Lieutenant General Christopher Bogdan
"F-35 Update"
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Lt Gen Bogdan: Good afternoon. Thank you for taking the time to come listen to me speak. I understand there are other speakers around, so you had a choice, as they say on the airlines, and you chose to fly on this airline today. So I'll try and make it at least entertaining if not interesting and informative.

Let me give you about 30 minutes' worth of the big picture, where I see the program is and some of the challenges we face and what we're doing about them, and then we'll open it up for questions.

I only have three charts. The first one's a build, not too many words, some nice pictures I think.

Next chart, please.

Back in 2010, 2011 we rebaselined this program. Everybody knows that. That came out of Nunn-McCurdy which was a significant emotional event on the program for everybody. And at the time, my predecessor, Admiral Venlet, had one thing in mind when he rebaselined the program, and that was to rebaseline it in a realistic way. Realism was a very important part of moving forward so that we could meet our commitments. So he left us with a great gift, and that gift was a rebaselined program that actually could be achieved. We had the resources. The department gave us the resources and the people and the money to execute on that baseline.

When I took over two years ago that was my job. My job was to take that realistic baseline and start executing this program to the commitments that you all expect of us.

The good news is that we're pretty much on that baseline today. We're making steady progress across all elements of the program. Not as quickly as we'd like to in some instances, and that goes to the heart of the issue of the F-35 program, it's how complex it is.

There are many, many, many things that happen in parallel in the F-35 program. Some of them by design and some of them just because we're late on some things and have to catch them up. And other things are waiting on things. So there's this -- The program is tied together in a lot of very complex ways.

When I took over two years ago what we noticed and what I've noticed over time is lots of pieces and parts of the program themselves were sort of disconnected from each other. And that's not good because if we're going to deliver a total weapon system to the partners, to our FMS customers and to the services, you've got to take a holistic weapon system approach where everything matters, not just an airplane. You've got to worry about training systems and you've got to worry about our ALIS, our Logistics Information System; and you've got to worry about the enterprise that builds mission data files; and you've got to worry about training, pilot training and maintenance training and support equipment. All those things that surround a program that are just not airplane centric in a lot of ways over time had not caught up to where the airplane was.

So we've embarked on a path over the last two years to try to catch all of that up together. That's really hard to do. That's why sometime we make slow progress here when we want to go fast, because any time we try and fix one thing on the program we've got to make sure all the other pieces and parts are moving together in a synchronized kind of way so that when we do deliver a weapon system, it's all ready to go. It does us no good if we deliver to the U.S. Marine Corps an airplane, a training system, an ALIS system but they don't have mission data files so that they can go into an AOR and support us or support the President.

So all those pieces have to really come together, and we have embarked on a journey where we've tried to take every piece of the program and all get it moving in the same direction. Not an easy thing to do. That's part of the reason why we don't go as fast as we would really like to go.

Next bullet please.

So number one priority on the program in the big picture is still affordability. It does you no good at all if you can build the world's greatest fifth-generation airplane, and we're going to, and we are, if nobody can afford it. Okay? And so we have three phases that we worry about when we talk about affordability.

In the development program we like to tell people that we have no more money and we have no more time. That baseline program we put in place has the resources to complete the program on time and on budget, and we intend on doing that. So anything that comes into the development program has to be met by something coming out of the development program. That sometimes gets the warfighters unhappy, that sometimes gets Lockheed unhappy, that sometimes makes a whole lot of people unhappy. But the truth of the matter is you've got to buy your way back into the SDD program if it wasn't there to begin with because we don't plan on going back and asking for any more money or any more time to get this program done.

On the production side, everybody's really concerned about the price of the airplane. How much does it cost to buy an F-35? And I've got to tell you, you can measure that in so many different ways it's not funny.

We put out a SAR every year and in the SAR we've got a PUC and an APUC, which if you're not an acquisition guy, that is just a crazy way of measuring things. You can look at unit fly-away cost, you can add the STD program into that. There are so many different ways.

