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Media Teleconference:

ARES I UPPER STAGE CONTRACT AWARD

Speakers:
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Exploration Systems Mission Directorate
JEFFREY HANLEY, Constellation Program Manager
STEPHEN A. COOK, Ares Project Manager
DANNY DAVIS, Ares I upper stage Element Manager

[Moderated by Melissa Mathews, NASA Public Affairs]

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P R O C E D I N G S

[Video clip begins.]

The Ares I upper stage will transport the Orion crew exploration vehicle to orbit for missions to the International Space Station early next decade and for lunar exploration late next decade in combination with the Ares V cargo launch vehicle which will lift the lunar lander to orbit in a similar system known as the Earth departure stage.

With design leadership provided by NASA, the upper stage will be manufactured by private industry using Lean/Six Sigma processes at NASA's Michoud Assembly Facility in New Orleans. The Michoud complex is uniquely equipped to produce large-scale hardware and has a deep water port for shipping to the Kennedy Space Center in Florida for launch operations. It also is convenient to the Stennis Space Center's testing facilities in Mississippi.

This 84-foot-long and 18-foot-diameter cylindrical structure will provide Ares I guidance, navigation, and control, while the J-2X engine will provide thrust. The upper stage includes the Ares I's main

propulsion system, thrust vector control, avionics, reaction control system, and first stage booster separation system, as well as tanks for the J-2X liquid oxygen/liquid hydrogen engine.

[Video clip ends.]

MODERATOR: Good afternoon, and welcome to NASA Headquarters. I am Melissa Mathews.

We are here today to announce a major milestone in the development of the Ares I rocket which will launch astronauts to the International Space Station and to the moon.

Here with me today, Doug Cooke, deputy associate administrator for exploration systems; Jeff Hanley, Constellation program manager; Steve Cook, Ares project manager; and Danny Davis, Ares I upper stage element manager.

Now Doug Cooke will give us the latest on this very important procurement process. Doug?

MR. COOKE: Thank you, Melissa.

This is an important and historic day as we make further progress in our march toward future flights of exploration. I am honored, once again, to have the

opportunity to make a selection as the source selection authority for our major component of the next human space flight vehicle which includes Ares I and Orion.

We are making great progress in our development of the systems and the various capabilities that lead toward the replacement of the shuttle with this new vehicle, with the vehicle that will take people into space on their way to the moon and beyond.

A year ago, we were here to announce the selection of the Orion contractor, Lockheed Martin. In the past few weeks, we have made selection, sole-source selections, one for the J-2X engine which is to be developed by Pratt & Whitney Rocketdyne. It is the engine that will be used on the upper stage that we are talking about here today, as well as the Earth departure stage for the Ares V.

We also announced the selection of the first stage engine to be developed by Alliant Techsystems, otherwise known as ATK.

Today, we are here to announce the selection of the upper stage for the Ares I. By sometime in December, about mid December, we intend to announce the selection of

the instrument unit avionics ring for Ares I. At that point, we will have the entire next human space flight vehicle under contract; that is, by the end of this calendar year.

The upper stage is, as you saw in the film, an integral part of the Ares I rocket. It provides the upper stage propulsion for sending Orion's space craft into space.

The process that we went through began with the release of the request for proposal on February 23 of this year. The proposals were presented to the Source Evaluation Board on June 7. On June 25, the Source Evaluation Board presented to me the initial findings, the strengths and weaknesses. After that point, they got back with the companies involved and went through these, asked questions, clarified what was in the proposals. The companies then provided their revised contract proposals August 13.

Yesterday, we had the presentation of the final evaluation by the Source Evaluation Board, and along with advisors that I picked, I made the selection for this contract. I have notified both teams at this point, and

the contract has actually been signed in Huntsville. So we are taking this step as we speak.

Now, I want to give my sincere thanks to the industry teams who developed the proposals, who put all the hard work into developing approaches for how we go and build the upper stage. I also want to thank the NASA team who is here today, the Source Evaluation Board, who spent many long hours, just as the industry teams did, in evaluating their proposals.

