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PRESS BRIEFING

Administrator Media Roundtable

MICHAEL GRIFFIN, NASA Administrator
BILL GERSTENMAIER, Space Station Program Manager

2:00 p.m., EST
Friday, August 5, 2005

Johnson Space Center, Houston

[TRANSCRIPT PREPARED FROM A TELEPHONIC RECORDING.]

P R O C E E D I N G S

MODERATOR: [In progress] -- but my orientation has been to have a free and open discussion with everyone. I mean Congress, White House staff, media, colleagues, co-workers about what is going on. I think that has a good side. I think people get it that NASA is being very open about what we are seeing.

Then, of course, at the same time, we have new instrumentation, new camera footage. I mean, the cameras worked great. We have got radar data. We have camera data. We had data taken from Space Station. It is just wonderful. So we have a lot more tools than we ever had before, and of course, we are going to talk about them. So that is the perspective I put on that.

MODERATOR: Mike?

QUESTIONER: Mike Cabbage with the Orlando Sentinel for Dr. Griffin.

My understanding is that sometime back down at [inaudible], there was some sort of indentation I guess described to me about the size of the end of your index finger that guys filled in and did what they call I guess a "sand and smooth operation" of some kind around that area,

and it almost exactly coincides with the part of the PAL ramp that came off during launch on the 26th, I guess it was.

I also understand that that procedure wasn't documented by the contractor, and I was curious, number one, if that is your understanding that that event occurred and, number two, if in fact that event should have been documented by the contractor.

ADMINISTRATOR GRIFFIN: Well, I can't usefully comment on that because, no, I haven't had that briefing.

Though he needs no introduction, Bill Gerstenmaier is my colleague here today. Bill is, of course, presently the Space Station program manager and one of the best managing engineers we have in the agency, and as you know from prior statements, I had asked for the formulation of what we often in engineering call a "tiger team" to dig into the areas of the tank that didn't perform as we had hoped and they report to Bill.

So, if you have any late-breaking data, I don't.

MR. GERSTENMAIER: We have got a small team there that is looking into the stuff. There are also some teams formed by Lockheed Martin themselves, and then there are

some teams managed out of the Shuttle program that are kind of looking at all of this activity.

The team that I chose is very small. It is made up of various NASA personnel, and they will give you a list of the names. Dr. Rick Gilbrech is leading that activity for us. Their idea is to really look at it kind of from an engineering standpoint and see what we found out here.

As Mike said earlier, this flight was tremendous. We have got data now we have never had before. So now we can see when foam was liberated and exactly how the foam was liberated during ascent. So now you can take that back to maybe a defect that was present in the tank we didn't think about before or wasn't there. Now you can see what that mechanism is and how it comes off. So we have a tremendous chance to learn from this exercise, so we can really take our knowledge base of how we apply foam to tank, how we ensure that it doesn't come off, or it comes off at a time when it is not a problem to us.

We got a tremendous engineering chance to learn from this test program, this test flight we just flew. So my purpose of having this team is to pull together these engineering talents throughout the agency to take a look at

it from an engineering standpoint, to improve our knowledge base on how we go put foam on tanks, how we ensure it doesn't come off because it is obvious it is not an easy problem.

We did it in a wind tunnel. We flew on F-15's. We took stuff at Eglin and looked at it thermally. We did it as good as we could, but then the only way you could put all those factors together is in the flight, and that is what we did on this flight.

Now we are given four or five instances where foam came off. We are going to use those to the maximum extent possible from an engineering standpoint to improve our knowledge base. So we really are going to be able to do a much, much better job the next time around.

QUESTIONER: Are you aware of that particular maintenance issue on the PAL ramp?

MR. GERSTENMAIER: I have not been briefed by my team yet. I am scheduled to get a briefing from them on Tuesday the 9th, next week, and then I am going to get biweekly briefings from them.

So what I have done is I kind of let them work, let them work with the teams. They are pulling the data

together, and then I will hear a briefing from them next week.

ADMINISTRATOR GRIFFIN: You guys are hearing stuff we are not hearing yet. Now, there is a reason for that. In my case, I am spending all of my time talking to you all.

QUESTIONER: Mark Karo from the Houston Chronicle.

