



## **Mitchell Institute for Airpower Studies**

**Presentation: Airpower for Hybrid Warfare  
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Grant: Welcome everyone. I am Rebecca Grant. I am the Director of the Mitchell Institute which is an independent part of the Air Force Association. I want to welcome you all this morning. First I'm going to say a few words about the institute, and then I'll introduce our guest speaker for this morning.

The Mitchell Institute is named to honor Brigadier General William F. Mitchell. In September 1918 General Mitchell became the first air component commander as we would call it today. He led a force primarily of allied aircraft, French and British predominantly, providing integrated air superiority and air-to-ground support for the first US Army offensive of World War I. The first time the US armed forces had conducted their own offensive with their own armies not in support of something else in World War I. That was, of course, the Battle of San Miguel that took place in September 1918 and happened to have been planned by one Lieutenant Colonel George Catlett Marshall. He went on to much greater things in the World War II timeframe.

As you know, Mitchell was a pioneer of air power. For his performance at San Miguel he was awarded his first star by General John J. Pershing. He came back to Washington for a time, worked later at Langley Air Force Base as Commander of the 1st Provisional Air Brigade where he with Navy flyers conducted some amazing tests of aerial bombardment as they captured German battleships. Mitchell was a controversial, outspoken air power advocate. His advocacy led to his court martial in 1925, and then to his resignation from the service. He died in 1936, but is known very well for having influenced a tremendous generation of air power leaders who followed him, among them Hap Arnold, the leader of the Army Air Forces during World War II.

The Mitchell Institute was set up to honor Mitchell's leadership, his vision of air power, his commitment to testing and development of weapons and new systems for air power, and to provide timely and high quality research on air power topics.

That's what we have for you this morning. Mike Isherwood has prepared a briefing on Air Power and Hybrid Warfare. I want to tell you a little bit about him.

Colonel Isherwood retired from the Air Force after 24 years. He was a 1982 graduate of the United States Air Force Academy, a fighter pilot flying A-10s and F-16s. He told me that among the highlights of his career he thinks, of course, of being a Special Assistant to the Air Force Chief of Staff; later a Special Assistant to General Myers when he was Chairman of the Joint Chiefs of Staff; and of course serving as Vice Wing Commander at Bagram in the 2005 to 2006 time period. But I also want to remind you that Mike Isherwood flew about 33 sorties in Desert Storm with the A-10. This is an expended round from one of his A-10 sorties from back in that timeframe. It's not often you can marry up the shell casing with the man who made it happen, but in the case of Mike Isherwood, and his many combat sorties, this is what we can do.

So without further ado I want to introduce Mike Isherwood and ask him to talk to us. He'll talk about 30 minutes or so then will take your questions and conclude our Mitchell Hour.

Thank you for being here this morning.

Isherwood: Thank you, Rebecca.

I'm privileged to be here today and honored that the Mitchell Institute would invite me to come over and share both some of my experiences and some of my perspective as I think the nation looks forward to the challenge which I think is clearly beginning to emerge on people's mind. That is as we get into the early years of the 21st Century, the nature of warfare is changing. As I predict you will see coming out of the QDR, the term hybrid warfare will be loaded throughout that entire document as a new perspective and a new challenge that our military forces and our nation has got to confront.

So when they asked me to put together what do I think the applications of aerospace power is in that, I jumped at the opportunity and this is what you have, to share with you today.

What I want to briefly touch on are what are some of the natures that we see today? What are the implications for how the nations would respond? Then how does air power fit into that?

If you'll excuse me, when I talk about air power today what I'm really meaning is that's a shorted phrase for air and space forces and their application. It's not just the weapon systems, communication network, it's also the people, the airmen, and the training, and most of all the discipline and the courage that they have day in and day out.

As you look at warfare in the 21st Century, force planners in the Pentagon and those who watch other people's militaries are very well aware of how it has evolved. A number of other nations, be they neutral to us or potentially belligerent towards us, are rapidly seeking to invest in technologies which will negate some of the honest cases, [inaudible] capabilities that we have.

As you see here in the air arena, the people who are coming up with missiles like the SA-10 and the SA-20, Russia and China, which is going to be able to extend their air defense network out to 100, 200 and in some cases they have missiles that will go 250 miles in range to a target, airborne target.

At the same time, they're matching that with fighter aircraft which are something we call 4th generation and a half. And places like Russia and China are also investing in technology which will be able to neutralize the F-22. That's not here today, but within the next decade, decade and a half, they will have and they will be flying it. So clearly, they understand that the United States likes to and prefers to operate through the air, and they want to reduce that opportunity.

On the land arena, I'm not going to go into great depths in here, but people are also investing in capabilities to neutralize what we have. Things like a T-90, things like explosive reactive armor, so when a shell hits it, it helps deflect that penetration power to preserve the people who are on the inside. As well as providing IR countermeasures for all those armored vehicles that they have so if it becomes that much more difficult for US forces to target them.

At sea, very similar things are going on. Some very old technology, like diesel submarines, which if you were in an attack submarine and you were the skipper of that boat, he would tell you that a diesel submarine is a very daunting challenge [inaudible]. Other nations like China are also investing in nuclear submarines, which are very very quiet. They're also outfitting these things with new weapons. Like a super cavitating torpedo which has the ability to go 200 knots, which is about 10 times faster than the current torpedoes that we have out there. So they're looking to be able to neutralize US power projection capabilities, if you will, across the open sea.

