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Fiscal Year 2010 Budget Rollout
"Exploration Systems Mission Directorate Budget Briefing"

Speaker:

DOUGLAS R. COOKE, Association Administrator,
Exploration Systems Mission Directorate

Moderated by **GREY HAUTALUOMA**,
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P R O C E E D I N G S

MODERATOR: This is Grey Hautaluoma in the NASA Headquarters, Office of Public Affairs. Welcome to today's telecon about the President's request for the FY2010 NASA budget. For those of you who have not gotten that information yet, you can go to www.nasa.gov/budget, and the full detailed documents are there.

With us today is Doug Cooke, the Associate Administrator for the Exploration Systems Mission Directorate. He will give a brief presentation, and then we will open up for questions and answers.

Again, press Star/1 if you have a question, and that will put you in the queue to let us know that you have one.

We do just have 50 minutes today, and we have lots of callers, and we may not reach everybody. So please limit yourself to one question, and if we have time, we will go back and do follow-up.

All right. Let me turn it over to Doug.

MR. COOKE: Thank you, Grey.

Thanks, everyone, for calling in. As Grey said, we are discussing the fiscal year 2010 budget request, and

we will be concentrating on that part that is associated with Exploration Systems Mission Directorate.

Just to start off with a few introductory remarks, between this year and next, we in ESMD are getting an additional, approximately, \$630 million of additional funding and including this year's 2009 budget, which is actually not part of the request, but it is part of the operating plan that is over on the Hill for review, where we did receive \$400 million in stimulus money

This money in these years is very helpful. We have been saying for sometime that in these years before Shuttle retires, the budget is constrained, and that money now is helpful in a development cycle for long lead items and early testing. So the additional \$630 million is important to us.

In terms of the overall budget through this run-out, starting with this year, our budget is \$3.9 billion, a little over \$3.9 billion. Next year, 2010, it is a little over \$3.9 billion. In 2011, after Shuttle retires, that will go to over \$6 billion, and that is the case in 2012 as well. In 2013, it is right at \$6 billion, and then 2014, it is about \$6.2 billion. Those numbers,

the exact numbers, I know are available.

During this time, we are still focused on initial operating capability for Ares I and Orion for March 2015, with all the supporting projects, and are continuing to work hard towards that goal.

We do have important milestones ahead for ESMD, the first being in June, we have the Lunar Reconnaissance Orbiter and the Lunar Crater Observation and Sensing Satellite, which is due to fly in June. We have a five-segment ground test motor, first-stage motor in August. We have the preliminary design review for Orion in August as well.

We do have Ares 1-X being assembled at the Cape right now for a launch later this summer or early fall, and we have Pad Abort 1 in November, which will test our abort system.

As a part of the budget roll-out, it has been announced that we are initiating an independent U.S. human space flight review of the human space flight plans post-Shuttle retirement. That will include assessing the transportation architecture options as we go forward in exploration, as well as looking at options for Space

Station extension beyond 2015.

The objective of the study is to ensure a safe, innovative, affordable, and sustainable plan going forward.

Some of the goals are to expedite capability to support early Space Station utilization, support missions to the Moon and other destinations beyond low-Earth orbit, to stimulate commercial capabilities that fit within the budget profile.

As I said, we will continue to manage the Exploration Systems Mission Directorate programs as currently defined in authorization bills and appropriations. During this period of review, programs in Exploration include Constellation, our technology program, the Lunar Precursor Robotic Program, Human Research Program, and COTS.

I think we should all consider this to be a prudent activity in terms of the review, as the new administration looks at the long-range plans for exploration and the associated investments over this long period of time, as well as the benefits that can be achieved with Exploration in the future.

And it is not without precedent. In my own

experience over the years, I have actually participated in four major reviews of Space Station and six major reviews of Exploration. So it is something that we do on a periodic basis to make sure that we have our best foot forward and the best plan in place.

I think with the leadership of the new blue-ribbon panel provided by the highly respected Norm Augustine, we should look forward to an objective and thoughtful review of these plans and the plans for the future of human space flight. NASA will fully support this effort, and that NASA support will be led by Mike Hawes, as was announced a little earlier today.

I encourage everyone who has asked to participate to give their full support. This review will ensure that we are on the best path forward for human space flight. We should expect to benefit from the recommendations from this committee, and we will move forward with the decisions that are made coming out of it.

I do want to emphasize that it is important as the new administration assesses this future and assesses the path for the future of human space flight and human exploration, that all us in the space community, including

NASA, industry, academia, and all the rest, support the decisions that are made coming out of the activity and put all of our energies into making them successful.

