S. HRG. 111–1067

THE INTEGRATION OF UNMANNED AIRCRAFT SYSTEMS (UASs) INTO THE NATIONAL AIRSPACE SYSTEM (NAS): FULFILLING IMMINENT OPERATIONAL AND TRAINING REQUIREMENTS

FIELD HEARING

BEFORE THE

SUBCOMMITTEE ON AVIATION OPERATIONS, SAFETY, AND SECURITY

OF THE

COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION
UNITED STATES SENATE

ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

SEPTEMBER 13, 2010

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ONE HUNDRED ELEVENTH CONGRESS

SECOND SESSION

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THE INTEGRATION OF UNMANNED AIRCRAFT SYSTEMS (UASs) INTO THE NATIONAL AIRSPACE SYSTEM (NAS): FULFILLING IMMINENT OPERATIONAL AND TRAINING REQUIREMENTS

MONDAY, SEPTEMBER 13, 2010

U.S. SENATE,
5SUBCOMMITTEE ON AVIATION OPERATIONS, SAFETY, AND SECURITY,
COMMITTEE ON COMMERCE, SCIENCE, AND TRANSPORTATION,
Grand Forks, ND.

The Subcommittee met, pursuant to notice, at 8 a.m. in the Red River Valley Room of the Memorial Union, University of North Dakota, Grand Forks, North Dakota, Hon. Byron L. Dorgan, Chairman of the Subcommittee, presiding.

OPENING STATEMENT OF HON. BYRON L. DORGAN, U.S. SENATOR FROM NORTH DAKOTA

Senator DORGAN. We will call the Committee hearing to order. Good morning to all of you. This is a formal hearing of the Commerce Committee of the U.S. Senate. I'm Senator Byron Dorgan, I chair the Aviation Subcommittee of the Commerce Committee. I'm joined by my colleague from the House side, Earl Pomeroy. Congressman Pomeroy is in town today and I invited him to join me at this hearing.

The hearing is about the subject of unmanned aerial vehicles, and most particularly, the issue of training and operations for UAVs in this region. Grand Forks and this region of North Dakota is slated to become a major UAV center. We will have the Predators and the Global Hawks. We'll have fleets of Global Hawks and Predators stationed here at the Grand Forks Air Force Base. We have Homeland Security, which flies UAVs here. The University of North Dakota Center for Aerospace Science is designated by law and in the DOD descriptions as the center for UAV research. I did that because we fly unmanned aerial vehicles in all kinds of weather, and I had visited Nellis and Creach a number of times and discovered they do quite well when it's warm, flying over desert sand, but they'll be flying them in other areas of the country as well, and the world, and having a center for research of UAVs here, connected to the Air Force and the University of North Dakota, one of the—probably the preeminent aviation school in the world, just made a lot of sense.

So, from that understanding, the question is, what kind of training capability exists in this region for the fleets of Unmanned Aerial Vehicles that will be here in the future? This really is an excellent location for perfecting and developing the rules and procedures necessary to allow unmanned aircraft to operate routinely in the national air space beside manned aircraft. We understand that there are commercial airlines and there's general aviation, and I have previously flown as well. We're not interested in doing anything that would in any way diminish safety in the skies for others who fly in those skies.

At the same time, we also understand that UAVs are going to be a significant part of our future and the opportunity to work collectively to find ways to operate them safely in the airspace of our country is very, very important.

Here at the University of North Dakota, at the Center for Research for UAVs, there's a lot of work going on, on sensitive technologies and radar and so on, on just this very subject. About a year ago, February 16, 2009, we met in this room, not in a hearing, but in a roundtable discussion, and we had a very substantial discussion about what needed to be done and the timelines to do it, in which to create routine training and operation capability for UAVs here in this region. We had the Air Force and the FAA talk about creating a working group, and from that meeting, a working group was created and has been working between then and now.

One of the reasons I wanted to have this hearing is to try to understand where are we with this working group, have we met time deadlines or time sensitive needs in order to get to where we want to be? And if not, how do we begin to meet those requirements? The FAA has one set of responsibilities and the Air Force another, and yet merging both in an understanding that what we need and what we can do to provide at the same time that we train and provide operational capability for UAVs, we can and will assure that there is safety in the national airspace, that it is not diminished at all as a result of this integration.

So that's the purpose of this hearing, to try to understand what has happened since February of last year, what's going to happen going forward, and what can we expect for the capability of the Air Force and the FAA to reach agreement on the capability and training that we know is going to be necessary here when we get fleets of Predators and Global Hawks.