These all sort of fit into that very conventional rubric that a lot of force planners look at and say okay, for our conventional capabilities we need to make sure that we invest in places that maintain our competitive advantage.

At the same time, the Department is well aware of this sort of irregular warfare and [stereotype] terrorist activities which are also happening in the early years of this century. The Defense Department has a definition, which you see up on the slide, and it breaks it out into a number of sub-categories underneath that--counterinsurgency, counter-terror, stability operations, peacekeeping, et cetera, and they've got manuals that dive into each one of those different areas and provide explicit values and doctrine [and reports].

Documents like this, and force planners, you've seen it quite frequently in the press. What should be the focus of the US military? Should the priority be on conventional war or should it be on the irregular construct of counterinsurgency operations that we're doing in Iraq and Afghanistan? Sometimes it's been nicknamed "this-war-itis" versus

"next-war-itis".

Secretary Gates to a certain extent lent his name and helped start this debate by talking about his frustration with what he perceived to be the lack of a commitment within the department to solving and fielding better capabilities for today's war, and not being able to field those. A little bit later on he modified that slightly, to sort of appreciate the fact that what we have going on out there is a new type of warfare that is going to blend together all of these capabilities--a hybrid warfare. And what you have in that category, what you have to realize is it presents a unique set of challenges to both force planners and the warfighter in the field.

So let me step you through a couple of scenarios here, a couple of situations that we currently have, that we've seen in the last decade, and sort of point to why I think hybrid warfare is going to be "the" defining element for at least the first 10, 20, 30 years of the century.

Our experiences in Afghanistan. And I break this down, the metric that I use is I talk about the weapons, the organizations and the tactics that we've seen on the battlefield and in the battle space.

Weapon size in Afghanistan, relatively consistent with an insurgency--small arms, mortars, some IEDs which are a little bit different from what the typical insurgent operates with.

The organizations, though, and this is where it really becomes fairly dynamic. It's very difficult for us to understand. There isn't a single enemy. Sixty-five years ago when the allies went into Port [inaudible] and attacked Nazi, Germany, there was one enemy and it was the Wehrmacht, it was the Luftwaffe in the air. When you come to places in a hybrid environment, you have a variety of adversaries that you're facing. What makes it even more confounding is that they will shift alliances week to week, month to month. So somebody who is an adversary now, six months from now, nine months from now, may be neutral; or maybe somebody that you're courting to try to bring over to your side, as the positions in that country have changed.

So in Afghanistan, quite frequently they talk about the Taliban; quite frequently they talk about [inaudible] in al-Qaida; but having been there, I tell you, you also need to appreciate warlords, thugs. Think feudal England back before the Roundtable came into being, and you had fiefdoms and they wanted to control people, power, opium trade, other things going on. They will shift their alliance to wherever they think they're going to have the most power and the most money coming in.

The tactics they're using, fairly traditional--ambush, intimidation. They come into the village. If I don't like what you're doing in the village I may kill the teachers as a way of saying don't send your girls to school.

In the last couple of years, though, we've seen that from time to time these forces, be it the warlords, the Taliban, et cetera, have no compunction with standing and fighting in a very very conventional, very very traditional manner. And in the last year or two as the [inaudible] forces flowed down and began to bolster their position in Kandahar and to the south of Kandahar, in fact the Taliban did that. They simply said we're not going to let you into this valley, and had a very well defined trench network set up and fought bitterly. When they lost terrain, they would re-attack to gain it back again. Activities you would look at and say this is not what an insurgent does. They're used to fighting and then fading and coming back at a different time.

So there's a little bit of this mixing of the typical insurgent type of operations with some conventional tactics as well.

In Iraq, again, the type of weapons that you're seeing, most of them, 90 percent, very very traditional in terms of what an insurgent does. On the other hand, as we've come to appreciate, some very high tech weapons using radio frequency, exploiting the radio frequency spectrum to explode ordnance. And timing it so it has the most damage on an American vehicle when it goes by.

We also have reports about UAVs operating to benefit the insurgents that are over there. Coming out of Iran. Something, again, that you wouldn't expect to see in a typical insurgent operation.

The organization, again, very very flexible on their side, very shifting in terms of who you're really up against. That makes who you're going to focus on as a military planner extremely daunting.

The tactics. Looking back a couple of years ago, there was report that was done [inaudible]. Again, 88 percent of the attacks were, as you would expect, from an insurgency or a terrorist type of operation. They would lie in wait, they would ambush, a firefight, then fade away.

About 10 to 12 percent of the time they're fairly complex. There's an initial attack, anticipating a response from the US forces, and then having a second or a third blow ready to go as they anticipate what our tactics are. Again, not something you normally see with an insurgency.

Lebanon, 2006. For people who have been studying hybrid warfare, they will look at this as sort of being the defining conflict, but I think it's just one that provides more light into it.

The weapons that you had involved from the Hezbollah, across the entire spectrum. Small arms, mortars, also some of the latest antitank weapons--HE13s and HE14s. They set up some very sophisticated tank traps. At the same time they had no compunction about taking these weapons and using them in an anti-personnel manner. What I mean

by that is they would be involved in building to building, room to room fighting. They'd pull out an AT13 and shoot it through the wall if they thought Israeli soldiers were on the other side. An innovative use, and effective from their perspective.

The Katyusha rockets, we heard about quite frequently in the press. These are the ones which were raining down on northern Israel and forced a significant number of people to have to relocate. But they also would go and marry those things with Mercedes trucks. So if you're a pilot or you're somebody who's exploiting the intelligence data coming in, there's a lot of Mercedes trucks on the roads over there. So how do I distinguish a possible belligerent one from one that's just normal civilian traffic? That's a daunting problem [inaudible].

