SPACE MISSION COMMUNICATIONS
AND DATA SERVICES (SMCDS)
PROCUREMENT INDUSTRY BRIEFING

PRERECORDED TAPE TRANSCRIPTION

December 18, 2002

Monet Ballroom
L'Enfant Plaza Hotel
Washington, DC

[This prerecorded tape transcription contains inaudible portions, not all speakers are clearly identifiable, and acronyms are phonetically spelled.]

Work Order No. 500-C-02
Gail Herzenberg
301-984-6220/305-867-1766
herzenbHRS@aol.com

Eberlin Reporting Service
14208 Piccadilly Road
Silver Spring, Maryland 20906
(301) 460-8369
eberlinreporting@yahoo.com

A G E N D A

9:00 a.m. Welcome to NASA
Presenter: Mr. Frederick D. Gregory
NASA Deputy Administrator

9:15–9:30 'NASA's Space Mission
Communications and Data Services
Management (SMCDS)
Presenter: Mr. Robert Spearing
Assistant Associate Administrator
for Space Communications

9:30–9:40 Solicitation and Selection Process
Mr. Bryan 'O'Connor
Selection Official

9:40–11:40 Center Work Package Presentations

Goddard Space Flight Center (GSFC):
1) Near-Earth Network Services (NENS)
2) Mission Operations and Mission Services (MOMS)

Johnson Space Center (JSC):
1) Mission Operations

Kennedy Space Center (KSC)
1) Communications Support

Marshall Space Flight Center (MSFC)
1) NASA Integrated Services Network (NISN) and NASA Information Systems Services Utility (NISSU)
2) Huntsville Operations Support Center (HOSC)

Jet Propulsion Lab (JPL)
1) Deep Space Mission System (DSMS)

11:40 a.m. Concluding Remarks and Information
Presenter: Mr. Chris Jedrey,
Team Leader, SMCDS Procurement Team

P R O C E E D I N G S

MR. JEDREY: I would like to welcome you to this morning's Space Mission Communications and Data Services Industry Briefing.

I have the distinct pleasure of introducing the Honorable Frederick D. Gregory, NASA's Deputy Administrator.

(Applause.)

WELCOME TO NASA

MR. FREDERICK D. GREGORY

NASA DEPUTY ADMINISTRATOR

MR. GREGORY: You know, I really cannot believe the numbers of people who come just to listen to us this morning, this little tiny Agency, and for you all at the Scholarship Room over in the other . . . down the hall, welcome also, large and small industry, academia.

As I said, I am really excited about the interest that is apparent in NASA space communication activities. NASA has decided to terminate the CSOC contract at the end of the base period of five years, and obviously this creates a competitive opportunity for industry and nonindustry to participate either directly or indirectly in this very important activity that we have.

NASA is moving forward, and, as you all know, we are going to compete that CSOC activity, but we will also be moving away from the name CSOC, and, as Chris just mentioned, this is the Space Mission Communications and Data Services Industry Briefing. The Space Mission Communications and Data Services we are at this moment calling SMCDS.

(Laughter.)

MR. GREGORY: SMCDS. It really needs a vowel in there. It is a process, not a contract name, and so I do not want you to confuse SMCDS with the actual contract.

The procurement development activities are underway, and you all are a part of those activities at this point, but what this will allow is NASA to pursue a much more streamlined and responsive approach to the Space Mission Communications and Data Services. We all realize that the mission requirements at NASA are very dynamic, and, though we thought a consolidated contract was the answer, what it did not provide was the kind of flexibility or the agility that is actually necessary in NASA as it moves forward.

The CSOC contract was pretty Center centric, and what we are now trying to do is move it to a more strategic level, and, if you have followed NASA recently, you will have noted that what we have is a One NASA activity. So this particular process will be run out of NASA Headquarters. It will have the One NASA, strategic look at the future. That is not to imply that the Centers do not have that capability, but, in order to assure that occurs, we will do it from the Headquarters level.

It is in line with and consistent with the President's Management Agenda, the competitive sourcing strategy, and, as you can obviously tell, we are in line as far as E-Government is concerned because we have handed out essentially nothing to you, and everything will be posted on the Internet. You probably have an agenda and some worksheets, but that is about it so everything else you should be able to find on the Internet, and I think one of the later briefers this morning will tell you exactly how that occurs.

This is really exciting for us. Let me give you a little information so I can begin to tell you about this One NASA, because I have got a couple of minutes. I might as well go ahead and do this. We have been, as I mentioned earlier, Center centric, but we also have been Enterprise centric in the Agency. We have had five Enterprises, and there has always been a bit of competition between the enterprises, ownership, budget, and things of that nature. In the

past, it has always been if I am to get something, it is at the expense of someone else.

So what we are looking at and have been working toward in the last four to five months is looking at NASA as an agency that can accomplish great things, as an agency utilizing the talents and the skills and the resources that we have within it. So the big area that we are looking at now is space flight. Space flight, if you are aware of NASA, covers each of the Enterprises, and so there has been in the past competition not only between the Enterprises, but between the Centers, who is in charge, and so what you will see is we have eliminated something called the lead center. The lead center is gone, but we now have an activity, space flight, that from our point of view, is an Agency program as opposed to an Enterprise program.

And as an Agency program, we have to look at it from the tactical point of view, short-term point of view and long-term point of view. So we have put a couple of activities in place in the Agency.

One is something called the Joint Strategic Assessment Council (JSAC), and it is a body of folks, very senior level, who use the strategic plan as their bible, and, based on that, they assess the recommendations for the future. This is an Agency activity.

Reporting to the JSAC is something that, as we have just developed, is a Space Architect. A Space Architect is probably something that is known from the military point of view, but the Space Architect in NASA is a brand-new activity, and it is a person that represents the Agency to present the future of NASA, not destination driven, but requirements are science driven. And, with the approval of the JSAC, also provides the moldable road maps to achieve that particular dream or that goal.

I intend to have also an Aeronautics Architect, a chief technologist-type architect, an institution and asset management-type architect, who will make presentations to the JSAC, who with all of this information allow us then to proceed from an Agency point of view to the future.

So this SMCDS is just part of the larger approach that we have. We have a strategic view. We have to make decisions now to allow us to achieve these enabling steps, and so it is important, therefore, that as we assess the future of the Agency from the space point of view, from the aeronautics point of view, from the future technology that we also have this very strategic view in our communication capability.

So if there is any question about why we are moving from a Center-centric to a Headquarters or an Agency communication process or SMCDS, I hope this is clear and, obviously if it is not, continue to ask questions. Perhaps in the questions section on the Internet many of these questions will be answered.

I wanted to just give you a basic understanding of what we are doing and why we are doing it, and to indicate that it is part of the activities and the approaches that we will be taking at NASA.

Again, I want to thank each and every one of you for coming. This is very, very important for us, and it certainly is represented by the turnout today and the variety of groups of people who are here. We hope very much to make this happen as quickly as possible, and we hope that we end up with something better than we have had before, more effective than we have had before, and I know that we are not going to be able to do it alone. It is going to take each and every one of us.

So thank you very much, and I will pass it back to Chris.

(Applause.)

MR. JEDREY: Thank you, Mr. Gregory.

Next on the agenda is Mr. Robert Spearing, Assistant Associate Administrator for Space Communications, and he is going to talk about the Space Communications Program.

NASA'S SPACE MISSION COMMUNICATIONS and

DATA SERVICES MANAGEMENT (SMCDS)
MR. ROBERT SPEARING
ASSISTANT ASSOCIATE ADMINISTRATOR
FOR SPACE COMMUNICATIONS

MR. SPEARING: As Fred was saying a little bit ago, he was amazed at the size of this audience, and so am I, and really impressed to see the interest and what I know will be a very strong competition for the work that will come out in this procurement in the spring.

What I would like to do is spend a little time with you talking along the lines that Mr. Gregory started with when he talked about how the Agency has changed and the different view we have of things. He talked a little bit about flexibility and things like that. I will not spend much time on that, but, hopefully, I will hit on it a little bit.

What I would like to do is talk to you about how we have changed in the area of space communications and data services from the model that basically had its roots in the Enterprise that was known as Space Communications a number of years ago and then was transitioned into the Space Operations Management Office at JSC for a number of years, and then finally or at least currently . . . I always hesitate with the final part because, as we go along, we find that we have to adapt, and we have to look for the best way we can to conduct our business and provide the services to the NASA research and flight missions that we put up.

(Slide.)

