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TRANSCRIPT

NOAA JPSS-2 L-30 Media Briefing

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NOAA JPSS-2 L-30 Media Briefing

John Bateman:

All right. It is one o'clock Eastern. Good afternoon, everyone. Thank you for joining this virtual Media Briefing for the upcoming launch and mission of NOAA's Joint Polar Satellite System 2 or JPSS-2 satellite. I'm John Batman with NOAA Communications and I'll be facilitating today's briefing. Today's briefing will feature a short introductory video highlighting the journey that JPSS-2 took to California ahead of its final preparations before launch. Then experts from NOAA, NASA, United Launch Alliance, Ball Aerospace, Raytheon, Northrop Grumman, and L3Harris will provide their perspectives on the technology and partnerships that are critical to this mission, as well as discuss the benefits JPSS-2 will provide once in operation. Lastly, our experts will be on hand to answer questions from the media during our Q and A session at the end of the presentations. Now, let's watch this video that shows the teamwork it takes to ship JPSS-2 from its Northman Grumman facility in Gilbert, Arizona to Vandenberg Space Force Base in California.

John Bateman:

All right, thank you so much for that. With that, I will introduce our speakers who will be presenting today. Our first presenter is Tim Walsh, Director of NOAA's JPSS program. Our second presenter will be Mitch Goldberg, Chief Scientist for NOAA's Satellite and Information Service. Next will be Jordan Gerth, meteorologist and satellite expert at NOAA's National Weather Service. Following Jordan will be John Gagosian, Director of NASA's Joint Agency Satellite division. Our next presenter will then be Andre Dress, JPSS Flight Project Manager at NASA Goddard. Then we'll hear from Shaun Daly, JPSS-2 Mission Manager for NASA's Launch Services Program. Following Shaun will be Sarah Lipscy, Acting Director of Civil Space, New Business at Ball Aerospace. Next will be Matt Magana, Vice President Raytheon Intelligence and Space. Following Matt will be Scott Capehart, JPSS Program Manager for Northrop Grumman. Then Andrew Stoller, Program Manager of Crosstrack Infrared Sound Spectral Solutions for L3Harris Technologies will present. Lastly, we will hear from Barb Egan, NASA Program Director for United Launch Alliance. With that, we'll kick off our presentations with Tim Walsh from NOAA. Tim.

Tim Walsh:

Great. Thank you so much, John. Good afternoon and welcome to today's briefing for the upcoming launch of the JPSS-2 satellite. I am Tim Walsh, the NOAA Director of the Joint Polar Satellite System Program and integrated program with our partners at NASA. The J-2 satellite or the JPSS-2 satellite is the third in a series of five next generation low Earth orbiting weather satellites that serve the United States and international weather communities today. JPSS-2 will observe every place on earth at least twice a day as the satellite orbits the earth from pole to pole 14 times daily. To predict weather, we really need to observe the atmosphere from this global perspective. The dust storm in Africa can affect the development of a hurricane that hits the East coast. A typhoon in Japan can cause heavy rain in California several days later. These JPSS observations inform the US public every day.

Tim Walsh:

Whether you are preparing for devastating severe weather events such as Hurricane Ian or checking tomorrow's forecast on your smartphone. To accomplish this mission, the JPSS-2 satellite will carry four key instruments to orbit. The Visible Infrared Imaging. Radiometer Suite, or VIIRS, is essentially the eyes of the satellite. It measures the infrared invisible part of the spectrum and gives us the images of hurricanes, floods, dust storms, cloud patterns, and ocean color. It is also used to locate and map wildfires and track wildfire smoke. The Advanced Technology Microwave Sound or ATMS observes passive radiated microwave energy from the earth to see through clouds and inside storms. The ATMS in conjunction with the Crosstrack Infrared Sounder, or CRIS instrument, gives weather forecasters a global 3D picture of our atmosphere's temperature and moisture, the most fundamental information required by forecast models.

Tim Walsh:

Our fourth instrument is the Ozone Mapping and Profiler Suite or OPS. The OPS tracks the concentration of ozone in the atmosphere. Data from OPS is used for in ultraviolet index forecast, which keep the public informed about the harm of UV damage. OPS also provides valuable measurements of stratospheric aerosol such as those caused by volcanic eruptions and wildfires. Considering the challenges of integrating and testing this amazing spacecraft or this satellite of this complexity in a pandemic environment over the last three years, I really want to extend a heartfelt thank you to the NOAA, NASA and contractor groups that constitute our JPSS team. This effort would not have been possible without you. Your dedication, your focus on our mission and our progress to getting to this point today where the satellite is sitting at Vandenberg Space Force Base, ready for the next step on November 1st. Now, I'll turn it over to Dr. Mitch Goldberg, the lead scientist for the National Environmental Satellite and Data Information Service at NOAA. Mitch.

Mitch Goldberg:

Thanks, Tim. It's really exciting to be here just a few weeks away for the launch of JPSS-2, and our NOAA weather satellites have never been more important as extreme weather events continue to be more frequent due to climate change. For example, as documented in our NOAA National Center for Environmental Information billion dollar disaster reports, from 2017 through 2021, there were 102 billion dollar disasters. While during a five-year period from 1987 through 1991, there were only 15, and we are seeing more extreme weather events during times of the year you would least expect it such as the December, December '21, the 15th and 16th, there were outbreaks of derecho as well as tornadoes resulting in $ billion in damages. While we're here to talk about the launch of JPSS-2, we also need to prepare for our next generation of satellites with even more capabilities to enable more accurate forecasts and climate mitigation actions.

