.

20 MR. GERSTENMAIER: Thanks, Mike.

21 Again, it was a tremendously good review in the
22 fact that we were very thorough in all the subjects we

1 covered and talked about.

2 I think you will tend to want to talk more about
3 the foam and some of the ice/frost ramps and other things,
4 but I think it is important to realize that we spent a lot
5 of time in this review talking about a lot of other issues
6 to make sure that we are really ready to go fly.

7 Sometimes it is the things that we think we
8 understand that we really don't understand that can cause
9 us the most problems. So we were really careful in this
10 review to make sure that we talked about everything as
11 thoroughly as we could. We reviewed everything as much as
12 we could to make sure we are really ready to go fly, and I
13 think we just had a very, very good discussion with all the
14 folks involved.

15 Obviously, the ice/frost ramps was one of the
16 vigorously debated topics. In the end, in the poll, we had
17 essentially two members, safety, and the chief engineer who
18 very similar in the last ice/frost ramp discussions were
19 both no-go or the recommendation was not to fly from their
20 position, but they do not object to us flying, and they
21 understand the reasons and the rationale that we laid out
22 in the Review for Flight, and I think we are good to go

1 with that. Again, they understand the position. They
2 understand where they are, but from their particular
3 disciplines, they felt that they wanted their statement to
4 be no-go, and they put essentially a little written
5 statement in their go criteria of what exactly they meant
6 by being ready to go launch.

7 I think the other thing that came out very
8 strongly during this is we really have a mission to go do
9 with the Space Station. It is going to be exciting
10 increasing the crew size to three. We talked a lot about
11 the criteria of what we would do to leave the third crew
12 member on board Space Station. We would look forward to
13 the other Shuttle flights to make sure we have a ride home
14 for him in return. We have contingency plans in case the
15 Shuttle flights slip or delay. We reviewed that in a lot
16 of detail.

17 We also spent a lot of time looking at the
18 contingency Shuttle crew support capability. That is the
19 ability to keep crew on board Station if there is a problem
20 with the Shuttle, and we have plenty of overlap. The
21 Station is in very good shape from an oxygen generation
22 standpoint, a carbon dioxide removal standpoint. The most

1 critical consumable on Station is oxygen, but it looks very
2 good, and we look very good having a good, sound, and solid
3 Launch on Need.

4 We also reviewed the tile repair techniques, and
5 those have made great progress since the last flight on
6 STS-114, and I think we also spent a lot of time looking at
7 the models and the transport of debris potentially back
8 into the orbiter, and again, those models have also been
9 dramatically improved.

10 I would like to show you two slides, if I could
11 right now, if we can call those up.

12 First of all, this is the external view of the
13 external tank. You will see on this view where the
14 ice/frost ramps are. There are 13 up on the LO2 side.
15 There is 7 on the intertank region, and there is 17 down at
16 the back. The little numbers next to them are the
17 stations. Each one of them may be slightly different than
18 the others. They are not all created equal, and they run
19 up and down the tank.

20 Next chart.

21 This was what we have seen in the past in terms
22 of the Top Ten LH2, and that is the lower portion of the

1 tank, ice/frost foam ramp losses. This is fully what we
2 expect to see, potentially on STS-121 when we get some of
3 our external tank photography back. We expect to see
4 losses in these regions, pretty much similar to what we
5 have seen here. We have designed to these, plus some
6 margin. So we have good capability to accept what we have
7 seen in the past historically, plus a margin, but this is
8 what we expect to see.

9 So, when we see this in flight and you get this
10 data down, we should not be surprised. It is a function of
11 when the foam comes off. It is a function of the mass, and
12 it is a function of the area. So, again, I just wanted to
13 kind of set the precedence of where we are setting overall
14 with what we expect to see on STS-121.

15 Again, it was a very good review. We have an
16 awesome team working together, and lastly, we set the
17 launch date of July 1st, and we are ready to go for July
18 1st.

19 And, Wayne?

20 MR. HALE: Well, I guess I wanted to just make a
21 comment on the human element here. As I was sitting in the
22 Flight Readiness Review, thinking how different this has

1 been from Flight Readiness Reviews that I went to before
2 the accident, there was so much engagement from so many
3 people.

4 There were folks that perhaps in the old days,
5 maybe not them personally, but their organizations would
6 have never asked questions, would never have participated
7 in discussion, would have gone out in the hall after the
8 meeting and said, "Well, I don't get why it's okay to go
9 fly. I really didn't understand the rationale for that."

10 We had everyone engaged. It was a huge room full
11 of people. I think that room holds about 250 people. It
12 was full. There was overflow rooms provided, and I think
13 we answered questions from all comers.

14 Now, at the end of the day, some people still had
15 reservations, and they expressed those reservations, and I
16 think that is a great step forward from where we were
17 sometime ago in the past.

18 So I think that those folks that were concerned
19 about the culture change in the Space Shuttle program or
20 NASA in general ought to take heart because of this huge
21 change in the way that people participate and are willing
22 to ask questions, and I am pleased to say the folks that

1 those questions are asked to are willing to engage and
2 respond with a discussion that's understandable and not
3 just some short comments.