On the screen now is a graphic that depicts the way in which we have set up the organization today. This organization is the result of a careful and deliberate negotiation, if you will, and deliberation about the best way to conduct the various parts of the program and the best way in which to integrate those parts of the program.

One of the things that was a characteristic of the organization that we had in place in the past was that it did tend to be very centralized in a sense and ended up providing a service without a lot of what I would call stakeholder buy in. And in the process of coming up with this organization, what we wanted to do was to make sure that the stakeholders not only bought in but had a lot of responsibility in the process.

So for that reason we ended up with an arrangement, which you see here, which involves all of the Enterprises that have a stake in the game. You have our Space Sciences Enterprise, our Earth Sciences Enterprise, Human Space Flight Enterprise, the Aerospace Technology Enterprise, and even the new Enterprise, Biological and Physical Research. They are brought together through a board that I chair. We call it the Space Communications Coordination and Integration Board, and that board specifically deals with cross-cutting issues. With the bringing in of these various organizations, one of the things we did was we gave them something, and what we gave them was on the one hand a problem and on the other hand greater authority and responsibility over systems where they were the primary user.

So in the case of Space Sciences, the Deep Space Network, Deep Space Mission Systems activities are under their management and budget authority.

Within the Office of Space Flight we have the Space Network, which includes TDRS (Tracking and Data Relay System) and a few other things. It also has the wide area network (called NISN).

Then within the Earth Sciences area we have the Ground Network, which consists of stations that are physically on the ground and primarily support our polar missions, which are one of the primary sources of our Earth Sciences information.

And then within the Aerospace Technology Office, we had included in that roll-up before the activities at Dryden that were in this communications data

area. They now come under the purview and budget authority of our Aerospace Technology Office.

If you look at the Centers that are most actively involved, you see those across the bottom of the page. They are the Jet Propulsion Lab, of course, Goddard Space Flight Center, Johnson Space Center, Kennedy Space Center, and Marshall Space Flight Center.

Dryden, of course, is what I talked about before relative to WATR. That is our Western Aeronautical Test Range.

Then supporting this arrangement and supporting the board are a number of working groups that we have established. These working groups deal with those cross-cutting issues. For example, spectrum is a cross-cutting issue, standards is a cross-cutting issue, and communications technology is a cross-cutting issue. So we have that kind of arrangement now that feeds into the board.

One thing that I do not want to miss in talking about the board is representing the various Enterprises on that board are what we call "program executives." These are people who are assigned within each of the Enterprises to represent the space communications and data services activities that are conducted, managed, and budgeted by that particular organization. So these folks, and there are four of them right now, and that will come and go, depending upon the amount of involvement that we see from various organizations within NASA. But the basic program of having program execs is the way we will go about bringing these various elements together.

How have we codified this? We actually have a Memorandum of Agreement, which we have established among the Enterprises that is signed by the Associate Administrator of each Enterprise and that represents the way we do business and more or less the scope of that arrangement.

So I guess that is about all I want to say about that part of it.

(Slide.)

What I would like to do is go to the next chart which really starts down the road that you will hear a lot more about in the next couple of hours, and that has to do with work packages and where those work packages reside in the terms of the organizations that will actually be managing and performing the work, and, as you know, especially if you look at it from the Center point of view, NASA HQ does not do the work, the Centers do the work, but we do a little, too. But we do rely on the Centers to perform not only this kind of work, but basically all of the major programs that we have in the Agency.

The idea here is to give you a sense of the funding flow. We have used the code letters here instead of the real names. Most of you probably know what they are, but Code S is Space Sciences; Code Y is Earth Sciences; M is Office of Space Flight; R is Aerospace Technology; and U is Biological and Physical Research. These all have varying degrees of involvement, and, to the extent that they are involved, they also provide money in the game.

So with that kind of an introduction, what I would like to do is pass on the discussion to Bryan O'Connor, who is going to be our Source Board Chairman for this procurement. I am sorry, Source Selection Official.

SOLICITATION AND SELECTION PROCESS

MR. BRYAN O'CONNOR

SELECTION OFFICIAL

MR. O'CONNOR: Why is he sorry that I am the Source Selection Official?

(Laughter.)

MR. O'CONNOR: My name is Bryan O'Connor. My normal job at NASA is Safety and Mission Assurance. Now, some people tell me that the reason I got the job for this important solicitation of Source Selection Official is because I am not one of the organizations listed up there on the chart. I do not really have a history in this area. I am one of those disinterested third party-type people, and, therefore, I have no biases. Some people think that the real reason I was picked is that I was not present in the meeting when they discussed this.

(Laughter.)

MR. O'CONNOR: I like to think it is the priorities that I bring to the table. I will tell you what they are, three of them, in order.

One: We safely accomplish our missions.

Two: We meet our schedules.

Three: We continuously look for ways to improve our efficiencies.

This solicitation will be composed of discreet Center work packages which basically replace the current CSOC work at four of our Centers. Now, the solicitation . . . I said four. I am going to talk a little bit about JPL here in a minute. This solicitation will be conducted at NASA Headquarters but will have significant involvement by the Centers involved. In other words, what we are doing is we are using NASA Headquarters to conduct the solicitation. The board will be at NASA Headquarters. Chris Jedrey is the Chairman of that board. The work will be done in preparing the board for its work by the Centers and the various work packages that will be briefed to you a little bit later.

The only thing that is really different is that the Centers do not have to select or find a Source Selection Official and a Chairman. That has already been done for them. We are doing this at Headquarters because this is how we choose to graduate from the CSOC approach to what we are doing next. It does not necessarily imply that we will always do it this way in the future at all. This is how we are transitioning, though.

The Centers will be intimately involved in the RFP drafting, the proposal evaluations, and in the recommendations to the board. NASA Headquarters will review the Center recommendations, NASA Headquarters Board, to ensure the best combination of contract types and awards for NASA.

Now, you can probably get a hint here that one of the reasons we are doing this is for NASA agency synergy that might be missed when you just have four or five different acquisition activities going on at the various Centers.

However, we do not plan to have a case where one contract, for example, covers a lot of different Centers. There could be one contractor that happens to win contracts at various Centers so the synergy we are looking for is at that level.

Now, when we talk about synergy, just a point on that, we are not looking for synergy for its own sake. You know, I do not want all 200 different proposers to come in and say I propose to do everything because synergy has to be credible in order to be reviewed and taken seriously.

Our intent is that the contracts that result from the solicitation will be awarded and managed by the Centers. So in my job, and Chris' job as the Board Chairman, and in my job as the Selection Official, I will select the winners of the solicitation and tell the Centers to go and make those awards.

We are currently working with the Centers to develop the solicitation requirements and to formulate the acquisition strategy. At present, we are developing seven work packages or statements of work that are identified by the Center and JPL in the agenda that you were provided.

At this time, all the work packages, with one exception, and that is JPL with their Deep Space Mission Services, will be part of the Headquarters Space Mission Communications and Data Services Solicitation.

So by this meeting today we are formally announcing that the work that was under the former CSOC is in the SMCDS, with the one exception of the Deep Space Network. We will brief it today for your information, but from here on that portion of the work is going to be carried out, that acquisition, that solicitation will be taken . . . carried out by JPL.

The reason for this, and we looked at all these things, but the reason for the JPL case is that the schedule of our solicitation, Headquarters solicitation, did not match their needs from a mission viewpoint, and so we released them from this.

Since the deliberations are still ongoing regarding the final composition of each work package, it is possible that a second work package may be removed. In other words, there is one other one that we are looking at that could possibly be removed from this, and that is the Johnson Space Center, Mission Control Center activities. We have not decided yet, so we are briefing that today as though it is in SMCDS, but it is possible it could drop out and go a separate route on a different acquisition approach.

By the same token, it is also possible that we may add some more things. You will notice today we have got some things already under SMCDS that were not part of CSOC, and there may be some more things that migrate into this umbrella as well, but today you are going to hear what we know today.

This is why it is really important at the end of the day that you understand how to keep track of the changes and the progress as we go along, and Chris will go over that. We put him at the end so nobody would leave early.

(Laughter.)

MR. O'CONNOR: We plan to draft a solicitation and to release it in the late spring. That is the draft solicitation. And the schedule will follow.

Now, in closing, I would like to echo Fred's sentiments in expressing my appreciation for the significant interest that we see here today, and, again, thank you for all being here. And, hopefully, what you see here in the next two or three hours will help to solidify what is in this SMCDS solicitation and will answer some of the questions we know you all have brought with you today.

