



Mitchell Institute for Airpower Studies

Presentation: "The Tanker Imperative"
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► Grant: Thank you all very much for being here. Our aim here today is to talk about the military requirement for tankers. But first, because it is sponsored by the Mitchell Institute, I want to remind you of what Mitchell did and why we named an institute after him here at AFA. Billy Mitchell was the first person ever to command a large force of allied aircraft in a combined air and ground campaign. This happened in September 1918 at the Battle of San Miguel. Mitchell had American, British, French, Italian, a whole mass of allied aircraft under his command to support a ground offensive that just happened to have been designed and planned by one Lieutenant Colonel George C. Marshall who became very famous later on in World War II and afterwards.

So in naming this research institute after General William Mitchell we celebrate his command achievements in airpower, World War I; also his pioneering spirit and interest in research and development. That in fact is what led me to the famous testimony of Friesland and other German battleships, a combined operation of the U.S. Navy for which he became very famous in the early 1920s.

As you know, Mitchell ran into controversy later in his career, was court martial led and resigned from the U.S. Army at that time; died in 1936. Interesting to note that by then Colonel George C. Marshall served as one of the pall bearers for Mitchell's funeral.

So it is in that spirit that we have named the Mitchell Institute to seek out innovative research on airpower, both historical implications, current operations, and the innovation in research and science and technology that was so important to let the Air Force [inaudible].

At the Mitchell Institute of course we do not shy away from subjects that are in the public eye or have excited controversy. I think we feel that with this discussion on tankers we are moving right into the center of one of the key debates on airpower today.

I want to say very clearly at the outset that nothing I say this morning should be interpreted as a preference or any one type of potential aircraft in this competition over another, nor for one company over another. This briefing will be abjectly neutral, and in fact the point of it really is to re-center this discussion where it belongs and that is on the urgent military requirement for [inaudible] the tanker fleet.

I think we might all agree that things being what they are in Washington, it's easy to lose sight of why this is in fact the number one acquisition priority of the U.S. Air Force.

What I'll do this morning is talk through a series of about 15 charts, taking about 25 minutes to do that, and then we'll open it up for questions and discussion, and then send you on your way.

As I said, tankers are the top acquisition priority for the U.S. Air Force. This has been clearly stated by Chief of Staff General Schwartz and also by his predecessors.

There are some pretty good reasons for that and I think that General Chandler in the Pacific has summed it up pretty well. He has said there is no theater in his opinion that's more dependent on tankers than the Pacific. It's for that reason that Chandler, as well, would put tankers very very high on the list of the things that the Air Force needs.

We know as well that the fleet is already a little bit short. The 2006 capabilities study listed out in fact a larger number of tankers. We know this number is in the process of being reworked. We don't expect to see anything terribly different from what's already there.

By that tally, our tanker fleet today is already a little bit under what we might prudently have to meet a range of joint warfighting needs. And let's remember what those requirements are. They include, first, the requirement to support multiple theaters of operation and whatever is required in that theater, whether it's close air support, tactical airlift, resupply, whatever is going on, the tankers must support it.

They also come to a crunch point when they must support a rapid time phased deployment of ground forces and air forces into a theater. We're hearing a lot of discussion in this season about what our defense policy will look like going forward when we move from 1-4-2-1 or two theaters to one, or some other variation. But in any of those variations we expect to have the ability to deploy rapidly and to deploy more than one place at a time. As you know, that relies on the air bridge that is supplied and sustained by the tanker force in order to do that.

Finally, as air forces arrive in theater they have to be able to support the Air Tasking Order put together by the Joint Force Commander's priorities and executed by the coalition forces [inaudible]. So there's a lot of work to be done, and that's the reason why the fleet needs to be sized big enough to take care of every crisis at once should that occur and to deal with sustained operations.

Of course there may well be situations, as on 9/11, where we have a heavy tanker requirement here for homeland defense as well.

Underneath this, the worry that perhaps brings us all here today is about the age and health of the 135 fleet. None of us have a crystal ball that can tell us when or if this fleet may reach a point of catastrophic failure, but numerous studies have shown that we are

in now a period of significant risk of the unknown with this airframe. And there's a very telling statistic. The average time that a 135 spends in depot has crept up recently from 180 days up to 240 days. And I'm told by the Commander of Air Mobility Commander of Air Mobility Command. There's one 135 out there that's been in depot 500 days. Why does something like this happen? It happens because the aircraft have reached a point in their life cycle where there are simply unknown quantities in their maintenance, where things that never were expected to last as long as they have are beginning to show signs of corrosion and other problems that make it very difficult for us to ascertain when and if we might experience a catastrophic failure [inaudible].