4 So I think the agency has really changed. I
5 think maybe it has gone back to the way it was a quarter
6 century ago or more, and that bodes well for the future.

7 Mike?

8 MR. LEINBACH: Okay. Thanks, Wayne.

9 I would like to report a little bit on the
10 processing of the vehicle now. Out at the launch pad,
11 Discovery's processing is going extremely well. We are not
12 tracking any technical issues at the current time that
13 would prohibit launch.

14 We have two major activities left to go before we
15 get into our launch countdown. One is our ordinance
16 installation which we will pick up Sunday, tomorrow, and
17 conclude on Monday. Then we begin closing out after the
18 orbiter, preparing for launch countdown. The launch
19 countdown starts on Wednesday the 28th, leading to a T-zero
20 on July the 1st of about 3:43, Eastern Time, afternoon. We
21 have 5 days of contingency left in that schedule. So, from
22 a processing perspective at the launch pad, things are

1 going really, really well. We see no reason we couldn't
2 get to July 1st from our perspective.

3 Meanwhile, over in the orbiter processing
4 facility, everything on Atlantis' processing goes well, in
5 the event we needed to call her up for a rescue mission, no
6 issues over there. That flow is being paced by the
7 external tank processing, but the tank is going well. We
8 should mate the tank the first week in July. So we are in
9 good shape on Discovery at the pad and in good shape with
10 Atlantis as well. Everything is going fine.

11 MR. ACOSTA: Thanks, Mike.

12 That will do it for opening remarks. We will
13 start with questions and answers, and we will go to Jay
14 Barbree to start us off.

15 QUESTIONER: This is Jay Barbree for NBC for
16 whoever wants to take it.

17 I understand that some doctors, flight surgeons
18 raised a question about Thomas Reiter for his accumulation
19 of radiation, and there was some talk about possibly
20 removing him and put into backup. Did any of that come up
21 today or anyone know what I'm talking about? Wayne?

22 MR. HALE: That's not one that I'm familiar with.

1 MR. GERSTENMAIER: There was no discussion in the
2 FRR, and Thomas Reiter is fully ready to go fly.

3 QUESTIONER: Okay. Thank you.

4 MR. ACOSTA: All right. Next question. Let's go
5 to Bill.

6 QUESTIONER: Bill Harwood, CBS.

7 One for Wayne and one for the Administrator. You
8 said at the DVR news conference that in your personal
9 opinion, the ice/frost ramp should be probable catastrophic
10 on the integrated risk matrix. Did it stay there, and can
11 you define that for us, wherever it ended up?

12 And for the Administrator, if you had some
13 dissent, which you are encouraging in this environment, but
14 if you have a system that some folks think about whatever
15 definition standards you have in place is potentially
16 catastrophic, how do you explain to people why in the
17 aftermath of the CAIB report and all that, that you are
18 good to go fly?

19 ADMINISTRATOR GRIFFIN: I will let Wayne go, and
20 then I will answer your question.

21 MR. HALE: Let's see. My observation coming out
22 of the Debris Verification Review, that there was

1 considerable uncertainty on the failure mechanism.

2 We understand that these cracks that are caused
3 by the thermal mismatch of thick foam on top of the
4 underlying foam can cause debris to liberate. That clearly
5 was the cause, proximate cause of the PAL ramp loss we saw
6 on the last flight, and it's intuitively obvious that that
7 can lead to debris.

8 What we don't have a really good handle on is the
9 connecting the dots and the physics to understand exactly
10 why and how that comes off. So our folks that have been
11 studying on that for sometime now and run a number of
12 tests, dissected inch by inch, actually eighth-of-an-inch
13 by eighth-of-an-inch, the foam on the one tank that we had
14 down here and loaded twice last year, have come up with a
15 pretty good understanding, but we still can't connect all
16 those dots. So any numbers that you might hear or analysis
17 that you might hear has got a considerable uncertainty band
18 on it.

19 In my mind and I think in almost everybody's
20 mind, this is dealing with the foam that surrounds the
21 ice/frost ramps because it has the propensity to do some of
22 these activities that Bill showed you the pictures of.

1 It's got to be our number-one item to take care of, and in
2 fact, I have turned on a tiger team to go design in rapid,
3 but thorough fashion, a fix that will eliminate that
4 hazard, and it is not ready now, and for reasons that I
5 think I have explained a couple times before, we're going
6 to go fly anyway.

7 So I put those right at the top of our risk
8 chart, which means that I feel as program manager, those
9 issues needed to be elevated to senior NASA management,
10 agency management, for their review and disposition. I
11 believe that they are in an unacceptable level for the
12 program manager to take that risk on by himself, and that
13 is what I understand when I recommended that we put those
14 at the top of the chart. It is certainly something that
15 from an agency level, I think is an acceptable risk.