It was an excellent open competition by excellent industry teams. There were two teams. One was Team Ares led by ATK, and they had as major subs, Lockheed Martin and Pratt & Whitney Rocketdyne. The other company was The Boeing Company who had Summa as a sub. I have tremendous respect for these industry teams and the work that they did. They put a lot of effort into this. They provided us with innovative and well-thought-out approaches to how they would support the NASA design team as well as do the production work on the upper stage.

This competitive procurement has indicated to us, once again, that the value of the open competition is very important.

The Source Evaluation Board was led by Ralph Carruth, who did an outstanding job, once again, spent a lot of tough hours working on this. They did their work at Marshall Space Flight Center. Members of the evaluation board were Earl Pendley who led the procurement, Fred Bickley who led the costing, Tim Vaughn who led the technical aspects of it, Keith Lane who led the Safety and Mission Assurance, and Patti Hall who is the recorder for the board.

I also want to thank our senior procurement advisor, Bill McNally, who has advised me as well as the team on putting together an excellent RFP [request for proposal] and a very good process for getting us to this point.

I spent time in Huntsville with the team going over key aspects or key parts of the proposals in reviewing the work, the comments and clarifications and answers to questions from the industry teams to get a good understanding. I challenged the team to work hard to get a clear understanding of the details of the proposals, so we could make an excellent choice.

I think they did that. In fact, I am sure they

did that, and I believe that in my judgment, we have the best overall proposal, and it has won.

It is now my honor and pleasure to announce the winner of the upper stage contract for Ares I. The winner is The Boeing Company.

So, in summary, The Boeing Company will become our newest team member as we go forward. The other competitors in this competition are team members, and I look forward to working with them in the future.

Now Jeff Hanley will talk about how the upper stage in Ares I fit into the overall Constellation Program.

MR. HANLEY: Thank you, Doug.

Before I hand it to Steve and Danny to give you a bit more background on Ares I and the Ares I upper stage and its role and mission in the Constellation architecture, I had just a couple of graphics to share with you to kind of set you on a good understanding of where we are at with the transportation system.

We are in the midst, as you know, of developing the detailed requirements for what we refer to as initial capability. That is Orion and Ares I, those systems and the ground and mission systems that will support that first

phase of the Constellation Program, but this procurement is also important for the future in the way that we procure systems in the future in Constellation in that it is a NASA-led design and an industry partner to come on for production, and Steve is going to talk more about that.

Obviously, Orion and our Lockheed Martin partner, that team is off working hard on that system already. Steve's team has made tremendous progress on the rocket in general, and we are getting set up to kick our teams off on both those systems off on their preliminary designs here this fall, and conceptual work continues on the Ares V and the lunar lander. The way that this procurement was run is very much in line with the way we hoped to do future procurements for those systems, so very exciting for us.

Next graphic, please.

Just to help everybody understand, this is kind of an eye chart, and hopefully, it is in your package, but this is the array of work around NASA's 10 centers that is going on in support of this program, the Constellation Program. All 10 centers are contributing significantly to this effort. This particular effort, the Ares I launch vehicle development and specifically the design and

development of the upper stage are being managed out of the Marshall Space Flight Center, and that effort is led for us by Steve Cook.

Steve?

MR. COOK: Thank you, Jeff.

What I would like to do now is set a little bit of the context for the upper stage procurement within the overall Ares project.

If you would, go ahead and bring up the first graphic.

As Doug mentioned, we have got three of the four major procurements now under our belts with bringing Boeing on board as our upper stage production partner, and we are really happy to have them on board.

Of course, ATK Launch Systems is our partner already for first stage. Pratt & Whitney Rocketdyne is already working with us on the upper stage engine.

This is a unique model in two respects. One, NASA is leading the overall integration of the stack. This is following the very successful model that was developed in the Saturn program, and we are also following a very similar model on the upper stage where NASA is leading the

overall design and then bringing in a production partner to work with us, and we are using that both in the upper stage and the upcoming instrument unit which we will have under contract by the end of this year.