Mitch Goldberg:

Now, JPSS-2 will join NOAA-20, giving NOAA the benefit of two fully operational advanced satellites in the same orbit. And we still have Suomi NPP. Once JPSS-2 is in orbit, it will become NOAA-21. This year, the year 2022 will be a special year because NOAA will have launched the latest geostationary GOES-R series and the latest JPSS polar orbiting satellites in the same year. Again, both would not have happened without our strong partnerships with NASA and industry. Both satellite systems, geostationary and polar orbiting are critical for the nation and to our partners to provide a complete picture of what's happening with weather today, tomorrow, next week, or even next month. Our advanced GOES-R series of geostationary satellites provides that real-time streaming weather imagery of severe thunderstorms, hurricanes, and even wildfires, while JPSS has that unique capability to provide global observations of atmospheric temperature and water vapor information needed to fuel weather models to provide accurate weather forecasts out to seven days.

Mitch Goldberg:

The devastating impacts on Florida from Hurricane Ian were forecasted days before landfall. JPSS is also critical for monitoring the state of the global climate. JPSS has higher space resolution for better detection of wildfires, flood waters, and since it's a polar orbiting satellite, monitors ice coverage over both poles. JPSS has unique visible imagery at night, allowing better detection of low clouds and fog, and for emergency response, which has been used recently over Puerto Rico and Florida, allows monitoring of power outages in their recovery.

Mitch Goldberg:

JPSS also monitors the health of the ocean through derived products of harmful algal blooms, marine heat waves, and the health of marine ecosystem such as coral reefs and JPSS, as Tim mentioned, monitors the health of the ozone layer and its recovery. In summary, JPSS provides the nation with critical information for a wide range of applications and decision support. Next, we have Dr. Jordan Gerth from National Weather Service to provide more insight how JPSS supports the weather service. Jordan.

Jordan Gerth:

Thank you so much, Mitch. I'm Jordan Gerth, the National Weather Service Meteorologist overseeing the weather observations that are available to over 120 of our field offices nationwide. I'd like to amplify the comments from my colleagues to extend our thanks to the entire JPSS team within NOAA, NASA, as well as our industry partners whose efforts and dedication to the mission will be on full display at the upcoming launch of the JPSS-2 satellite. The JPSS-2 satellite represents an essential step in preserving the continuity of low earth orbit observations. The JPSS-1 satellite now NOAA-20 and the predecessor mission, Suomi NPP, support our meteorologists in meeting the National Weather Service mission of saving lives and protecting property. First, JPSS is a major input into our numerical weather prediction model systems that maintains the outstanding quality of our three to seven-day weather forecast. Second, for Alaskans, JPSS provides regular coverage over the poles to detect fires, monitor flood extent, and track Arctic weather phenomena.

Jordan Gerth:

Third, for all Americans, JPSS provides more than twice daily observations over the Atlantic and Pacific oceans that helps meteorologists monitor weather systems where we do not have the benefit of weather balloons and only limited buoys compared to the dense weather station network over land. Reflecting on the impacts of Hurricane Ian to Florida, the NWS was able to predict a landfall on the coastline between Tampa and Fort Myers, in part due to the observations that we collected with NOAA-20 and Suomi NPP. Let me share some of the data that we used and hopefully my slides will be coming up here shortly. This is an example of the infrared window imagery from the VIIRS instrument, which provides visible imagery and a spatial resolution of 375 meters or approximately quarter mile, and enables the detection of thunderstorm features such as overshooting tops.

Jordan Gerth:

On the next slide, you will see a nighttime visible scene that shows mesospheric gravity waves emanating from the center of Hurricane Ian. This band will also help us monitor the recovery in Florida, as nighttime lights are correlated with economic productivity, and I wish Florida the best of outcomes as they work to rebuild their communities and neighborhoods. Next, this is data from the Advanced Technology Microwave Sounder that shows the eye wall of Ian. Our meteorologist at the National Hurricane Center used ATMS to identify storm structure beneath the cloud canopy, and this was certainly an intense storm.

Jordan Gerth:

Lastly, I want to highlight the benefit of multiple satellites and similar orbits. Here, NOAA-20 captured a portion of Hurricane Ian and consecutive orbits about 100 minutes apart. However, the Suomi NPP satellite was able to pass nearly directly over the storm in between, providing the best imagery of the storm. JPSS-2 will continue this capability. Thanks again for the opportunity to talk about the benefits of JPSS to the National Weather Service. I'm excited about the JPSS-2 launch and placing the data in the hands of our meteorologists. I'm looking forward to your questions after my colleagues remarks, starting with John Gagosian, and I understand now that these slides were late coming up. Here is the image of Hurricane Ian from VIIRS. Here is the day/night band from VIIRS of Hurricane Ian showing the mesospheric gravity waves. This is the sounder showing the eye wall of Ian as it was off the Florida coast, and then this shows the two passes from JPSS ...

PART 1 OF 4 ENDS [00:15:04]

Jordan Gerth:

... shows the two passes from JPSS, or excuse me, from NOAA-20 on either side of Ian, and this was the pass that we received from Suomi NPP that underscores the value of having multiple satellites in orbit. So with that, I will now turn it over to John Gagosian for his remarks. Thank you.