16 I recommended to the Administration and to Bill
17 Gerstenmaier that even though we did rate these very high,
18 I think it is acceptable for a number of reasons to go fly
19 for a limited number of flights where we come up with a
20 redesign. So that is where we rated it.

21 I will tell you that it was an interesting
22 discussion, and engineers can argue over words more than

1 English majors can. I was reminded of Dr. Diane Vaughan's
2 book when she talked about how process-oriented engineers
3 are. The argument about the process and the definition of
4 words and exactly how you do this has gone on for probably
5 6 weeks now and culminated in our discussions today.

6 ADMINISTRATOR GRIFFIN: I guess the way I would
7 answer the question or the question you addressed to me is
8 that I am not concerned with what box in the matrix we're
9 in because that's a matter of terms and definitions. In
10 point of fact, I don't agree with the way that we have
11 categorized that risk as being probable because, if it's
12 going to be probable, then that means that over some
13 reasonable span of flights, I would expect to see evidence
14 of that behavior.

15 We can as statisticians go off and argue about
16 what percentage of the time you would expect to see it, but
17 if we say probable, we mean that over some reasonable span
18 of activity we should see it, and I won't at this point
19 refine it further.

20 Now, in fact, we have 114 flights with this
21 vehicle, with these ice/frost ramps under our belt, and
22 while we have had two loss of vehicle incidents, they have

1 not been due to ice/frost ramps. So I have a great deal of
2 trouble believing that a statistically sound statement
3 would be to say that this is a probable event to be seen
4 over the next 16 flights. I just have trouble with that.

5 Now, without regard to the label, so getting past
6 the label, the concern then is do we, in fact, think that
7 if we fly this ice/frost ramp the way it is for some very
8 small -- not 16, but some very small number of flights, a
9 few, until we have a better design, and let me be the first
10 to lead the parade in saying that we would like to have a
11 better design, but we want to know that it is a better
12 design, and we want to take our time with it.

13 So the question is can we fly a few times with
14 this ice/frost ramp without probably incurring a hazard,
15 and based on the data that I have seen, I believe that we
16 can.

17 I believe that our models are quite conservative.

18 I believe that our models have a huge variance in them.
19 We really don't know as much about these phenomena as we
20 would like to because, if we believed our models, we would
21 believe that we had a worse problem than our flight data is
22 showing, which is a red flag to indicate that we don't

1 understand as much as we would like to understand, and as
2 Bill likes to say, we need to continue to be hungry. We
3 need to continue to dig out the information that the
4 vehicle is telling us, but we need to fly it to dig it out.

5 So how do I justify that? With as much
6 uncertainty as we have, I would admit to you that I don't
7 know how the decision would come out, but I certainly would
8 have to think harder about putting a crew on this vehicle
9 if I thought we didn't have the Space Station safe haven,
10 the CSCS option and the Launch on Need option and, for that
11 matter, if push came to shove, the availability to call up
12 Russian Soyuz spacecraft for rescue.

13 I do not see the situation we are in as being a
14 crew loss situation. If we are unlucky and we have a
15 debris event on ascent, it will not impede the ascent. The
16 crew will arrive safely on orbit, and then we will begin to
17 look at our options, whether those include repair, Launch
18 on Need, extended safe haven on the Station, asking our
19 Russian partners for help, maybe some or all of the above.

20 We would have decisions to make, but we would
21 have time to make those decisions. We are not in the
22 situation that we were in with Columbia where we didn't

1 know that we had a problem. We know we have a problem. We
2 are electing to take the risk. We do not believe we are
3 risking crew.

4 There is a programmatic risk, without a doubt.
5 If we have another major incident in launching a Space
6 Shuttle, I would not wish to continue with the program.

7 We are going to use this flight and the
8 subsequent flights to complete the Space Station. That is
9 what we want to do with the Shuttle over the next 4 years.

10 We are going to complete the Space Station. We believe it
11 is possible to do so, but if it is going to be possible to
12 do so, we are going to have to take some programmatic risks
13 because the Shuttle will be retired in 2010. This
14 President's budget will not carry funding for vehicles,
15 Shuttle vehicles, beyond 2010. So, if we are going to fly,
16 we need to accept some programmatic risk and get on with
17 it.

18 Again, I will point out for me to accept
19 programmatic risk to do this, in the spirit of answering
20 your question, it is not the same as accepting a crew risk,
21 which we believe we are not going.

22 Thanks. That was a good question.

1 MR. ACOSTA: All right. Let's go with Mike
2 Schneider.

3 QUESTIONER: Mike Schneider, Associated Press.

4 I have a question for Dr. Griffin. What were the
5 specific objections to the members from the Safety Office,
6 and also what did you tell them to try and sway them, if
7 you did, and if it was a hand poll, how close was it when
8 you went around the room polling everybody?

9 ADMINISTRATOR GRIFFIN: Well, I will answer my
10 part. I am going to let Gerst answer about the polling. I
11 wasn't actually keeping track.

12 First of all, I didn't try to sway anybody.

13 Let me make another point that seems to have been
14 lost over the years. NASA gets lots of advice. We get a
15 lot of external advice. Advisors advise. The
16 Administrator, whoever he is and whatever era, has the
17 obligation to decide. That is what I do.