I believe strongly that human space flight and the benefit it brings is a national asset, and I do believe that the President has shown that he believes that human space flight is important to the economic, technological, and scientific leadership of the country.

So, with that, I would like to open it up for questions.

TELECONFERENCE OPERATOR: Thank you.

If you would like to ask a question, please press Star/1 on your touchtone phone. Remember to unmute your phone and record your name clearly as prompted, as your name is required to introduce your question. If there is a question you would like to withdraw, simply press Star/2.

One moment while we wait for the first question.

MODERATOR: Okay. Thank you. Again, identify yourself and the media outlet you are with, and at this point, limit yourself to one question. We will try to get to as many people as we can.

We will start with Bill Harwood of CBS.

TELECONFERENCE OPERATOR: Mr. Harwood, your line is open.

MEDIA QUESTIONER: Thank you.

Hi, Doug. It is Bill Harwood down at the Kennedy Space Center.

MR. COOKE: Hi, Bill

MEDIA QUESTIONER: A quick question for you. Knowing what you know about building space systems and all of that, is there any other architecture that you could even imagine that is politically or technically feasible that could get anywhere near an IOC around 2015, other than what you are working on? In other words, if somebody comes back and says we really want to change course, is there any imaginable way you have an IOC anywhere near 2015?

Thanks.

MR. COOKE: Thanks, Bill.

Obviously, over a period of time, we have looked at a lot of different approaches and have continued to look at and evaluate our own. I have confidence in what we are doing, and I think we are putting our best energies into a capability that will work. If there are new ideas that come out, Bill, that can improve on that, we should be

ready to accept them. I don't see a problem with that.

MODERATOR: Okay. Thanks, Bill.

Next up will be Frank Moring of Aviation Week.

TELECONFERENCE OPERATOR: Sir, your line is open.

MEDIA QUESTIONER: Thank you.

Hi, Doug.

MR. COOKE: Hi, Frank.

MEDIA QUESTIONER: We were told a little earlier that there is \$150 million in this stimulus package for accelerating human commercial transport to the Space Station. Can you give us a schedule on that and tell me whether it has been affected by this review, if it would be put on hold until the review is over?

Thanks.

MR. COOKE: Actually, I don't know exactly the schedule. I do know it is a part of the operating plan that we have put forward and is being reviewed on the Hill, which is a part of the normal process.

I think that we are in a position to move out on it, once we are free to do so. I don't think that will be held up by this study.

MODERATOR: Okay. Thanks.

Seth Borenstein of the Associate Press, you are next.

MEDIA QUESTIONER: Hi. Doug, thanks. This is Seth Borenstein at AP.

Between now and the end of August when the Augustine review would be coming, can you detail what major spending that Exploration program will be doing on Constellation between now and then and how much they would be, and would you consider -- and I know this is a second question -- would you consider delaying the PDR for Orion until after the Augustine Commission report, just because they are going to have a great say on your future?

MR. COOKE: Thank, Seth.

Our plans are to fully pursue our milestones on the path that we are on during this period, and that has been supported by the White House.

I mean, we are under guidance right now from the Authorization Act and our appropriations, and we are responsible to the taxpayers and our stakeholders to deliver what we have said. So I think it is incumbent on us to continue to do that.

We can't presume a solution out of the review.

So the best thing we can do is make progress, and all of that should contribute to where we come out of this.

MEDIA QUESTIONER: And in terms of spending between now and August?

MR. COOKE: We will be spending on plan, exactly the way it has been laid out in the program.

MODERATOR: Okay. Thanks.

Florida Today is next, Todd Halvorson.

MEDIA QUESTIONER: Todd Halvorson of Florida Today. Hey, Doug.

MR. COOKE: Hi, Todd.

MEDIA QUESTIONER: I just wanted to ask you what you personally think about the idea of switching from Ares I to an EELV at this point in the program.

MR. COOKE: I really don't want to presume an answer. I think all of that will be looked at by this review committee.

I know that we will be asked to support it, and we will provide data. I think our job is to provide data at this point and let them evaluate it.

MODERATOR: Okay. Irene Klotz of Reuters is next.

MEDIA QUESTIONER: Thanks very much.

I think I am having some deja vu here that we all voted out Norm Augustine committee report, gosh, almost 20 years ago, and I was sort of poking around a bit and just remembered that one of the findings of that report is about using the Moon as just a stepping stone and that the real target of long-term human exploration program should be Mars.