What I wanted to talk to you about on this slide was what airpower looked like before we had tankers.

What you see down in the corner is a group of [inaudible]. The illustration that has not popped up was a map that I put in of Atlantic ferry routes.

In World War II if you wanted to send aircraft to the allies overseas you had to ferry them up through Newfoundland and Iceland and along this torturous route. General Dwight D. Eisenhower in fact regarded that ferry route as one of the big accomplishments of the early phase of the war, getting aircraft to Europe. It was just as easy in many cases to literally shift aircraft to Great Britain in order to get them there in time [inaudible].

Once in theater, as you know, combat radius was constrained by the amount of on-board fuel the aircraft could carry. That's why the addition of the drop tanks that became such a strategic advantage.

Luckily, back in those days the propeller driven aircraft had really quite fuel-efficient engines. They were pretty good at what they did, could see some tremendous ranges, specially modified P-38 Lightnings operating in the Pacific [inaudible].

At any rate, airpower was limited by on-board fuel. There had been experiments like the famous question mark experiment with refueling, but this was not something that was part of airpower's suite of capabilities during the war.

After World War II the beginnings of nuclear deterrence left the Air Force with a need for a global reach posture. The little water color sketch up in the corner shows of course the well known General Curtis LeMay. It's hard to miss him. He was the second commander of Strategic Air Command. And you see up in the far right-hand corner, you see a plume coming down into a bomber aircraft. This is actually a pretty neat invention because in looking at what SAC needed, it had a bunch of rather unattractive alternatives—more drop tanks, staging fuel, one-way missions. But the British actually had done some successful experiments with the gravity [inaudible]. Then Boeing came along and decided they could in fact manage the solid [inaudible].

So the first commander of SAC, General George Kenney, declared air refueling to be his number one priority back in 1948 as they looked for ways to extend [inaudible]. It was LeMay who really brought this into the force. The first true tanker was a modified B-29, KB-29—big aircraft, huge wing span, big carrying capacity. And with the speed that they moved in those days they managed to have a pretty good refueling fleet within a pretty short period of time.

The real global power first came with this modified bomber called [Muffy Lady II] that managed to circumnavigate the globe in a mere 94 hours with four air refuelings. So it was a pretty [inaudible] period of time. Nonetheless, SAC had a good refueling capability in place. And the war plans from about 1950 to 1951 began to count on this air refueling capability. As someone remarked at the time with the successful air refueling, "Now the tail is wagging the dog." A very satisfying moment, indeed, to bring this capability on-line.

The picture up in the right hand corner actually shows [B-50] bombers and also some modified KB-21 tankers.

The tankers also rapidly began to assist in fighter deployments. The fighters at the time, however, had a pretty interesting arrangement for carrying fuel. In one case, there were two wing-tip tanks and a [inaudible] tank and they all had to be refueled individually and in the correct order to maintain weight and balance. So it was something that was pretty intricate to do, but it rapidly became a capability much in demand. The first combat air refuelings occur during the Korean War, believed to be an RFA [inaudible], no doubt in some emergency.

KC-135 prototype comes along in 1954. What's happening in 1954? I think it was the year that Mirror Window was released with Jimmy Stewart. It was a long, long, long time ago. And finally the first delivery of the 135 full variant occurs in 1957.

The last KC-135 produced I believe in 1965, and as General Lichte has said, these KC-35s were bought at well over 100 a year in a seven year period, and as you know, that is our fleet we have today.

The tankers provided a new look for America's strategic power. In the 1950s "new look" was a big phrase. It was a catch phrase coined by Eisenhower as President when he looked at the drawdown from the massive manpower invested in Korea and began to set the nation on a footing for a strategic posture that would cost less, prevent the defense budget from driving the U.S. into recession, and also provide the necessary strategic capability.

You may not really be able to read that quote at the bottom, but I threw it in because it's rather interesting. He explains what the new look is and he says that the new look also required a new outlook among the men in Washington, and that this was very hard to achieve because it meant giving money that had gone to the Army to the Air Force. As

you know, this becomes a period of time when the investment in Air Force strategic capabilities is at an all-time high.

It's interesting, of course, that a former Army general, former Army Chief of Staff, was the one who had the strategic wisdom to look out at future threats and configure the defense budget for America to field the forces needed for future threats as well as what was going on [inaudible] space.