18 We get a lot of advice internally to NASA to the
19 program. The program and the Mission Director Bill
20 Gerstenmaier have to at some level decide, and at some
21 level, if the issue gets big enough, it comes up to me.

22 Our staff offices, Office of Safety and Mission

1 Assurance and Office of Chief Engineer and, indeed, our
2 entire engineering and flight safety organizations, have
3 the right, have the obligation, have the utter necessity to
4 tell us exactly what they think, but all of that is advice.

5 The Chief Engineer, the Chief of Safety and
6 Mission Assurance, no one else except for the Administrator
7 is the Administrator, and fortunately or unfortunately, in
8 this particular time, that is me. So I am not trying to
9 persuade people. I am trying to listen as carefully as I
10 can to everything that is being said to me.

11 I try to integrate it all as best I can. I make
12 a decision, and then I explain to people what the rationale
13 for that decision was because, if I have any holes or flaws
14 in my logic, I want to hear about them. In fact, I
15 desperately want to hear about them.

16 The discussion that you heard earlier about that
17 since the day I walked into this position, I have said that
18 we need to regain a culture of openness and a culture of
19 willingness to engage in technical discussion on the merits
20 without it having an adversarial component to it. We did
21 that. If there was anybody in that room who didn't get to
22 have their say, you are going to have to go and search them

1 out because it was a great 2 days, and at the end, I have
2 to decide, and you have our decision.

3 QUESTIONER: Bill, are you going to answer the
4 polling question?

5 MR. GERSTENMAIER: Yes. I guess in terms of the
6 polling, I polled all the Flight Readiness Review board
7 members, and with the exception of the two I mentioned,
8 they were all go for flight with the understanding of where
9 we are.

10 I think if you kind of boil down to where we are,
11 it is a difficult situation because we have data that shows
12 we have potentially cracks underneath large foam or foam
13 that is put on top of other foam. Then we have a flight
14 history that doesn't show that we lose a lot of foam.

15 I mean, I showed you the pictures. The looked
16 dramatically not very good, but in reality, those are not a
17 real threat to the orbiter, what we see in those history
18 pictures that I showed you.

19 So the dilemma is how can we not rule out that at
20 some point in the future, we are not going to have some
21 larger foam loss with this underlying problem, and therein
22 lies the debate.

1 We can't figure out the theory that can explain
2 to us why we haven't had larger foam loss with this
3 underlying crack. There is obviously something we think
4 that is protecting us physically in the physics of the
5 situation, but we don't know what that is, and what we
6 discussed as an engineering team is what the pros and cons
7 of that are. We looked at statistical models. We looked
8 at transport models. We discussed all of this as a team,
9 and it was a great discussion.

10 I got to listen to all the guys explain to me how
11 the models work, where our physics-based model works, how
12 we understand, what we don't understand. Folks would bring
13 up differing points. There wasn't a united engineering
14 position on this. I mean, it was very varied, depending on
15 who you talked to in the room, and in fact, it is very
16 inappropriate to say all engineers agreed with one position
17 and all managers agreed with another. That was not the
18 case. It was a very, very good discussion, and then as
19 Mike said, we laid out our rationale for the decision to go
20 fly, and really no one objects with the decision to go fly.

21 Both the Safety Office and the Chief Engineer,
22 their point was they recommend being no-go, but they don't

1 object to us going to fly.

2 So, again, I think it was a good discussion
3 overall. It was healthy, and it is a difficult situation
4 to be where we are. If we knew a better fix, if we could
5 put a better fix on this tank, we would all put a better
6 fix on this tank and go. The problem is without
7 understanding this underlying failure phenomena that I
8 described to you, any fix we put on has some risk
9 associated with it of losing foam or generating ice. We
10 can control that as much as we can through design, but we
11 can't eliminate that. So, in a sense, we almost need to go
12 fly to gain some more data.

13 Now we have non-destructive evaluations of the
14 ice/frost ramps. We know there are some defects in those
15 ice/frost ramps to begin with. We will get a chance to see
16 how those perform. We have some new cameras which, if we
17 get lucky during the first 120 seconds, will capture some
18 foam potentially coming off.

19 That will give us release time, which will allow
20 us to go back and add to the failure mode analysis, and
21 then once we know more what this failure mode is, then we
22 can target a better design, so the next time we can come

1 around with a better ice/frost ramp design. If we don't
2 and we don't get this data, we are just kind of making a
3 change to make a change, and yeah, we think we did it
4 right, but we know the transport from these regions is not
5 good, and you don't want to make a change lightly in these
6 regions. You make a change and you guessed wrong and you
7 have ice or you have foam, you could be very much worse
8 than you are today.

9 So, in a lot of words, that kind of summarized a
10 lot of the discussion that was occurring amongst the team
11 members.