John Gagosian:

Great. Thank you, Jordan. Good afternoon, everybody. I'm John Gagosian. I'm director of NASA's joint agency satellite division and our division is part of NASA's Science Mission Directorate. We manage on NOAA's behalf, the development and deployment of operational weather satellites like JPSS-2, the third of five in the JPSS series. We've partnered with NOAA for more than 50 years on the nation's terrestrial and space weather satellites in polar, geostationary, and vibration point orbits. Our partnership has been very successful, having significantly advanced the nation's earth observation capabilities to improve weather forecasting, severe storm and hurricane prediction and climate observations. For JPSS-2, NASA is responsible for the formulation, development launch and initial operation of the satellite. JPSS satellites form the backbone of the global observing system, circling the earth from pole to pole and crossing the equator every 100 minutes to cover the entire planet twice a day.

John Gagosian:

The NOAA and NASA teams have continually demonstrated a strong working relationship over the last several decades. Our partnership has successfully deployed more than 60 weather satellites. We're committed to the continued success of the JPSS program and its final two missions, JPSS-3 and 4, which are currently in development. In addition, NOAA and NASA are together formulating the next generation Low Earth Orbit satellite architecture. I'd also like to highlight the interagency collaboration that will allow NASA and ULA to perform the Low Earth Orbit flight test of an Inflatable Decelerator, or LOFTID, after JPSS-2 separates from the Centaur upper stage. This test will demonstrate how to use the atmosphere to perform planetary reentry as efficiently as possible, allowing us to deliver more mass to the surface of Mars and other planets. NOAA's cooperation has enabled this innovative public private partnership to become a reality. Now I'll turn it over to my NASA colleague Andre Dress, JPSS flight project manager at NASA's Goddard's Space Flight Center.

Andre Dress:

Hi, how you doing? I'm Andre Dress and I'm the flight project manager for JPSS. As I think about it in these missions, they seem to come up and everybody seems to think that they happened recently, but this is a culmination of something that took place over the better part of a decade. So those relationships that we develop over that time period really matter when it comes to the technical problems and the programmatic problems that we have. It helps solve those problems by having those good relationships, not to mention that period that occurs during the pandemic, just exacerbated things. So we want to remember that a lot of the development and stuff that took place during this was during that pandemic period. Those relationships got us through that and got us to this point. We successfully just completed an environmental test program and checked out the spacecraft showing that it's going to meet the requirements and meet the needs of the NOAA and this nation.

Andre Dress:

We had a very successful pre-shipment review in which we presented to an independent review team and they unanimously agreed that we should ship the observatory to the launch base. It's here. The team that has done an amazing job, again, of just the processing and verification and all the plans in place to test out the observatory where it's here. And I'm happy to report that at this stage of the game we're ready to integrate it on top of the LOFTID mission that John was just talking about as well as encapsulation into the fairing. So we're very excited about it. It's been a pleasure to work on this mission and work with the teams that we have here in NASA, NOAA, ULA, Northrop Grumman, Raytheon, L3Harris, and Ball Aerospace. So it's been a real pleasure with that. So we're getting ready to put it out in the rocket, encapsulate it, as we speak, but after that it's not done.

Andre Dress:

So we have still have the launch phase to go. Once we launch the mission, right after separation, our operations team is well prepared, well-rehearsed to take over the keys and start operating the satellite after separation. They had done lots of rehearsals, a lot of testing, exact right with the spacecraft and so I'm happy to say that they're also prepared and ready to go.

Andre Dress:

They will have about a 90 day commissioning period in which we will again check out the observatory and making sure that the spacecraft, the instruments and everything all are operating well and prior to handing it over to NOAA. So at the end of that 90 day commissioning period, the data all looks good, we hand it over to NOAA and they operate it for the rest of his life. So in summary, I'm happy report that we have an observatory that's ready to go, well checked out and ready to be integrated on top of the launch vehicle and we look forward to those first images that show up after launch. Thank you. And now I hand it over to Shaun Daly, who's the mission manager for the launch services program for NASA.

Shaun Daly:

Hey, thank you Andre. Well said. My name is Shaun Daly. I'm from the Launch Services program, the mission manager for JPSS-2. And Andre and I are both in the VANDENBERG Space Force Base at the moment and the Mission Directorate Center. This is one of the spaces that we utilize for launching the JPSS-2 satellite from here on the West Coast. Launch Services program, if you don't know us, is referred to as LSP. It's the primary means of how we provide commercial launch services for NASA's missions across all of our agency directorates. In this particular case, we're partnering with NOAA and we've done this across the board on missions flying very successful spacecraft and national assets such as the Go Constellation and in this case, the JPSS-2 series and the JPSS-1 and SUOMI NPP. In this case, we did a competitive procurement for the launch services and manage that as part of that mission for us, for NASA and we do that with the ULA team.

Shaun Daly:

I saw question in there about how we get to space and that's their means that we do that. I'll talk to you a little bit about that. The launch services provider on this particular mission is the ULA or the United Launch Alliance, and we're going to be riding at the top what they refer to as the Atlas 5401. If you break down that 401 number, that first number four is for four meter fairing. The zero means zero solids and one refers to one centaurs on the second stage. And it is designed to launch JPSS-2 into that polar orbit that you hear the team talking about on November 1st. This mission is notable as in terms of milestones because this will be the final launch for Atlas-5 from the west coast. It's the final four meter fairing. If you saw that video, there was a hand painted fairing there.