What I really care about is, I really care about a price curve that my suppliers -- Lockheed Martin, Pratt & Whitney -- have agreed to and they understand that and the enterprise understands what that price reduction curve looks like and we stick to it. Because what we need is predictability. We need predictability that lot over lot and year over year the price of buying an F-35 is going to go down. So the partners, the FMS customers and the services, know what they're going to spend to buy an airplane. So we have that price curve. And the good news is-- we have, about since LRIP-five, been tracking down that price curve very very nicely. So that's good.

The key to that price curve and the reduction of what it costs to build an F-35 is inherently tied to how many airplanes you're building and the ramp rate. It's very simple. For every dollar that you save on the F-35, 80 percent of it or 80 cents on the dollar comes directly from the ramp rate and economies of scale. The 20 percent that remains comes from how efficient you can build the airplane, but the bulk of it is the ramp rate. So with that predictability and price, we hope that we can now get our partners, our FMS customers and our services to understand what it's going to cost them in the future so they can commit to airplanes and stick to it and get that ramp rate so the price can keep coming down.

Lockheed also introduced a concept this year called Blueprint for Affordability. I won't get into the gory details of it. Suffice it to say there was a point in time where the government wasn't sure that our cost reduction initiatives were being used wisely, the money we were investing. So Lockheed to their credit, and Pratt coming on board now to their credit, proposed, hey, we'll take some of our own money, we'll invest in reducing the cost of manufacturing F-35s. And then when you get that savings, General Bogdan, you can pay us back with those savings. Then I can take money later on after their investment and I can add onto that to bring the price of the airplane down. It's kind of a win/win for all of us. I don't have to invest the money up front. We get the savings up front. Lockheed and Pratt get their money back later. And the quicker the savings accrue, the quicker they get their money back. So they're motivated to get the most savings out of the program as quickly as possible. Why is that good? Because savings up front on a production line is the gift that keeps on giving. It counts for the next lot, and the next lot, and the next lot and it just multiplies. So that's a good news story on the Blueprint for Affordability.

The third thing we're doing right now to try and stay on that price curve and actually come down that price curve is a thing we call block buys. We're not talking about a multi-year here, because the U.S. services have very tight statutory requirements before we can get into a multi-year. But we have partners out there who have already gone through the grueling process of

asking their governments for permission to buy airplanes. And they've gotten that approval. And they've gotten that approval for large numbers of F-35s.

A perfect example of that is Australia. Australia has their government's approval to buy 72 airplanes. They do not have to go back and ask for permission to buy those airplanes year by year. They have that permission and their government said when you're ready to buy them you let us know and we'll give you the money.

There are a number of partners and a number of FMS customers who are like that. If we can put together all of those partners and FMS customers who already have that approval to buy a large number of airplanes and put them on a long term contract, we will see savings. We will see savings for them and we will see savings overall in the program. Not quite the multi-year, but the same idea with our partners.

Then what we'll do is we'll marry up the multi-year with the block buys later on when the U.S. services can join in to keep coming down that price curve. So production price is important to us.

The big kahuna, the big number when it comes to affordability is the O&S costs. You know we're the trillion dollar airplane. We want to get rid of that label as best we can, but over 75 percent of the life cycle cost of the F-35 is built into that O&S cost. The way we look at it is, we're not as concerned in the JPO about what that number is. We don't like the T in the trillion, but we're not concerned whether it's $1.01 trillion or $900 billion or $800 billion. What we care about in the JPO today is what are we doing about it? Because if you don't start right away in a program driving that cost down, by the time you get to 1,000, 1,500, 2,000 airplanes it's too late. Right now we only have 150 airplanes. Now is the time to start working and driving down those O&S costs.

So what are we doing about it? We started a reliability and maintainability program, we have put a cost war room in place where we look at every aspect of the program. We are looking and recognizing that aircraft availability is a key driver in

how much it costs to repair airplanes and do those kinds of things. So those three areas, we've taken a hard look at this year. We've put plans in place, we've put money and investment dollars in place to get that stuff done so we can start affecting what it's going to cost to operate this airplane in the future.