12 ADMINISTRATOR GRIFFIN: Some of that is what I
13 said earlier. We want a better design, but we want it to
14 be a better design, and in this program and in every other
15 spaceflight program that I have ever been associated with,
16 there has darn sure been times where we thought we had
17 something locked down. We were sure that the change we
18 were going to make was better, and then we had egg on our
19 face. So we are trying to avoid that here.

20 MR. ACOSTA: All right.

21 QUESTIONER: David Waters from Central Florida,
22 News 13.

1 You were talking about the redesign there. How
2 close are you to a redesign? What is the status of that?

3 And then also, Mr. Gerstenmaier, when you walked
4 over, you said there were other big issues brought to the
5 table. Walk us through what some of the other issues were
6 there today.

7 MR. HALE: Let me take the first part of that,
8 the redesign question.

9 Steve Cash at the Marshall Space Flight Center,
10 who is the deputy manager for the propulsion organization
11 there, is the designated leader of the ice/frost ramp
12 redesign team. They have come forward with three options.

13 They are doing some testing this month. They hope by the
14 end of the month to down-select to their lead option. Then
15 they are going to put that in the wind tunnel and some
16 other test fixtures to make sure that we have a good design
17 that won't come apart.

18 You will remember we tried this before, and we
19 put it in the wind tunnel. We were not as successful as we
20 wanted to be in terms that the foam came off that one.
21 These designs have much less foam; in fact, no foam in some
22 areas.

1 So we hope to have a design down selection about
2 the time we fly Discovery that we will put into the second
3 level of tests and analysis, and hopefully, we can start
4 implementing that on tanks in the fall. So that is kind of
5 the game plan here.

6 Of course, I hasten to add that if we find out
7 significant information on this flight, we will fold that
8 back into the design.

9 MR. GERSTENMAIER: I am going to give you a
10 couple of the other items we talked about. We have the
11 trailing umbilical system reel on board Space Station. You
12 will see it on the ICC (Integrated Cargo Carrier). It sits
13 over on the right side of the cargo bay.

14 We looked at that to be able to withstand landing
15 loads, and we ran, I think they told me, 678 million stress
16 cases to go look at that, to certify that it is ready to go
17 land. So, if you say we were focused on other issues and
18 we didn't spend quality time with some of these issues,
19 this is one we clearly spent some quality time with.

20 We still have a little bit of work to do. They
21 still have to finish some of the final paperwork analysis,
22 some of the final signature stuff, and that should occur

1 next week, and we will see that. That was one of the
2 items.

3 Also, as I said in the opening remarks, we talked
4 a lot about the planning for increasing the crew size on
5 board Station to three and what is the criteria of when we
6 do that and when we wouldn't do that based on what we see
7 during imaging and what may happen on the Shuttle side.

8 We talked a little bit about a pyrotechnic cutter
9 that can cut a cable on the SSRMS (Space Station Remote
10 Manipulator System) or on the OBSS (Orbiter Boom Sensor
11 System). Again, a drawing review identified for us some
12 fasteners were not the appropriate length in that location,
13 and we have done some testing to show that it will perform
14 the way it is supposed to go perform. So that is okay to
15 go fly.

16 Another issue was talking about some other
17 fasteners that sit on some racks that sit in a
18 multi-purpose logistics module, and we made sure that those
19 are all okay.

20 We reviewed in detail the main engines for this
21 flight to make sure that their performance levels are
22 acceptable from what we have seen before, that all the

1 testing on those main engines is consistent with what we
2 have seen on the ground. We reviewed the solid rocket
3 motors to make sure that they are all ready to go and
4 support the mission. We reviewed the tank, the
5 pressurization valves that will occur. We talked about our
6 wonderful ECO sensors, the engine cut-off sensors. Those
7 are just the topics, and I could probably go on for another
8 half hour here, giving you topics, but I will save the
9 pleasure of a Reader's Digest version of the meeting.

10 MR. ACOSTA: All right. Next question. Let's go
11 over here to Todd, third row.

12 QUESTIONER: Todd Halvorson of Florida Today.

13 I guess for Gerst, I am curious about what the
14 position of the External Tank Project Office in Marshall
15 was vis-a-vis the ice/frost ramps, and I am wondering if
16 you could elaborate a little bit on the written statements
17 that were filed by Safety and the Chief Engineer. What
18 exactly did they say, for the record?

19 MR. GERSTENMAIER: I guess, first of all, from
20 the External Tank Project at Marshall, they were go for
21 this flight. Again, they would like us to change the
22 ice/frost ramps, like we all would, as soon as we can, but

1 it was basically a go with the contingent upon we redesign
2 as soon as we can on the ice/frost ramps.

3 In terms of the other two statements, basically
4 there is a form we sign, and they essentially said for this
5 flight, from their technical positions, they were no-go,
6 but they didn't see -- they didn't have any objections to
7 us going ahead with the decision we made.

8 So, in other words, they understood the decision
9 that we made as a board and as a team. They accepted to an
10 extent our rationale and didn't disagree with our
11 rationale, but from their discipline and their position,
12 they felt they were no-go.