So, in the two years since the Exploration Systems Architecture Study concluded in September, we have made outstanding progress working with our partners in Orion and ground operations in Constellation.

Just very recently, some of the recent progress that we have made, the J-2X engine is out in front. It is a critical item for us on Ares and Constellation as a whole. We will be conducting the preliminary design review on that engine on Wednesday of this week. We have been completing the installation of the large-scale robotic weld tool -- that will be the largest robotic weld tool in this country -- at the Marshall Space Flight Center. That will be used for welding up the friction stir welding, some of the very complex curves for the domes, and the common bulkhead that we will use on this system. A duplicate of that will be installed at the Michoud Assembly Facility under this contract in the coming years.

We have recently built a full-scale mock-up of

the instrument unit and the interstage for producibility and operability demonstrations, and we have got that at Marshall Space Flight Center.

We have recently begun conducting again some of our pilot parachute drop tests out at the Yuma Proving Ground for the first stage. Later on in September, we will begin dropping 150-foot-diameter parachutes. These will be some of the largest parachute drops that have ever been conducted, again, for our recoverability of the first stage.

We are about 50 percent of the way through our overall wind tunnel testing on the Ares I. So we have made a lot of progress.

Some upcoming events, we are going to be installing in the month of September and October, the J-2X powerpack 1A test in the test stand at Stennis Space Center A-1. That is a critical test for us. We are taking some of the heritage hardware that came from the original J-2X program that was used in the X-33 program in the late 1990s. We have reconfigured it back into a mode for the J-2X, and we will be testing the heart of that engine, which is the turbo machinery and the gas generator.

We recently were down at Stennis last week and saw that hardware, and it is making great progress, and the test stand is being readied for the testing that will begin in October.

We will begin the systems definition review on the overall Ares stack in just a couple of weeks in September, and we are conducting our flight software systems review as well in the month of September.

So great progress by the team, and since this is a NASA-led design, I thought we would talk a little bit about the NASA design. So bring up the next chart, please.

On the overall upper stage, you see the graphic here. The stage is 84-feet long, including the interstage there, and 18 feet in diameter. The avionics is mounted on the instrument unit on the forward end. Of course, that is a production partner we brought on later on this year. It holds 305,000 pounds of propellant. In the forward end there is the liquid hydrogen tank, separated by a common bulkhead from the liquid oxygen tank on the aft end. That is a very similar approach to what was used on the Saturn SIV-B Stage, the Saturn V, and the Saturn I-B.

It is actually two separate tanks, the way that

is set up. The tanks will be a self-reacted, friction-stir-welded, aluminum-lithium orthogrid structure. That is a state-of-the-art, probably the most state-of-the-art aluminum-lithium structure that will have been formed. We have got helium pressurization tanks there that you see mounted in the liquid hydrogen tanks. We have got a hydraulic thrust vector control system there, which points the engine, that keeps the stage in control on the second stage flight. We have got hydrazine reaction control systems and roll control systems for first stage flight, and we have got a composite interstage.

All of these systems are being worked very closely with our operations partners at the Kennedy Space Center to make this one of the most operable systems that we have ever built at this large a scale. This is about six times larger of any upper stage that flies today, but this is on the scale of things that were built and flown in the Saturn era, but we want to make this as low cost, as reliable and safe a stage as we have ever built.

Now with the addition of our Boeing upper stage manufacturing partner, we are bringing needed industry input into this process.

So I will turn it over to Danny Davis who will describe the Boeing manufacturing approach. Danny?

MR. DAVIS: Thank you, Steve.

Well, the NASA design team has made significant progress with the conceptual design. As mentioned, we understand our requirements. We have a design that meets those requirements, and development testing is underway.