Therefore, the tanker and the B-52 become the iconic representation of the nuclear deterrent. Even though it's [inaudible], and all through the pictures and the memorability of SAC at this time if you look back at it you see the tanker featured pretty prominently. They understood how important this was to creating this nuclear deterrent capability as it evolved through the '50s with things like [inaudible] basing and intercontinental [inaudible] interceptors and all the things that go with that posture. The tanker was very much at the center of it.

It was in the Vietnam War that we began to see tankers enter into the role they play today and the role we've taken for granted in many ways. That was involving the tactical advantage. The picture up in the right hand corner, if you look very closely, you can see that these aircraft are carrying [inaudible] guided bombs. People tend to forget that over 20,000 of these were used in Vietnam.

The tanker piece is interesting in two ways. One, you see the beginning of the absolute reliance on pre- and post-strike refueling. As we discussed, this is not something in World War II. It was not something that was done very often in Korea, either. It was really with these fuel-hungry, highly capable jet aircraft like the F-4 and the F-105 that tanking became a necessity. You want to get back to base, you need to tank; you want to make a strike, you need to tank; you want to go to a base farther away, you need to tank.

Vietnam also presented some of the evidence for why this would be important. There were attacks on airfields done by guerilla forces that convinced the Air Force that sometimes you couldn't put bases too close to the front lines.

Roll it all together and you have some of the most interesting examples of reliance on tankers.

One of them came in 1967. The caption there has the citation for a 135 crew that shared in the Mackay Trophy for that year. When you read the citation you find out that what's going on is you've got three aircraft linked in a refueling in order to bring one back [inaudible]. The tanker did this, actually then itself ran low on gas and had to land in a virtually [inaudible] which is strictly not something we liked to do in those days.

You begin to see the stories that are now common of how glad we were when a tanker showed up and how crucial it is to mission execution.

The final piece of this also comes in the Vietnam War. A good example is the 1972 deployment, redeployment of air forces into Vietnam. Why was that going on?

Well, there was something called the Easter Offensive that occurred in that year. It was an offensive by the South Vietnamese forces. This was in a period of drawdown. One of the responses was to rush joint tactical air forces back into theater. Of course the way the Air Force did that was with heavy reliance on tankers.

So as we leave this period of time we've come to expect tankers will be available for [inaudible] refueling and tankers available to support strategic deployment of forces.

You can say, and we would say later on, that we now see tankers operating as sinews of expeditionary power. And perhaps nothing sums this up better than the description of [inaudible] of [inaudible] the tanker [inaudible].

This has become a picture that you see commonly now everywhere, in different locations. This could be Guam, this could be Diego Garcia, this could be another base in the Persian Gulf region, this could be England, this could be just about anywhere. What you now see is this pairing of tankers and strike aircraft as the signature of an air campaign.

[Inaudible] from the tanker force also came to include enhancing the deployment of airlift aircraft. The turning point here, of course, is the 1973 Arab Israeli War. The U.S. supported Israeli forces and airlift but because of the politics of the conflict there were very few bases available from Europe through which to stage airlift. Evaluation then led to the decision to make [inaudible] refueling capable and to include refueling capability on the C-5B, and I believe it also contributed directly to formulation of the requirement of the much larger KC-10 tanker.

Now interestingly, Strategic Air Command which still owned all the tankers had considered adding a cargo requirement as far back as 1968, but it was really with the KC-10 that you see the first evolution of a tanker that is expressly built for the needs of rapid global deployment, not just of fighters but of larger forces, and expressly built to include more of a cargo passenger capability that we now see used quite routinely in theaters of operation.

Operation Desert Storm gave us a new pattern for airpower and one that I would say is still a template for what we do today. Tankers were very much a part of this.

I don't know about you, but I think quite a lot of people couldn't even have found Kuwait in a map on August 2, 1990. Now it's become as familiar as it could possibly be. The whole security in the Persian Gulf region is very much intertwined with the history of all of our military forces. But of course what it took to get deterrent air forces there in the first place was a heavy reliance on tankers.

So what had been experimented with and perfected in operational tests from Vietnam and through the 1970s and 1980s, became a key strategic option to Desert Storm. The Navy brought carriers, the Air Force brought its fighters and relied on tankers to do so.

Tankers then supported a very large air campaign over a mass of deployed, opposing coalition and Iraqi ground forces arrayed along that Kuwaiti border.

Operation Desert Storm took a lot of tankers, nearly the entire KC-10 fleet that was available and 262 KC-135s deployed in combat. They flew with coalition tankers which were deployed from several nations. They flew 15,000 sorties in that period of time.