Shaun Daly:

That's an impressive work that the team does to be able to get this flown and to be able to be ready and deliver it safely to space. And it really serves as a gateway for ULA to convert their pad here to be able to get ready for a future Vulcan launch, which will be the replacement for the Atlas-5. LSP team serves as the technical arm to manage the commercial launch service provider. At the moment, we sit just shy of about 28 days from that November 1st date, and this is the start of a lot of the operations that considered as integrated. So this is where the launch vehicle and the spacecraft teams come together. For example, on the 28th, ULA began what they call LVOS or the launch vehicle on stand, where they erected the first stage and was followed shortly thereafter by the inter stage adapter and centaur, and it sits ready for us for the boat tail and then very soon as Andre was talking about the encapsulated payload will be transported there and put atop.

Shaun Daly:

So in addition, today start, we also start what we call an integrated operations at our payload processing facility, Astra Tech here on the west coast, and that's where we're going to be mounting JPSS-2 on top of LOFTID, which is our ride share. It's a critical operation and it's one that it's been years in the making as you heard the team say. A lot of testing and getting ready for the day to make sure that that is smooth and there are no surprises.

Shaun Daly:

So the mission has another milestone being this is the 17th mission from the west coast and also it's LSP's hundredth mission since we started back in 1998. We're committed to seeing these missions launch successfully. We look forward to that opportunity, whether it's foggy or clear, it doesn't matter on the west coast, it still gets there. And to see this national asset added to help improve weather reporting and as a Florida resident, I can definitely tell you I appreciated the opportunity to have advanced notice of what was happening with hurricane Ian and in the case of LOFTID, we're very excited to utilize the excess performance that's there on our mission and had an amazing partnership on the team to be able to enable new capabilities for launch service providers and also push technology for delivery of payloads to distant worlds.

Shaun Daly:

So I will definitely turn this over now to Sarah Lipscy and she's the acting director of [inaudible 00:24:45].

Sarah Lipscy:

Thanks Shaun. So excited to be here today and I want to let you know that I'm calling you, I'm talking to you from Boulder, Colorado, where Ball Aerospace builds a lot of our hardware. So yes. I'm Sarah Lipscy, I'm the acting director of Civil Space New Business here, and I want to thank everyone for having all of us here. Thank you for calling in to all media. I'd like to tell you a little bit about the Ozone Mapping and Profiler Suite, or as we call it OMPS. This is an instrument that you've heard is integrated onto the JPSS-2 satellites. This is the third OMPS instrument that Ball has built and it's the third in the series. The other two, as you've heard, are acting operating on SUOMI NPP and JPSS-1, which is now the NOAA 20 satellites. I am very excited, particularly for the launch of the JPSS-2 satellite and the science that the mission will provide. I've spent over a decade at Ball working on various OMPS instruments, including having the privilege to serve as the Ball project scientist and deputy program manager for OMPS.

Sarah Lipscy:

OMPS instrument is an advanced suite of hyper spectral instruments that measure the global distribution and vertical structure of ozone in our atmosphere. The latest OMPS instrument consists of two native viewing spectrometers, which measure the altitude profile and total column ozone, as well as a limb viewing spectrometer whose primary role is to track the concentration of ozone in the atmosphere as a function of altitude. The data from the OMPS sensors help scientists track and monitor the health of the ozone layer, which of course protects us from the harmful ultraviolet radiation from the sun.

Sarah Lipscy:

And OMPS data continues a five decade ozone record. Then we use these measurements, various ozone researchers as well as policy makers to create global climate models as well as to assess policy impacts that are made. The OMPS data fulfills the US treaty obligations also to monitor global ozone concentrations. This comes from the Montreal protocol, and OMPS helps to ensure that there are no gaps in that data coverage. At Ball Aerospace, we have more than 40 years of experience developing ozone monitoring instruments for NOAA and NASA and we're incredibly proud of that heritage. And of course, we look forward to the future with new insights and new innovations. I do want to thank NOAA and NASA and of course all of our industry partners on this important mission, which will monitor the health of our planet. And I want to say go JPSS-2. I will now pass the mic to Matt.

Matt Magaña:

Thanks, Sarah. As John mentioned earlier, I'm Matt Magaña, the vice president here at Raytheon Intelligence and Space. Raytheon contributes two of the critical capabilities for JPSS mission. First, the visible infrared radiometer suite, better known as VIIRS and the JPSS common ground system, CGS. Let me start by telling you a little bit about VIIRS. From 500 miles up in space, VIIRS is changing the way that we see Earth. VIIRS has 22 multi-spectral bands that look at emerging storm patterns and generate high fidelity sea, land and atmospheric data. That data helps us monitor wildfires, droughts, flooding, vegetation health, and nighttime phenomenology with our day night band. This data is critical to the industry's diverse agricultural, finance, transportation, insurance, and energy businesses. VIIRS is indispensable to NOAA and it is an application seemingly to be unending. VIIRS has been used for everything from charting rescues of fishing vessels through the ice in the Bering Sea to fighting wildfires in Australia.

Matt Magaña:

Every day someone is coming up with new ways to put VIIRS data to use. All that data can only be used if we can get it down to the ground, and that's where our common ground system comes in. JPSS CGS talks to NASA, NOAA, the Space Force, JAXA and UMET satellites to provide 80% of the data that is used for the two to seven day weather forecast. JPSS-2 and the other satellites each downlink their data to the north and south poles 16 times a day. The CGS will take over 120 contacts a day when JPSS-2 is launched.