That kind of endeavor, unfortunately, takes a while. You're not going to see huge decreases in the O&S cost estimates in the next year or two but you've got to believe, you've just got to believe that what you do now is going to pay off later, and that's what I've been asking the enterprise. Have some patience. We just started this process about a year to a year and a half ago. Let us put some initiatives in place and show some real progress and then over time we'll see those costs come down.

Next bullet please.

Schedule. The U.S. Marine Corps IOC on 1 July 2015 is fundamentally on track. What do I mean by that? There are a few things that are hanging out later than July. Modifying their 10 airplanes may take a little longer. We're trying to pull that back in. Building that mission data file we talked about. Right now it looks like it's sticking out past July. But fundamentally all the things we have to do to deliver a weapon system to the U.S. Marine Corps so that they can deliver IOC is right in that July time frame right now. So from that perspective I feel pretty good about that.

The Air Force is in even better shape. They have an extra year on top of that and I can tell you whatever we do for the Marines we're doing for the Air Force, and when you give me an extra year in my JPO, an extra year to do something, we're going to get it done. So from the Air Force's perspective I would consider their IOC date of August 2016 to be low risk, quite frankly.

Then we have the Navy out in the 2018 time frame. Again, we're already starting to look today about those things that we need to do for the Navy to ensure that they have all the assets they require for IOC. It's not too early to start looking at that.

The other thing, and you're going to see a chart on this later on, one of my four charts, is we have finally started accelerating and putting real plans in place to build a global sustainment posture on this program.

In the next five years we're going to stand up 17 more sites. A good number of those are going to be overseas with our partners and our FMS customers. And what we have to do is, we have to build a global sustainment posture that can support all those airplanes out there. And I can tell you, until about a year ago that was just some kind of nebulous dream. It's not anymore. We have hard, solid plans. We have a way to do that. I'm going to show you some of the stuff we're doing to build that sustainment posture so that when those airplanes are delivered to our customers and our partners and the services, that we can support them in a way that they need to be supported.

Software always gets a great discussion on this program because it's really hard, and it is. And of all the things that are the most difficult to do on this program, software is still right up there as one of the hardest things to do. It's just a really complicated system. It's as simple as that.

The good news about software and the dot-dot-dot on the rest of the story about software is you always hear that our software's been delayed. True statement. Our 2B software, if you go back to the 2010 baseline, is four months late from where we said the software would be done. But the dot-dot-dot rest of the story is that when we put that 2010 plan in place we knew we weren't going to be perfect, so we built some margin into our plans. So despite the fact that the 2B software is four months late, it doesn't affect U.S. Marine Corps IOC because we built some margin in there.

The exact same thing with the 3i software for the Air Force. It's probably about five months late from that 2010 plan, but what you don't know is we built six months of margin into that plan from the very start. Now it's not good to eat five out of your six months of margin, I will agree with that, but we're not at the point where we've moved any major milestones on the program. So when you hear the software's late, the schedule is

late, you've got to take the whole picture and the whole weapon system view of what's really going on in the program.

Relative to 3F, it's the same way. 3F is our final software that's to be delivered at the end of 2017. Right now I would tell you we're probably about six months behind, but that's a risk. That's not a real six months behind. If we don't change something we'll end up six months late, but we have an awful lot of time to improve ourselves up until that point and we do have plenty of margin to Navy IOC with that software. So you just have to understand the whole story of the program instead of just getting the sound bites of oh, this little piece is late or this little piece is late.

Finally, as we talked about before, a lot of the other pieces that surround the weapon system, all those things that you need, you need ALIS, you need mission data files, you need a training system with full motion simulators, you need all that stuff to deliver a weapon system. A lot of that stuff for a long time was late. Some of it is still late. And we are just trying to pedal as hard as we can to get it all together to bring it up to speed.

Next bullet.

Technical performance. If you were here last year or even the year before that, I'll tell you the big things on the technical issues list were oh my gosh, the helmet's not going to work. Oh my gosh, the hook doesn't work for the C model. Oh my gosh, when you fuel dump this airplane it gets totally sopping wet with fuel. Oh, how funny is it that this is called the Lightning II and the airplane can't fly in lightning? Software maturity, as we already talked about.