Let me call for a brief moment on my colleague, Congressman Pomeroy, for an opening statement. We have witnesses that I will then describe and we'll proceed. Congressman Pomeroy, thank you for being here.

STATEMENT OF REPRESENTATIVE EARL POMEROY, CONGRESSMAN FROM NORTH DAKOTA

Representative POMEROY. Thank you, Mr. Chairman, I'll be very brief. Thank you for bringing your Subcommittee here. Thank you for your leadership, Senator, on basically the focus this area has shown on the UAV technology. I'm still wrestling the various acronyms, whether we call them UAVs for purposes of this hearing, whether we call them remote-piloted aircraft, whatever we call them, we are, I think, focused like no other place in the country,

bringing together a variety of assets that we have here, the Air Force Base, the University and an awful lot of open sky, to have a sustained focused area that this 21st Century flight technology, which will be broadly incorporated into how this Nation functions by the end of the century. We are on the cutting edge and we intend to flesh it out.

You know, 19 months have passed since the productive launch we had of these discussions in this room. I don't see an awful lot of accomplishment for it. It looks to me like we're kind of at a standoff where the Air Force is not really allowed to operate these things in an integrated Air Force capacity. And by the way, a request for a restricted airspace isn't going anywhere. And so, to me it's a Catch-22, it has got things pretty well locked in place.

So I—Senator, I'm very pleased that you convened this hearing today, and we look forward to seeing what—maybe there's more underneath the surface than I'm aware of, but I think this thing needs a good solid shove to get things back on track.

Thank you, Senator.

Senator DORGAN. Thank you very much. It is the case that not enough progress has been made, and the question is, how will more progress be made in the future and what can we expect, and that's the purpose of calling this meeting. I would not have had a hearing had I felt that we were on track, that there is a required urgency to it, and that we would meet expectations. But because that has not been the case, I wanted to have this hearing to put on the formal record these matters.

And I recognize this is not the easiest thing in the world to do. I recognize there are very substantial issues here, but we need to solve this, and it's going to require, I think, some real focus to do so.

We are joined by Mr. Hank Krakowski, the Chief Operating Officer of the Air Traffic Organization of the FAA. He is accompanied by Mr. John Allen, Flight Standards Service at the FAA. David Ahern is the Director of Portfolio Systems Acquisition at the Office of the Secretary of Defense. Major General Marke Gibson, Director of Operation at the Air Force. And Brigadier General Leon Scott Rice, Co-Chairman of the Air Force and Air National Guard National Airspace and Range Executive Council. Let me say that again, National Airspace and Range Executive Council of the National Guard Bureau.

We appreciate all of you coming and appreciate the fact that I started this hearing early, and that's because it turns out the U.S. Senate, which is not the best planning unit in America, decided to have votes this afternoon. And so, I'll have to be on an airplane to go back and cast votes, and your willingness to get up at 8 in the morning is appreciated.

Mr. Krakowski, you were with us a year and a half ago in this room. Let me ask all of you, if I might, to say—I would say that your entire record—your entire statement will be part of the permanent record, and I will ask you to summarize your testimony.

Why don't we begin with you, Mr. Krakowski, on behalf of the FAA. If you can tell us where we've been, where we're going, and what we can expect from the FAA.

STATEMENT OF HANK KRAKOWSKI, CFO, AIR TRAFFIC ORGANIZATION; ACCOMPANIED BY JOHN ALLEN, DIRECTOR, FLIGHT STANDARDS SERVICE, OFFICE OF AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION

Mr. KRAKOWSKI. Senator Dorgan, Congressman Pomeroy, thank you for asking the FAA to testify here today. I will be speaking on the air traffic issues involving these issues. John Allen is here to talk about flight standards, safety, and air worthiness issues.

Senator DORGAN. Would you pull that microphone closer to you?

Mr. KRAKOWSKI. I'd be happy to do that.

Senator DORGAN. Thank you.

Mr. KRAKOWSKI. The airspace is somewhat of a national treasure, as being part of the FAA, our job is to be stewards of that. So, as we make changes to the airspace, we want to make sure that we do it methodically with all interests, including DOD, DHS, commercial aviation, and general aviation. As you said, they have some equities around it. So, that is a key issue for us.

We've made a lot of progress. Right now, today as we sit here, we have 251 certificates of authorization for unmanned aircraft, 140 of them are DOD related. We have not rejected or denied any DOD COAs in 2010, and we keep moving forward. We've been doing a lot of interesting things in 2010. We supported the Gulf oil spill, the Red River flooding a year ago, and the Haitian earthquake relief operations. We've got some very innovative things going on with the Army in El Mirage, California. We hope to have our first test bed for ground-based sense and avoid in military operations. So, we're moving as quickly as we feel we can, to make things happen.