Matt Magaña:

JPSS CGS routes that satellite data back to its primary ops center in Maryland and backup op center in Virginia in real time. CGS is also responsible for the command and control of NPP, JPS one and all the other instruments. CGS will also do the command and control for JPS two through four in the future missions. The data processing occurs on the Amazon Web Services Cloud, providing new visible temperature pressure and other weather products within minutes of the satellites flying over the poles to the National Weather Service and the Department of Defense. All this data is used to generate knowledge about our earth, it's climate, our sun, the solar system and benefits that will benefit humanity and beyond. My team here at Raytheon is very proud to be part of this mission.

PART 2 OF 4 ENDS [00:30:04]

Speaker 1:

My team here at Raytheon is very proud to be part of this mission. Go JPSS can wait for launch here in November. And with that, let me hand it over to Scott at Northrop Grumman.

Scott Capehart:

Hello everyone. I'm Scott Capehart, program director at Northrop Grumman for JPSS-2. I'm excited to be here discuss Northrop Grumman's role in this mission and our commitment to the JPSS program and our NASA NOAA customer. For JPSS-2, we built the spacecraft, integrated the four instruments and performed environmental testing on the integrated satellite. In addition, Northrop Grumman built and tested the ATMS instrument. The spacecraft is based on our LEOStar-3 satellite bus for low earth orbit operations and was built in Northrop Grumman's Gilbert, Arizona satellite manufacturing facility. Our LEOStar-3 bus is a medium to large, high performance, versatile and expandable spacecraft bus designed for low earth orbit missions for up to 10 years. The LEOStar-3 architecture accommodates payload masses from 150 kilograms to over 3000 kilograms and a payload operating average power of up to 800 watts.

Scott Capehart:

This is one of Northrop Grumman's most versatile spacecraft and has been launched more than a dozen times, including for earth resource monitoring satellites, LANDSAT-8, LANDSAT-9, ISAT-2, and it will be used for JPSS-3 and 4. This contract has been a major priority for our space business with hundreds of employees contributing to JPSS-2 over its development and test life cycle. We designed JPSS-2 to provide real time data to any ground system around the world. This will allow NOAA to receive urgent weather updates as they're happening, better informing our nation's ability to respond quickly to developing weather events.

Scott Capehart:

The ATMS is a critical instrument that collects microwave energy from the Earth's atmosphere and surface day and night, regardless of cloud cover. It will help ensure accurate, short and long term global and regional weather forecasts. We are proud of our work for the JPSS program and our building of long partnerships for earth observation and weather missions with NASA and NOAA and we're working hard on building the JPSS-3 spacecraft. So we're looking forward to continuing being a partner for this program for many more years. Thank you. With that, I will turn it over to Andrew Stoller, program manager for CrIS and with L3Harris.

Andrew Stoller:

Hey, thanks Scott. L3Harris Technology is a key partner on NOAA's JPSS program. We design and build one of the mission critical payloads on board JPSS-2 satellite continuing the NOAA NASA and L3Harris infrared sounding legacy. The L3Harris Crosstrack Sound or CrIS instrument is on board both NOAA-20, which was launched in 2017 and the SNPP satellite, which was launched in 2011. The CrIS on board the SNPP satellite is still operational today, and the CrIS instrument will be flying on future JPSS missions including JPSS-3 and JPSS-4. The CrIS instrument is an advanced spectrometer that represents a significant enhancement over the previous generation of infrared sounders. The CrIS instrument features over 2000 infrared spectral channels, including the forecast critical long wave and mid wave frequency ranges, representing a 100X improvement in spectral resolution. This detail performance is delivered by a sensor that could fit under our desks at work, and given its stability and characterization, the CrIS instrument has been designated as a reference instrument for cross calibration of other infrared images and sounders.

Andrew Stoller:

The CrIS instrument produces a comprehensive set of infrared radiance profiles used by the science community to generate vertical moisture, temperature, pressure profiles and the atmosphere from around the globe. As we heard earlier, CrIS provides these global infrared observations twice a day. The enhanced precision accuracy of the CrIS instrument improves the quality and quantity of the data collected, and the more levels of data we can provide to our National Weather Service models, the more accurate the weather forecasts will be. The data provided by the CrIS instrument improves the accuracy of these weather models, especially for extreme forecasts in that three to seven day range. This is crucial for improving short term forecast for severe weather, including thunderstorms, tornadoes, and flood predictions. In addition, Chris data products also help weather professionals understand longer term phenomena such as El Nino and la Nina and allow for better tracking of short-lived climate pollutants such as carbon dioxide, methane, and ozone, which improves our understanding of chemistry climate interactions.

Andrew Stoller:

The CrIS instrument onboard JPSS-2 was designed and assembled at L3Harris's state-of-the-art facility in Fort Wayne, Indiana, and for more than 60 years, L3Harris has delivered mission solutions for NASA NOAA designing and building critical weather sensors and ground systems. L3Harris has supplied every operational infrared sounder for NASA NOAA since the mid-1970s and we value this trusted partnership tremendously and we look forward to delivering transformational forecasting capabilities for decades to come. So I'll echo the sentiment some of my colleagues and partners for this mission. Go JPSS-2. Up next is Barb egan, she's United Launch Alliance's NASA program director. So over to you, Barb.

Barb Egan:

Great, thank you. On behalf of the team at United Launch Alliance, we're excited to be here as we prepare to launch JPSS-2 and LOFTID for NOAA and NASA. The LS-5 is currently being processed in preparation for launch. The team began the stacking process at Space Launch Complex 3, and the first and second stages are now vertical. The next major milestone is mating the two payloads that are encapsulated in the protective faring to the top of the rocket. Once the rocket's fully stacked, we'll perform integrated operations and final processing in preparation for launch.