But the Hezbollah also had cruise missiles that they used. That takes a level of sophistication, a level of training, fairly concentrated, in understanding the environmental conditions to be able to use that. And they didn't just shoot one, but they shot two. The first one was a deliberate miss to go over the head of the ship to get their attention; the second one came in at the water level. A level of tactics that you normally wouldn't associate with what seemed to be a part-time citizen warrior who's out there fighting you.

The organization. Some people reported as many as 7,000 fighters with recognition of about 500, maybe a few more, who were their core, hard trained, had spent the past several years training to do that. From that they were able to expand and create five to seven person cells that were very autonomous, understood what their mission was. If they could reinforce back and forth, they would. They had a higher headquarters to try to shift things back and forth. If they had the communications network in place. The Israelis worked very hard and I think were fairly successful in severing that communications link, so the degree of the fight could have been far worse had the Hezbollah adversary been able to do that.

The tactics. Again, here you saw a whole variety from ambush to fight to hold ground and launch counterattacks to regain ground. There were several pitched battles over there that would go for a day or two. Again, not the type of activities which you normally would associate with an insurgency, or you'd associate with an unconventional type of warfare.

So my point is, as you look at these things in the conflict itself, if you're a military planner, or you're the commander as you step forward into that, you've got to be prepared for the full spectrum of conflict. From the low end, simple, somebody with an AK-47, to somebody using UAVs and using cruise missiles and other very sophisticated tools to put down a target.

The learning point, if you will, is as you go forward you can't really, in my mind, have a force which is just an irregular force and over here you've got your conventional force. You've got to take the entire skill set to the conflict because the adversaries going to bring an entire skill set towards you.

Mumbai, last December. I just want to touch very briefly on this. A very short, very intense type of thing. But look at some of the things that they had access to. Google Earth, GPS, the internet was their command and control network. When they were trying to, a big part of their objective was influencing the press, and they're on blackberries watching the live feed. They would say we want to get on the internet. Call a news reporter, [the problem was solved]. That style of using the cyber medium, if you will, is an important element that we need to understand they're out there doing.

This type of irregular, unconventional warfare that was not constrained to non-nation states. As you look around the world that I'm going to cite to here, nation states are also investing in it. North Korea. If you've been to the Korean Peninsula you understand that North Korea has 60,000, perhaps more, irregular, special forces, unconventional troops who are dedicated to infiltrating into South Korea. A number of their targets are military targets, but they also have a stated purpose of inflicting damage on the civilian population and destroying the population's confidence in the government.

If you think back on that last statement, that's consistent with what happens in an insurgency. Trying to bring down the government by the population's lack of confidence in it.

In Iran, a very similar type of thing. They have conventional forces and they've invested significantly in unconventional capability. We're seeing some of those people on the streets now dressed in civilian clothes and enforcing peace on the street. But those forces move outside the borders of Iran, they're part of their irregular force. They're unconventional in two ways.

Finally, if that isn't enough to make your head hurt, look through this chart. A lot of the events that were concerns to us--the I Love You virus, to name just one of many--how did they start? Not by a nation state. In some cases a couple of college kids were playing around with their computer and being able to exploit it to do some damage. In some cases it evolved to the point where there was billions of dollars worth of damage and [negating] our information tools and our information technology.

So if individuals can do that, and you look at things that happened in Georgia, that happened in Estonia, you've got to believe that nation states are going to invest in this as well.

Is this a part of irregular, unconventional? This is part of a hybrid warfare that we're going to be facing in the future. In my mind, it's part of that spectrum.

So as I've looked through this I've come to appreciate that hybrid warfare is going to be fought by both nation states and individuals and different types of groups. And they're going to reach for whatever tool they perceive is going to be the most effective for their needs. And the state of many of our weapon systems today is it takes training, but you

don't have to spend five or ten years like I did in learning how to fly an A-10 or an F-16 to hone your skills to be able to do it. In many cases concentrated effort over a short period of time, and you can achieve the same lethal effects.

They're going to fuse these in for different objectives. Quite frequently as you dig into this hybrid environment, the objective is to undermine the government and to have [inaudible]. As opposed to a force on force battle, you're concentrating on destroying the enemy's ships, tanks or airplanes.

Something else to consider is we look at the belligerents who are involved in this. Their appreciation for the law of armed conflict is that they have one. [Inaudible]. Look at the number of Chinese military writers. There have been some who have reinforced that same point. This is a Western notion and not one [inaudible].

I'm going to pick on the Air Force doctrine document for just a moment. They talk about this, traditional and the IW, and say in the future you may have both of them present. My update to that is I think the force planners and the commanders need to expect that it will be [inaudible]. They're going to face both. If before you sort of had this very convenient mindset of I've got irregular on one side and conventional on the other, I now suggest we look at that as a continuum, and where on that scale you wind up is going to change. Week to week, month to month, even involved in the same conflict.

So if that's what it looks like, what are the objectives, or how should the United States approach it? There's been a lot writing, if you will, on counterinsurgency and irregular warfare. One of the many studies that are out there Rand did, and here are a number of things that they highlighted the importance for a successful counterinsurgent campaign. We appreciate the type of warfare that's frequently going to pursue the same style of an objective, we realize these are important tenets as well in a hybrid campaign. These are very unmilitary things [inaudible]. It's not bringing down their combat power 50 percent, which is a task I was given with telecon back in Desert Storm. There are things about the confidence of the people, that the people have in the government. Electricity, security. Will it have a justice system that I can turn to? Or do I turn to my gun and seek justice on my own [inaudible]?