Hey, you know what the good news is? Those are all past problems. We have solutions for those. Some of those are already in place. Some of them, all of them have already been tested. Some of them are just waiting for implementation.

Lightning protection. We know how to do it. We've just got to modify our airplanes with our improved inerting system OBIGGS. It's gone through Triple-E testing thanks to the Dutch. We took

an airplane down to Pax River and we zapped it with lightning, time and time again. We didn't bust the airplane at all. Thank you Netherlands. And we will be ready come next summer when the Marine Corps declares IOC to be able to fly in lightning. We don't want to do it on purpose, but if you get there, the airplane's not going to melt or explode.

So those risks that were a big deal a year ago, two years ago -- not such a big deal now.

Does that mean we're out of the woods? Nope. We've got other things that showed up. We've got an engine problem which I'm going to talk about in a few minutes. We've got structural cracks that showed up this year, especially on the B models that we've got to deal with. We've got a reliability and maintainability problem that is a really tough one to solve because it takes a lot of little steps to fix it. We've got ALIS that's behind. Mission data, as we already said. Not rocket science to do it. It's just late. We've just got to -- It took us a really long time to build the factory, as I call it, where we build the mission data files. We built that factory down at Eglin and now those guys down at Eglin are pedaling as fast as they can to build a whole bunch of mission data files.

So it's not that we don't have problems. What I like to tell the enterprise is, there are no problems that we can't solve on this program, and I'm convinced of that. I think from a technical standpoint, I really don't lose a whole lot of sleep over technical problems on this program. I lose a little bit of sleep over the programmatics. I lose a lot of sleep over the affordability. But I don't lose too much sleep over the technical piece of this program.

Next bullet.

Relative to the partnership, pretty darn strong. A lot of our partner countries over the last year and a half have fully committed to buying the airplane. We're anxiously awaiting the Canadian process to see where that goes. We're supporting Denmark in their process. We're in the final stages of negotiating with the South Koreans. Japan and Israel are

working pretty well to deliver their airplanes. So from that perspective I think the program is pretty strong.

What I like to tell my partners and my FMS customers-- they punch much above their weight class. It is very, very important for the U.S. Department of Defense to keep this coalition and this partnership together for a whole lot of reasons, the least of which in DoD's mind, is the cost savings that goes with the economy of scale. It has an awful lot to do with having our allies, having our partners fighting alongside of us with the same equipment at the same level as us. That's a big deal for all of us. So we do everything we can to keep that partnership together.

Sometimes keeping that partnership together means that we all have to compromise and nobody likes to compromise. But that's what it takes sometimes to keep a big coalition of folks moving in the same direction.

Last bullet on this chart.

It's not the same program that it was in the past for a bunch of reasons. One, we rebaselined it, we added a bunch of money, and we added a bunch of time. So it's not like we have an unrealistic plan here. We have a fairly realistic plan.

Two, the JPO and the department has done a whole lot of things over the last few years to change the way we do business. We have a much more rigorous systems engineering process. We have much improved business processes that we're using. Our test team is now up and running, and if it were not for the engine problem we had in June, I would have told you that FY14 or calendar year '14 would have been an awesome year for flight testing. As of May, before the engine problem, they were probably on track to be 25 percent ahead of where we thought they'd be at the end of the year. Then we hit the engine problem and it slowed us down a little. But bottom line-- not quite the same program it used to be.

So what I'm asking you to do is, when you read articles about the F-35 and you hear anecdotal things about the F-35, ask the question, "Is that the old F-35 program? Or are we talking

about the current new F-35 program?" Because if it's the current new F-35 program, then you ought to hold me accountable. Okay? But if it's not--if it's the old program that's in the rear view mirror--the rear view mirror's only about this big. The windshield in front of us is about this big so it's way more important to be watching where the car's going forward than looking in the rear view mirror.