Then President George H.W. Bush said in a speech at the Air Force Academy that Gulf War Lesson One was the value of airpower. We have relied on airpower heavily to shape our regional engagements since that time.

That airpower force is backed up entirely by tankers. Without a reliable tanker fleet, we'd lose this ability in this template for shaping and deterring combat operations. We'd go back to something that looks not unlike what we saw in World War, these ferrying aircraft to [inaudible].

Does it seem like a little bit of a catastrophic scenario to discuss what would happen without tankers? Of course it does. We're so used to having them there. Yet as we take on more and more [inaudible] KC-135 [inaudible], it's exactly this capability that we're putting at risk.

Does irregular warfare demand less in the way of tankers? It would depend on how you look at it, but my answer would be no. My reasons are shown on this chart.

The chart here mixes two types of data. The first two bars show total sorties flown—first in Desert Storm, and secondly in the major combat ops phase of Operation Iraqi Freedom that lasted from late March 2003 through early May of that same year. Those are total sorties.

The purple bars have a slightly different measure. They are merely sorties flown in support of the CFACC for CENTCOM. But I think that the magnitude of these is interesting from a force planning perspective.

First of all you see that tanker sorties remain pretty high throughout a period of irregular warfare. In fact they increase, driven largely by the Iraqi surge and the increasing operations and heavy kinetic operations in Afghanistan that we've seen at the beginning of 2006, 2007, and 2008.

So what this chart says to me is that on a yearly basis over the last couple of years our tankers have been doing the equivalent of a major theater war.

The Operation Desert Storm major theater of war used a high number of tankers, and partly because of the really extraordinary number of fighter and other strike aircraft that were deployed there.

But even the OIF/MCO tells you that there's still a pretty heavy requirement. One way to look at the differences here is to think about the number of tanker sorties required to support the number of close air support, fighter attack and bomber sorties being flown. During Operation Desert Storm that ratio was about one to five. About one tanker for every five fighters.

[Inaudible] at that time on precision, very very different than the airframes [inaudible]. OIF/MCO, the ratio is about one to three. About one tanker sortie for every three close air support sorties.

Now of course the tankers are supporting some other types of operations as well. In irregular warfare/stability operations we see that ratio at about one to two.

What I think this tells you along with the raw numbers here on the chart is that there's rather a floor under tankers in their operations. We don't drive this number down much lower than what we're seeing today. That's because what you want here is effectiveness. Not necessarily efficiency. No one is saying the tanker force is sized for efficiency. This is a luxury a warfighter cannot afford. If a commander needs to allocate extra tankers to be airborne spares, to sit on ground alert, tankers to be set in specific tracks for F-15Es or A-10s as they were in Desert Storm, tankers to be set up for bad weather as they were in Operation Allied Force over Yugoslavia in 1999, then that's what you do.

If you need a tanker to fly in extremely bad weather up into the deeper reaches of Afghanistan to support aircraft, that's what you do.

So any type of force planning construct going forward will place a heavy reliance on tankers. That's what this data really shows you. Whether it is major theater of war or whether it is using airpower to provide overwatch and close air support, if aircraft have to be there, you have to have tankers to support them.

In sizing, probably one of the most difficult parts of the equation is the surge over close air support. This is something that you could not fail to take into account in any sizing of tanker forces because this represents the most stressing demand on an air force, for the industrial level production of sorties, combat power, backed up by tankers. I want to take a minute and talk about how this looked in Desert Storm, how it looked in OIF/MCO and why it remains a very relevant indicator as we're looking at fleet sizing and the KC-135 threat.

The table shows you for Desert Storm and for the OIF/MCO the average strike sorties level there. Again, remember we're talking about two rather different air forces. A very large air force in Desert Storm, combined forces, and a formal precision-capable force in [inaudible]. It also had a lot of time to carve up the Iraqi airspace.

Now let's throw in another factor. How many sorties are flown in the daytime? Why in the daytime? Well, it turns out that is often when you see the most enemy action. So air campaign strikes do tend to peak in daylight hours for [inaudible]. Then let's assume that each striker needs a certain number of refuelings per sortie and put that into how many refuelings per hour are required. This starts to give you a theoretical look at the most stressing case. It means for a large force like Desert Storm you might need 16 per hour; for the OIF/MCO about 7.7, let's call it 8 per hour.