13 So, again, just as we talked about, allowing
14 others to voice their opinion without restricting it, this
15 is an excellent way to go do it. "Opinion" is probably the
16 wrong term, but it is to express their position from their
17 engineering discipline without the regards to the bigger
18 program, they were free to go do that, and that reflected
19 in a no-go piece, but then they recognized the broader
20 discussion and our broader rationale for the flight, and
21 they can understand that, and they didn't have an objection
22 to us going to fly. And that is as straightforward as I

1 can give it to you.

2 MR. ACOSTA: All right. Let's go to the next
3 question. Let's stay right here.

4 QUESTIONER: Tariq with Space.com and Spacenews,
5 and I think I have a question for Bill Gerstenmaier.

6 Yesterday, Commander Steve Lindsey kind of walked
7 us through what he thought you would be talking about in
8 terms of choosing July 1st or a few days later, based on
9 what they would see on the tank with the photographer. I
10 am curious how that actually did play out today and did you
11 basically decide it is not going to be worth it, depending
12 on what you get on orbit.

13 MR. GERSTENMAIER: Basically, Wayne and the PRCB
14 had looked at this issue in a lot more detail than we did
15 in the Flight Readiness Review, and what happens on July
16 1st -- and Wayne can help me here a little bit -- is there
17 is a little shadow that comes off the 17-inch ox feed line
18 that can shade some of ice/frost ramps back on the hydrogen
19 side of the tank. The other ice/frost ramps up on the
20 intertank and up on the oxygen tank are very visible in
21 this lighted condition, but that is a function of how the
22 tank separates from the orbiter with, I think, no tip-off

1 rate. If there is a little bit of a tip-off rate, then
2 that shadow may move to another location.

3 Wayne and the team looked at it, and we agreed as
4 a Flight Readiness Review board that it wasn't worth
5 waiting a couple of days for that shadow to move to a
6 different location because then, if we got unlucky and we
7 got tip-off rates in the other direction, then we thought
8 we were doing something good, and then the shadow drifted
9 right back to where we didn't want it to be. So we
10 determined the thing to do was to go for the beginning of
11 the launch window, even though the analysis of minimal
12 tip-off rate shows a little bit of shadow, and we will
13 accept that on those ice/frost ramps.

14 MR. HALE: The only thing I would add to that is
15 you have got to understand this photography is not
16 guaranteed. We have got new cameras here, and they worked
17 great on the last flight, but we have had experiences in
18 the past where cameras didn't work right or the attitude --
19 there was an attitude. I don't want to say upset, but
20 maybe we were at the corner of our attitude control box,
21 and there is a number of things that can cause the pictures
22 not to come back.

1 We really want to get these pictures. There is
2 no guarantee any day in the launch window that you are 100
3 percent going to get these pictures.

4 We have, in the judgment of everybody that
5 reviewed it, a really good shot at getting them on July the
6 1st. We talked very briefly about June 30th, and then that
7 probably is just a hair over the limit that we want to try
8 to get.

9 The other thing we found out looking at the
10 shadows, of course, is that it is not, as the analysis
11 would indicate, a pure black thing in the shadows. There
12 is reflected light, and you can see quite a lot in some of
13 these shadowed areas. So you roll all of that together and
14 you say is it worth waiting until the 2nd to get just a
15 fraction more percent chance of guaranteeing those
16 pictures. No. July 1st is a good day, and we recommended
17 to go fly.

18 MR. ACOSTA: All right. Next question. Let's go
19 right there.

20 QUESTIONER: Dan Billow from WESH TV.

21 I don't know which of you has been to the most
22 FRRs, maybe Mike, but for any of you, how many times, if

1 any, have you had an FRR where there were recommendations
2 like you had today that were no-go and then, in fact, you
3 went ahead and did set the launch date and go fly?

4 And then a second question, if I can, for Bill
5 Gerstenmaier, how many more times in the future will you
6 expect to have a Launch on Need or a back-up Space Shuttle
7 ready to fly in case you need it?

8 MR. LEINBACH: I will take a shot at the first
9 one.

10 I have been to quite a few FRRs in my career,
11 going back to the mid '90s, really the early '90s. I
12 mentioned to the Administrator walking over here today,
13 this was the best one in my perspective, from the
14 perspective of people speaking up and speaking their mind.

15 You hear it over and over from us. I can tell
16 you, from my perspective, it really truly happened.
17 Engineers, managers who had issues to present did so. They
18 were listened to fully and fully discussed among all team
19 members, and then decisions were made.

20 In the old days, people would have been more
21 reluctant to stand up and speak their mind. We have a
22 different culture now since the Columbia accident. You

1 heard that a lot in the Columbia Accident Investigation
2 Board, the culture of NASA. I can tell you, it has
3 changed, especially in the FRRs and the Launch Readiness
4 Reviews that we do locally, Wayne's PRCB, lots of
5 discussion in today's environment. We are not blowing
6 smoke. This really happens. It was a great FRR today.