Yeah, we added $13 billion to develop it. Yeah, we're six years late. What I like to tell people is, get over it. Okay? Get over it. We're not six years late anymore, in fact in the last four years we haven't lost a day. Yeah, we put that money back into the program in 2010, 2011 and we haven't asked the enterprise for another penny since then. So I would ask you to do that, just to kind of change the tone on the program. It's not perfect. Believe me, it's a complicated, messy, ugly program sometimes and we're going to have problems and we'll solve those problems--but not quite the same level as it used to be.

Let's go to the next chart. Two specific topics I want to talk to you about.

Everybody wants to know about the engine and what happened with the engine because this is the latest technical issue that we have. So let me try and explain in about two minutes what happened.

First of all, fighter engines, a lot of you already know this so just indulge me for a second. Fighter engines, they're actually not static things when you put them in an airplane. When you put a fighter engine in an airframe, that engine actually moves around in a lot of different ways.

First of all, when you heat the engine up, it expands and contracts. Two, when you accelerate and decelerate in the airplane, the engine actually shifts this way a little bit. Moreover, when you pull G's on the airplane or you put yaw on the airplane or you roll the airplane, the engine actually flexes like this a little bit. So you've got this, you've got this, and you've got this. So necessarily when you build a

fighter engine you have to expect that parts, moving parts and stationary parts, may touch. We plan for that.

We plan for that because at least in the fan section, the front section of this engine, we have stators which are stationary, and we have fan blades. Those fan blades move around, and every now and then when that engine flexes you will touch that fan blade to the stationary part of the engine.

We plan for that because we build what we call a polymide rubber material between where the titanium blades and the stationary part of the engine interact. So we plan for some of that interaction.

What you would normally have expected to happen on an engine, is over time, as that engine breaks in, it would create a wedge or kid of a trench in that rubber material from where the blade slides through. Then over time, even if the engine flexes and that blade moves front/back, up/down, there would be enough room such that that trench would create enough clearance so the blade doesn't hit. Okay?

What happened on this airplane, this particular airplane, AF-27, three weeks before the incident, the pilot went out and he was flying… ([he is] an Air Force instructor pilot), …flying well within the envelope of the airplane--wasn't doing anything wrong. He put G on the airplane, he rolled the airplane, and put yaw on the airplane, all at the same time. Perfectly okay to do that-- well within the envelope.

What ended up happening is, because the engine flexed so much, that blade--that titanium blade and that rubber touched each other deeper and faster than we ever expected it to. Okay? So when that rubbing occurred we got heating. We expected some heating but we didn't expect the heating we got. That polymide and that titanium material are supposed to see about a thousand degrees. It got up to 1,900 degrees from that hard rub, as we call it.

That excessive heating caused micro cracks in the titanium. Over the next three weeks that airplane went out and flew, and flew, and flew, and those micro cracks began to grow, and grow,

and grow until we got to a point where it failed. And we call that high cycle fatigue. And when that blade section failed, it liberated -- I love that verb -- the blade liberated from the engine and went up through the fuselage, through a fuel tank in the left fuselage. That's what caused the fire. And that's where we had our problem.

So we count our lucky stars and we consider ourselves blessed for a whole lot of reasons. One, we put the fire out really quickly. But two, had that pilot had that occurrence about 20 seconds later we'd have had a much much different outcome. The pilot did awesome. Aborted the takeoff, got out, first responders put the fire out right away. We were all safe and sound and that was really the important thing.

Now what do you do about that?

Well, we've done a lot of things about that. The first thing you've got to figure out is why it happened. We call that root cause analysis. We are very very close to finishing up the root cause analysis and I would tell you before the end of this month we will probably have the two or three or four things that we know were the root cause of this engine problem.

That's good. But we have a problem in the program now from a programmatic perspective. Problem one is I have SDD airplanes that today are somewhat limited in the envelope. They can fly because, guess what we're trying to prevent? We're trying to prevent that hard rub from happening so we've limited the envelope they can fly in.

I also have airplanes in the field right now who are also limited in that envelope, and on top of that, they have a three hour inspection on that part of the engine. After they fly for three hours we've got to look and make sure that that heating we talked about isn't excessive.