It should be noted, as you said Senator, that we are currently flying operational missions with unmanned aircraft out of Grand Folks with the Customs and Border Patrol, and those are typically daily missions, weather permitting. We have the tools and the techniques available to allow additional unmanned aircraft operations today, if the machines were available and ready to fly. We think we can use the same techniques that we did with Customs and Border Patrol to make that happen.

The issue that we do have to work—that's going to take some time—is the restricted area, which has been requested, south of Devil's Lake area. And that's going to take a regulatory change, because it is public airspace that we have to transform into restricted airspace. We don't do a lot of that in this country. The restricted areas that exist have been there typically for a long time and they've been quite useful. To create new restricted airspace for hazardous operations, which is the request, does take a process of regulatory change, which includes public comment.

We've been told that we can expect the concept of operations from the Air National Guard, as well as the safety study, which are the two basic requirements to begin working toward that regulatory change, at the end of the month. From that point forward, in order to create the actual restricted airspace would take one to two years to go through the whole public comment period and everything that we need to do, and that's fairly typical. But, by using COAs and temporary flight restrictions, we do think that we will be able to start operations immediately once the machines become

available and the staff is in place to start flying, even before that process is complete. So, if it takes 2 years to get the restricted area done, there's no reason that we couldn't start flight operations before that process is over.

We have to do this deliberatively. These are unusual vehicles to enter into the national airspace system. They were designed for the war theater. And as you know, this is an environment with a multitude of different types of aircraft that we have to deal with. So, we want to be careful, we want to be measured, we want to make sure that we have all the necessary stakeholders onboard with the plan going forward. That includes airline pilots, AOPA, and all the different constituents and we're prepared to do that.

But, one of the real positive things, as we now have in ExCom or an Executive Committee, which David and I serve on, to help be a forcing function to move these issues faster and to move them more efficiently through the system. In our opinion, over the last 2 years, we've learned a lot. We've learned how to work with each other better, and I think as time goes on, we'll be able to have a more accelerated, better working relationship to move these things faster and more efficiently than we have in the past. So, it's a learning process, it's a new type of vehicle which has certain limitations that we have to account for. The FAA is required to do this in a measured fashion.

Thank you.

[The prepared statement of Mr. Krakowski follows:]

PREPARED STATEMENT OF HANK KRAKOWSKI, CFO, AIR TRAFFIC ORGANIZATION; ACCOMPANIED BY JOHN ALLEN, DIRECTOR, FLIGHT STANDARDS SERVICE, OFFICE OF AVIATION SAFETY, FEDERAL AVIATION ADMINISTRATION

Chairman Dorgan, Senator Conrad, Congressman Pomeroy:

Thank you for inviting the Federal Aviation Administration (FAA) to this hearing. Accompanying me today is John Allen, Director of the Flight Standards Service in the Office of Aviation Safety at the FAA. Together, we have distinct yet related duties in carrying out the FAA's mission to ensure the safety and efficiency of the National Airspace System (NAS). Mr. Allen's organization is charged with setting and enforcing the safety standards for aircraft operators and airmen. My role as the head of the Air Traffic Organization is to oversee the Nation's air traffic control system, to move flights safely and efficiently, while also overseeing the capital programs and the modernization of the system.

As the most complex airspace in the world, the NAS encompasses an average of over 100,000 aviation operations per day, including commercial air traffic, cargo operations, business jets, etc. Additionally, there are over 238,000 general aviation aircraft that represent a wide range of sophistication and capabilities that may enter the system at any time. There are over 500 air traffic control facilities, more than 12,000 air navigation facilities, and over 19,000 airports, not to mention the thousands of other communications, surveillance, weather reporting, and other aviation support facilities. With this volume of traffic and high degree of complexity, the FAA maintains an extremely safe airspace through diligent oversight and the strong commitment to our safety mission.

With regard to unmanned aircraft systems (UAS), the FAA sets the parameters for where a UAS may be operated and how those operations may be conducted safely in the NAS. Our main focus when evaluating UAS operations in the NAS is to avoid any situations in which a UAS would endanger other users of the NAS or compromise the safety of persons or property on the ground. The FAA acknowledges the great potential of UASs in national defense and homeland security, and as such, we strive to accommodate the needs of the Department of Defense (DOD) and Department of Homeland Security (DHS) for UAS operations, always with safety as our top priority.