Can you give us what you do know now about what happened or what your next step is? We really don't even know the organization. I guess you are going to put that in a press handout after this briefing, but where have you gone since the launch in terms of looking for the problem, and have any of the things that you have looked at so far led you one place or another?

MR. GERSTENMAIER: Again, the team went down. The team that I am kind of leading or following or are reporting to me, they went down on Tuesday. They were formed last Friday, and they went down Tuesday, and they have been down there for this part of the week.

Again, they are interacting with the other teams that were in place, and the Shuttle team had a team in

place and Lockheed Martin had a team in place. They are interacting with those teams, and they are gathering data.

Again, I didn't constrain them. I wanted them to spend a little bit of time to understand what the problem is, to see where things are, don't make them report out to me every day and micro-manage them. I want them to spend a little time and look at it from an engineering standpoint and report back to me on Tuesday.

So I am pretty much letting them go fact-find and look and see what they are finding. They are getting tremendous data. Cooperation is phenomenal across all the organizations. Everybody is providing them with the data they need. That is all I need to know.

On Tuesday, we will get the first technical briefing and see where they are, but all of the areas that you saw on the video during ascent, each one of those areas we are looking at, and we are trying to determine what the root cause is of each one of those areas.

Then say, for example, you find one of those areas had a repair on it for whatever reason. Then the question, where on the tank, are there any other areas where we may have repaired that it didn't come off, foam

didn't come off. So why is it different? It is very much like a scientific or engineering investigation.

How do you take the knowledge that we were given here on this flight, apply it in other areas, and extrapolate our knowledge base on foam installation on tanks? Then that is what this team's purpose is.

ADMINISTRATOR GRIFFIN: And then what does that look like on the next tank?

The amazing thing is -- well, not amazing, but the good thing is that almost all of the tank changes worked. Some didn't. So what is the difference between the ones that did and the ones that didn't? That is what engineers do, and if we can extract that difference, then we can go and look at the next tank or tanks and say this one applies to the next tank, but it doesn't apply to these others, or whatever the conclusions turn out to be.

Now we have actual test data that we can use to see how well we did, and in areas where we didn't do as well, why we didn't do as well. We have never had that before. Never.

MODERATOR: Irene?

QUESTIONER: Irene Klotz with Reuters.

If each tank -- although they are standardized, of course, but each one kind of comes out a custom model, could you talk a little bit about just how you think NASA would proceed? I mean, this tank originally was supposed to fly in Atlantis. So say the one that right now is on Atlantis has some other issues or maybe it is perfect and maybe one two down from now is going to have a problem. How can you be sure that you are going to fix the problem if every single tank is kind of a custom one-of-a-kind?

ADMINISTRATOR GRIFFIN: Well, every tank has enormous portions of it that are all the same, and then every tank has areas where there is hand application foam or installation because the automatic machinery isn't that sophisticated, and then every tank undergoes at some point in its career minor damage. People touch it or lean on it or whatever the wrong way, and things have to be patched and fixed. So those are the areas that will get a lot of attention, as Bill just said, from looking at the Discovery footage, and then we will try to see what is common with these other tanks.

We will never as long as we manufacture these tanks or much of anything else -- we will never be able to

eliminate the fact that there is some custom work for each tank. So what we have to have coming out of these test flights is an understanding of which types of custom work are okay and which types of custom work that we do are not yielding good results, and we need to stop that and do something different.

QUESTIONER: I have a follow-up. This is going to sound very silly, but in hearing Wayne talk so much this weekend, displaying kind of the engineering on the fly that has been done around here since the Shuttle has been in flight, I know you can't put the external tank in a wind tunnel, but I guess I don't really understand why it is that you have to fly the Shuttle and call it "test flight" as opposed to building model ETs and putting them on an orbiter science vehicle or some other way of actually testing that some of these repair things that you are doing work before putting people in the Shuttle and the expense and the focus on these flights.

ADMINISTRATOR GRIFFIN: Well, which pieces of the tank do you want me to put on a smaller rocket? This tank is huge.

We don't know. After the fact, when I have the

camera footage, then I can say, "Oh, yes. I wish I had had the PAL ramp," or whatever, "on a high-speed flight test on a sounding rocket," but before the flight, I don't know that that is the area that is going to be difficult.