At this point, with how much work NASA has done on Constellation, I just wanted your assessment of if there was a strategy change in the long-term goal. Would that impact anything that has been done so far, and as far as you know, is all of this on the table for the review committee?

Thanks.

MR. COOKE: This is all just forming. So I don't know exactly what scope they will pursue. Certainly, all of that is possible.

I think that in terms of the approach that we have been on, it has been, and associated with the authorization bill, it has been on a path that pursues the Moon and does look at steps beyond.

I think that the architecture that we have been working on does that, and if there are changes in priorities, I think it is adaptable to those other possibilities.

The approach that we are taking was envisioned to pursue the various possibilities.

MODERATOR: Okay. Space News is next, Becky Iannotta.

MEDIA QUESTIONER: Hi, Doug. We have seen a number of reports out in recent weeks about Constellation, and I have kind of a two-part question. One is, why do you think the President feels we need yet another report on Constellation, and in this process, how do you keep morale among your staff, you know, in check when these questions continue to crop up?

MR. COOKE: Well, once again, I think it is prudent for the new administration to look into a long-term plan such as human exploration that goes out many, many years and with the associated investment and looks at the benefits that are to return. So I think it is a prudent thing for anyone who is inheriting an effort of this type to go look at it.

I think with the blue-ribbon panel and what I understood of the nature of the participants that are expected, that it will be an objective, and no matter how it comes out, they are a group that will provide new eyes to what we are doing, and I think we will benefit from it, regardless.

We have had internal, kind of independent reviews in the last year or so, and each time we do that, we get new ideas that we end up adopting that are improvements. So I certainly think that we are in a situation where we will benefit from what comes next.

MODERATOR: Okay. Ken Chang of The New York Times will be next.

MEDIA QUESTIONER: Hi. I noticed that in the years 2011 out, this is a sharp drop compared to what President Bush had proposed last year. That strikes me as somewhat of a lack of confidence in the current program, and how will this affect going to the Moon in Ares V?

MR. COOKE: I think the near-term budget is the most important to us because it is in early years when we need money for long lead items and early testing, as I mentioned. I think that the budget will continue to be

evaluated over time, and so the best thing we can do is make the best use of the money we have in the near-term years, and then we will see, coming out of this review this summer, ideas on the plan forward. And NASA and the administration will make decisions on that path forward, and it will take into account budgets and very many aspects that we haven't even talked about in terms of workforce and so on, as we move through these next few years.

MODERATOR: Okay. Rob Coppinger of Flight International is next.

MEDIA QUESTIONER: Hi, Doug. Looking at the budget, I can't see where the money is coming from for the Ares V concepts, designs. Four contracts were supposed to be in place last month. Are those contracts going to be placed, or is that permanently on hold now?

MR. COOKE: We have talked about those contracts, and more than anything, I think I have been inclined to hold off on them because I don't want to presume an answer out of this review. I think we really need to see where we end up in terms of recommendations there before we start a new contracted activity.

We are going to continue on our current

contracted activities on plan, but to start a new one right now, I am not sure we fully developed that thought process.

Right now, I am inclined to hold off.

MODERATOR: Okay. James Dean with Florida Today is next.

MEDIA QUESTIONER: To continue with the current Constellation architecture or something similar, can you say how the funding outline in this budget would impact the planned workforce transition from Shuttle, Constellation, and specifically, if you are able to say, down here at Kennedy Space Center?

MR. COOKE: Well, of course, we are looking at this, once again, this review this summer that will look at -- actually, it will consider workforce and transition. Our program is intermingled and intertwined with Space Operations, the Shuttle Program, and Space Station. I know that the review will consider all those aspects, and we really should rely on that activity to see where we are.

MODERATOR: Okay. We have a little time left. Please press Star/1 if you do have a question, and we will be able to take follow-up, if there are additional questions from other people who haven't asked.

We will go back to Becky Iannotta right now.

MEDIA QUESTIONER: I am looking at the out years for the commercial crew and cargo budget, and I see it is stated as a priority, and we talked about it being a priority, but there is really no money in the request for 2011 through 2014. Do you anticipate that changing? Where is that money going to come from?

MR. COOKE: Once again, I think that will be a subject of part of this review to evaluate that. There is money in the SOMD budget for cargo missions, and that is in their budget.

MODERATOR: Okay. Bill Harwood of CBS News is next.