Thank you very much.

(Applause.)

CENTER WORK PACKAGE PRESENTATIONS

MR. JEDREY: Thank you, Bryan.

In the next part of the briefing, we are going to provide you with a top-level idea of what each of the work packages contains. The Centers and JPL have been working hard to define the new work packages, and, in order to get through all the work packages in the allotted time, I have asked the speakers to limit their time to 15 minutes per work package. So if they skip anything, it will be on the Internet and you can download as much or as little as you want.

With that said, I would like to introduce the first series of work packages, and the speaker for Goddard Space Flight Center is Karen Blynn.

GODDARD SPACE FLIGHT CENTER:

1) NEAR-EARTH NETWORK SERVICES (NENS)

2) MISSION OPERATIONS AND MISSION SERVICES (MOMS)

(Slide.)

MS. BLYNN: Good morning.

(Chorus of good morning.)

MS. BLYNN: As Chris said, my name is Karen Blynn, and I am representing the Goddard Space Flight Center and will be talking about our requirements from Goddard for this solicitation.

(Slide.)

Goddard actually has facilities located at a variety of sites. We have the Space Flight Center in Greenbelt, Maryland; the Wallops Flight Facility at Wallops Island, Virginia; our IV & V Facility in Fairmont, West Virginia; our Goddard Institute for Space Studies, which is in New York City; and our White Sands Complex in Las Cruces, New Mexico.

(Slide.)

Over the next 10 years, Goddard is implementing an array of missions and research. We have a significant amount of work in that timeframe, and it is an evolving set of missions over time. We see truly increased technical complexity, multiple spacecraft missions, new areas for scientific emphasis, and an increased reliance on our partnerships.

(Slide.)

Our requirements will be supported through two work packages. You have heard that already at least once today. They are our Near-Earth Network Services, what we are calling our NENS work package, and our Mission Operations and Mission Services (or MOMS) work package. Both of these work packages are going to include extensive Government-furnished equipment, and that is extensive in both dollars and in quantity, so I will go through each of these work packages at a high level.

(Slide.)

The first one is the Near-Earth Network Services.

(Slide.)

Overall, our NENS work package provides the tracking and data acquisition for our Near-Earth customers with responsibility for performing customer commitment management, operating and maintaining the NASA Ground Network, and the Space Network, and performing sustaining engineering, logistics, facilities management, and hardware and software development.

(Slide.)

We have a rather diverse set of customers in our NENS area. It includes the Space Station, expendable launch vehicles, both the Earth and Space Science missions, and sounding rockets, including the National Science Foundation and many, many others.

(Slide.)

Our NENS requirements include customer commitment management. This includes developing and maintaining customer requirements and commitments and documentation for both the Space and Ground Network, as well as the interfaces with other NASA and non-NASA networks. It also includes performing modeling and loading studies for future mission feasibility, for Space and Ground Network workload studies, and advanced network architectural assessments. In addition, the requirement includes performing testing and integration of customer missions with our supporting networks.

(Slide.)

Operating and maintaining NASA’s ground network includes our NASA orbital tracking stations, the Shuttle S-band and the UHF communications assets, our Wallops Research Range telemetry, radar, and other assets at that facility. It also includes tracking services that are contracted with both commercial and foreign assets, as required by our customers.

(Slide.)

We have ground network stations located around the world in Santiago, Chile; Alaska; South Africa; Antarctica; Norway. There are lots of locations. This map just points out the locations for our current ground network stations.

(Slide.)

For the space network, our NENS requirements include operating and maintaining the White Sands complex in New Mexico, which includes responsibility for the Guam Remote Ground Terminal. It also includes the operation and maintenance for the Tracking and Data Relay Satellites.

(Slide.)

We have a little more information on the White Sands Complex and the Guam Ground Terminal. At White Sands, we have two ground terminals, and they also have responsibility for the flight operations of the TDRS constellation. We also have another component of the ground segment at Guam.

(Slide.)

This just shows the constellation for our TDRS satellites. Typically the space network actually supports five to six thousand scheduled customer events in a month.

(Slide.)

You can get some more detailed overview information for both our ground and space networks at these user guides that you can find at those Web sites.

(Slide.)

To go on to our Mission Operations and Mission Services work package.

(Slide.)

Our MOMS work package encompasses all mission phases from concept studies and formulation through development and operations, through extended operations and decommissioning. The scope of involvement for each of those specific missions is going to be decided on a case-by-case basis by the Government.

(Slide.)

The MOMS work package provides mission operations for ongoing missions that are managed at the Goddard Space Flight Center, and these are for both the Earth and Space Science Enterprises. For the Earth Science Enterprise, we operate the TRMM mission satellite and the Earth-Observing System Mission Set, which includes Terra, Aqua, and Aura. At this point, that mission set will be transitioning 90 days after the Aura launch actually occurs, which is currently scheduled for January of 2004.

In addition, in support of the Earth Science Enterprise is the operations for the Earth-Observing System Data Operation System.

The Space Science Enterprise includes a range of satellite missions that are an ongoing mission set at this point in time. The list is there. It is SOHO, ACE, TRACE, RXTE, WIND, POLAR, and the HST Data Operations portion. Of this, as a frame of reference for you, our WIND mission was actually launched in November of 1994, and our most recent launch in that existing mission set was TRACE in April of 1998.

(Slide.)

Under MOMS, our mission operations elements include flight operations, mission planning and scheduling, maneuver planning, flight dynamics, and the level zero data processing. It also provides for flight dynamic services related to all of our NASA Enterprises and our reimbursable missions, and specifically that includes the Space Transportation System, the Space Station, expendable launch vehicles, and our NASA networks.

(Slide.)

The mission service elements include conducting engineering studies, providing ground system development and re-engineering, spacecraft integration and test support, and sustaining engineering, which includes our mission operations centers, our flight dynamics facility, and our development labs at the Greenbelt location. It also includes ground system hardware and software maintenance, logistics, facilities management, and flight software support.

In addition, it includes advanced information technology tools and techniques, and the advanced flight dynamics tools and techniques.

So at this point in time, these are Goddard’s requirements under this solicitation.

Thank you.

MR. JEDREY: Thank you, Karen.

Next, we would like to move to the Johnson Space Center, and George Bull will give us the Johnson work package summary.

JOHNSON SPACE CENTER (JSC)

1) MISSION OPERATIONS

MR. BULL: This is the first of at least two, maybe three, work packages you will hear that reference human exploration of space.

(Slide.)

To give you an idea of the size of this work package, we are talking about 13 thousand pieces of hardware and about seven million lines of source code.

As in the past, and will continue, the primary focus of this particular work package will be the safe and successful execution of flight operations supporting the Space Shuttle and Space Station.

(Slide.)

Where we are today, we believe we have in place an architecture that is very efficient and effective. The challenge that remains for us in the future is

to maximize this capability so that we can support not only Space Station assembly sequence, but safe Shuttle flights.

Success is imperative to meet the Space Station assembly sequence, with U.S. core complete currently scheduled for February 2004. If you look at the calendar, this contract goes into place January 1, 2004, and that is a mere six weeks after this contract goes into place.

(Slide.)

With that, I will go into the presentation on page three to talk about the purpose of the briefing. Basically, we are talking about eight specific facilities here. The main ones that you are probably familiar with is the Mission Control Center (MCC). There is a lot more than you just see on TV or NASA Select. That is only one or maybe possibly two rooms that we use. It is triply redundant, possibly sometimes quadruple redundant operations that we use in that control center.

As part of that control center architecture, we have rooms in other nations. The Back Up Command and Control (BCC) Facility is located outside Moscow, Russia. As part of that back up command and control capability, we have a group of dedicated U.S. flight controllers there in the Houston support room. At any given time, this back up command and control can take over when the mission control center is out of service.

We did that recently when Hurricane Lily threatened us. We deactivated the control center and turned over command and control to our Russian counterparts.

Along with that is the Integrated Planning System (IPS). It does both short-term and long-term planning for the International Space Station. It also does the flight planning for the Space Shuttle Program.

In addition, we have the Ground Systems Development Environment (GSDE). That is where we do our future architecture, design, and implementation to stay consistent with the onboard configurations of the Space Shuttle and Space Station. Space Station has 45 distinct elements. It is our challenge to stay in sync with each of those elements so we can support them from the ground.