Barb Egan:

We're proud to be at this stage in processing and look forward to launching this mission after successfully launching the first JPSS mission on a ULA Delta-2 rocket in November of 2017. The rocket launching this mission is an Atlas-5 401. Sean Daley explained the 401 nomenclature, thanks Sean, which will deliver the JPSS-2 spacecraft to a sun synchronous low-Earth orbit. Two subsequent burns by the Centaur upper stage will lower the altitude and put the stage in a reentry trajectory for the LOFTID experiment. To support this unique mission, ULA developed a new launch vehicle adapter that attaches LOFTID to the launch vehicle and also serves as a canister to enclosed LOFTID and supports the deployment of the JPSS-2 mission.

Barb Egan:

The Atlas-5 rocket will stand 191 feet tall and fully stacked and weigh around 750,000 pounds. It will produce just over 860,000 pounds of thrust at liftoff. The Atlas-5 has been a true workhorse for NASA's launch services program, launching 22 scientific missions across the solar system since the launch of the Mars Reconnaissance Orbiter in 2005. The JPSS-2 mission marks the last Atlas-5 launching from Slick 3 at Vandenburg Space Force Base. After this launch, modifications will begin to the launchpad to support future Vulcan Centaur launches. To date, ULA has launched 153 times with 100% mission success. We thank all of our mission partners, the entire A team looks forward to a successful launch of JPSS-2 and LOFTID. Over to you, John.

John Bateman:

All right, thanks so much, Barb, and to the rest of our experts for your presentations today. Now we're going to open the briefing two questions from the media. To ask a question, please find the Q&A box located at the bottom of your screen. Type in your name, affiliation, your question, and the specific expert you'd like to answer it if possible. Again, find the Q&A box located at the bottom of your screen. Type in your name, affiliation, your question, and the specific expert you would like to answer it, if possible. And we have a first question already. It looks like this one is for you Jordan Gerth. How will the addition of JPSS-2 along with the currently orbiting NOAA-20 and CNPP satellites help with weather prediction?

Jordan Gerth:

Thank you so much for that question. So, JPSS is a series of satellites and each satellite in the series has a design lifetime for the JPSS-1 or NOAA-20, and this coming JPSS-2 satellite, they have a design lifetime of approximately seven years. I believe that was five years for Suomi NPP. So because the weather satellites in the polar orbit are so critical for weather predictions as I talked about, I'm going to advance here to slide ... I don't know if I can. I don't think I can advance the slide five. There we go. What you'll see here is the benefit of having the two satellites. With the NOAA-20 satellite, when it comes to Hurricane Ian, we captured sides of the storm, or about half the storm with the consecutive passes, which were spaced about a hundred minutes apart. It takes a hundred minutes for the NOAA-20 JPSS satellites to make a full orbit around the earth.

Jordan Gerth:

So if you go onto the following slide here, this shows what Suomi NPP captured, and this was because it was displaced ... offset, I should say by approximately a half orbit, we were able to capture essentially right down the center of the storm, and that's what's really critical for our meteorologist to have is to have the best view of the various storm systems. So we have the primary/secondary for our numerical weather prediction models. It's a critical observation that we have, and the two satellites in tandem provide the best quality of the storm depending on where the position of the storm is. I will also mention that we're not done with Suomi NPP quite yet. We're going to make sure first and foremost, that JPSS two is able to meet our mission during the checkout. So you have high confidence that it will be able to. And if there is remaining life in Suomi NPP, we're going to work with the program to figure out how to provide that additional data to our offices, particularly up there in Alaska. They appreciate having additional data as the weather is developing. Thank you for that question.

John Bateman:

Thank you so much Jordan. We have another question from Deborah Warner from Space News. This is for Tim Walsh. How is JPSS-2 different from JPSS-1, Tim?

Tim Walsh:

Yeah, thanks for the question, Deborah. My former job was over at the Office Satellite and Product Operations down in Suitland, Maryland where we actually fly SNPP and J-1, so I got to know the spacecraft pretty well. J-1 is notably different in primarily three different ways that I know off the top of my head, one of which of course is the satellite itself is different. It was created and built in Boulder, Colorado by Ball. And now we're of course going to J-2, which is a whole different bus built by Northrop Grumman in Gilbert, Arizona. The satellites are largely the same performance. The other differences are primarily on the instrument suites. There's an extra instrument on the J-1 spacecraft that was a NASA contributed instrument CERES, and that sounds that stands for Cloud and Earth's Radiant Energy System.

Tim Walsh:

And I'll leave it to John Gagosian to add if you would like to on that one, but that's primarily looking at the Earth's radiated energy from the sun. And it is used for climate and other reasons, but it's not part of our operational requirements, so it's an added instrument that we manifested on J-1. The other thing I'll mention is the ops instrument on J-1 is a little different than the instrument on SNPP. It has something called a LIM sensor, which looks right at the atmosphere on the LIM of the earth. And we will have something similar on JS-2, 3, and 4. So that's one thing why we're going to use SNPP during early orbit validation of the J-2 spacecraft is to compare that instrument functionality the same as well. Now if anybody else would like to answer, please do.