MEDIA QUESTIONER: Yeah. I just wanted to go back and see if I could talk you into actually answering that question I was asking. I know you are not trying to presuppose what anybody might do, and that is not what I am asking. I am just asking as a space engineer and expert, in your opinion, you know, is there any other system out there you see that wouldn't, by default, push IOC downstream from 2015, if there was a course change?

Thanks.

MR. COOKE: Okay. Thanks, Todd.

I don't personally see one. We have looked at other possibilities in anticipation of questions.

I think that we have got a plan that gets there as quickly as we know how. If we could come up with one that is better, we would do it.

MODERATOR: Okay. We will go back to the Associated Press and Seth Borenstein.

MEDIA QUESTIONER: Let me try to get another answer to my original question too, then. Thanks again, Doug.

In term, can you spell out what major spending you will be doing? I know it is all just continuing with what is, but what big purchases are being done between now and August on the Constellation program?

MR. COOKE: There aren't any new contracts being let. I mean, we have fully contracted for Ares I, all parts of Ares I and Orion. Those are the only ones that we are pursuing. They are on a plan with milestones and tests, and so there aren't any major purchases at that level.

Obviously, as we build hardware and components

are bought, those are done at lower levels of the program in terms of test hardware and that sort of thing.

Somebody asked about this one. We did have some RFPs out and proposals in on phase one study contracts on Ares V and Altair, the Lunar Lander, and we are holding off on those because they haven't been awarded yet.

MEDIA QUESTIONER: Until after August?

MR. COOKE: Until we see where we come out at the end of the summer. Right.

MODERATOR: We will go back to Irene Klotz of Reuters.

MEDIA QUESTIONER: Thank you.

I was wondering if you might talk a little bit about this COTS-D and the issue with a commercial passenger service to the Space Station and how that might impact your plans and funding for Orion, and if you see it at all as a conflict that there could be a commercial provider for a service that NASA has pretty invested in developing on its own?

MR. COOKE: Right now, we don't see it as a conflict as a funding matter to develop that capability.

We do have money that we are spending, that we

intend to spend, in the stimulus to further capabilities that will enhance that opportunity, but, once again, I think the review this summer will include consideration of the possibility of COTS-D itself, which is purchasing -- well, COTS-D is actually a demonstration of a crew transfer capability, a crew launch capability, and I am sure they will consider that in the mix of possibilities for support of the Space Station.

MEDIA QUESTIONER: Thanks. And just a clarification, SpaceX is the only company that has that D part of its contract; is that correct?

MR. COOKE: Well, currently in our Space Act Agreements, I think is what you are referring to, there was a COTS-D component of their proposal, but that hasn't been funded.

MEDIA QUESTIONER: Right. But Orbital doesn't have that?

MR. COOKE: Orbital does not have that. Right.

MEDIA QUESTIONER: Thanks.

MODERATOR: Okay. Frank Moring, Aviation Week.

MEDIA QUESTIONER: Thanks.

Doug, can you explain to me just exactly what IOC

means? I mean, Chris said this afternoon that it was taking a crew up to the Space Station and bringing them back, but does that mean supporting the Space Station like Soyuz does now with the six-month stay period and the ability to do a quick return?

MR. COOKE: It will eventually, but the initial flight will not be a six-month stay. That will come later.

MEDIA QUESTIONER: So IOC is really a test -- or what you are calling the March 15th -- I mean the March '15, March of 2015 date is more of a test flight. An actual operational capability would come when?

MR. COOKE: The full operational capability is March 2016. That would include a launch daytime.

MEDIA QUESTIONER: For verification, what needs to be done to get from March 2015 to March 2016, what changes in the vehicle?

MR. COOKE: There wouldn't be any changes at that point, and we are assessing all of that right now to see how that might be brought in. There is a pull-up flight, uncrewed, before the IOC flight, and so we are looking at, depending on how testing goes on the earlier tests, exactly how we will step through that, but it is possible we could

do a little better, I think, but the full operational capability is a long stay and really, actually, doing the full job.

MEDIA QUESTIONER: Thanks.

MODERATOR: Okay. Todd Halvorson, Florida Today.

MEDIA QUESTIONER: Thanks. Todd Halvorson, Florida Today, again.

I am wondering what the rationale was for spending stimulus money to stimulate the COTS-D program, rather than accelerate Ares and Orion.

And just a quick second one, what has happened to the idea of maybe doing an Ares 1-X prime mission?

Thanks.

MR. COOKE: Well, the way the stimulus spending was put together had to do -- there were agreements with the White House on the balance and all that, and so that is part of it.