General Casey, looking at what happened in Lebanon and his own experiences as a commander in the past few years has come to appreciate that who he needs to have on his team in modern warfare. It's very different than when he was a captain and a major.

So the partners that you're going to have out there are very varied, are quite diverse. We're seeing that in Iraq and Afghanistan. Federal agencies. Allies. Allied military partners as well as some of their civilian counterparts. NGOs have a significant presence [inaudible] as well. As you look back at that Rand report, they've got the ability to deliver a number of those services to the population. I would suggest to you, you want them to deliver. I want Doctors Without Borders in Afghanistan helping build the health care system for those folks because I don't want the US military to be in the forefront of

that. We don't have enough [inaudible] to do that.

So I need to recognize that they're there, and embrace them that they're going to be a part.

If you take a look at one of the innovations that the US military has, and I saw some of these in my time in Afghanistan, Provincial Reconstruction Teams provide that mix of military and non-military tools with a very focused effect. I think they're expanding over time to include a number of others.

One way I came to appreciate it, how hybrid warfare [inaudible] approaches, you've got somebody in charge of security--that's the military office. At the same time you have somebody dedicated to the governments. Economic justice, et cetera. Who's doing that is where the team comes together--the military, allies, contractors, NGOs, et cetera.

That's what the nature of warfare looks like and this is how the US needs to go forward. What is air power's role in all this? I appreciate [inaudible] go through that. [Inaudible] see the applications. What you will see, what I've come to appreciate, is that air power is the foundation of the national response. Why do I say that? As you get into the conflict, [inaudible] the qualities that you need the nation's response to have. It's got to be lethal and non-lethal. At times you have kinetic options and you have non-kinetic options. You have to have the capabilities that you impose a cost on the adversary [inaudible] your way; or if he has attempted to oppose you, [inaudible] inflict a significant cost on him in terms of life or the resources that he has.

If he has some anti-access capability to deny you to come in from the air, land or sea, you've got to be able to overcome that without missing a stride. This goes back to that spectrum of conflict that you have out there. You just can't say this is irregular, it's the low end, I don't need Army vehicles, I don't need sophisticated airplanes or [inaudible].

Most of all, the technology and the systems that you bring have got to leverage manpower. It's got to be value added and not [inaudible] to be able to operate. As I look at what I will call the four cornerstones of air power--the ISR, the mobility, the strike and the command and control, all play into delivering those type of capabilities.

These are the specific attributes that airmen always talk about--speed, range, lethality, flexibility, persistence, survivability that I gain by operating in the air.

Grant talked about what Billy Mitchell did. We went through the air vertically [inaudible] so we didn't have to slog our way through the trenches. And we could still put the enemy's ground forces at risk. Air power has done that for 100 years and it's just as applicable in this type of conflict as well. That vertical dimension, and we'll talk about that here in a little bit, gives me [inaudible] amplifies these things in a number of wonderful ways. Let's see what I mean by that.

When I was in Afghanistan, if you were in a place where you are worried about somebody who's going to try to come and kill you, one way to construct your thoughts is to say, as we learned back in fifth grade - who, what, where, when, why? Who is it, what are they going to try to do? Sniper fire? IED? Assault a main building? The other questions you see up there.

Down the left hand side you see a number of the very traditional intelligence forms that we have. Human intelligence, down to signals intelligence, NTI, et cetera, that you have. As you walk across it you get to appreciate that you know, the different type of intelligence sources that I have [inaudible] answers. We get in a long discussion, we can create a variety of different scenarios. But you have to realize that sometimes the imagery that I get, that Dick Cheney took back in 1990 over to a conference in Saudi Arabia and said see, these are Saddam's tanks sitting on your border. That was valid for that one moment in time when the picture was taken. We were fairly confident that they really were Saddam's tanks. It didn't say what they were going to do tomorrow. It didn't say the status of how much armament they had on board or how much fuel. Were they going to be able to launch or was that the end of the line for them? So there's a whole series of other questions that other types of intelligence will fill in.

A signal you can collect from a tank commander saying boss, we're armed and ready to go adds in more to the picture about what do you expect this adversary to do?

The other thing to appreciate is there are generally two types of information I get. Surveillance and reconnaissance. Surveillance is looking at a very wide area of where do I need to focus; and reconnaissance is to focus on a specific point in time. [Inaudible] detailed battle. If you don't know where to focus, if you don't have good surveillance you won't be able to pick up the sort of details that will save your life.

As you look at what ISR assets seem to do, they're going to tell you the where, the when and the accuracy, whatever the data is. I'm going to send a radar signal off an FA-10 radar, how accurate is the fidelity of that that I'm getting?

Take a look at a place like Afghanistan. Many people don't appreciate that it is larger than Iraq. It has more people than Iraq, and yet we've had roughly a third of the forces that we've had in Iraq.

If you take a look at some very traditional counterinsurgency manuals it says that you need to have roughly one person for every 25 civilians that you're trying to protect. I'll let somebody else do the math, but 32 million people, means I need a little over a million man Army on the ground? I have a difficult time envisioning how we'd do that. But I can fill in the capabilities by leveraging technology which is what air power is going to bring to that fight.