MR. GERSTENMAIER: If you think about just the complexity, the hydrogen tank has got this liquid level of liquid hydrogen on the inside. So it is extremely cold on the inside. On the outside, the temperature is varying as you are going up through the ascent profile. Then you have solid rocket boosters separation, and you saw the fixtures of the tank where the plumes are there and they are scarred. You also saw where the shock wave interacts back with the tank.

How do you ever simulate and put all of those variable conditions and test conditions into one test facility? You can't do it. It is just so complicated and there are so many variables that are there.

The other thing we need to be very cautious of is we flown this tank once. So we have only flown through one specific set of winds. We have only had one set of upper-level winds. We had one set of pad conditions. When we fly it the second time, we are going to get a different

set of conditions. So we may get different foam performance on the second flight than we saw on the first flight. So we need to be aware that not only is this a complicated structural engineering environment on the tank itself, but the external environment that it flies through also varies from flight to flight. So we need to figure out a way to bound that as well.

We need to be in this continuous learning mode where we used to think that maybe a void of this size is fine to go fly with. Yeah, it is on 99 percent of the weather days, but on certain days, it may not. So we are going to have to be very, very careful as we take this data and move forward.

ADMINISTRATOR GRIFFIN: And how does it react in the winder versus the summer? Winter is coming on. What if it spends a number of days out in colder weather? Does that make it better, or does it make it worse?

QUESTIONER: Well, I get what you are saying that every flight is going to be a test flight, but how are you going to go ahead and do something like build a Space Station if every time you fly there could be some other situation and you got to do all of this inspection and

repairs and everything else? I don't see where --

ADMINISTRATOR GRIFFIN: You are now making the point that I have been trying to make since I came on board as Administrator, which is, to wit, this manned spaceflight stuff is really hard. We are still at the tiptoe-in-the-water learning stages. The equipment and the technology is not what we would have it be. We are learning our way.

The United States has conducted 145 exactly manned spaceflights in 44 years. A student pilot has taken an airplane off the ground and landed it more times than that by the time he gets his ticket. We are at the dawn of this enterprise, not its maturity.

Now, maybe that is not the way it appears when you see it on TV. Maybe that is not the way that you think it should be, but what I am telling you is the way that it is.

The next generation of technology, the crew launch vehicle, the crew exploration vehicle that follows the Shuttle, hopefully we will learn the lessons that the Shuttle has taught us because it has taught us many, but to characterize human spaceflight as a mature discipline, an

operational discipline, is foolish, and I have tried to recast that picture since the day I walked in.

Bill, I mean --

MR. GERSTENMAIER: I would say that, and I also would say that what we also learned on this flight was look how much image data we processed for the first time. This is the first time the image analysts ever got this volume of data in one mission, and they figured out ways, a lot of manual processes, to review that data and present it back to the Mission Management Team and Wayne.

What they have done now is they are actually starting to automate some of that stuff. So the next flight around, some of this is going to occur much more automatically. It will be more routine. So there is a lot of overhead and a lot of personal sacrifice made by a lot of people to make sure all of this data got reviewed, but now we know this is part of our way of doing business, and we need to bring that data in. They are going to get more efficient in doing that process, and it will allow some more time, then to get some more activities done.

The other side is look what was accomplished on this mission. The CMG change-out was huge. We have got

every Space Station objective accomplished that we wanted on this.

ADMINISTRATOR GRIFFIN: We got every Shuttle objective accomplished. Look how perfectly Discovery performed.

MR. GERSTENMAIER: So, even though it was a test flight, we still accomplished a very aggressive mission, and it worked out great.

It is very encouraging for me. The teams have not lost the ability to work together and to coordinate. Between the Shuttle and the Station teams to choreograph this and operate, that is not lost at all. The team, they are right back at the same level they were before. So we are ready to move forward at the right time, but we have got to be aware, just like Mike said, that every one of these flights is a test flight, and we have got to be ready to learn from that flight and apply it as we go forward.

ADMINISTRATOR GRIFFIN: Look how well the 100-foot arm worked. That was a biggie.

Next question.

QUESTIONER: I guess for Mike, for each day that you don't have a solution for the foam problem, the

September launch window is eroding. Do you still have hopes for making the September launch window, and if you do, when?

ADMINISTRATOR GRIFFIN: Well, you already know my orientation on these things is I don't presume the worst. I don't assume the best. I like to go where the data takes me.