We are looking to spend money, the remaining money out of that for a ground test article acceleration for Orion, buying critical engineering development units for some of the critical hardware to get into early testing, and also looking at materials testing for getting

better margins on structures and that sort of thing for the crew launch vehicle. In particular, the J2X engine, we are buying engine assemblies to get into testing earlier.

So we are striking a balance there, and in actuality, some of the things that we would be doing as a part of the COTS piece of that -- we are not calling it "COTS-D" because it is not the demonstration flight, but it is bringing along capabilities earlier for their developing a human capability. Actually, a lot of it has dual use. It helps them, but there is also development of capabilities that are accelerated, that actually we will be using as well. So there is a dual use to a lot of what we are doing there, but it helps them, and it helps us too.

MODERATOR: Okay. We will go to Rob Coppinger at Flight International.

MEDIA QUESTIONER: Hello again. Of the Recovery and Reinvestment Act, \$400 million for Exploration, I think \$250 million of it is not going to commercial. Can you talk about how you are going to spend that \$250 million, and can we see it included in the budgets? Is it being given to Orion in this fiscal year, or is it being given to Ares in the next fiscal year? What is the breakdown on how

you are spending that \$250 million?

Thanks.

MR. COOKE: Okay. That was a little bit of what I was talking about, but I can go into a little more detail.

Once again, this is up on the Hill with our operating plan. So this has come out of our work with the White House, and it is over on the Hill now, and they have an opportunity to review what we are doing.

But in terms of the breakdown, let me talk about the phasing of it first, between now and next year. We will try to get all of it in work as early as possible, and that has been a major objective of the stimulus activity.

In terms of some of the things that we are doing, we are spending \$25 million on the Mobile Launch Platform, ground support equipment down at the Cape. We are obligated by law, actually, to spend some of it on SBIR work. So that is about 10.2

On the Crew Exploration Vehicle, we are spending \$165 million. I mentioned the Service Module Ground Test Article. That is right around at \$49 million. That will be for getting a Ground Test Article accelerated, so that

we can do early testing, looking at the loads and environmental testing on the vehicle to get early data there.

We will spend about \$112 million on the higher risk engineering development units to demonstrate some of the critical capabilities in systems early on, so that that can be done before critical design review.

We have about \$4 million going into testing the materials and investigating the materials in terms of their margin of safety and their failure limits, and then the rest of it, then, is in commercial capabilities, the 150 that we talked about.

There is a lot more detail to that, but, at a high level, that is what we are doing.

MODERATOR: Okay. Bill Harwood, do you have another question?

MEDIA QUESTIONER: Yes, I do. Just a quick budget question for guys like me who aren't used to perusing budgets. Looking at last year's projections compared to this year's projections, as Griffin said in a recent speech, it looked like Exploration was down by about \$3.5 billion over the out years. Is that an accurate

number, realizing these are projections and they have asterisks on them now, but is that an accurate number?

Thanks.

MR. COOKE: Actually, what we have got through 2013, which is our comparison with FY09 President's budget, it is down in the current budget by about \$3.1 billion.

So, because the run-out on the 2009 budget only goes to 2013, that is the comparison that we make. Once again, we are up this year and next by about \$630 million, but, over that time period, it is down about 3.1.

MEDIA QUESTIONER: Thanks.

MODERATOR: Okay. James Dean?

MEDIA QUESTIONER: On your most recent target date for Ares 1-X, I presume it is probably well after the review is going to be completed. So its future hinges on that review?

MR. COOKE: Right now, we are planning on getting it going as quick as we can, and right now, it is slated for no earlier than the end of August.

I don't presume what will come out of the review and how it might affect or not affect that flight.

MODERATOR: Okay. We do have a few minutes left.

If anybody has another question, please let us know, or we will get wrapped up here.

[No response.]

MODERATOR: Okay. Not seeing any further questions, we will conclude this teleconference.

Let me give you replay information. This recording will be up in about an hour and will be there through May 22nd. If you dial 800-879-5816 --

Hold on. We have some late-breaking questions, so we will continue on for a minute.

Okay. Seth Borenstein?

MEDIA QUESTIONER: If the Augustine Commission asks you what do you find wrong such as the Direct plan or the EELV plan, what would you say is the biggest flaw with the alternatives?

MR. COOKE: In my view -- and this is my view -- I have always felt that the biggest difference is in the risk. I mean, we can argue numbers all day long in terms of cost and schedules and that sort of thing. They have different levels of maturity. So you are never exactly comparing the same equivalent numbers.