Now you might say why would you even look at Desert Storm given the changes in the Air Force since that time? The reason is this. The OIF/MCO supported essentially two divisions—the Army's 3rd Infantry and the 1st MEF heading towards Baghdad very rapidly. There were far more divisions deployed in Desert Storm. Again, major changes in capability, but if you have a disbursed battlespace such as Army doctrine expects to fight in the future, it's one of their scenarios, then it may be that your close air support requirements are driven not just by two divisions moving up in a sort of half linear fashion, but by a much more disbursed battlespace. That may mean you may need tankers operating here to support fighters and bombers and our overwatching forces here. And ones that are dotted across the battlespace. Non-linear operations for ground forces means they are not mutually supporting in their direct fires. Therefore, Army doctrine relies heavily on indirect fires, those come from the air component, and those are backed up by tankers.

That means that your need for tankers is probably bounded somewhere in that region between the peak efficiency of the OIF/MCO and the less efficient but still powerful reduction in force that you need to support these first [inaudible] in a heavily contested theater.

Under any scenario you're looking at a lot of tankers to keep this airpower flowing over the ground forces when they are in their crunch zone. It is delivering this close air support that is the major stressing feature for the air component and the major driver from a combat force scenario planning of the number of tankers that you need to have ready to go in that force.

Let's talk about, in a very rough way, about quantity and risk. What's the point behind a [prompt] tanker buy? One, it hedges against the risk of catastrophic 135 failure.

What would happen if you had a loss of that 135 fleet? Well, it would curtail a lot of options, both in deterrence and strategic policy and from the prosecution of our current operations.

How many might you need? Well, let's look at the bottom of this chart with the [inaudible]. Average sent out daily tankers in use, 45 to 50, according to Air Mobility Command. That's every day, supporting Afghanistan and Iraq. That does not include deployments [dragging]. That includes just what's going on in the air.

Let's take another measure on top of that. The number of tankers put in the air or ready by the Air National Guard on September 11th—78.

We can't have them in two places at once.

And let's add on top of that, just for fun, that number from the OIF/MCO back in 2003.

You get a number that's a lot more than 179 KC-Xs. The number is about 227.

This is the most coarse way of looking at this requirement. As all of you who have studied tankers know, any time you really look at tanker scheduling and tanker allocation and sortie allocation you're going to end up with a study that's about this thick. The data is fabulous. There's lots of it. You can [write] any number of variables and spend a year in time wondering what the requirements really are.

But I think what we know and what our warfighters will say is there will be many theaters, quite possibly including Northern Command's realm of operations here in the U.S., there will be many theaters that require tankers. We just don't know how it's going to look. We always want to size some of your worst cases. This means that we really are at risk the longer we stick with the [inaudible] buy.

General Lichte, Air Mobility Command, has said no, he sleeps all right at night. He's not worried that this fleet is going to stand down today or next month or even next year. But what concerns him is the risk over a two year, five year, ten year period. Because we are still counting on having these 135s in the force for such a long time.

This gives us a sense of what the parameters of that risk might be.

We count on our tankers to do a range of tasks. I love this picture because it's just one of the most exotic. As you look at this and think about the first [inaudible], they shook their heads at such a tremendous capability and understood immediately how central it was to the execution of war power.

We count on our tankers to deliver this kind of surveillance all around the globe if we want it. We count on our tankers to give us the combat range and striking power to range any target on the face of the earth.

When we talk about bombers being able to range and survey any target we're really talking about tankers supporting the bombers to do that.

And we expect this capability over our U.S. homeland as well. Refueling on the 11th was not just about topping up F-16s, it was also about keeping AWACS—critical comm links in that time frame—forward as well.

So what is the way forward? As we know, we've had deep cuts in the USAF budget, particularly affecting Combat Air Force but many other aspects of the force. To my mind this makes a prompt decision on tankers even more critical.

What's new in this debate is the heavy discussion in recent weeks about the prospect of dual sourcing. That's an acquisition strategy that's now on the table. The logic of it runs like this. Accelerate tanker replacement; generate additional price competition over a period of time; and ensure you have a robust base, among other things, for potential replacement of other wide body type of aircraft like that AWACS I just showed you, like Joint Stars, like some others. But the key to it all is a prompt and stable program.

The specifics of a dual buy are different from our discussion of a split buy. As General Lichte has said, sign me up for any kind of tanker at all. The idea behind a dual buy is really best described as doubling up on a tanker buy in order to recapitalize this fleet even more quickly. It's a simultaneous buy rather than dividing one pie in half among two potential competitors.