We eagerly await the Boeing production team to join our numbers. We last shared our design back last fall in preparations for the solicitation and the proposal delivery and evaluation, and now we want to join back as a team and finalize this design with the expertise from the manufacturers, so that our product is as robust and manufacturable as possible.

The video we are going to show is derived from simulation models that were provided that are used to simulate the manufacturing process and optimize the manufacturing process.

Can we roll the video, please?

This is a discrete event simulation that shows key processes required for fabricate and assemble the upper stage. Shown here is the fabrication and checkout of the

common bulkhead. The model simulates the workforce, the tooling, the material required to assemble the hardware.

We have learned many things from lessons learned from the Apollo Saturn SIV-B stage. Our design includes two precision machine domes with the honeycomb core.

We will use friction stir welding for the roughly 18,000 inches of welds required to assemble the stage. Friction stir welding forges the materials together without melting the components. This provides a reliable and high-strength weld that is virtually air-free.

Our thermal protection systems have also learned from past experience. We will be pushing the development of environmentally safe and worker-safe processes for priming, painting, and applying insulating foams.

We are moving to not use any ozone-depleting blowing agents in our foams and always chromate-free primers and paint.

A major attribute of the Boeing process is the build a little, test a little approach. Many of the major subcomponents will be built up and checked out as subsystems, and this will avoid passing on any defects later into the flow. Shown here is our thrust structure

that is populated with various components from the main propulsion system, thrust vector control system, avionics, and reaction control system. We will have all of these assembled, these subassemblies put together and the engine integrated, so that we can check these for their installation and their operations.

Shown here, the aft -- the thrust structure and the engine will be gimbal-tested prior to commitment to assembly to the rest of the vehicle.

The manufacturing approach will use extensive kitting or kit development of small parts and larger parts, so that the flow process of manufacturing can be streamlined.

Other components that are applicable to this approach are the system's tunnel. We will build a system tunnel up offline, so that it can be totally checked out and then attached to the side of the vehicle.

The last step in the process is to install our composite interstage. This process will take place, and the stage will be checked out and prepared for shipment to the Cape for launch.

The Boeing team brings outstanding experience,

both from their commercial airline and from their commercial space programs. We are very happy to have their lean manufacturing expertise coupled with our commitment to a design for manufacturing to provide a stage that will be robust, very safe, and very affordable for our nation.

Welcome to the Boeing team, and congratulations to the Boeing team.

Steve?

MR. COOK: Thank you, Danny.

This is the eve of the two-year Hurricane Katrina anniversary. Clearly, there was a lot of devastating on the Mississippi and Louisiana Gulf Coast. NASA Stennis Space Center in Mississippi and NASA Michoud Assembly Facility in New Orleans have critical roles in the Constellation Program.

The workforce there have done an outstanding job through personal hardships of getting these critical facilities ready to take on this work and continuing the work on the space shuttle program.

Just last Thursday, workers broke ground on the A-3 facility, the Stennis Space Center, which will test in altitude conditions the new J-2X engine.

Final assembly of the upper stage will be at the Michoud facility. NASA is committed to staying in the New Orleans area. We are continuing to work with the space shuttle external tank through its flight in 2010 and now are bringing in new projects, the Ares I upper stage, the Orion structures, the Ares V Earth departure stage, and core stage will follow.

The next NASA astronauts to land on the moon and Mars and will owe their success in great part to the Gulf Coast folks already working on the next generation of space travel.

Melissa?

MODERATOR: All right. Thank you very much.

I would like to recognize Scott Horowitz in the audience here. Doctor, would you like to say a few words?

DR. HOROWITZ: Sure. Thanks, Melissa.

First, congratulations to the Boeing team. This is really a big moment for all of us, and we are really excited to have them on our team.

I wanted to especially recognize the Source Evaluation Board. This is a really big job, and a special thanks to Doug and Jeff and Steve and Danny to bring us

this pretty historic moment. You can see the models here of the transportation system. It all started with a study a couple of years ago, as was pointed out. We have gone from study to concept designs to requirements. Those requirements have held very firm and very stable for these two years to get us to this point, one contract away from having a complete transportation system that will carry our astronauts to orbit.