7 QUESTIONER: Have you had any others where you
8 have had no-go recommendations?

9 MR. HALE: You know, I can recall at least one
10 other occasion, and I haven't been to nearly as many FRRs
11 as Mike Leinbach has, but I can remember at least one where
12 we had a no-go recommendation from a subsystem manager that
13 we should stand down and fix things, but I think that was
14 much less frequent than we had today. So this has really
15 been interesting.

16 MR. GERSTENMAIER: To your question about how
17 long we are going to have orbiter Launch on Need, it looks
18 like we can keep it around fairly easily in the manifest,
19 and I think that is a smart thing to go do so. We are
20 going to keep it around for a fair amount of time and keep
21 it in the program.

22 MR. ACOSTA: All right. Next question. Let's go

1 back over here to Bill.

2 QUESTIONER: Just two quick ones from me for
3 anybody, really.

4 First of all, the statements that you were
5 talking about that these guys signed, is that an exception
6 to the culture? Is that what you are talking about? There
7 is no waiver involved here. It is just an exception. Is
8 that right?

9 MR. GERSTENMAIER: Yeah. They actually annotated
10 on the Flight Readiness Review forms their own words. So
11 we gave them, again, the freedom to write it how they
12 wanted to write it. So they printed right on the form,
13 right above their signature, that says we are go for
14 flight, what they meant by their signature.

15 QUESTIONER: Okay. I guess for Mike, maybe, if I
16 had to distill this news conference down to an editor in
17 New York who doesn't follow the Shuttle, the statement that
18 everybody would hear is they recommended no-go, but they
19 are okay for flight. How do you explain? I mean, just
20 take another crack at explaining that where my next-door
21 neighbor would possibly understand what you are saying
22 because it doesn't come out that way if you don't have

1 context.

2 ADMINISTRATOR GRIFFIN: Well, sorry. Let me try
3 again.

4 Some people -- and NASA has many different
5 disciplines that are required to be pulled together to
6 execute a flight. We have senior. We have junior people
7 who work those disciplines, and we have senior people who
8 are in the end responsible for those disciplines, and then
9 we have all levels in between.

10 Some of the senior NASA individuals responsible
11 for particular technical areas, particular disciplines,
12 expressed that they would rather stand down until we had
13 fixed the ice/frost ramp the way that -- something better.

14 Whereas, many others said no, we should go ahead. So we
15 didn't have -- did not have unanimity. Therefore, a
16 decision had to be made.

17 Now, one possible way of making decisions is that
18 unless everybody feels we should go, then we will stand
19 down, in which case I don't think at least for Shuttle
20 flights or any other flights we don't need an
21 Administrator. All right? We don't actually make
22 decisions. We just make sure that no one is unhappy. That

1 is not the method that we are using.

2 We enunciated a careful rationale for flying, and
3 I gave you a piece of it in your earlier question, that I
4 believe mitigated the concerns that were expressed by the
5 Office of Safety and Mission Assurance and by the Office of
6 the Chief Engineer, and, in fact, they agreed with that,
7 and the rationale fundamentally consists of what I said
8 earlier.

9 We have -- I don't want to say and I don't want
10 to be quoted as saying there is no ascent risk on the
11 Shuttle. There is plenty of ascent risk on the Shuttle.
12 Debris shed from the tank does not pose an ascent risk for
13 the Shuttle. Okay? It poses a risk for entry, but since
14 we have inspection methods, we are beginning to converge on
15 some rudimentary repair methods which may be useful. Since
16 we have Station for a safe haven, since we have the
17 possibility of -- in fact, we evaluated quite carefully.
18 We have an excellent capability for Launch on Need, and we
19 have the Russian partners. So we have a number of
20 mitigation strategies should the unlikely occur and we have
21 a debris strike.

22 Subject to those conditions, Chief Engineer and

1 Office of Safety Mission Assurance were okay with launch.
2 Looking at their specific discipline area, they would
3 recommend that we stand down, but there are larger
4 considerations.

5 If we stand down, now we back up Shuttle assembly
6 flights -- sorry -- Station assembly flights for Shuttle.
7 One of the areas that was surfaced during the CAIB
8 investigations was the issue of schedule pressure on NASA.

9 Now, schedule pressure for us is a fact of life,
10 but it has to be balanced. I do not want to make decisions
11 today which are going to result in having all of the
12 schedule pressure in creating Station assembly in the last
13 year or two. I don't want to get us into a situation where
14 by being more cautious than I think technically necessary
15 today, we wind up having to execute six flights in the last
16 year or something. That is not smart.

17 So I am willing as Administrator, looking at the
18 whole picture. I am willing to take a little bit of
19 programmatic risk now, and you will notice that I did not
20 say crew risk. I am willing to take some programmatic risk
21 now in order to prevent an excessive build-up of
22 programmatic risk later on. This is, in fact, what you pay

1 me to do.

2 The Chief Engineer and the Office of Safety and
3 Mission Assurance are not paid to worry about schedule risk
4 4 years in the future. They are paid to worry about what
5 is the situation with this particular flight.