Now, if next week the guys have a eureka moment on the foam and spot why this big chunk came off and they say now we understand it, we truly understand it, and they come back to present to Gerstenmaier and I and tell us why and we buy it and then we say okay, the next tank doesn't have this problem -- I am sketching a favorable outcome for you -- then we will go forward. Okay?

QUESTIONER: When?

ADMINISTRATOR GRIFFIN: Whenever. All right?

Until we run out of lead time to make the September window, we will preserve it. Until we run out of lead time to preserve a September window, we will preserve it because that is what the taxpayers pay us to do, and when we no longer can make it, we will tell you. Then we will recycle for November.

MR. GERSTENMAIER: And from a planning standpoint, I think the Shuttle program is about ready to release. We are going to aim towards the later part of the window, around the 22nd.

ADMINISTRATOR GRIFFIN: Okay. Is that so? So not earlier than the 22nd at this point?

MR. GERSTENMAIER: I think that is where they are starting to head, and again, it is not necessarily driven by the tank work, but we are just looking at all the other work we need to do and all the other review processes.

The vehicle is in pretty good shape, but we learned a lot on this flight independent of the tank, and we just look at how much people have worked during this time frame. We need a little better break. We looked at the scheduling stuff, and we kind of all collectively agreed that that is probably about the right time to target. It still gives us four launch attempts towards the end of the window. It still looks good from a planning standpoint. So we have kind of set a planning date at that point, and I think that will be released here fairly soon.

ADMINISTRATOR GRIFFIN: I think you just did.

[Laughter.]

MR. GERSTENMAIER: Sorry.

ADMINISTRATOR GRIFFIN: That is okay. I mean, I didn't know that, and we are not going to give up on that until we run out of time to make it.

MODERATOR: John Kelly.

QUESTIONER: John Kelly from Florida Today.

For either of you, but it may be that this is for Gerst, obviously you have got a great deal of information that is going to be coming your way, and humans aren't perfect, which is not a big news flash for you. A lot of this hand-applied foam, are there things that you can do to make that application process perfect? I mean, it is not being done by robots, and every tank is going to be different. Clearly, you have got a problem over the years with that foam being more susceptible to damage and flaws and things of that nature.

Is this just the kind of thing you are going to have to live with?

MR. GERSTENMAIER: Again, I think Mike characterized it pretty good. If you can use the machine to apply some of the foam, that is going to be a more consistent process.

What we don't really know now is which parameters are really key drivers. We know some are obviously key drivers, and we fixed all those on this tank we just flew.

Now that we have got this new data, we need to understand what that data is telling us and what aspect of the manual foam process is really critical to the outcome we are trying to protect for.

ADMINISTRATOR GRIFFIN: Yes. Why didn't all of the manually applied foam come off?

MR. GERSTENMAIER: Right. We re-sprayed I think a portion of the PAL ramp, a 10-foot section and the inter-tank region, and that performed fine. Why did it perform fine? We don't know. We think we know, but again, we got the data. So let's see what the data is telling us and see if we can improve the process.

ADMINISTRATOR GRIFFIN: What we are trying to do here is sort of lead you into the world where our minds live as engineers and how we look at things and how we examine things.

With an automatic process, you usually kind of get a result where either all the foam should stay on or it should all fall off. Clearly, with the automatic

processes, it didn't all fall off. So we are in pretty good shape there, and if the manually applied areas turn out to be the suspect regions, why didn't all of them fall off? This is the way we look at it.

QUESTIONER: Following up on that, I just wanted to ask. Foam has been coming off for two decades, and you have been fixing problems over that time and it is still coming off. I know that you have got more data than you ever got before.

I was talking to a materiels science guy the other day, and he said you basically got a problem with something with two different kind of coefficients of what the forces expose them to, and I guess the question that he had and that I have is, is it possible that this is insoluble, that, in fact, foam will always come off someplace or another?

ADMINISTRATOR GRIFFIN: Well, it is possible. Yes. Of course, foam has been coming off for two decades and more, but you have to understand -- please do understand -- and absolutely this was a mistake. This was the central mistake to the loss of STS-107. It was not thought to be anything other than a maintenance and

turnaround issue. Now, that was a mistake, and that mistake brought down STS-107. We understand that.