The third problem we have is future engines. We have engines going down the production line right now. We have thousands of engines to build. And we can't build them with that same polymide titanium interaction. We've got to fix that.

So on the right side of this chart you'll see five things that we're doing.

The first thing we did was we knew the really important SDD airplanes that we had to get flying to keep the program on track. They're up there right now. We've expanded their flight envelope so that the impact of the flight-test program would be minimized.

The second thing we did was, we said we've got to get the rest of the SDD airplanes back into commission, and the way we're going to do that is we're going to actually take a fairly new engine, put it on a test airplane, put a test pilot in it, and we're actually going to fly various profiles that open up the envelope slowly so that burning in that we talked about--that rubbing occurs in a controlled way so that maybe all the SDD airplanes can follow that profile--and then they'll have that pre-trenching done through flight maneuvers.

The third thing is, we're going to build a prototype of that fan section. What if you pre-trenched that carbon polymide material and you already put that hole in there so that the blade doesn't hit against it? We've got that prototype going. By about 24 October that will be in flight test and we'll see if that's a possible solution.

The fourth thing is, once we get to the root cause by the end of this month, we have six different options on the table for how we're going to fix the engine in the future. A long term fix. I would say by the end of October we will down-select to what appears to be the best solution to fix the engines and then we'll start cutting that into production.

Finally, for the maintainers out there, if you've got to inspect an engine every three hours, that is not helping. So we are trying to work our way through a system now where we can expand that interval for the inspections to greater than three hours to take some burden off the maintainers.

The other two things that are happening relative to the engine is we, the JPO, failed in that when this mishap occurred we did not recognize how the Air Force's SIB process needed to

necessarily interact with the larger enterprise. We have many partners and we have many services who have air worthiness authority outside the program office. When the SIB is doing its job it needs to hold information very tightly because of privilege. But at the same time, the air worthiness authorities who decide whether we should or shouldn't be flying airplanes need to know what's going on so they can decide, "Do we ground the airplanes? Do we not ground the airplanes? Are they safe to fly? Are they not safe to fly?"

We the JPO missed that, when we built our plans for how to deal with mishaps--that communication link took us about three weeks to figure out. So what we're doing is, we're going to go back and we're going to rewrite the entire mishap planning process for the F-35 to do two things. One, to preserve the integrity of the safety board for whosever airplane it is, a partner or a service; but at the same time provide that conduit to the rest of the enterprise so they can make broader decisions on their fleet of airplanes as to whether they can fly or not. An important thing--I think by the end of the year we'll have that ironed out with the partners and the services.

Finally, to Pratt & Whitney's credit, they recognized that this was not only a government problem,that this was a problem that they had also and they have taken the necessary steps, as we said, to get to a solution. They have put their A Team on this in terms of engineering skills and management skills. And they are standing up, true to their word, and taking accountability for this.

What do I mean by that? I've got 150 airplanes out there that are eventually going to need a new fan section, right? The fielded airplanes. Pratt & Whitney has said, "when the time comes to retrofit those airplanes, we will pick the cost up of doing that." That's one of the expectations we would have of a good partner in industry. So to their credit, we've modified some contracts and we are working to balance the cost and risk in this program now and moving forward with Pratt and I thank them for that.

Next chart. The last thing I want to talk about.

We talked about how our global sustainment posture is now accelerating. What I mean by that is, we're late. We're late in standing up everything we need to stand up to make sure that this airplane, no matter where it is in the world, and no matter who owns it, it's sustainable for them.

So one of the things we're doing on the heavy maintenance side of things. Now we're talking about the heavy maintenance stuff, the depot kind of work. We've decided that we're going to break the world up into three regions -- a Pacific region, a European region, and a North American region. And it actually makes business sense. We've done some studies. It makes business sense to build that kind of depot capability in each of those regions. Because we're going to have a lot of airplanes in each of those regions and in some instances it just doesn't make sense to send an airplane all the way across the world to get landing gear repaired or airframe repaired.

So we're going to stand up three separate depot level kinds of capabilities across the world in those three regions. You can see the timeline on the tasks for doing that.