I want to thank both teams, Team Ares and the Boeing team. Putting these proposals together is a huge amount of work, and these were very, very, very good proposals, and it was a really good competition.

So my hat is off to everybody who was involved. It is another step closer to realizing the dream of exploration. So I just wanted to add my thanks to everybody and recognize what a major step this is.

Thanks, Melissa.

MODERATOR: Thank you.

All right. Now we will take questions. Have we got any here at Headquarters?

Brian?

QUESTIONER: Brian Berger with Space News and

Space.com. This question is for Doug.

Which team had the lower dollar value proposal, and what set the Boeing proposal apart and caused you to select it?

MR. COOKE: Brian, at this point, we really can't talk about it. We haven't talked with the companies yet, other than to announce the winner, and so we have a selection statement that we have developed. So that information will be coming later, but right now, we need to talk with the companies first.

MODERATOR: All right. Frank?

QUESTIONER: Frank Morring with Aviation Week.

Does the dollar value that we get here in the press release include the engines? Since Pratt & Whitney Rocketdyne was on the other team, how does that work out?

MR. COOKE: The numbers represent the upper stage. The engine is separate. The J-2X engine is a separate contract that was sole-sourced. That was the one that we awarded a few weeks ago.

So this is the upper stage and its components, and Danny can probably tell you exactly what the components are.

MR. DAVIS: I would be happy to elaborate on that. The upper stage proper includes the instrument unit, including the avionics. The structure of that is included in this contract, but not the avionics. Those components will follow in the next procurement, but it includes the hydrogen tank, the oxygen tank, the main propulsion systems, the reaction control systems, thrust vector control systems, and then we have a small solids subsystem. That includes [inaudible] motors, and not to forget the thrust vector control systems.

MR. COOK: This contract goes through 2016. The basic contract included six production units, three flight test units, a ground vibration test unit. We have got several qualification test hardware elements in there, and then there is an option that we have got to buy up to four per year, additional 12 more flight hardware units as well.

MODERATOR: All right. Frank?

QUESTIONER: If I could just continue. What are those options valued? What is the overall length of the contract and the total potential value?

MR. COOK: The total contract runs through 2016. The total value for the contract can be up to $1.25

billion. That includes the option part of that -- is up to $325 million.

MR. COOKE: It also includes individual tasks, what is called IDIQ-type tasks that go to the companies as asked for by NASA.

MR. COOK: That is worth up to $275 million. So the breakdown is $515 million for the basic contract, $275 million for what is called IDIQ which is kind of as-needed engineering and production support to kind of give us flexibility to order things as we need, and then we have got an option for those additional 12 units of $335 million. That gives us the total value of contract at $1.25 billion.

QUESTIONER: Let me just ask a couple more quickly and then give up the mic.

You mentioned IDIQ. How much is weight still in play on this stage, and who is going to be doing your composite interstage?

MR. DAVIS: Mass is always important to a launch vehicle, obviously. We are just now ready to go to our preliminary design phase. We feel like we have a really good handle on our mass allocation. We think we will be

there.

Composite interstage is a key part of that. The Boeing Company will manufacture that element for us and deliver it either at MAF [Michoud Assembly Facility] or deliver it to MAF. Our manufacturing flows, we still have some work to do in figuring out exactly how we are going to provide that hardware to the stack.

MODERATOR: All right. Any other questions here at Headquarters?

[No response.]

MODERATOR: Okay. We will go to the Johnson Space Center in Houston. Johnson?

QUESTIONER: Thank you. Mark Carreau from the Houston Chronicle. I have a couple of questions.

First, I wonder if you could sort of paint a little bit of a word picture about the launch and the point or the altitude where the second stage takes over and then where it takes the Orion and then what happens to the upper stage. I presume it reenters into an ocean or something like that.

Then I have a follow-up. Thanks.

MR. COOK: Sure. I can take that.