In terms of the tactical ISR assets that you have out there, this is a list of what currently the company and battalion commanders [inaudible] who didn't have the air component

out there. And the [inaudible] for the Army, relatively short range with sensors, relatively short time on station. They do have some ISR systems and [inaudible], and they need to get into a high point so that the antenna covers can stand out [inaudible] something fairly decent.

But even if I'm only going 10 or 20 miles away, if you're in some place like Afghanistan, as large as that area of responsibility that you have to protect, that's leaving a lot of the area uncovered. A similar thing for the Marine Corps.

The other thing I want to point out to you is if you look at the type of sensors they have, the vast majority of them are ER/IR, they are imagery collectors. Think back to the who, what, where, why, and this shows you what it's basically filling in. I'm going to see a lot of what's, where it is, right at the moment the picture is taken. That's why the Air Force has come to appreciate the Predator, because I've been constantly updating it as much as 24 hours on where that person is and where they're going. As opposed to when I first came into the Air Force and we had an RF4 [inaudible], it took a picture, and two days later I knew where he was two days ago, but I don't know necessarily where they are today.

So what does my ISR system give me? Again, if I'm ground basing it and if I take something like [inaudible] and stick it up on a 500 foot hill, available range out to about 27 miles. You see a little over 2900 square miles. Better than nothing.

But if I take that same system and put it on a U2 or a Global Hawk and I go to 60,000 feet, I can reach out on the horizon 300 miles. And the area that I'm going to be able to monitor goes out significantly farther.

[Inaudible] airborne systems, which I tend not to have on my ground systems, I [inaudible] multiple sensors. The U2 carries an ER/IR camera and signals intelligence. The next generation Global Hawk is going to have ER/IR, the radar, and signals intelligence at the same time. And I would predict if you look out to the future five and ten years from now, the next generation ISR platforms are going to have things like [MASIV] system as well. It's going to give you a multispectral analysis of the battlespace [inaudible].

So I'm getting more things out of the same platform. Versatility. Adaptability to a variety of situations. We're doing it in the air in a way that you will never do on the ground because the range you're going to get is not worth the investment.

One way of taking a look at it. At 60,000 feet, the area that I cover that I talked about before, the other thing you get in a place like Afghanistan with hilly terrain, if I go from 30,000 to 60,000 feet, the vertical size that I'm able to see and cover, I eliminate the shadow and I get about three times greater land/soil coverage, if you will, from that high altitude. That's the advantage of the vertical versus the [flat].

A number of times when I was flying in Afghanistan, I was supporting a battalion, and the battalion was spread over a hill. I kid you not, the guys on the east side of the hill could not talk to the guys on the west side of the hill because of the terrain. The vertical position allows you to [inaudible].

In terms of signals intelligence, one of my key ways to focus my attention, my key surveillance technique. The other one is ground [inaudible]. The way I like to think about this is a well trained adversary won't talk on the radio. But if he's going to attack you he must move. From Pakistan across the border to attack the out posts, I've got [inaudible]. So everybody walks, but not everybody talks. So I've got the ability from the air to fill in who is moving and see that with a high fidelity. That value to the ground commander [sitting in] that outpost at 2:00 o'clock in the morning is invaluable. If somebody tells you, boss, we've got 100 troops moving across the border right now, that's significant. Because Pakistan and here is not that much different. 2:00 o'clock in the morning, most people are in bed. They aren't moving across the landscape. So that provides a key piece of information. Now you can begin to focus other sensors. Get the Predator airborne, see where they are, what type of weapons are they carrying, et cetera.

Let's shift now to the second tenet that we talked about, the mobility aspect. First and foremost, fortunate for us, most of our conflicts happen a long way from our coast. That's good. They've got to get there. That initial response has been appreciated many many times, it happens with our air mobility forces. C-17s, C-5s, and [inaudible]. Our ability to deploy and [an opposing] force is unparalleled in the world.

I was one of the force planners after 9/11 and in three weeks we were able to set up an attack force that was in position and very effective that launched the operations into Afghanistan. Unprecedented to have moved that far, to a place where we had no footprints, and be effective [inaudible]. It all happened through the air.

But you also value it for the medical evacuation. Our commitment to the soldiers and the marines and everyone else on the ground. If you get injured, we're going to take the best of our nation's resources, [inaudible]. As you've seen, the Air Force Magazine does a very good job to help talk about a number of those cases where we've done that for young men and women.

Humanitarian operations. If you think again about hybrid warfare, it includes a focus on bolstering the legitimacy of the government. What is the government doing for me? The ability to get aid into isolated places is key. We did that in the beginning of Operation Enduring Freedom, we continue to do it today in the mountainous regions where the villages are isolated, delivering aid to them.

Sustain the force. Over the past year the Air Force has used the joint precision airdrop system to effectively remove a significant portion of the vehicle traffic off the road while being able to sustain a number of those isolated outposts that's important to strategy. The Army recognizes this and says JPADS has saved lives of their soldiers.

Strike. When I first got into this I was a little bit frustrated that when we typically talk about irregular warfare the only thing people wanted to talk about was close air support. That was what they thought was the only contribution from the air. And it's true, it is. And in the nature of hybrid warfare your ability to strike through the air changes the game on the adversary. Because for the ground forces who are out there, who are living and operating among the people to build that confidence--think about it. They can't roll down the street and stop and talk to the owner of a cafe by poking their head out of an M1 tank and saying how are you doing today? Everything going all right? Some of you [inaudible]. That doesn't work. It's too intimidating of a position. And the Army understands that. That's why we're seeing in Iraq and more now in Afghanistan, placing the soldiers in the force among the people, building the confidence, having the relationship with them is very very important. An Army that does that is lightly armored and lightly weaponed. [Inaudible], maybe a heavy machine gun at best.