6 We had their input. In fact, both of them are
7 long and valued friends of mine and people whom I have
8 nothing but the greatest technical respect for. I mean, I
9 think that goes without saying, but I cannot possibly
10 accept every recommendation which I am given by every
11 member of my staff, especially since they don't all agree.

12 Bill, I don't know how to say it any more
13 clearly. I'm sorry. I'm really doing the best I can here.

14 MR. GERSTENMAIER: I think, again, simply the
15 Flight Readiness Review board as a whole was go, but then
16 within that go, there were differing opinions about what
17 that go really means, and again, the important thing was
18 the discussion, that everybody got to understand everybody
19 else's opinion, and then as a collective group, this is
20 what we are going to go do.

21 MR. ACOSTA: All right. Next question, let's go
22 to Jay.

1 QUESTIONER: Dr. Griffin, your rationale is well
2 understood, and I am sure that if you could fix everything
3 that needs fixing on the Space Shuttle within 6 months and
4 make it absolutely 100-percent safe, you would do it, but
5 that is a job that obviously cannot be done 25 years after
6 this machine has been flying.

7 I want to go back to what you said a while ago.
8 God forbid if we have another loss in these last 16 or 18
9 flights. Is that, cut and dry, the end of Shuttle, and
10 then we go on to Constellation?

11 ADMINISTRATOR GRIFFIN: Leaving aside the issue
12 of crew, we are trying, of course, to protect crew, and I
13 made that quite clear, and I don't believe we are taking a
14 crew risk. If we were to lose another vehicle, I will tell
15 you right now that I would be moving to figure out a way to
16 shut the program down. I think at that point, we are done.

17 I am sorry if that sounds too blunt for some, but
18 that is where I am.

19 Now, we are trying to navigate some very
20 difficult waters for the next 16 flights to get the Station
21 assembled. I think it is worth doing. I have stated that
22 on multiple occasions, but we know it is not easy.

1 MR. ACOSTA: If there are any questions, then we
2 will go with Mike.

3 QUESTIONER: Getting July 1st --

4 MR. ACOSTA: And there doesn't have to be any
5 questions. I don't want to prod you guys.

6 [Laughter.]

7 QUESTIONER: -- does this improve the likelihood
8 of the third space walk, and do you think it will happen?

9 MR. HALE: Let me address that. I think that we
10 have got the second tank here at the Kennedy Space Center.

11 It is in the VAB. We are, as you know, changing out our
12 famous engine cut-off sensors to make sure we have good
13 sensors there, and it is going to be a little tight for us
14 to get that guy ready to go at the end of August, but I
15 think we are going to make it, and we are certainly going
16 to make a run for it. We have a little bit more than a
17 2-week launch window at the end of August and the first
18 part of September.

19 So, barring a major hurricane in the central
20 Florida area, I think we have a really good shot at getting
21 the second flight off in that launch window.

22 The third flight, the tank is coming out of

1 Michoud. We reviewed the schedules for the production of
2 that tank. They have been able to find some production
3 efficiencies that brought that schedule to the left, and
4 now it supports the date that needs to be shipped to arrive
5 here to support a December 14th launch.

6 The orbiter processing will be interesting to
7 watch when they turn Discovery around. Frankly, I think
8 that is going to be a bit of a challenge, but the long pole
9 is the tank, and given that the tank production schedule
10 supports, barring some unforeseen circumstance, I really
11 think that we have a really good shot at getting three
12 flights off this year, and we will be back down here.

13 Let me see. If we launch on the 14th, that will
14 land right around Christmas, maybe a couple of days after,
15 and we will have a wonderful Christmas in Florida.

16 ADMINISTRATOR GRIFFIN: It would be my first
17 time.

18 MR. HALE: That would be great.

19 MR. ACOSTA: All right. David?

20 QUESTIONER: David Waters from Central Florida,
21 News 13.

22 You briefly mentioned the rescue Shuttle. What

1 is the new estimate these days of time between that being
2 called up and being able to launch?

3 MR. HALE: Well, in fact, on this flight, we have
4 quite a bit of margin. We would call that up about 10 days
5 into the flight if we had problems that we knew potentially
6 earlier, but no later than that far into the flight, if we
7 had problems that we knew would prevent us from returning
8 the Shuttle.

9 Atlantis is well on track. I think, Mike, it was
10 47 days after call-up that we could get off, 41? And we
11 have about 82-days capability on board the Station. So --

12 MR. LEINBACH: Yeah. That's about right. We are
13 showing a Launch on Need launch date of August the 21st if
14 that becomes necessary and if we get the decision in time,
15 and that is well within the CSCS capability of the Station,
16 as I understand it.

17 MR. ACOSTA: All right. Any more questions
18 before we wrap up?

19 [No response.]

20 MR. ACOSTA: All right. Appreciate everybody
21 joining us today. That will conclude today's Post Flight
22 Readiness Review press conference. Have a great afternoon,

1 and we will see you in 2 weeks.

2 [End of STS-121 Post Flight Readiness Review
3 Briefing.]

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