Basically, the solid rocket booster, the first stage separates it about 125 seconds into flight. That is at an altitude of 314,000 feet, mach number of 5.8. We have a manage-and-start there that will carry the second stage in the Orion. That will burn until manage and cutoff. That is about 591 seconds. At that point, we are at about an altitude of 70 nautical miles, and that is in an orbit of minus 11 by 100 nautical miles. At that point, the Orion and the service module will separate. The Orion will then perform a circularization maneuver once it reaches apogee and will then take itself and either go up and dock with Earth departure stage in the lunar mission or phase and go to the International Space Station.

The upper stage, the reason we chose the minus 11 by 100 is so the upper stage, whether it is in lunar or an International Space Station mission, will impact in roughly the same location in the Indian Ocean, and that was the reason for that because obviously the upper stage is discarded.

MODERATOR: And was there a follow-up?

QUESTIONER: Thank you.

I apologize if my question is a little bit

redundant, but it really seems like you have, with the exception of this one contract that you award at the end of the year I guess for the avionics -- you have really got your spacecraft, the work parceled out. So, if one of you could again sort of describe the milestone that you believe this to be, that would be helpful.

Thanks.

MR. COOKE: This milestone is the big milestone. It is the major component where we had a competitive selection. The other components were the J-2X, the first stage, and the Orion last year at this time, and the instrument unit is what is left. It is a part of the upper stage, but it is where the avionics reside, and that is the competition that is coming up in December.

MODERATOR: Okay. Now we will go to the Kennedy Space Center in Florida for questions. Kennedy?

QUESTIONER: This is Patrick Peterson with Florida Today.

I am wondering what percentage of the work will be done there at the Michoud assembly plant and then whether any of the work and how many jobs might be created at Michoud and at other NASA facilities like Kennedy Space

Center for this project.

MR. DAVIS: I will take that.

We anticipate the major manufacturing work to be done at the Michoud Assembly Facility. We will do a good bit of development work at the Marshall Space Flight Center, but all of the qualification hardware, the test flight units, and of course, the production units will be done there.

We have a significant amount of testing to do at the Stennis center, both development work and then green-run testing there from the engine and then from a stage perspective.

Our intention is to ship a completed stage to the launch facility, pretty much ready for stacking at that point.

MODERATOR: Okay. Now I think we go to the Marshall Space Flight Center in Huntsville, Alabama. Marshall?

QUESTIONER: Hi. This is Shelby Spires with the Huntsville Times.

I was wondering if you could kind of walk me through a timeline of a transition for MAF, and will this

stage be being built while the external tank is still being worked on?

MR. DAVIS: We are working that transition process now. It depends a great deal on our manufacturing flow. We have identified space at the Michoud assembly that we can do our work, and we are trying to right now weave that in with the external tank project, so that we can optimize that for the appropriate production flow.

That is a very big facility, and it looks like at this point, we are very optimistic that we can do the work there we need to and with no impact to the external tank program, and we are doing our planning now, of course, for that work, but in late '08 and in '09, we would like to have a presence down there.

QUESTIONER: Just a quick follow-up. Here at Marshall, how many jobs does this mean?

MR. DAVIS: For the NASA design team, we are currently running on the order of 600, maybe a little better, civil servant and support contract engineering. We have 700 on the NASA design team if you include the other centers.

With the new contract we are just putting in

place today, we would expect to bring on about 100 more for producibility support, for help with our production test articles there at Marshall and then for other engineering work that we need done.

MODERATOR: Okay. And now we go to the Stennis Space Center in Mississippi for questions. Stennis?

QUESTIONER: Ronette King at the Times-Picayune.

Can you give any figures on employment closer here at the Stennis Center and also at the Michoud Facility and when you would expect them to be coming on?

MR. DAVIS: In the Louisiana area, Mississippi area, we will probably peak out around 250 or so. We have yet to have our complete manufacturing plant in place, but the first work will be done at the Marshall Space Flight Center, and then we will transfer our work down there and engage that workforce in the late '08-'09 time frame.