One of the dangers of hybrid warfare is that the adversary has the initiative. You and I could walk by this coffee shop 99 times, and on the 100th time that individual could turn [inaudible]. The ability to strike from the air is the neutralizing factor. [Inaudible] forces. And in fact USA Today, at the bottom you see they may be the enemy, they may be dying in droves, but they learn. American air power [inaudible] fear and [inaudible].

I want to talk about command and control, and I want to talk about it on two levels. Quite frequently the situation is when you get into a [inaudible] the air environment is relatively secure. It's what we're about proving, that the adversary could use UAVs, could use cruise missiles. That's something the air component has got to worry about and naturally is part of their [inaudible]. But quite frequently as we're seeing now in Iraq and Afghanistan, it's secure, and so this very valuable command and control tool is dedicated to solving other people's needs--sea, land and the city component as well. It can bring together what their needs are, what their plans are, and help distribute and apply force to [inaudible].

At a tactical level, the Air Force is unique among all the services that integrates its command and control apparatus down at the tactical level of other people's organizations. Inside other components. Okay? We do not have a single control of the Army in a fighter squadron, but you do have it at the battalion and the company level. It's that ability to bring all the nation's resources down to that company commander. You can do that right now with a thing called Rover. There are tools that help pass information back and forth. To link what you're seeing in the air to people on the ground, and pass information back. In fact Sergeant Summers from the 82nd Airborne was talking about the value of him being there to provide that link, to provide that strike power, and what it means.

My personal experience when I was in Afghanistan, if I put A-10s overhead, no one on the ground was hurt. When [inaudible] shot at, injured, [inaudible] that overwatch position brought peace back into the situation.

So as you take a look at it, talk about the ISR, the mobility, command and control, and strike capability, this is why I think it provides a foundation [inaudible]. The things and the services that it provides, the intelligence, the moving around, the linking together of plans, and to begin to provide that protective overwatch benefits everyone [inaudible]-- soldier, marine, civil component, and even Doctors Without Borders [inaudible]. So it provides that foundation for them, but it also provides a foundation for the larger strategic response of the nation [inaudible].

Now this isn't to mean that it's the only decisive element, and it isn't meant to demean or belittle the value of the soldier or marine who is on the streets right now in a variety of villages, a variety of places, [inaudible] and other places around the world. They too are very critical and are part of the decisive element of building confidence in the people. But the foundation that all these people are going to rely on, the information they're going to get, the timeliness of it, the resupply, et cetera, is primarily coming from [inaudible].

Can it get improved? Sure. A couple of thoughts.

On the command and control arena, if we talk about [inaudible] civic component out there, both federal and NGO, my experience is it would be valuable to know what their plans are, and I'm [inaudible] a certain amount of [inaudible]. General McChrystal has talked about recently the strategic loss that happens when the coalition forces kill a civilian. [Inaudible] to find out what people are doing to prevent that from happening. And in my years when I was over there, we had a situation where a convoy got attacked, air power showed up, they went over the hill, into a village, went into a building and started fighting from the building. We came in and put a 500 pound GBU on top of it and destroyed it and took them out. [Inaudible], completely legitimate. They have made that location a hostile location.

At the same time I have wondered who else would have been in that house? Had an NGO been there or had somebody from USAID been in there and that's why the belligerents walked into that building, it could have been a strategic setback for our [inaudible] in that country.

How do I find out about that? Our command and control tool [inaudible] allowed [inaudible] information to be sent back is the next step to go. As military forces have that [inaudible] components now, [inaudible].

Secondly, in terms of sharing ISR data. General Odierno has talked about in Iraq, he claims that [inaudible] success was the fact that he was able to push the exploitation down to the company level. Okay. Do I have enough intelligence for guys at the TED, the Tactical Exploitation Distribution? Do I have enough of them to [inaudible] a full complement of ISR, movement intelligence, signals intelligence, imagery, in each one of the companies? I don't think we [do]. I can't [inaudible] ISR exploitation [inaudible]

close air support. What they need is information. How do we get the information to them?

Rover I think has broken down the barrier by being able to take a target pod I have on an [inaudible] or an A-10 and share that with the guy on the ground. Why not come up with a laptop that has all the ISR data available from that airplane and share it with persons on the ground?

Christmas Day 2005 I had a call to an ambush. I was flying overhead and trying to find the guys who ambushed him. I saw the vehicle, a very distinct road. I got back [inaudible] and asked my intelligence officer and I said, hey, the U2 was flying today. Where was he? The intelligence officer came back two days later with a top secret photo from the U2 that was stamped two minutes after I arrived. He was there. I didn't know it. The guy on the ground didn't know it. The people at Beale knew it but they weren't under attack.

So why can't I get a system that allows that information to flow very rapidly down to the guy who is [inaudible]. The technology is there to be able to do that.

As you add in some of the systems you have coming on board right now, Warrior [inaudible], ACS, et cetera, Fire Scout. What you begin to appreciate is they're trying to get higher up in that vertical position so that their sensors range out that much farther, so that their endurance is that much greater. I'm not going to take that away from them, but that's something that the air component must [inaudible] for them. As you look at the answer to my who, what, where, when questions, they're beginning to fill in more and more to see the value of what the vertical dimension gives them in this arena.

I mentioned that it's a foundational role. It's sort of the hub that's allowing the joint force, air, land and sea, to do a number of its operations. It's got the potential with the right vision to provide that response and that capability to the entire nation's response in a hybrid environment.