When new aviation technology becomes available, we must determine if the technology itself is safe and that it can be operated safely. Whether the technology is

to be used by pilots, operators or air traffic controllers, we determine the risks associated with putting that technology into the NAS. Once the known risks are mitigated, we move forward with integration in stages, assessing safety at each incremental step along the way. Unforeseen developments, changing needs, technological improvements, and human factors all play a role in allowing operations within the civil airspace system.

The FAA is using this same methodology to manage the integration of the new UAS technology into the NAS. While UASs offer a promising new technology, the limited safety and operational data available to date does not yet support expedited or full integration into the NAS. Because current available data is insufficient to allow unfettered integration of UASs into the NAS—where the public travels every day—the FAA must continue to move forward deliberately and cautiously, in accordance with our safety mandate.

Because the airspace is a finite resource, and in order for us to carry out our safety mission, the FAA has developed a few avenues through which UAS operators may gain access to the NAS. First, the FAA has a Certificate of Waiver or Authorization (COA) process. This is the avenue by which public users (government agencies, including Federal, state, and local law enforcement, as well as state universities) that wish to fly a UAS can gain access to the NAS, provided that the risks of flying the unmanned aircraft in the civil airspace can be appropriately mitigated. Risk mitigations required to grant a COA frequently include special provisions unique to the requested type of operation. For example, the applicant may be restricted to a defined airspace and/or operating during certain times of the day. The UAS may be required to have a transponder if it is to be flown in a certain type of airspace. A ground observer or accompanying "chase" aircraft may be required to act as the "eyes" of the UAS. Other safety enhancements may be required, depending on the nature of the proposed operation.

The FAA may also set aside airspace for an operator's exclusive use to segregate the dangerous activity or protect something on the ground, when needed. Some of these exclusive use areas are known as Restricted, Warning or Prohibited Areas. The DOD conducts most of its training in such airspace. In order to set aside Restricted or Prohibited Area airspace, the FAA would need to undertake rulemaking to define the parameters of that airspace. This is typically a time-consuming process that would also include environmental reviews that could impact the proposed airspace.

Civil UAS operators must apply for a Special Airworthiness Certificate—Experimental Category to gain access to the NAS. This avenue allows the civil users to operate UAS for research and development, demonstrations, and crew training. The Special Airworthiness Certificate—Experimental Category does not permit carriage of persons or property for compensation or hire. Thus, commercial UAS operations in the U.S. are not permitted at this time.

We are working with our partners in government and the private sector to advance the development of UAS and the ultimate integration into the NAS. First, in accordance with Section 1036 of the Duncan Hunter National Defense Authorization Act (NDAA) for Fiscal Year 2009, Public Law 110–417, the DOD and FAA have formed an Executive Committee (ExCom) to focus on conflict resolution and identification of the range of policy, technical, and procedural concerns arising from the integration of UASs into the NAS. Other ExCom members include DHS and the National Aeronautics and Space Administration (NASA) to capture more broadly other Federal agency efforts and equities in the ExCom. The mission of this multi-agency UAS ExCom is to increase, and ultimately enable routine, access of Federal public UAS operations in the NAS to support the operational, training, developmental, and research requirements of the member agencies. All of these partner agencies are working to ensure that each department and agency is putting the proper focus and resources to continue to lead the world in the integration of UAS.

The ExCom's work has also facilitated the work of the Red River Task Force (RRTF), the interagency working group that was established to work on issues regarding the basing of UAS at Grand Forks Air Force Base (RDR). With the ExCom's work and the RRTF's work running in parallel, the FAA is able to support more easily and fully the DOD's needs at RDR. One of the RRTF's first tasks was to establish two separate tracks for DOD's goals at RDR: one would be an aeronautical proposal that would involve establishment of a new restricted area(s), while the other would be a broader menu of operational options that could be used either as a stand-alone solution or as a layered approach for the operation of UASs at RDR. We have done this in numerous places and continue to streamline the approval process.

Currently, the FAA is working with the DOD to determine and evaluate the scope and details of its operational needs at RDR. In addition, the RRTF has examined

18 option sets that can provide short, mid- and long-term solutions to UAS NAS access at RDR. The FAA continues to be committed to working with the DOD on matters relating to UAS operations at RDR in a manner consistent with our safety mission.

Unmanned aircraft systems are a promising new technology, but one that was originally and primarily designed for military purposes. Although the technology incorporated into UASs has advanced, their safety record warrants caution. As we attempt to integrate these aircraft into the NAS, we will continue to look at any risks that UASs pose to the traveling public as well as the risk to persons or property on the ground. As the agency charged with overseeing the safety of our skies, the FAA seeks to balance our partner agencies' security, defense, and other public needs with the safety of the NAS. We look forward to continuing our work with our partners and the Congress to do just that.