Once that new development baseline is complete, it is transferred to the Consolidated Development Environment. That is where for the first time the flight controller community has an opportunity to implement their user applications. And then after it is validated, it is transferred to the operational database as part of the MCC and BCC.

In addition, we have the Electronic Systems Test Laboratory (ESTL). It is a ground facility that has all the space communications, flight-qualified equipment, or its flight-like equivalent.

And then we have the Emergency Operations Center (EOC), which is primarily dedicated to our security, emergency medical activities, and any fire alarms. This particular activity used to be part of the control center, but its architecture has now changed somewhat as you will see in the follow on pages.

In terms of services, we basically have six services in support of each of these facilities. They will be discussed later. They are operations, maintenance, sustained systems engineering, support functions, CMIT security, and specialized integration between the space and ground networks.

(Slide.)

In page four, I’ve got more detail about the MCC. It is primarily dedicated to supporting human exploration and development of space. It has ground data and telemetry processing, commanding, trajectory, video, voice, network data for displays, and controls supporting Space Station and Space Shuttle.

It is a distributed architecture. We have the capability to do three simultaneous operations and sometimes four. We maximize the use of COTS, both in terms of hardware and software. And we do concurrent flight activities. We support Space Station 24X7 and Shuttle as they fly, and we do plan/train flight activities in preparation for all these activities.

The dynamics of the control center, while it is currently stable, it is by no means static. As the onboard architecture evolves for both Shuttle and Station, so must the control center evolve to be able to support that effectively.

And to do that we involve systems obsolescence, and we also look at making it more available to increase the reliability at a lower operations cost.

Our long-term design is to make this control center flexible enough to support future human explorations of space, including orbital space plane and follow-on programs.

(Slide.)

Page five talks about the Back Up Command and Control Function. It has a limited telemetry set, but it is able to command Space Station through U.S. assets. We also provide the Houston Support Team that is there to support our Russia international partners, and it has similar equipment and architecture of the MCC to stay compatible.

Integrated Planning System (IPS) supports again both Shuttle and Station. It primarily does this by using planning and analysis tools to support the flight profiles, and also contains modeling and other activities to support training and systems development.

(Slide.)

The next page continues the IPS. Again, it is intended to maximize the availability of commercial off-the-shelf hardware and software, but it does, again, like the MCC, have flight-specific requirements that require customized code to be able to support those activities.

It is a distributed UNIX work station-type system with an open systems architecture.

The dynamics, again as the Shuttle and Station evolve into their final status, IPS is currently stable, but it is by no means static. We want to take advantage of new technology as it becomes available to the communities, and we want to replace all obsolete equipment and make it more reliable in terms of maintainability and decreasing operations costs.

(Slide.)

The next page shows the MCC content and availability. Please take note of the center circle there that says at a minimum our expectation is the MCC will be available 98 percent of the time. We are currently at 33 consecutive months of meeting or exceeding that standard.

Now, for critical events such as launch and landing, rendezvous, EVAs, we do have 100 percent standard of expectation. That is also our standard of excellence.

You can tell by this chart that we have at least three different flight control rooms. The flight control room is normally reserved for Space Shuttle activities. The blue control room is your Space Station 24X7 activities. The red control room we use primarily for training and reconfiguration activities.

You will take note at the amount of equipment that I referred to earlier. We have 18 front-end processors, 16 command servers, some 200 comm circuits, 500 work stations, almost 4.5 million lines of source code in the control center, four trajectory servers, two air-to-ground strings, and two space-to-ground strings.

On the right hand side, you see activities supported. We can support three and sometimes four of those activities simultaneously in this control center, and we need to do that to be able to meet our commitments to our customers.

(Slide.)

On the next page is the IPS operational content availability. Again, your attention should be pointed at the center circle. It, too, has a 98 percent standard of expectation, and it is in its 15th consecutive month of meeting that minimum expectation.

This one is a little bit smaller than control center but much more distributed across not only the continental United States, but to our international partners. It has 22 workstations doing robotics work and planning and activities, and 25 workstations doing consolidated planning systems. It also has 544 distributed workstations across with our international partners, and it has 2.25 million source lines of code.

In addition to specific times depending on the activities going on it supports Day of Launch and I Loads for Shuttle launch activities, flight dynamics planning and analysis, and resource utilization aboard Space Station.

Again, on the right hand side, the activities that are supported, we can support three of these activities simultaneously with the IPS system.

(Slide.)

On the next page, I talk a little bit about the Ground Segment Development Environment. This is where we keep our hardware/software configuration in sync with future Space Station elements and upgrades with the Shuttle program. It is a NASA-owned facility. We see that not changing at this point.

What we do is we install, configure, validate, and verify new platform systems with new operating systems as part of the GSDE before we import that to the consolidated development environment.

In the CDE, that is where the flight controller community comes in with their user applications. They are required to recertify their user applications with this new platform environment. Once that is done, any Space Station reconfiguration items that are necessary, then we import this new baseline to an operational environment.

(Slide.)

ESTL, the Electronic Systems Test Laboratory, is a spacecraft communication system. It is very high fidelity. We maintain very strict configuration control on this because it is the only facility that we have that we can validate space-to-space and space-to-ground communications with the current configuration.

ESTL is also used by the Space and Ground Network to make sure that their interfaces with the Mission Control Center are compatible with our systems performance.

(Slide.)

Emergency Operations Center is our JSC emergency management process. The primary function is security. They have a series of cameras across our center and sensors. They also have the Emergency Medical Response Team for any emergency medical-type activities, and any fire alarms we call the appropriate Houston Fire Department or the ones that are on site.

It also includes a secondary function, a community function, where if there is a natural disaster such as the Gulf Coast being threatened by a hurricane, we have a cooperative agreement with the local communities that they come on site, and we can manage all the emergency response activities from the Emergency Operations Center. It is physically attached to the Mission Control Center. It is in the same facility.

(Slide.)

In terms of services, the first one is operations. I have already mentioned the Space Station obviously is manned 24X7. It is differing levels of activity, but we are still there 24X7.

The second operation is 24X6, unless we are flying a Space Shuttle, and then that increases to 24X7. So you can see we will be flying both Shuttle and Station simultaneously at the same facility.

In addition to that, we are always planning ahead to the next baseline, the development baseline, for any new reconfiguration activities, and MOD continues to plan, train, and fly as required in this third ops.

(Slide.)

Now, on any given day we may try to quadruple operations if we believe we have fallen behind, or we need to test something specifically. Houston Support Room, Back Up Command and Control is normally 8X5, one shift, but it is on call 24X7 and can be operational up to 60 days. Again, we did have . . . we have activated this facility in the past, and we do have a tremendous dependability on it to work with our Russian counterparts as part of our international program.

(Slide.)

IPS platform is 12X5, with the exception of Day of Launch I Load updates that support the Space Shuttle launches. And then the MCC automated system is a PC subnet to IPS where all of our flight notes are stored to support both Shuttle and Station.

(Slide.)

Facility services and maintenance. We require all the maintenance be performed to meet the reliability and availability requirements, which is 98 percent, minimum expectation. We expect all critical spares to be provisioned and located such that you can meet that availability requirement. And we require any preventive and corrective actions to ensure that that facility is available to meet those minimum expectations.

All the operators and maintainers of the facility are required to be trained for their appropriate tasks, and in some cases these people are part of the flight control team, and, as such, they have specific certification requirements that they have to meet.

(Slide.)

ESTL and EOC. ESTL is operational 8X5, but it is pretty much directable at the program's request to be able to support any troubleshooting between the space and ground networks and onboard systems and the ground. Their standard of excellence is 100 percent. Their expectation is 99 percent readiness expectation.

EOC, of course being our emergency response system, is available 24X7. The operators of the Emergency Operations Center are part of our center ops contract. They are not part of this specific procurement. EOC availability is expected to be 100 percent for its primary functions and 99 percent for secondary objectives.

Again, all the people that are working this facility are required to be trained to maintain the hardware and software, but these people are not required to be certified except on a case-by-case basis.

(Slide.)

Facility services and sustaining. We expect the coordination of all new reconfiguration products to be delivered and coordinated. All support requirements, whether they be from Space Station or Space Shuttle, are expected to be analyzed and integrated into the operations platform. All anomalies, whether they be in-flight anomalies or anomalies that are occurring during testing, are expected to be resolved and reported back to the programs. All software licenses are expected to be maintained and updated as required, and you are expected to manage the technical power or the commercial power in this facility at all times. We cannot afford to have the facility brought down due to a technical glitch in the power system.

(Slide.)