John Gagosian:

Yeah, I can jump in. And Tim, thanks for mentioning the climate measurements that we're getting out of NOAA-20, specifically the energy reflected and emitted by the earth. We don't have those measurements on JPSS-2, but we will have similar measurements on JPSS-3, because we have a NASA supplied instrument for that mission called Libera. It does similar measurements to CERES, but it's a different design. So we're actually very grateful that NOAA provided us the opportunity to fly Libera on JPSS-3, which will launch in the 2027 timeframe.

John Bateman:

Wonderful. Sarah, did you want to add onto that? And we're having some problem with your microphone, I believe. And I believe we still are having some issues with your mic. We will try to see if we can take care of that, Sarah, thank you so much. But let's go onto a second part of Deborah Warner's question from Space News. She had a second part, Tim, I think you can answer this one. What's the health status of Suomi NPP, the fuel batteries, anything else limiting its lifespan at this time?

Tim Walsh:

Absolutely, and I think Jordan alluded to the fact that SNPP was literally a pathfinder. It was not considered to be operational when it was designed, but it was operational at launch. It was a five year mission that is now on its 11th year, so very impressive performance by the satellite. These satellites were launched with roughly 10 and a half years of propellant onboard-

PART 3 OF 4 ENDS [00:45:04]

Tim Walsh:

These satellites were launched with roughly 10.5 years of propellant onboard. And so, we're getting towards the end of that lifetime on SNPP. So we have to think of some innovative ways to keep it in its station or its in desired orbit. We may elect to do some things like drift it or otherwise utilize it, whereas, I think Mitch Goldberg suggested earlier, we might think of some ways to use it differently from a scientific perspective. But we do have to retain 200 kilograms of fuel on board to bring it back to Earth, literally splash it in the Pacific Ocean. We have a requirement to do that with all of our spacecraft that we launch today.

Tim Walsh:

The other big thing I would mention about SNPP is the instruments are doing extremely well considering their age. They're still used, as Jordan mentioned, operationally, but the big impact on the spacecraft is probably the fact that one of its arrays, there's three array panels. One of the arrays is not contributing energy at this time. We still have enough power to support all four instruments that are on the spacecraft. So we're really happy that it's still in orbit. Thanks.

John Bateman:

Thank you so much, Jim. This next question may be for either Jordan or Mitch. I'll let you guys decide. Sean Sublette, from the Richmond Times-Dispatch wanted to know, "With the lower orbit, what is the difference in horizontal resolution of surface imagery and features, compared to the GOES-R series in the higher geostationary orbit? Is it similar in both the visible and IR wavelengths?"

Mitch Goldberg:

I can take it. And then Jordan, you can follow up. So from geostationary, the resolution for the visible red band, which is centered to 0.64 micron, is a half of kilometer. The other visible channels are one kilometer, and then the infrared channels are about two kilometer. And that's all at the equator, and they degrade as you go further north. So let's say we're referring to two kilometer infrared resolution, at the equator, that turns out to be about two and a half to three over CONUS, and then up in Alaska it might degrade up to six to nine kilometers, depending where you are in Alaska.

Mitch Goldberg:

Veers has 375 meter resolution practically everywhere. It doesn't degrade a little bit, but by not that much because it has a special feature of oversampling. And so, across the track, their space resolution is retained. So it has really good space resolution. Both satellites are important because of course ABI, even though the resolution is not as good, it has higher temporal resolution. So often, if ABI detects something first, we get to detect it again with the pole orbiting satellite with higher space resolution. So we always use both satellites in tandem. Jordan, you want to add anything?

Jordan Gerth:

Yeah, Mitch, I think you covered it really well. I'll just note two additional benefits. First of all, the JPSS satellite is the only one between the LEO and GEO that has the low light imaging capability. So if we're looking at nighttime visible, the JPSS-2 two will provide some important continuity for us there. And then, the added benefit of what we get from the JPSS Series is the microwave and the hyperspectral infrared data that is valuable for our numerical weather prediction. And it's also valuable for our hurricane forecasters, if they're trying to look underneath the cloud system. So it all plays in. Mitch is absolutely spot on in terms of the spatial resolution. As you get into those northern latitudes, the JPSS is far better at resolving certain features like floods, however, we don't get it as frequently. Thank you.

John Bateman:

All right. Thank you, Jordan. And Mitch, our next question maybe, Tim, you could kick this off for us. Irene Klotz, from Aviation Week & Space Technology had a question, "What technologies on JPSS2 cannot be, or JPSS in general, cannot be replicated by commercial constellations and which ones can?"

Tim Walsh:

Yeah, I'd be happy to start on that one and I'll defer to my scientific colleagues for the instrument performance. But I love the question. I think it's a great... It's something that we're investigating right now, as was alluded to earlier by John Gagosian. We're looking at the next generation LEO Constellation, and we're looking at ways to leverage what we see as commercial advances in terms of constellation management and the observing capabilities we're seeing on orbit. In fact, today, NESDIS is utilizing data from radio occultation sensing, I guess providers from the commercial sector. But I will say that, right now, when we start looking at these instruments, we go to people like Jordan and his team at National

Weather Service, find out what the fundamental requirements are. And usually in the past, we've had to build instruments that go well beyond what's provided on orbit by some of these commercial constellations.

Tim Walsh:

And particularly, the ones people are probably familiar with are some of the imaging constellations that DOD and others have provided. But our instruments, like the Veers that Matt talked about, have many more wavelengths that support among other things, ocean color and other things that may not be the full complement of wavelengths, may not be on orbits. Having said that, we are going to look at everything. We're going to try to do the best we can to leverage what is on orbit, not just in terms of what the instruments can provide, but what kind of practices and maybe efficient commercial practices that we're observing on orbit. We're currently evaluating what those are, but now Jordan and Mitch, I'll defer to you to talk about the instruments that are on board our spacecraft.