We already know that we'll have a mixed fleet for a given period of time. That mixed fleet will include KC-10s, 135s, KCX in whatever variant it turns out to be. I would contend that adding a second KCX, call it a KCY, to this mix, does not compromise operating and support costs, total life cycle costs for this fleet in an insurmountable way. It does not create too big a bill to pay.

What it does do is give an opportunity to mitigate the risk.

We know we've seen some support for the strategy on the Hill. We've some in the Pentagon saying not so fast. This is where the acquisition strategy discussion rests today.

What I think is most important to think about is what I've spent the last several days talking about—that military requirement moving forward.

I want to close with something that General Lichte said recently, and that was that it is simply unconscionable to expect our air crews to fly in 50 year old aircraft. We've seen in this discussion how important aerial refueling is to our [inaudible] airpower today, to expeditionary combat deployment, to the execution of combat operations. There simply is no U.S. Air Force as we've come to know it without tankers. And there is no long range application of carrier airpower without tankers in the same way. We don't have joint and coalition air forces able to operate in the same way unless we have a tanker fleet to support their ability to get into every nook and cranny around the globe, in hunting for high value targets, or to hold any dangerous target at risk. That's what the tankers do, that's why we need to go forward, and I think we can echo what George Kenny said all the way back in 1948. There is no more important priority today for the strategic power of America than [inaudible].

Thank you very much for listening.

[Applause.]

► Question: Where did this number 179 for the KCX program buy come from in the first place? You've just showed a chart that suggested that 270 or so, if I remember correctly, were needed. So what is the origin of that 179?

► Dr. Grant: The sum of 277 is a back of the envelope calculation of what some of the requirements might be added on top of each other. That's intended to balance the usage of tankers. [Inaudible] the number that we use, [inaudible]. One hundred and seventy-nine was part of a three-phased plan to procure replacement for the 135 with [inaudible] that were dubbed KCX-179, KCY, which would be another 179 tankers, and KC, with a quantity yet to be determined. The aim there was to replace the 135 fleet to the requirement specified in the [inaudible], which at this point range around the 500 to 600 [inaudible]. So it was simply a discussion of what that first tranche of replacements would look like.

► Question: So you're suggesting that a dual buy actually means—I'm not sure I understand why you say that a dual buy means KCX and KCY simultaneously. Can't it just be KCX being the 179 being purchased, although perhaps not at economic quantities, and [inaudible] the two rival bidders?

► Dr. Grant: We don't know how a dual buy might look, so there are several characterizations of what that might be. The thing that critically separates it from a split buy is the idea of trying [inaudible] buy at economic rates. Rather than taking one plan number and splitting it into uneconomic order quantities, to look at [inaudible]. That's why in my characterization I talked about the possibility of doing, as if it were replacing the first two tranches of 135s together at the same time which would make it KCX and KCY.

We need to see from the Pentagon and potentially from the Hill what a dual buy might really look like.

► Question: [Inaudible] Air Force [inaudible] commercial fee for service [inaudible] in between [inaudible]?

► Dr. Grant: The question was is there a prospect of the Air Force deploying a commercial fee for service type of arrangement.

As you know, the Navy has done this in a limited way to support some very specific training and other types of missions, and I believe the Air Force has at least taken a glance at what this might entail. But in my opinion, commercial fee for service is not a substitute for a full KC-135 recapitalization program.

► Question: Is there any kind of generally agreed sweet spot in terms of how many represents an economic quantity for a dual buy as opposed to what is too few for a split buy?

► Dr. Grant: I'm not prepared this morning to speak to what the economic order quantities are [inaudible] split. What I will tell you is that let's assume that you went ahead with a programmed number of 10, 12, 15 aircraft, perhaps under a single buy. You're still looking at period of at least 10 years of having significant KC-135 risk. If you increase that number and look at 15, 20, 25 a year, then you are shortening the period of KC-135 risk.

There's also a milestone out there at about 2018 when many KC-135s come up for re-skinning and other major repairs. It would be in the economic best interest of the Air Force and the nation to avoid that bill and invest in the new tanker instead.

► Question: Do you have any idea at this point that the Air Force does in fact take out three wings worth of fighters, 250 fighters, what affect that would have on the tanker fleet?