Facility services, modifications in systems engineering, this is our way of saying that we need all the necessary systems engineering performed to stay compatible with the onboard configuration. We expect all the technical performance analysis to be done to say that this is the best solution for the dollars spent for it. You will be asked to do make-buy-type analysis and make a recommendation to the Government as to which is the best way to go, customized solutions or a COTS solution. Also, we are expecting you to do performance analysis on the total system as a whole.

(Slide.)

Support functions. We expect to know what the current configuration is of the control center at all times. In the event that we have a problem, we do not want to be in the situation where we have an unknown configuration. So CM is of primary importance to JSC.

Along with that, security has become increasingly important. We have a series of guidelines supplied to us by Headquarters. We have a series of directives at the Johnson Space Center, and we have a team that is on call to react to any security elements that could impact operations.

Along with that, we have quality assurance.

Strategic engineering ensures that we stay at least compatible with any future activities that the programs may have.

And we do provide the program support through the Ground Segment Control Board, who is our primary interface with our international partners and defines the interfaces necessary to work with remote-control centers. Right now we only work with the Russian Control Center, but in the future we will have NASDA and the ESA control centers to be integrated along with the other international partners for Space Station.

(Slide.)

On the final page 18, we talk about space communications. This is equally important. Everything I have talked to up to this point has been primarily contained in the JSC community. This particular one requires that the contractor will perform integration with the space and ground networks, and you need to develop associate contract agreements with another contractor or with a center, depending on who controls those facilities and the products that you will be requesting to support mission operations.

You will be required to say that this thing is operational and ready to support Space Station and Space Shuttle. In some cases, you will be required to sign the certification of flight readiness to NASA Headquarters saying that we are ready to fly a Space Shuttle and/or Space Station mission.

Any anomalies, whether they be in-flight anomalies or anomalies in training or testing, you will be required to explain to mission operations and program manager satisfaction.

There are also a series of engineering reviews that will be requested for you to support. They all have charters. They are all documented in our statement of work.

Along with that, Space Station has a communications integration activity for international partners that is called the NACAIT. You will be required to support them as necessary.

And then all the requirements for both Shuttle and Station are documented in the program requirements documentation. You will be required to support those requirements definitions and implementation.

(Slide.)

And the final page is just a series of acronyms. I tried not to use many acronyms so as not to confuse anybody. That is the work package for the Johnson Space Center.

MR. JEDREY: Next we would like to move to the Kennedy Space Center and Retha Hart to tell us about Kennedy’s work package.

KENNEDY SPACE CENTER

1) COMMUNICATIONS SUPPORT

(Slide.)

MS. HART: Good morning. On the front page there you will notice I am the presenter today. The point of contact is going to be Kirk Lougheed, and his phone number is there so you can contact him as need be.

(Slide.)

The second chart is just kind of an overview of what Kennedy Space Center looks like. We are on the east coast of central Florida. The weather is a lot better there I can guarantee you.

(Laughter.)

MS. HART: We have about 140 thousand acres. It is almost like a small city. Over 900 facilities and this contract touches just about all of those facilities.

(Slide.)

On page three, I will get into the actual functions that we will be looking for in this work package. Much as George mentioned, a lot of the functions are operations, maintenance, sustaining engineering, upgrades, and any modernization that we might do to some of the systems that will be included in this.

The systems here include both operational and institutional communications systems. What we mean by operational systems are those systems that support the Space Shuttle, the Space Station, and our expendable launch vehicles. The systems also support our payload ground processing and support launch and landing, including the contingency landing sites and Transatlantic landing sites.

(Slide.)

On page four, I get into the services. This statement of work will include voice, video, and data transmission services. In the voice services, we have an operational intercom, paging, and area warning system that is in all the facilities at Kennedy; an extensive radio system; audio and voice distribution systems; an Astrocomm system for communication between the astronauts while they are onboard the Shuttle back to the firing rooms; the Transatlantic landing sites that I mentioned previously; voice recording systems; and also support to our public affairs, both for audio and video.

(Slide.)

Page five, the video services are an operational television and then a broadband system which is kind of a closed-circuit television system central to Kennedy. Again, we support our public affairs television system and provide photographic services.

Cable and transmission services. We currently have T-Carrier and SONET Multiplex systems, ATM systems, fiber optics, and in the cable plant both internal to the buildings and external between buildings as a part of this work package.

Institutional computer networks, the firewall, and wide area network support at Kennedy is included in this also.

(Slide.)

On page six is kind of a gee whiz chart. This is just a little bit to give you kind of a scope of the work. You can see there are about 800 miles of major cable. It is about a half million cable pairs, 488 manholes, over 3,000 fiber circuit . . . fiber optic circuits, over 3,000 radios, over 200 video cameras and 700 video monitors, and over 14,000 IP addresses to maintain and track.

(Slide.)

On page seven, some of the metrics, the measurements that we will be looking for here, again is similar to what George mentioned, is system availability, percent of time that the systems are up and operational, and those are especially critical during launch and landing times. The service request performance, this is what percent of those requests are completed by the due date. Problem resolution, what percent of problems that have been reported, are closed within a specific amount of time. And then the financial metrics, plan versus actual and the overruns, and those kinds of things.

(Slide.)

I have a few charts to show you some of the facilities at Kennedy. On page eight, this is the vehicle assembly building. This is where the Space Shuttle is

stacked, the orbiter is mated with the external tank and the solid rocket boosters before it is rolled out to the pad.

On the right of the screen is a small building, actually it is a four-story building. It looks small there. That is the launch control center where the firing rooms are located.

(Slide.)

On page nine is a shot from inside the firing room. You can see that the launch control team, the headsets they have on, that is part of the operational intercom system that will be part of this contract. And then if you can look at the consoles, you will see the TV monitors there, which is part of the operational television system, a part of this contract.

(Slide.)

On page 10 is an aerial view of one of the pads, and I believe there is a Shuttle on the pad in that view.

(Slide.)

On page 11 is a shot of some of the folks installing the cameras out on the launch pad in preparation for the next Shuttle launch. There is a Shuttle on the pad there.

That is a real brief summary of the requirements for Kennedy as we know them today.

MR. JEDREY: We are doing pretty well on time. So let's have a 15 minute break. Please be back here at 25 after, we will start promptly.

Thank you.

(A break was taken.)

MR. JEDREY: The next presentation will be from two work packages for Marshall Space Flight Center. The first one will be NASA Integrated Services Network, and Brad Torain is going to talk to us about it.

MARSHALL SPACE FLIGHT CENTER

1) NASA INTEGRATED SERVICES NETWORK (NISN) and NISSU

MR. TORAIN: Good morning.

(Slide.)

My name is Brad Torain. I am the Deputy Program Manager for the NASA Integrated Services Network.

For all of you who presently know me, I have not changed jobs. In line with the One NASA initiative, I will not tell you what Center I am from.

(Laughter.)

MR. TORAIN: But I am sure some of you already know, and that leads into the first chart.

(Slide.)

When you think NISN, I want you to think wide area services. NISN is a wide area telecommunications provider. We interface with projects, all the projects, all the Enterprises, all the Centers on a local basis, but we are wide area, so I want you to keep that in mind as I go through this.

Since Chris so generously let us take a break, and you all are refreshed, and you have all taken care of certain business, you made your cell phone calls, I had no intention of going through the 48 slides I had, but, since I have time now, I will cover each and every one of them.

(Laughter.)

MR. TORAIN: I am only joking. I could actually do this presentation with two slides. This is one of them.

I refer you to the part about responsibility. This leads into the fact that I am not from Marshall Flight Center. NISN is an organization that exists between two Centers, and I know we are in the One NASA mode, but, I am sorry, NISN is a distributed organization between Goddard Space Flight Center and Marshall Space Flight Center. You need to know that because we have staff at both Centers so as I go through the services and the function that we provide, do not confine yourself to Marshall, Goddard, or even the other Centers because

we do it all. We are the glue that connects all the Centers together. You cannot get your data without us. One way or another, we carry your data.

The second slide, please.

(Slide.)

This is the other slide I could do this entire presentation from, but I included a lot of slides just for your information, so when you download it off the Web, you will have ideas of what we mean when we go through this.

This work breakdown structure is divided up into three parts, as you can see. The part on the left that covers the program management. These are the things that will be in the package that are usually self-explanatory. I will not cover them at all in this presentation. I will confine myself to the middle part and the part on the right.