Fundamentally the way this works, is our partners, when they joined this program, had an expectation that their industry would benefit from this program. It was one of the founding principles of the partnership. So as a result of that, when it comes to standing up this kind of capability -- you would expect and the department has delivered -- that the partners would get the first opportunity to build up their industries to do this work.

So what we're going through right now in the Department of Defense is what we call the assignment process. We're going to assign different capabilities to different partner industries.

For example, if we know we need two landing gear depot facilities in Europe, next year we are going to decide which two partners would like to do that work, if there are two of them. Which two partner industries have the capacity and the capability to do that. And then we would assign that capability to that partner's industry.

In turn, the partner's industry and the partner country invest in standing up the infrastructure to do that work in their country. What we, the JPO guarantee them is a minimum amount of work equivalent to how many airplanes they're buying so that their industry can eventually see a return on investment.

The competition piece of this comes in if you have two landing gear guys in Europe, okay, and then the minimum work they get is equivalent to how many airplanes they had, there's a whole lot of extra work in Europe to do landing gears for all those partner airplanes that aren't either one of those countries. Okay? Depending on which one of those landing gear facilities does a better job, we will give the lion's share of that extra work to the facility that's doing the better job or giving us the better value. So that's where the competition piece comes in.

This year the decisions by the end of the year to be made are in Europe and in the Pacific. "Where are we going to put the heavy airframe maintenance facilities? And where are we going to put the heavy engine maintenance facilities? And who will get assigned those? The partners are very interested in that. We have what we consider to be a transparent process, and we think before the end of the year we'll have those decisions made in both the Pacific and the European region and we can start building up the infrastructure when the airplanes get there.

I think that was my last chart. I have one more chart which I always like to end on, and I always like to end like this. Like most acquisition programs, this one to an even greater degree, it runs on trust and credibility. If we in the JPO lose the trust of the Congress, we lose the trust of the taxpayers, lose the partnership, if we lose the trust of the services, the FMS customers, if we lose their trust that we're not working in the best interest of the program and in their best interest, this program's lost. It's gone.

So for us, we live by a whole bunch of core values that we can't cross the line on ever--ever. Because if we lose trust and credibility in the eyes of all the people in the enterprise that care about this, then we won't be able to execute this program. So for us, things like integrity—realism—transparency, so people

know what we're doing--accountability. I don't want accountability for us to say we're going to hold industry accountable, but to turn around and say I'm going to hold my team accountable for the promises that we make -- we call that 360 degree accountability in the program office -- are very, very important. And they're important because, again, when you spend, hmm, this year $8 billion, and that's not a big number compared to what's going to happen in about three or four years from now when that number doubles or triples in just one year. When we start spending $10, $15 billion a year and a lot of that money comes from the partners who don't have nearly the budgets that the U.S. Department of Defense has, you have got to believe that they need to trust you, and you have got to believe that you have to be credible.

So that's why we stand up and we always talk about being transparent and giving people the good news and the bad news and let them form their own judgments.

I thank you for the time. I think we have some time for some questions. I'll try not to duck any of them if I can, but if I have to duck them, I'll let you know. Thanks very much.

Moderator: Thank you, sir.

The first question has to do, I think you started off by saying that most of your cost savings are going to be done in ramping up to economical production rates. Can you kind of give an overview of that? And how sensitive is that to perhaps a pending sequestration?

Lt Gen Bogdan: Good question. In Lot 8 that we're right in the end game of negotiating right now, we're negotiating 43 airplanes. In Lot 9, the program of record has 57 airplanes. In Lot 10, I think the number is 74. And in Lot 11, I think there's 119. So in our next three years we're going to double production, and I think in the next five years we triple production. So there is a significant ramp coming to us.

Any time a partner or a service moves an airplane to the right, meaning I was going to take delivery of it here or buy it here

and I move it later, it affects everybody. We all sink and swim together.

So last year we had a lot of movement. Sequestration caused the services to move airplanes to the right. Some of our partners moved airplanes to the right. What I can tell you is a result of that for everybody was on the order of about one to two percent price change for everybody.