MODERATOR: Okay. And do we have any other questions at NASA Headquarters?

Brian?

QUESTIONER: Space News. This question is for Danny Davis.

Can we total up total workforce numbers for the

upper stage and then maybe kind of pull out and tell us how many folks are working on Ares I altogether? It sounds like you are about 1,000 people, just for the upper stage.

MR. DAVIS: Well, currently, we are running -- the NASA design team is right at 600 civil servants and support contractors. Nationwide, on the NASA design team, it is about 700, and that number will increase in '08, obviously, as the design becomes more intense and we finalize our plans, and right away, to bring the production contractors on, we expect another 100 or so support next year to support that design process. We will ramp up that workforce to basically total out at about 1,500 full-time equivalents for the duration of the design activity and the manufacturing activity through '16.

MODERATOR: Okay. Any other questions?

Brian?

QUESTIONER: Maybe Steve could kind of address Ares I total head count.

MR. COOK: Brian, I don't have the Ares I numbers with me for the total, but we can get that for you later.

MODERATOR: Frank?

QUESTIONER: Frank Morring with Aviation Week

again for Jeff Hanley.

Now, is the Earth departure stage also planned to be built at Michoud, and is the transition or the follow-through on that part of the selection of this contract?

MR. HANLEY: This is focused on the Ares I upper stage production.

The follow-on work for both the Ares V core stage and Earth departure stage is yet work ahead of us. We have requirements to go formulate and procurements to put into motion for those elements of the lunar program. We certainly are hoping to have that pretty well set for authorization to proceed in the time frame that this shuttle program ends. So the end of 2010, we would hope to be moving out then on the process of bringing on industry partners for those elements.

Exactly what those procurements will look like, we haven't pinned down yet, but this procurement -- and Steve can talk a little bit more about what is unique about this procurement -- it really sets us up well for having NASA design expertise integral to the overall plan, and I think Steve should talk a little bit more about the unique aspects.

MR. COOK: Well, I think some of the unique aspects are that NASA started off by laying out the requirements, and that is not unique. That is always the government's role is to define the requirements for an acquisition, but where this is unique is that we own the design, and we will own the design throughout the life, but we are bringing on a partner early on in this process, about six months prior to our preliminary design review, to work with us and make sure that this is the most manufacturable vehicle that we can possibly make, and that makes this unique in the modern era, but not unique certainly in the history of launch vehicles because this was a very successful model the last time we went around and we went to the moon with the Saturn process.

So we believe we are taking a page out of the Saturn playbook which worked very well, and it will set us up for a multigenerational launch vehicle activity, and it will allow us in the long term -- our goal here in the long term is to be able to purchase a launch vehicle on a firm fixed-price basis and run competitions for these things down the road where we are not running a classic cost-plus arrangement in the long term, and NASA owning the design

allows us to do that. So that is one of the key aspects of being able to do that.

QUESTIONER: For Doug, when do you expect the evaluation?

MR. COOKE: Actually, we haven't discussed that yet. We do have to get with the companies. I did sign the Source Selection statement today, but we will get with you on that.

MODERATOR: I am told we have another question at the Stennis Space Center. Stennis?

QUESTIONER: Ronette King again.

When do you expect work to begin on the ground at Michoud in preparation for the work to be done there?

MR. DAVIS: We have planning in place now. Some of our major tooling, once we have selected the sites for placing that major tooling, we would probably want to get into excavation in late '08, early '09, and then we have a production schedule that we will back out of our new manufacturing flow.

MODERATOR: Okay. Thank you.

At this time, we would like to recognize with us today from The Boeing Company, Brewster Shaw, vice

president and general manager of the Space Exploration Division. Congratulations, and thank you for being here with us today.

One final note, immediately following this news conference, we will have a photo opportunity in the lobby.

So thank you all very much for being here today, and that's it. Thanks.

[End of media teleconference of August 28, 2007.]

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