I've talked to you a little bit here today and I appreciate your time and your patience with me. But clearly, warfare in the early decades of the 21st Century has changed. It's not distinct. It's a continuum. And where it's going to [inaudible]. The nation understands that. There are a number of people who talk about bringing all elements of national power to bear, and I applaud that. As that happens, I am convinced that air power, air and space forces, the men and women who operate them are going to be that foundation to ensure it's an effective force.

What questions do you have that I might be able to answer?

Voice: With regard to the Raptor, [inaudible]. I understand [inaudible].

Isherwood: I usually start out by, sometimes if I don't answer some of these questions

it's either I don't know or it's classified, and I'm not going to share with you which category it's in.

Does the F-22 have a role? Sure. Can it provide the overwatch? Absolutely. The same with [inaudible]. Does it have sensors that can get out there and [inaudible] the overwatch [inaudible] and share widely among the force? Absolutely. So if I describe that [inaudible] and the ability to put a 500 pound or a 250 pound bomb on a set of coordinates and destroy it, you probably would want that. But the minute I tell you it's the F-22 [inaudible] goes negative [inaudible]. No that's overkill. I think that's the wrong answer. It's the capability that you want, not necessarily the [inaudible].

After about the third or fourth week into Enduring Freedom, the B-2 was still on the schedule. The Marine officer came to me and said [inaudible] it isn't really necessary. You don't need stealth. I was frustrated because I said stealth is just one of its qualities. It has got a wonderful ordnance load, and 80 500 pound bombs [inaudible]. It's the only platform that can deliver the 5000 pound bomb [inaudible] target. It's got the [inaudible] on top and it's got a kick-ass targeting system. That's what it's bringing, it just happens to be stealth. Don't get turned off with stealth [inaudible].

So long answer. Yes. F-35, the same thing. [Inaudible] appreciate the cyber environment, what the AESA radar can do or potentially can do in the future, there's applications for that as well. That's as close as I'm going to be able to go.

Voice: [Inaudible] experience with the Russian [inaudible] which had all the elements [inaudible] you described, and advanced, anti-access [inaudible] on both sides. As well as [inaudible]. There's another [inaudible].

Voice: You talked about ISR and that it needs to be shared, or [inaudible] partners. [Inaudible] partners. Why is that not being done?

Isherwood: My personal experience is about three years old. Part of this is a cultural element. Part of it is realizing it's my job, I need to do it. But also a big part of it is distrust. As you get into [inaudible] agencies, and especially as you get into the NGO arena, some of them look at military forces and go I don't want to be associated with you. You will discredit me among the population, so I prefer to go it alone because I've done that in the past.

I will be honest with you, part of this is building trust and confidence across those boundaries. The NGOs are going to want to have [inaudible].

My point to them would be I don't want you as part of the system, but I'd like to see what you're doing that I can help you with and share what's appropriate [inaudible]. And there's been progress made.

For example, when we were in Afghanistan, USAID was over there. They were building

roads. The US Army was building roads, and the commander at the time, General [Comia], was absolutely [inaudible] about making sure the roads [inaudible]. If we're going to build a total of 200 miles worth of roads this year, let's make sure it's the right 200 miles, and not five miles here, seven miles over here. So he helped break down a lot of those barriers [inaudible]. But there's more work to be done.

Voice: What about the distribution [inaudible]?

Isherwood: My perception, and [inaudible]. [Inaudible] tactical operations [inaudible] has been the hub of all the [inaudible]. And the information flowed into there at best. When you're in a conventional fight and you're in your lane, and you have battalions out in front of you, you get the information, you pass it over [inaudible].

You get into an environment like Afghanistan where the brigade commander basically is in charge of the whole eastern portion of Afghanistan, several hundred thousand square miles of land out there, they're too widely disbursed. Just the simple day-to-day operations like go over here, pick up the ammunition and then drive it back. A logistics function. It's got in a firefight. It's now combat. So how do I get the information to them that they need?

Rover has been a big part of crossing that barrier [inaudible].

Voice: Virtually all of your presentation assumes benign [inaudible] in Afghanistan and Iraq. What happens when it's not benign?

Isherwood: You can very easily have a situation where, in Georgia, where the adversary [inaudible], and so now you have got to secure that [inaudible] before you can do anything else. F-22s, F-35s, [inaudible] bomber, an important [inaudible]. That's why at the beginning I said you've got to [inaudible] any anti-access capability they put out there [inaudible]. The nation would be very poorly served if it didn't have that capability and the adversary was able to project it.

What would happen if for whatever reason Iran got their hands on SA-10s and 20s and set them up and said we're enforcing a no-fly zone over the eastern portion of Iraq. US forces are not welcome. The missiles are going to be in Iran, but the no-fly zone is in your area. Would we put soldiers and marines on the ground to try to execute their mission when I can't fly ISR and mobility assets into that? That would be a very poor response [inaudible] that situation.

Voice: I'm older than everybody else in the room here, but what's new? Take me back to Vietnam, and apply this hybrid warfare, and you have the methods and everything's changed, but what's new about all of this? That's part one. Part two is, are we at risk of sounding the death knell of conventional war by a focus on hybrid war? I see the Department of Defense focusing on hybrid war to the exclusion of everything else and making grand statements like we don't need this, we don't need that, et cetera, et cetera.

So reconcile all that for me.

Isherwood: What's different is, particularly with the mindset of the Army in Vietnam, is that they have this counterinsurgency force and they have a real Army [inaudible]. And the two are distinct.