So the corrective measures that were taken in the wake of the loss of Columbia were to understand and define the damage mechanism by foam on the orbiter and to define maximum limits for the size of a piece that could be allowed to come off and then to institute fabrication procedures for the tank that would -- and I use this word advisedly -- guarantee that no piece larger than an okay piece could ever come off.

Looking at the data, the team almost succeeded, but there are four or five pieces where they didn't, and we need to understand why before we can go again.

It is always possible that any problem is insoluble, of course. We cannot make a guarantee, but we came very close, and we are hopeful that with a little more work, we will understand and we will get these last half-dozen areas.

MR. GERSTENMAIER: And again, success isn't the fact that no foam comes off. We just need to be able to understand that the foam is a small enough size where it comes off so late that there is no mechanism that there is

enough delta velocity to bring it back into the orbiter where it can be a damage point.

I sometimes joke every valve we have leaks. You think a valve doesn't leak. Well, every valve leaks some small amount of helium if you put it on one side of the valve. There is no such thing as a perfect valve where there is no leakage to a valve. Every valve has some leakage of helium if you get small enough through it. All you need to do is have a valve that is good enough to meet your specifications.

It is the same thing with the foam loss. All we need to do is control it well enough to the level we are not risking the orbiter with damage and then we are okay.

ADMINISTRATOR GRIFFIN: And that crucial word is "control" it. We need to understand the process and control it.

MODERATOR: Back up front here.

QUESTIONER: Hi. I am Howard Witt from the Chicago Tribune.

I want to ask a question about the Space Station. I get a sense from talking to a number of people here that there is a feeling among some people that the Space Station

really is kind of an albatross, that you need to finish it simply out of fulfilling your obligations to international partners, that its utility will be limited anyway when you can't find Shuttle missions to it anymore as far as the science potential. So why not cut your losses? Why is the Space Station still important? Why not just jump forward to the next big mission of the moon and Mars?

MR. GERSTENMAIER: I guess my answer to that would be the Station is a tremendous facility from a research standpoint, but it also has a tremendous capability to be an engineering test bed for exploration.

There are some key technologies that are going to have to be done for exploration. For example, automated rendezvous and docking, we have done that in the past, but we needed, again, to make it routine for exploration. The Station is a tremendous platform to demonstrate those automated rendezvous and docking procedures and techniques with Station.

I have pumps that have been circulating water through Station for 5 years now. Those pumps are a great design. That same pump design and technology is going to have to reside somewhere on the surface of the moon or on

Mars. I can take that technology that I have developed on Station, proven through spaceflight, proven through operations, and apply that directly to the exploration.

The same thing, techniques of how I maintain Station, when we have maintained Station without the Progress vehicle or just with the Progress vehicles over the past several years, I have had to develop ways to get extremely creative to minimize up mass and down mass. That same creativity we are applying and learning on how to minimize up mass and down mass has to be applied to the lunar environment where you can't afford the delta-V to take large supplies to the lunar environment.

So you can use Station as a stepping stone or a piece to exploration. So it is not a project that needs to be ended. It needs to contribute directly to exploration, so it continues to move forward and we can push software development, procedures development, hardware development, do all of that development activity on the Station.

QUESTIONER: But all of that stuff you are talking about, didn't that end up being kind of an afterthought from the original mission of the Station you kind of glommed onto the mission?

MR. GERSTENMAIER: Again, I think you need to be flexible and adapt as you go through this.

We have got this tremendous Station, these tremendous capabilities up there. How can we maximize the utilization of that? I think you can say that we are developing that way. Sometimes in research and technology, you don't always get the end item that you wanted, but sometimes that spinoff or that serendipity thing you learn is more valuable to you than what you were intending.

Again, I think we just need to use Station the way it is and move forward and see what we can do. It is a tremendous capability. It has more power than any other Station we have flown. It has tremendous volume to do experiments. It is a tremendous capability there.

The other side is we can use it also as an avenue to start pushing some commercialization. We talk about logistics, resupply to Station, and we want to have a mechanism or place to take supplies and resupply. We can maybe do some things on the commercial side.

Again, you can look at it two ways. You can look at it as an albatross or whatever you want to call it, or you can look at it as a tremendous capability to push us in

both commerce, to push us in development towards exploration, and maximize the use of the Station. That is what we want to go do.