Let us take the NISN services in the middle. These are the services that we provide for our customers, so the contractor that gets this award will be in direct contact with customers as we provide these services.

The functions on the right are support functions that are normally supplied to the NISN organization in more than one location. The one function on the right side which is not covered in the slides . . . and I will have to correct that before these get uplinked . . . is disaster recovery. The bottom function. And what we mean by disaster recovery is we mean the recovery from manmade, natural disasters and some disasters that we, our customers, create ourselves.

(Laughter.)

MR. TORAIN: That is true. We do that sometimes, but, because of the function that we provide, if you listened very closely to George's presentation, these mission-critical functions, they have to be recovered very quickly. So in this package will be the opportunity to provide disaster recovery scenarios on a number of scenarios that we will provide for you.

(Slide.)

Okay. I am going to run . . . actually I have 19 slides, so I am going to fly through them, so put your seatbelts on.

(Slide.)

The slide that says NISN services. These are the services that are provided. I will go through them. Some of them are just for information only. Being an engineer, I am going to stop on the one that says engineering because that is what I do, and I will get a little more specific in things that I want you to pay particular attention to.

(Slide.)

The next slide shows the video teleconference services. All the different functions we do with that particular service.

(Slide.)

The next slide is a continuation. It describes the portable ViTS facilities. It describes how we operate the reservation system to provide that particular service.

(Slide.)

If you go to the next slide, there is a description of the ViTS room operations. And all these functions are what we do when we provide video teleconferencing to our customers.

(Slide.)

The next slide begins a series of slides that covers voice teleconferencing. That service is provided by NISN.

(Slide.)

The next slide describes the facilities, and the last bullet, of course, covers the mission voice circuits that we also provide.

(Slide.)

The next slide begins with "Routed Data-IP and Legacy Protocols." I am going to stop here for a minute. If you notice, there are five different

services available under NISN. Mission-critical and real-time critical are very special to people like George Bull and others sitting in this audience because that is the service that carries their mission-critical data. It carries data that is responsible for the lives of astronauts and other people that are flying in space. Not to say that the other data is not critical, but we do not want to go to places where we have been before.

The other three services are services that are normally provided, and a lot of people like to stop by to do the best effort. They ask for best effort, but actually they want real-time critical. So it causes for a lot of conversation with customers when they describe their requirements, but then they tell you what they want to pay for it.

(Slide.)

The next slide covers customer service activities, and the one that covers service requests is things that we do as an internal process that we use to provide service.

(Slide.)

Okay. The next slide says engineering. That is me. There are several slides that cover engineering. This particular item here is system engineering, which we do a lot of because no matter how large these Centers are, we are larger. We are the ones that move the things between the Centers, so we have a lot of system-engineering issues and opportunities to perform and to excel. Some of it involves online inventories of data, and it all falls into the next slide that goes into the sustaining engineering function.

(Slide.)

All the systems that we use to provide service have to be sustained, and they are constantly changing depending on the requirements that come from the customers. In this case, the customers are located at Centers. Sometimes the customers are international partners, or they are at universities, but we are still responsible for sustaining all the services that we provide.

New services implementation, there are quite a few of those that come up, too. So the contractor that gets this package will be heavily involved in design and development engineering-wise.

(Slide.)

The next slide is a continuation of the design and development efforts that we need to have performed.

(Slide.)

The next slide is a description of the system integration and testing. We do a lot of testing. We are responsible for teaming with the Centers, projects, and Enterprises. Every time they run a test, we show up, because they will not get any data off a Center if we do not. So there are a lot of test activities which include the scheduling of tests and making sure that we fit within the mission profile and launch schedules.

(Slide.)

Implementation is the same way. After we do all that other engineering stuff, we have to implement things, and we have to do it in a timely manner, and this chart just details some of the functions under that.

(Slide.)

Configuration management and control, there are no additional items under here, but let me tell you that is a very important function of the NISN civil service organization, and that means that the contractor that gets this contract will also be heavily involved because everything is controlled by CCB. The contractor may make its own CCB arrangements, but you eventually have to bring things to the NISN CCB. Preventive maintenance is the same way. It is normal stuff you do.

(Slide.)

Remedial maintenance. The only issue here is that it has to be done within certain time lines. If we have Shuttles flying, and we have people on Station,

which we have all the time, you have to be very careful about when you do certain types of maintenance, and, therefore, there is an approval process that has to be implemented. There is one that is currently implemented, but we are open to work with whomever the contractor is to make sure that things flow smoothly and that we do not disrupt any communications.

(Slide.)

And now to the last slide. Network management and operations. There is a lot of that that occurs because that is where we get the information that we need to feed back to Centers and all the customers about how well we are doing, and also that is the area, the point of focus for the problem resolution.

The last bullet that says collaboration with internal and external technical working groups, I am not going to even begin to try to name all the groups that you, if you are successful, are going to get associated with to collaborate with, and it includes people within the Government, outside the Government, industry, universities, but there are a lot of activities that we are involved in that you will also be involved in.

And that is it, Chris.

MR. JEDREY: Thank you, Brad. Next Cynthia Frost will talk to us about Huntsville Operations Support Center.

2) HUNTSVILLE OPERATIONS SUPPORT CENTER (HOSC)

MS. FROST: Hello. I am Cynthia Frost.

(Slide.)

The HOSC is what we call it. It is the Huntsville Operations Support Center. It is actually one of the buildings there at Marshall in Huntsville.

(Slide.)

Right now most of our support is part of the utilization and mission services contract. That contract is not part of the current CSOC contract. So we are being added into this. That contract covers the Huntsville Operations Support Center itself and some associated facilities which I will get into later. The facilities provide voice, video, and data services not only to the Shuttle but also to the Station and the payloads on it, as well as the remote users which are scientists that have payloads on the Station, and also provide data and telemetry services. We provide support for testing, simulations, near-real-time and real-time mission support.

We are also adding to the utilization and mission services contract into the new contract support for the Shuttle Data Reduction Center, which has the component and vehicle testing for the Shuttle prior to test, during all of the orbiter integration and so forth, and during launch. So we will provide all of those services as well.

(Slide.)

The Huntsville Operations Support Center is actually a multi-program facility. We have systems and services such as the enhanced HOSC system, which provides a lot of the ground data services systems. It supports the cadre for Station. Our side of the cadre is actually for the payloads on the Station itself, rather than the vehicle, which is managed through Houston. We have local users and remote users as we have talked about earlier. We support spacecraft operations through all phases of mission, whether it is actual flight or prior to flight. We do a lot of simulations for crew training and so forth. We support the Shuttle both during the testing phase and launch phase. We support Station, and we also support the Chandra X-Ray Observatory.

As I said, we go through the whole mission services end of it all the way from the beginning to end.

(Slide.)

We have a very product-oriented development contract that actually starts with the requirements development integration and goes all the way through after mission, but we do systems engineering. We have software development, and we have hardware systems development, the design. We test the systems. We deliver

them not only within our own facility but also to other facilities. We have facilities at Kennedy Space Center. We have facilities out at Ames Research Center in California. We have facilities at Goddard. We have a facility within Marshall that is actually in a separate building, so it is also considered a remote site.

We do activity preparation and simulation. We have flight evaluation activities that we do both in support of Shuttle missions and Station missions. We do hardware and software maintenance for all of the computer systems that support these functions, as well as the voice and video systems.

You have the systems and facility operations themselves that go with making sure that the building has power because we are operating 24X7 and heating/cooling, all of those type things, as well as IT security. We have a lot of firewalls and all the systems that make sure that the data does not go out where it should not.

We do data collection, processing, distribution, and archiving. Right now we are doing it for Station payloads predominantly. We are adding the Shuttle piece to that.

We also do validation and verification of the data products that we develop, as well as the ones we modify that are COTS and our systems.

Next slide, I am sorry.

(Slide.)

We also do a lot of service-oriented-type activities, and we have a lot of maintenance and operations that get done. There is a lot of sustaining engineering of the systems that we develop, making sure that they stay consistent as hardware platforms change and so forth.

We have several operations-type centers. We have a series of payload operation centers. One of them is actually where the cadre that supports the payload operations for Station is. It is in one of the buildings within the HOSC or one of the rooms within the HOSC.

We also have a Shuttle engineering support center that is used during launches. The data reduction center, which is for Shuttle, is also within this building. Then we have a lot of remote locations. We have payload operation centers that are located in other places. We actually work with ESA and help support some of their payload operation centers. We work with the Canadians and with the Russians as well.