► Dr. Grant: That's a good question. What if the Air Force drops its overall quantity of fighter [inaudible] decisions. My research suggests that it's not going to affect the initial procurement number for KCX. That is, again, because of the risk contained in the 135 fleet and because of my analysis that shows that even when you have a relatively smaller number of fighters involving operational instability and irregular warfare operations, your need for tankers does not go down in a linear fashion. You still have a requirement to be able to put in place the support structure of deployments, air bridge, overwatch and surveillance and surge for close air support. That requires a large number of tankers. Simply cutting out 200 or 300 or 400 fighters to my mind does not at all change the urgency of the KCX requirement for the number for the initial tranche.

► Question: You might have answered part of my question, but can you bring up the chart that you had from '91 to 2008 where you were talking similar [inaudible]. You had Desert Storm and—

► Dr. Grant: I can try. I don't think I'm going to be able to do that one.

► Question: You had Desert Storm, 15,000. What was the 15,000?

► Dr. Grant: Sorties flown during the Desert Storm air campaign, a distinct from Desert Shield.

► Question: During the whole year?

► Dr. Grant: Just over a six week period. January 17th through March—

► Question: I think your point was from '04 to '08 the level was about the same, 12,000 to 18,000.

► Dr. Grant: Correct.

► Question: I think you used the word irregular ops for that. Can you expand a little bit more on what you characterize as irregular ops?

► Dr. Grant: Certainly. I'd be glad to do that.

The Desert Storm number, of course, is a very intensive focused air campaign. Most of the sorties are concentrated on strategic attack and in fact the bulk really are [inaudible] Iraq tanks, [inaudible] and artillery pieces. Very very intensive use of airpower with fighters and bombers doing the bulk of that work and the tankers in support.

What we see after 2004 is a phase called stability operations. The major combat operation phase of course took place in 2003, so all the blowing up of Iraqi equipment and things of that nature was over. So what we see is fighters used for close air support on call, and used increasingly for intelligence, surveillance and reconnaissance, to the point now that in Iraq, many days 100 percent of the tasking is for non-conditional ISR and the fighters.

The difference here perhaps is in Desert Storm aircraft go out, they're assigned a set of targets, or they're assigned a kill box or a piece of a kill box to patrol for a certain period of time.

In irregular operations what we see is the latter aspect of that for the most part. Aircraft are assigned regions they need to look over and watch over for a certain period of time, replacements come and spell them off. If they begin to work a high value target or to provide support for troops in contact, then they're getting into a profile where they have to deliver munitions.

So although we see a relatively small number of fighters we see a very large amount of fighter coverage, and tanking is essential to those missions.

I think what that shows us is that when you have irregular warfare and stability operations, to put it bluntly, forces on the ground are really counting on having air-delivered fires available and on having air-delivered surveillance available. They don't bring in with them all the heavy stuff they need, despite there being quite a lot of heavy artillery in Afghanistan, believe me. But it's not everything they need at that moment.

So that shows you that even if you look at one of your force planning constructs as being in support of relatively light forces on the ground, you'll still have your tankers flying a lot of sorties in order to back up what the air component is delivering in terms of on-call fires and precision ISR.

Now that may not translate always to number of bombs dropped, but it translates to the demand on the air component to support strike operations, fighter/bomber, carrier operations, and allied operations as well and deliver that to forces on the ground. That has become the way that Americans fight. That is what we see over the last several years. We're not going to change that if we go into another irregular scenario or into another more conventional scenario. It will still be required. So thank you for that question and letting me go on a little bit longer.

► Question: Thank you. Just one follow-up. You mentioned the word sustainment [inaudible]. Are you making the word stability and sustainment the same, or sustainment something different?

► Dr. Grant: I can't recall the context in which I mentioned that. We really refer to this as stability operations and ability to sustain the stability operations here. Perhaps indefinitely.

► Question: I'm just wondering if your studies and perhaps even the Air Force's for that matter have considered the ever-increasing use of UAVs? Not only in the ISR role, but particularly in the hunter/killer role. Even Secretary Gates in his announcement talks about sort of the Reaper being a fighter airplane. Unmanned fighter.

And taking advantage of or considering the much greater endurance of those airplanes, or those aircraft, vice a fighter, and therefore potentially a reduced requirement for tankers. If you see what I mean.

You just talked about stability and how the sort of concept now is you've got overhead coverage for instantaneous CAS or CAS on call that has to be supported that's done by fighter aircraft that have to be supported by tankers. If you've got hunter/killer overhead that's got a 22-hour endurance presumably, simple minds would say you don't need as much air-to-air refueling. So I'm wondering if that aspect has been figured into future requirements.

► Dr. Grant: That's a great question. I can't speak to how much OSD has looked at that, but I think there's some really important trends here to observe in the first place.