On an A model, that's about $2 million--per airplane. So it is -- The ramp rate and the economies of scale have an important role in how much each and every one of you pays for those airplanes.

Sequestration. So we came out of sequestration, we the F-35 program, in the last two years, unscathed. Literally, unscathed. We didn't lose a single airplane. We didn't lose a single dollar in our development program. We didn't lose a single dollar sustainment wise. So the department, to its credit, put its money where its mouth was or is, when it said this is our most important acquisition program and we're not going to let it falter because of that.

Moving forward, we know that on the horizon in 2016 there may be future problems with the DoD budget and constraints. What I will tell you is department senior leadership has told me the same thing that they told me two years ago. This program needs to continue on. It's not too big to fail. It's too important to fail.

So I love it when people say it's too big to fail. Nothing's ever too big to fail. But sometimes when something's really, really important to you, maybe it's a little too important to fail.

I have faith in the Department of Defense leadership when they tell me and the services, that if sequestration comes we're going to do everything we can to minimize the impact on the program because that's what we need to do.

Moderator: Engine noise. Always popular around those bases where it's stationed or will be stationed. What's been the real

world experience with the local communities? Is that still a big issue?

Lt Gen Bogdan: Always an issue. Always an issue when -- You know, it's not just the F-35. Whenever you introduce a new airplane into any community folks rightfully get nervous. You know, property values and things like that.

This is one of those areas in the F-35 where a few very vocal voices have provided what I would consider to be less than accurate information and created a fervor that probably really doesn't exist. Okay? I would know because I look at all the noise data. I would know because last year I ran another set of noise tests on the airplanes. And eventually we're going to present all of those results.

But here's what I can fundamentally tell you from the Chris Bogdan school of simplifying D-Bs and noise levels. On the ground this airplane is no louder than any legacy airplane we have. What's changed and what people are upset about is that the OSHA standards and our partner standards for how we protect our ground personnel, the bar has been raised. So while the airplane is no noisier than other airplanes, the things we have to do to the maintainers and the folks around an F-35 have increased because we've set the bar on protecting our people better. That's one little miscommunication.

Second, when you fly this airplane from idle power to mil power it's no different than any other airplane in the legacy fleets, and in some instances, are you ready for this? It's actually a little bit quieter. You go, "Well how can that be General Bogdan?" Well here's how it can be. First of all, it's one engine and not two, so you put it up against a two-engine airplane and you've already got a little bit of advantage. But guess what? This airplane is very, very, very, drag resistant because of its LO surfaces and its contouring. So if you take Airplane A, non-LO, on stealthy, high-drag airplane; and you put it next to an F-35 and you fly them at the same altitude and the same airspeed, guess what? The power setting for them to stay level with each other for an F-35 is slightly less than the power setting for the legacy airplane. Lower, power setting, lower noise.

When you put it in afterburner, totally different game. This is a big, loud engine in afterburner and there's no getting around that. Can you qualitatively tell the difference between an F-35 in afterburner and a legacy airplane in afterburner? Yeah, maybe a little bit. They're both going to hurt your ears a lot. They're both going to hurt your ears a whole bunch, so it's just a matter of how much pain you can tolerate.

We'll get the data. It's going to come out here very soon because we have to put all the reports together and make sure it's digestible to folks, but what I will tell you fundamentally is, it's not as big a deal as people made it out to be years ago.

That's partly our fault. Partly because we didn't have great data. The data we had early on, on the program with non-production representative engines and non-production representative airplanes, and we didn't do a lot of testing early on in the program for noise. Now we've done it a little more comprehensively so the facts are there.

Does that mean that communities shouldn't worry about it? No. I'm not saying that. I'm not saying push this under the rug. I'm saying we'll put the data out there, we'll let people look at it, we'll let those environmental things take their course in terms of the studies and stuff. It's just not quite at the rancor that it used to be I don't think.

Moderator: Sir, thanks very much for a great presentation. As you can tell from the size of the audience here a high interest item. Thanks very much.

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