We have what they call remote telescience support centers which are actually set up to where the scientists who have payloads on Station can either come to a center that is supporting them, and we have a lot of scientists at Glenn Research Center and Ames that actually stay at their center and can talk to the Station and see their data and voice and so forth at those places rather than having to come to Huntsville.

We also have the telescience resource kit and the Internet voice distribution systems that allow scientists to actually stay at their university, or even at their own home, and see their data from payload on Station. So we provide all the support services for that.

We deal with Kennedy Space Center, and we have our systems installed down there and make sure that they stay up and running. We talk with White Sands both for data distribution and voice and so forth, and we are also looking at possibly going even more into international distribution with allowing some of the European payloads to actually have track and I Loads and stuff, which has a lot of export control issues as well as IT security issues. So that work is still ongoing.

Next slide, please.

(Slide.)

We perform or provide systems and services throughout the entire life cycle of projects. We start in the early phases with developing what the requirements are that you need and actually go all the way through the

operations phase. So this contract will cover that, and the contractor will have to be able to provide everything from the requirements all the way on through the system, plus provide all the documentation and so forth that supports it. That will not only be for . . . this is set up kind of funny because we did combine two contracts. It is not only for the UMS portion of the contract, but it is also for the data-reduction portion of the contracts. So that is why those two were culled out separately. You have already seen all the lists of everything that is included in that, so I will not go over it any further.

(Slide.)

We have a lot of systems that are currently in operation. We also have systems that are being developed and upgraded. We are doing a lot of re-engineering work at the moment. And because this new contract will be coming in during the development activities, the new contractor will have to be able to ensure that all the tasks that are in work as well as the new ones are all properly defined, that they identify any deficiencies that exist, and that they can manage everything so that everything is delivered on time.

We are very concerned that all of our products be available on time, since they support actual missions. We do real-time mission support. Our software systems have to be in place. Normally for each Shuttle mission there is a new software input that goes in, and those have to be up and ready when the mission launches, not only to support the Shuttle but also to support the Station, and so it is very important that all deliveries be on time. That is a big deal.

We integrate all of our services and functions across the variety of the facilities that we talked about, the TSCs, the POCs, and so forth. We are very concerned that the systems continue to improve and grow. Hardware and software have changed a lot since this facility has been in existence. They first built this, I believe it was the early 1960s. A lot of the systems now are being changed out as the hardware and software become obsolete, and that is part of this, as well as the planned obsolescence and upgrade of the systems to make sure they always stay functioning.

Next slide, please.

(Slide.)

We wanted to give you some of the specific technical functions that are involved in this. It is a combination of maintaining and operating the software systems. As we say, we provide data acquisition, data reduction, the processing. For the Shuttle side of it, it takes a combination of the test data, the real-time data, and then the telemetry data, and actually combines it into one set so that you have got the best set because you drop data and so forth as it is transmitted.

We archive raw and processed data and store it . . . well, archiving is storing it. But there are also specific products that get generated for each mission. So although the products are generally very similar, they are tailored for each mission and will change slightly mission to mission.

We also have a lot of documentation as can be expected that goes into this, and that is expected to be maintained and new documentation generated as needed.

We have hardware and software maintenance activities that go with this and, as usual with anything, the project and program reviews and reporting that goes on with the contract.

(Slide.)

At Marshall, they are very big on what we call the core values, and we manage all of our contracts and programs to these values which are people, customers, excellence, innovation, and teamwork, and I probably did not get them in the right order, but that is a big part of how we do things within our center.

Thank you.

(Applause.)

MR. JEDREY: Next, I would like Mike Rodrigues from JPL to talk to us about the Deep Space Mission System.

JET PROPULSION LAB

1) DEEP SPACE MISSION SYSTEM

(Slide.)

MR. RODRIGUES: Since I am the last one, I was going to say that they saved the best for last, but I really thought I was last because I could make the announcement that we were not going to be part of this consolidated solicitation, but then Bryan stole the thunder from my speech. So I will just go through.

MR. O'CONNOR: I needed something to make mine interesting.

MR. RODRIGUES: I am the presenter, Michael Rodrigues is my name, and the contact for this procurement for JPL will be Clifford Findley.

So please call him, do not call me.

(Slide.)

I have three topics that I will go over today. I will just give a brief overview of the DSN, and I will talk a little bit about the statement of work and the plans for this procurement.

Next slide.

(Slide.)

Okay. Basically what we are trying to show here is where the DSN sits within the whole space communications end-to-end system. You have the spacecraft, and you have the ground acquisition system, followed by the missions and the advanced mission operations system.

The deep space mission system itself consists of the DSN and the advanced mission operations system, which is on the bottom of the picture.

Next slide, please.

(Slide.)

Our sponsor is the NASA Space Science Enterprise, and we support interplanetary missions. We also provide support to high Earth-orbiting missions that do require special support that the DSN provides.

We support on the average about 40 deep space missions a year, and we are a 24X7 operation, and that basically means that we are up all the time, and that is an important part of supporting this contract. And as time has gone by, each and every mission gets more and more complicated. So it becomes very important that the operations of the system be very perfect in a sense such that we do not miss any data capture opportunity like flybys. Once you fly by a planet or so and you have not gotten the data, you will not get it.

We also provide launch and early orbit and contingency support.

(Slide.)

The DSN also provides ground-based radio science experiments, radio astronomy, and radar. This is in addition. The DSN is used as what you would call a scientific tool, as opposed to just collecting data and passing it through. We also have agreements or rather NASA has agreements with foreign agencies to support their missions, and we also use foreign assets to support some of our missions.

Next slide, please.

(Slide.)

I probably will not go through all of this, but really this is to kind of give you a flavor for the unique challenges that we have when we track spacecraft in deep space. And, you know, the law of physics basically says that the communications performance decreases as the square of the distance. What that really means is the signal that you get from spacecraft that is way, way out there is very, very weak, and so it really requires special techniques to get the data and as much data as possible, so we have large antennas. In fact, if you look at the picture there on the right, top right, that is a DSN 70-meter

antenna. And I think, except for Marshall's HOSC, it was in all the other slides.

We use large high-power transmitters, and, of course, because of the distance, the signal takes time to travel. So, for example, Voyager is about 14 hours, I believe, round-trip light time to get their data. So, you can send information to the spacecraft, and, if you want to turn it back around from the spacecraft, it will probably be the next day. It makes for unique challenges.

And lastly but not least, navigation. We do not have any maps of what it looks like out there. We have to create the maps as we go along. And for that reason it is very important that the ground system collect the information that is required to do the navigation, and navigation is a very important aspect of being successful.

Next, please.

(Slide.)

This is a picture of what the network looks like. There is one they call a deep space communications complex. This is basically where all the antennas are. One in Goldstone; one in Madrid, Spain; and one in Canberra, Australia. They have . . . basically what happens is that you can track an object in space, radio signal continuously as the Earth rotates through the day.

(Slide.)

What we have is the Goldstone operation or maintenance of the Goldstone complex and the network control that is executed out of Pasadena. So what that really means is network control from Pasadena has to be responsible for making sure that the overseas stations have the data that they need to operate correctly, and we get the data back and coordinate between the stations.

Next.

(Slide.)

So the DSN O&M procurement, like I just said, is Goldstone operation maintenance, network control center, operation and maintenance, and network support that is to make sure that the products that are necessary for operating the whole network are provided, and sustaining engineering.

I will not go through this slide, but there are a couple of things I want to point out here. Even though Goldstone operations has tracking of the local Goldstone . . . responsibility for the Goldstone itself, they also have responsibility for making sure that any network-related operational equipment that needs to be fixed is really fixed at Goldstone. So they have that additional responsibility.

Also, one key thing that is at Goldstone, which is not in this slide here, but I will probably add it later, is that there is an emergency control center at Goldstone in case of earthquakes which we have to worry about in California, and JPL control center is not available. Within a short period of time, Goldstone can be brought up and operate the network from Goldstone, which means the mission sometimes will be able to take their stuff, take it to Goldstone, and run their mission.

The next slide.

(Slide.)

Let's see. I think the only other thing in this next slide is if you look at MIL-71, there is a function that is used while a spacecraft is being readied for launch, to check for compatibility and so on, which is done at the Cape. It is only activated when we support launches and then deactivated, and the stuff is brought back.

Sustaining engineering, we do plan to look for development and sustaining of particular equipment of the network in this contract. Not all of it, but some of it.

The last slide.

(Slide.)