You're right about the endurance of Predator and Reaper and Global Hawk and other platforms. They are such efficient platforms that they kind of take us back to the World War II days when you had really long range official [inaudible]. These of course being immensely more capable.

But a couple of things stand out. One, as we have seen the growth in ISR and Reaper and Predator, armed Predator and Reaper operations in Iraq and Afghanistan, we have at the same time seen an increase in tanker sorties. So it's gone up from the 12,000 to 14,000 range up into the higher ranges.

The reason for that is not because of Predator and Reaper. It's because of the accompanying fighter sorties. So what we're seeing as the initial trend is that an increase in Predator and Reaper do not necessarily give you a decrease in your strike.

Now your other question really is can that change over time. What about when you see combat air forces that have a much higher percentage of Predator and Reaper type vehicles?

Well, I think we are all hoping that the next versions of these aircraft consider the possibility of air refueling.

As you know, there's a lot of very interesting research and demonstration underway on autonomous air refueling. Some successful experiments under DARPA, we just had [inaudible] demonstrated. In fact I talked to one of the pilots, an ex-pilot who had run this and he said think about when the computer air refuels, it's perfectly smooth [inaudible]. So there's very promising research there.

Why that matters, I think we may well see a time when we have unmanned systems that seek to take fuel from a manned tanker. We may have an unmanned tanker one day, but I'm talking in the first instance of a boom operator in the back of a tanker who is fueling perhaps an unmanned system. We may see a higher level of automation.

Again, it doesn't necessarily tell me that this decreases the initial KC-135 recapitalization requirement. Remember, that requirement instead of 179 is a third of the current force. So I think under any scenario we see that requirement very much stable and staying in place, and we frankly don't know what may happen later on.

There's also research into micro vehicles and the possibility of refueling micro air vehicles. So I think we won't know for quite some time whether even a large entry of UAVs into all our combat air forces will really pull that tanker requirement down. If it happens, it won't be until after the first tranche of the 135 replacements.

► Question: You used the word economic [inaudible]. It appears your study is mostly operational.

► Dr. Grant: That's right.

► Question: You didn't do a lot of work [inaudible] economic [inaudible] curve is important to figure out given all the demands we have on our budgets and [inaudible] doubling up sounds great [inaudible]. Is there anything additionally you did beyond this? You talk about life cycle cost and the costs that are needed to replace not only the infrastructure but the types of tankers that would come in, whether it's branch-based, [inaudible]-based, [inaudible] or logistical tail. Is any of that included in the studies?

► Dr. Grant: None of that is included in the study. I would simply reiterate that the point of this study and this presentation this morning is to center us back on the

warfighting requirement for tankers and the need to promptly begin a replacement. Clearly there's a lot of work to do to get that process started. I think [inaudible] period of time.

My study suggests that the dependence on tankers is so strong and the risks are growing to the point where it's really worth making the investment that we need to do. We wanted to make these investments some time ago, that hasn't happened. I don't know about you, but I don't think we'll have more money down the road.

So my key point here today is to remind us of the warfighting imperative of the tankers and the need to get going.

► Question: Dual buy. Commercial, both variants [inaudible]?

► Dr. Grant: I think the full competition benefits from the availability of some great commercial platforms that are out there. The Air Force has some tremendous contenders, although I have to be willing to say that the Air Force has those to pick from because, as you know, the acquisition authority now currently rests with OSD. So our nation has some great commercial variants to look at. I think everyone wants there to be a commercial variant as the [inaudible] for the tanker.

► Question: Are you suggesting that a dual buy would have been, is the smart acquisition strategy even if not for the political stalemate that has developed? Or are you suggesting this is the best way to get around [inaudible]?

► Dr. Grant: I'm suggesting that the dual buy is an acquisition strategy that's now on the table. There are points out of which it links up with the warfighters' requirement and the strategy. It deserves a serious look. My larger point, of course, is that the urgency of moving forward is now very brave. You must keep this warfighter requirement in place.

We I think often take a lot of things for granted, but if there's anything that the month of April of 2009 has reminded us, it's not to take for granted things like combat search and rescue as a requirement. I think these days we need to remind ourselves that this requirement for tanking is out there not just for the Air Force, but for joint forces, for allies, and in fact to give us the ability to be a global power.

► Question: Can you give us the optimum strategy? I understand—

► Dr. Grant: I'll be happy to talk to you after, if you like, but I think I'm going to end it on that point. You've been very patient. Thank you very much for coming and listening. I appreciate your time. Thank you.

END TEXT