MODERATOR: John?

QUESTIONER: I guess I would start with you, Mr. Gerstenmaier, and then to the Administrator.

The first question to you, sir, is have you got any sense -- this memo that some of us have been talking about for the last couple of days out of JSC that looked at hand-foam application, have you or your team looked at that? Have you looked at the NASA response that was developed at the time? What did you think of it, of both sides of that? Then I have got a follow-up question.

MR. GERSTENMAIER: I haven't reviewed that yet.

Again, my team is focused more towards the engineering aspect and what we can learn out of it than it is in that area, but we will take that information and see if there are some things there, again, from a technology standpoint or from an engineering standpoint that we can use and apply. I haven't reviewed that yet, and it is available, I am sure, in all of the documentation that the teams are looking at.

QUESTIONER: The second question would be for you, Dr. Griffin. During ascent, we all know what the key moments are and what we look for, solid rocket booster ignition, separation, managing cutoff, ET separation, and at each point, people sort of relax a little bit more.

There don't seem to be the same kind of milestones on return, but what are you going to be looking for? And once the wheels are locked, do you then plan to celebrate?

[Laughter.]

ADMINISTRATOR GRIFFIN: Well, last question first. I will sure celebrate when we come to a halt.

You are right. We don't have those kind of milestones, but you do have the peak heating regime that you get through, and you know where that is. So we will certainly be paying attention to that.

By and large, entry as you say is a milestone-limited process. We just sort of have to go through it and see how it comes out.

Understand that everything we can tell, Discovery looks like a very clean bird. So we are certainly looking forward with a very positive feel toward this entry. So

that is where we are.

And by the way, if you guys don't stop calling me "Dr. Griffin," I am going to stop responding to questions.

[Laughter.]

MODERATOR: Okay. We have got time for one more.

QUESTIONER: Thank you very much. [Inaudible] for Bill.

When your team does get back to you with recommendations for correction to the general tank, I am curious how that will be a point to Atlantis' next flight. Will you take incremental steps, maybe make minor fixes as opposed to switching it to an entire new tank, or will you have to use a brand-new thing from scratch and restack the entire vehicle?

MR. GERSTENMAIER: Again, we really don't know, but the approach is, first of all, we learned a lot from this flight. So the first step I have asked the team to do is take a look at what we have learned from this flight. Take every case where we lost foam or didn't lose foam and then understand each one of those. Then the next step after we have done that, then go back and look at the future tanks that are coming and see if there is any

applications from what we learned to this to the other tank. Then only after you integrate both of those are you ready for that third step, which is to answer the question you asked me.

ADMINISTRATOR GRIFFIN: Yes.

MR. GERSTENMAIER: So we are a ways from there, but we have got a logical process to get to those same answers.

ADMINISTRATOR GRIFFIN: And as we work it out, we will tell you how it is going. We are not going to keep it a secret.

MODERATOR: Fred, we are about at the end of our time. Is there anything you gents would like to add before we move on to the next item on the agenda?

QUESTIONER: [Inaudible.]

MODERATOR: All right. That will have to be it.

QUESTIONER: Thank you.

I just was wondering if you might just briefly update on where you stand with the purchase or lease or agreements for the Soyuz. You are getting ready to launch another U.S. Space Station astronaut, and he doesn't really have a confirmed ride home at this moment. If for some

reason the Shuttle isn't ready to be launched by October when he goes, what is your game plan?

ADMINISTRATOR GRIFFIN: I don't know the answer to that question.

The administration is seeking to work with the Congress to develop or work around for the INA provisions that apply to NASA. That hasn't been finalized yet. It is a work in progress. The Congress is in recess. So the Congress returns, what, the first week in September, after the first week of September? We will be working with them to get an outcome that allows us to continue to purchase assets from the Russian partners.

We need to do some thinking to figure out what the game plan is if that doesn't come true. I am not there. Are you?

QUESTIONER: Can you give an emergency policy at all? Does having a U.S. astronaut on board the Station qualify as a national emergency, or is that only for medical or --

ADMINISTRATOR GRIFFIN: That would be a Presidential decision, and if he wants my opinion, I am sure he will cal me.

QUESTIONER: Thank you.

MODERATOR: Thank you all very much.

[End of Administrator's Media Roundtable of August 5, 2005.]

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