You all know that we have been excluded from the consolidated solicitation. We will be doing our own competitive procurement on a schedule. I will briefly talk about it. Point of contact, I already said that.

Documents on the Web. We have a Web page where you can get the information, and we will actually conduct this as solicitation and responses on the Web. That is the goal at this point in time.

Dates: In early February, we will have an industry briefing. At this time, it will probably span three days primarily because we will have a session at Pasadena, and then we will show you facilities at Pasadena, and you will have to go on out to Goldstone, which is about 100 miles, I believe, from Pasadena. It is on Fort Erwin. And that will take a whole day. So you will probably go the night before, stay in Barstow, and we will make arrangements to have a bus to take people out to Goldstone and back.

We plan to release then the RFP in mid-February with a contract award in September. January 1, of course, is the start of the new contract because December 31 is when CSOC expires.

A key reason we are doing this is between November and February of next year, 2003 to 2004, there are a number of mission-critical events. There are launches. There are encounters. And these have to be supported successfully, and the network and Goldstone are a very, very important part of doing that.

That is all I have. Thank you.

CONCLUDING REMARKS AND INFORMATION

MR. JEDREY: Thanks, Mike. I plan on discussing communications and schedule. Relative to communications, I will be discussing the items on the slide in front of you. I will then share with you what our plans are relative to the near-term schedule. I would like to point out that the questions from the industry up on that slide really refers to the online questions that were submitted in advance of the conference, and we really have not made provisions for accepting questions from the floor today.

Next slide.

(Slide.)

We basically have established four methods of communications for the SMCDS solicitation process after the industry briefing. Although we have not reached the blackout periods, so to speak, where we shut everything down, we would really like to control the communications. Because there are so many people and companies and interested parties out there, we would like to have some kind of organization in how we communicate and make sure everyone receives the right information at the same time, and that no one is left out.

So the first thing we will have is a Web page, which you may have gone to earlier, that announced the conference, and we put our 18 questions and answers, which we referred to as the frequently asked questions. There, when we announce the conference, we intend to supplement those as we get additional questions and answers. As we proceed, we will go through some questions and answers today. Those will be added to the frequently asked questions.

We will also put the industry briefing material on that Web site. We are having transcripts of the proceedings done, and those transcripts will probably take a couple of weeks, but those will be posted as well, in addition to all the charts from the presenters today and the attendance list.

We plan to continue using this Web page to maintain a status of where we are. As we move into the procurement phase, we want to release information that is reliable and credible, and not just be putting anything out as a response to a question just on our best guess as we are moving to the formal phase we want . . . and have . . . establishing our acquisition strategy, we want to make sure we are telling people the right things so you are not off preparing teams or proposals based on faulty information.

The second bullet up there, which many of you may have visited already, we had a hot link both in the Westover conference announcement, as well as in our

site, that is the CSOC Web page. Johnson Space Center has been kind enough to establish a Web site so you can look at the FSAs, which are the little statements of work for the various pieces of work you have heard today. There are also select pieces of the contract that you may be interested in, and, if you go to that Web site, you can review. And there is a lot of information there.

The third item is we are establishing an e-mail address for the Space Mission Communications and Data Services project team. The site should be up and working. You can e-mail the project team, and we will get your question and your comment. At this time, I would like to point out, though, that we may not answer those questions or respond to your e-mails in a traditional sense as responding to your e-mail. We may take those questions, we will come up with a response, and we will put it on the frequently asked questions if it is appropriate at that time.

The last bullet on there is a very prominent person in our process, and that is the contracting officer, Mr. Christopher Whyte.

Chris, do you want to stand up?

This is the man of the hour, and we have designated Chris the primary focal point of contact, as we are trying to make sure we collect any information and we do not lose anything in the process, and we handle this process efficiently.

Next slide.

(Slide.)

We received 40 or so questions online prior to the conference, and we will address a majority of them. There were a few that we did not get consensus on to develop an answer prior to today, and once we have an answer, we will post those on the frequently asked questions, but what I would like to do now is basically walk through the questions and the responses for you.

On the first slide, it talks about the period of performance of the work packages, and, as you have seen on the frequently asked questions site, since we have not gotten to the acquisition strategy phase, we are still in the process of trying to determine how long each of the work packages are. The Centers are basically evaluating their requirements and trying to come up with what the best fix is for period of performance, as well as the next bullet on the next page talks about option periods, which we will get to.

Someone wanted to know whether or not we were going to use cost savings based on commercialization, and are we shifting the emphasis from cost reduction based on commercialization to best value for NASA’s activities.

Next slide.

(Slide.)

This sort of refers to what Bryan mentioned earlier when he was talking about economies of scale. We had a question that dealt with economy of scale and stand-alone proposals. To answer the first question, since we are doing it basically in work packages, we will require stand-alone proposals. And then as we go through the acquisition strategy, we will be determining how to deal with multiple-benefit or economy-of-scale proposals that may cross work packages and how to provide some guidance in the solicitation as to what we would determine to be credible versus receiving a lot of proposals that might not be meaningfully evaluated.

We will not limit the number of work packages you can bid on. You can submit a proposal for any or all of the work packages.

Next slide.

(Slide.)

These are two questions that Bryan really addressed earlier. We sort of have our set number of work packages, but there is one that may be out of this set in addition to JPL. Next slide.

(Slide.)

This is a question on the agenda. The question is, “Will the NISN work be moved into the PrISMS solicitation at Marshall?” Now, the PrISMS solicitation at Marshall also included something at NASA called NISSU, which is a new initiative that we are going to be embarking on in January. And what is the relationship between the procurements?

The response is that we are moving the combination of those two (NISN and PrISMS)into the SMCDS procurement. The next slide.

(Slide.)

This should also be in your handouts. There was an information sheet that included this Web site. I mentioned earlier how we were going to be updating this site. So there would be a continuous source of information for everyone who is interested in the SMCDS procurement.

The next slide.

(Slide.)

There is a series of questions here that talk about a lot of acquisition strategy items that we have yet to grasp, or they may even be different from work package to work package, so the response basically is that we really have not gotten to the acquisition point where we can actually respond, you know, accurately and effectively to these. So the answer is as soon as we have our acquisition strategy, we will have a better idea where to go with these, and so we are really not telling you anything today.

Next slide, please.

(Slide.)

We sort of envision, even though we have not gotten the specifics on the phase-in period, how long or when they would begin. They may actually be different periods of time based on the work package. We are going to ask the Centers for their opinion as to how that should occur and for how long. I would envision that for the complexity of most of these statements of work that there would be a phase-in, so the contracts can turn over in an orderly fashion.

I mentioned earlier about priced options. It is fairly likely we will have priced options. That is still under development in our acquisition strategy, so we do not know what the periods are, if we do have options, and what the duration of the options are, but it seems that we are heading in that direction in most of the work packages.

The next slide.

(Slide.)

This deals with our international responsibilities, particularly in Madrid and Canberra. And we have . . . the requirement to support Madrid and Canberra will really be addressed, I think, in the JPL solicitation. I think the bottom line is NASA’s requirements will not change. The international relationships will continue as the slide said, and the only thing that would be different would be the acquisition. We will represent that in the acquisition strategy.

Next slide.

(Slide.)

The question was will selected contractors have any developmental architectural responsibility, and the answer is yes, just in support of the space mission communications and data systems, which means we have to define it in statements of work.

That really is the extent of the questions that we received from the industry. There is a handful more that we need to address and put on the frequently asked questions Web page. With that, I would like to move to the next slide to go to our schedule.

(Slide.)

Basically giving you the next three months of what our plans are. We hope to finalize our acquisition strategy by the end of January, working with our Field Centers. And then take that strategy, put it in a consolidated package, and take it to the NASA agency, Code H, our Procurement Office, and our Agency

management, get an approval from the Agency, and then move out with a draft RFP in the March timeframe. With awards, of course, in December or prior.

Next slide, please.

(Slide.)

In closing, I would like to thank you for attending and, just like everyone else on the NASA team, appreciate you coming today and listening to us. We wanted to give you some information. Everyone has been really interested in trying to find out what we were doing, how we were doing it, and we wanted to basically be responsive to you as much as possible. We are pleased with the attendance, and hope that it indicates the level of competition we are going to see in the proposals submitted on the work packages.

And, finally, NASA and the JPL family wish to wish all of you a happy and safe holiday season and a happy new year.

Thank you for coming.

(Applause.)

(Whereupon, at 11:18 a.m., the proceedings were concluded.)

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