Mitch Goldberg:

Well, I was going to mention in terms of how replicated by commercial constellations, in my opening remarks I talked about that we have to start preparing for next generation of satellites with even more capabilities, because of all these extreme weather events, due to climate change. So when we look at JPSS, we look at it as a constellation of backbone instruments with really spot on performance, lasting many, many years as an anchor to the observing system. In the future, I'm hoping that the commercial sector will be able to replicate. You can imagine small versions of LPSS, instruments like microwave and infrared and so forth, to supplement the observing system.

Mitch Goldberg:

So instead of having a few orbits, because of course when I say a few, we partner with the Europeans, EUMETSAT, that they're part of the Joint Polar Satellite System, but instead of having a few or two orbits, it would be more beneficial to have a whole constellation of many, orbits in order to provide higher temporal refresh of really, the advanced instrumentation that we have in JPSS... Excuse me, in a more affordable approach. And so, I see that developing in the future. We hoped that there will be a role for commercial weather capabilities in the future to provide that supplement, but at the same time, you need that anchor, that backbone. And so, we see the both being complimentary and Tim, I think that's part of your planning too, to look towards the commercial weather sector as potential solutions to improve the temporal coverage from polar orbiting satellites. Thank you. Jordan.

Matt Magaña:

This is Matt Magana, at Raytheon, too, I would like to jump in just a little bit just to stop what Tim, Mitch and Jordan were talking about, the 22 bands that Veers gives you today, including that Day/Night band. Day/Night band is one of those ones where the commercial sector, it's a hard nut to crack. And we ourselves are looking at, how do I go drive things like Day/Night band into the commercial end? And what does it take for us from a technology perspective to really go drive down those things into, getting those into a commercial and a much more available thing, versus this Veer center that we have today? But we are working that, and I think as Tim and their team lays out the future, and obviously with the LEO instruments that are coming up, we are quickly trying to go drive the technology to make sure that we can get there and drive these at the more affordable commercial price points.

Jordan Gerth:

And maybe I'll just summarize the discussion. One key aspect of the Joint Polar Satellite System is its contribution to numerical weather prediction. And there's a very complex process, it can take several months to do the calibration, validation and characterization for numerical weather prediction models. And the lifetime of the JPSS satellites allow us to use those satellites for several years. We're trying to figure out how commercial satellites, perhaps with shorter design lifetimes and more of them, can fit into that paradigm. And it's really a work in progress. As Mitch said, one idea is to have the anchor observations, where we have a highly calibrated instrument that we can use to reference other observations. The other thing we need to think about is the use case. If we're just launching satellites for storm detection, perhaps those do not require the degree of calibration that we need for numerical weather prediction. So we have to think about all of those in the context of our budget, and that's what's going to evolve our constellation moving forward. Thanks.

John Bateman:

All right. Thanks so much guys. We have one last question before we wrap up the media briefing. I think this one might be for you, Mitch. This is from Lamar Johnson, from E&E News. The question is, "In addition to being used to predict severe weather events, how do you all predict using the JPSS2, to understand and combat climate change?

Mitch Goldberg:

Well, JPSS2 will continue the long term climate records that NOAA has established since the 1970s, early '80s. And so, there's a couple things. So one, we extend the climate record so we understand past events. Number two, it further improves the input is used for weather forecasting of extreme events. And tying the two together is that, when we forecast an extreme event, and you want to look at the historical data to see what the impacts... From past data. So for example, let's say you have an extreme flooding event that's being predicted with the use of JPSS data as well as other data sources, over Texas let's say. You're going to have an extreme event taking place. You can use the historical data that JPSS contributes to, to say, when was the last time I had that event? And what were the impacts associated with that event?

Mitch Goldberg:

So earlier, when I talked about the billion dollar disasters, those extreme weather events are not going to go away. However, we want to be able to mitigate the impact. So for example, a extreme event that was a $1 billion disaster in 1995, maybe it's only a $500 billion... I mean, $500 million disaster in 2023, because we've learned about how better to prepare the public, what precautions to take, how to improve building code and things like that. But we can only figure out how to do that by, in addition to having the real-time data, feeding the models for real-time forecast, but also to understand the historical aspect and tie it to societal impact. So no, JPSS3 is another series within that long chain of historical information that's important for us to understanding and mitigating impacts of climate, from climate change.

John Bateman:

All right. Thanks so much, Mitch. And with that, we are going to wrap things up today for the media briefing for NOAAs JPSS2 launch. The first I'd like to thank all of our presenters and participants for joining us. Today was great, very informative. I want you guys to remember that, a recording of this media briefing will be available later today, at the online media advisory on noaa.gov, as well as on NOAA satellite's YouTube channel. And if anyone from the media has additional questions that we didn't have time for today, then you can please reach out to me and John Leslie, my colleague at NOAA Satellites, and our email address is nesdis.pa@noaa.gov. It's also available at the top of the media advisory. I'd also like to remind you all to mark your calendars for the LOFTID Media Briefing, being held via WebEx, next Tuesday, October 11th at 1:00 PM Eastern Time. Again, that is the LOFTID Media Briefing, being held via WebEx, next Tuesday, October 11th at 1:00 PM Eastern Time. The advisory for that will go out later this week. Thanks for joining us.

Mitch Goldberg:

Bye-bye.

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