But in terms of the risk numbers that we have

seen and calculated -- and I usually look closest at loss of crew numbers -- the Ares I approach has always been about at least two times better than these other approaches, comparing with EELVs and the Direct 2.0, and it gets down, in simple terms, the numbers of moving parts.

The first stage engine on the Ares I is a solid rocket that is simpler than a liquid fuel engine or combination of engines. So you can think about it somewhat in those terms, but I personally believe that the risk is lower to the crew on this vehicle, and that to me is the bigger of the discriminators.

MEDIA QUESTIONER: Thank you.

MODERATOR: Okay. We will go to Rob Coppinger of Flight International again.

MEDIA QUESTIONER: Oh, hi. Just two things. One is, could you just clarify what you mean by high-risk engineering development units for that \$112 million?

The other thing I would like to ask, the Aerospace Corporation Reports on EELVs for launching Orion, has that now finished that report, and can you tell us what the conclusion is?

MR. COOKE: The first question on EDUs,

engineering development units, basically, when you are developing hardware and you are developing the components of a life support system or an avionics system or a power system, you have various components, boxes that you build that have varying degrees of risk associated with them, and the ones that we have that are of higher risk are associated with life support systems and propulsion.

You go through a development process where you do preliminary designs and you build test hardware, which are these engineering development units, and then you are also getting further into the more refined designs as you develop further.

We were in a situation with constrained funding in '8, '9, and '10, where we were having to push out development of some of those units to be worked in parallel with further design work, which means that you build them and you have a problem in a test and you have to redesign, then that ripples through work that you are doing that is actually supposed to be further maturing where you end up.

So there was work that we were doing in parallel that we would rather do serially. So, with additional money this year and next, we are able to pull some of that

work back, especially in the more critical systems, to be more serial in nature, so that it is a more logical development path.

We have done these things in the past in other programs, but it always pushes some schedule and, therefore, cost risk into your development, if you have a problem somewhere along the lines.

In terms of the Aerospace Report, we have got draft charts on that, and we have not had a presentation from them at this point. We are trying to schedule that now. It has taken a little time because of this entire budget process. So we still need to have that presented and be able to ask some questions that we have. So we are not finished with that yet.

MODERATOR: Okay. We will go back to Florida Today, Todd Halvorson.

MEDIA QUESTIONER: One more time. Doug, I was just wondering what your thoughts are on the gap and any changes that might come out of this review. It seems to me that any significant changes would exacerbate the gap, and I was just wondering what your thoughts were on that.

MR. COOKE: I think that they will consider the

gap very, very, strongly. I mean, there are a lot of parameters involved in any changes that will include how the workforce is affected, how the gap is affected, the cost, the schedule. All of those will be taken into account. So, if there are ideas that help us improve that, then I am sure we would be happy to do it.

We are constantly looking ourselves to improve our situation. You have heard of some changes that we have made. We had actually planned this before all this has occurred, but we have been going through cost scrubs, which you do from time to time in a program to make sure that you have not over-specified your design and you are not trying to build too much into it, more than you need. So we are going through a cost scrub to try to make sure that we have got exactly the vehicle that we want, and that is why we have recently taken out the near-term ability to put six people in this vehicle, since we are not going to need that for a while. So we don't need to be flying hardware that we are not going to use.

We also have not brought into developing an extended nozzle for the first stage solid rocket engine. We were going to do that for life cycle cost purposes, but

it was going to cost us more in the near term, and we decided because of the constrained budget, we would put that off and carve out a little more overhead.

So we are constantly looking at ways to improve our budget posture and cost posture. We are also going through and looking at all the facilities that we would be using and trying to make sure that we are not spending money on facilities that we don't need on the ground.

So, I mean, we are going through those kind of processes ourselves, but, you know, once again, you get another set of eyes looking at this, they might find things that we haven't seen. We did have a Constellation Acceleration Study that was done that identified some items in design even that we have incorporated because they were good ideas. So I am looking forward to potentially new ideas that will help.

MODERATOR: Okay. Well, thank you, everybody. That will conclude our telecon today.

Again, the replay number is 800-879-5816. For international callers, it is 203-369-3565, and if you haven't seen it yet, we did just issue an advisory about an 11:30 a.m., Eastern, teleconference tomorrow with Norman

Augustine about the review of the U.S. Human Space Flight Plan, and there is more information on nasa.gov if you want the information about RSVP-ing.

Thank you for joining us.

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