What's happening now is they're beginning to appreciate that they're both coming together. That your insurgent Viet Cong could well show up with a cyber weapon or with a sophisticated surface-to-air missile capability that is just [inaudible]. So that's one of the elements that's changed.

There is a risk within the department to say this is hybrid warfare, really all I'm going to worry about is the low end guys with RPGs and AK-47s and [inaudible] among the people, et cetera, [inaudible]. When [inaudible] to what hybrid warfare means is when you show up to go to work that day in a hybrid environment, we [inaudible] from a sniper with an AK-47 to a biological attack. And you need the means to both protect that, prevent it, and disable it. So it's going to go the entire spectrum.

So before if you had two distinct forces you've got to bring to the fight both of them within the same force. That's what's different. I can't tell you when you get to the area what you're going to face.

It's sort of like getting up and saying well am I going to go play soccer today or am I going to go play football? I'm telling you, you've got to show up and be ready to do both. And it could change minute to minute.

Voice: Is anything [inaudible] take off [inaudible] theater of war capability [inaudible] necessary?

Isherwood: No. Because take a look at the situation of North Korea. If North Korea decides to celebrate the 4th of July by invading South Korea next year, you are going to have elements of both. You're going to have large armies and artilleries moving south, and you're going to have 60,000 plus troops conducting an irregular, hybrid conflict [inaudible] the south. If you're the commander of US forces in Korea, [inaudible] in Korea, you do not have the luxury of saying we're not going to do that [inaudible] stuff. [Inaudible].

Voice: Back to the growing civilian casualties challenge for the Air Force in Afghanistan. Do you think that can be solved mostly with better command and control? [Inaudible] technology.

Isherwood: Obviously the answer is more accurate, more [inaudible]. If you were able to go back and say if this bomb dropped and killed 12 kids, in retrospect, would you still drop it? You'd probably say no. You probably wouldn't. So how do you [inaudible]? That's the challenge.

It actually occurs in that manner.

It's tough to [inaudible].

Voice: Let me follow up on that. The questioner asked about the Air Force's problem of dropping bombs. Can you tell us how the system works? It's not like you as [an aviator] decide you're going to bomb that building today. There's clearly a ground component to this whole thing.

Isherwood: There's a huge ground component to it. When you get called in to do a strike in Afghanistan or Iraq or any place in this type of environment, you as the pilot are flying completely on the information you receive from the ground. Here's where the friendly forces are, here's where the adversary forces are. And in those adversary forces there is this presumption, if you will, that it's homogeneous. They're all bad guys. And it's very very very difficult, I would suggest, for a soldier who's on the ground in a firefight to be able to look across the street and know with 100 percent accuracy that non-combatants were collocated at that place. That's the unknown.

Voice: So it's the soldier that's calling in the strike and telling you where to put your --

Isherwood: Right. And that's why as the Air Force has moved towards, back in Vietnam the command and control was literally radio, here's my yellow smoke, [inaudible]. If you move that to, if you have laser target designators, LITENING and Sniper Pods which are able to see your laser spots, your ability to provide a six or eight digit GPS coordinate and say this is exactly where the enemy is located. I see it, I'm able to give you those coordinates, and I put it into my aircraft system and I roll in there and I have a target designation box on top of that, or my GPS guide to that specific location. I'm acting completely on the information I got from the soldier on the ground.

So from the airman's perspective, if he follows those procedures and hits that spot, in theory he or she is blameless. The reality is, you're never blameless. What does the headline say? Mike Isherwood, Air Force pilot, killed 12 kids.

Voice: [Inaudible].

Isherwood: That's what the headline says.

Voice: It doesn't say Private Smith called in this attack and told you to drop it right there and you did exactly what you were told.

Isherwood: Never anywhere in the story is that. This JTAC or this Army battalion commander authorized the strike. And every time I drop ordnance I have the ground commander's [inaudible] responded to the strike. [Inaudible]. Ultimately and legally, that's the person who's responsible. He is responsible, if we're sitting here and the

building across the street is attacking us, he's responsible for ensuring that there's no non-combatants in that building. Or if there are, the risk to them the risk to them is commensurate with the risk [inaudible]. The legal argument doesn't matter much, [inaudible]. From the airman's perspective, he's doing as much as he can.

Voice: To continue that point, [if you pull the plug] it's not really relevant to--It's interesting, but it's not [inaudible]. If the Afghan government [inaudible] over time [inaudible], and General McChrystal [inaudible] reducing the rules for employment of air power, that has an effect on the overall perception of the employment of air in this kind of warfare, regardless of [inaudible]. It's just not [inaudible]. The real point is that the utility of air power [inaudible].

Isherwood: [Inaudible] because we haven't seen the adverse effects of not [inaudible] air power. To not fly the missions or [inaudible] don't let a pilot drop a bomb and hope that my presence is [inaudible].

One of the consequences of that would be, I would suggest, [inaudible] more soldiers and marines get killed. More civilians will be caught in the crossfire [inaudible]. So it's a balancing act. If General McChrystal does something like that, we'll see what happens three and six months from now, how much has air really been changed, and what's the impact to the people on the ground.

Having been on the delivery side, I will assure you that it's never an easy decision to hit the pickle button and pull the trigger. You never want to harm a civilian [inaudible]. You just don't. And you're doing everything within your capability to prevent shooting the wrong ones. To the point of putting you and your plane in some very demanding situations [inaudible].

Grant: Thank you very much.

END TEXT