Chairman Dorgan, Senator Conrad, Congressman Pomeroy, this concludes our prepared remarks. We would be pleased to answer any questions you might have.

Senator DORGAN. All right, Mr. Krakowski, thank you very much.

Next, we'll hear from David Ahern, the Director of Portfolio Systems Acquisition at the Secretary of Defense Office.

Mr. Ahern?

STATEMENT OF DAVID AHERN, DIRECTOR, PORTFOLIO SYSTEMS ACQUISITION, OFFICE OF THE UNDER SECRETARY OF DEFENSE, (ACQUISITION, TECHNOLOGY AND LOGISTICS)

Mr. AHERN. Good morning, Chairman and Congressman Pomeroy, thank you very much for the opportunity to be here today. I really do appreciate it. I think as Mr. Krakowski said, it's going to be a learning opportunity for us, as we press forward in addressing the requests for airspace access.

As was mentioned earlier, I have submitted the written testimony. As a summary to where I stand or where my role is, as one of the members of the ExCom with Mr. Krakowski, we have stood up the ExCom, and we have the access plan completed by the working group in review now. We expect to deliver in accordance with the legislation, next month, in October. It has been done collaboratively between the FAA and the other two members of the ExCom: DHS, who has signed off on it, and NASA. We're in the review process now. I have reviewed it. It's a good document. It has both the framework for moving forward to gain access to the airspace in a measured and responsive way, as Mr. Krakowski mentioned. And then there is a second part of it, which is a DOD site transition plan, which indicates the kinds of UASs that we're going to want to operate: the Army, Navy, the Air Force, and the Marines. In many of the states in the United States, as we go forward between now and 2015, so I think that you will find it a comprehensive document that shows where we are, how we're going to move forward with the FAA toward the airspace access, and then where across the country the Army, Navy, Air Force, and Marines are going to be basing their UASs and have need of training.

And as you may be aware, the Department, and the FAA signed a Memorandum of Agreement in 2007 that initiated this process. That was followed in the Department with a stand up of a UAS Task Force, which I chair, and that's the reason that I'm one of the DOD members of the ExCom. One of my roles as the Chair of the UAS Task Force, which was set up with a number of different purposes, one of which very definitely is that we get airspace access.

And we have been working on that—in that area toward, again, the measured process through the framework, which includes, as Mr. Krakowski mentioned, at El Mirage that we now have a COA in the operating area for—based on ground surveillance—the search—I'm having a moment here—but the ground-based—sense and avoid, which is a first step. And we're looking forward in other areas along that same way, the ground-based sense and avoid. There's a Marine base in North Carolina, Cherry Point which is looking to do the same. The Air Force has a same sort of process, at Cannon Air Force Base on that technology, as we move forward. As I said, I think that this opportunity here at Grand Forks to work toward solution to the request for the airspace is very important to us.

I would close with saying that we have made significant progress in establishing a working relationship through the ExCom, and as we go forward, I expect that we will move in that area in a measured way, to ensure that we are able to afford the operators, the pilots of the UASs, the opportunity that they're going to need in the United States to do the training in support of their combat mission, while also ensuring that we are operating safely in the airspace.

Thank you very much, sir. I'm ready for questions.

[The prepared statement of Mr. Ahern follows:]

PREPARED STATEMENT OF DAVID AHERN, DIRECTOR, PORTFOLIO SYSTEMS ACQUISITION, OFFICE OF THE UNDER SECRETARY OF DEFENSE (ACQUISITION, TECHNOLOGY AND LOGISTICS)

Senator Dorgan, Senator Conrad, Congressman Pomeroy, and distinguished guests: thank you for the opportunity to update you and the people of North Dakota on the progress of the UAS Executive Committee's efforts to advance the integration of Unmanned Aircraft Systems into national airspace.

As you are aware, Section 1036 of the 2009 Duncan-Hunter National Defense Authorization Act, the U.S. Congress recommended that the DOD and the FAA form an Executive Committee (ExCom) to act as a focal point for resolution of issues on matters of policy and procedures relating to UAS access to the National Airspace System (NAS). The sense of Congress was that progress has been lagging in the integration of UAS into the NAS for operational training, operational support to the Combatant Commanders, and support to domestic authorities in emergencies and natural disasters. Additionally, the NDAA language suggested that techniques and procedures should be rapidly developed to temporarily permit the safe operation of public UAS within the NAS until more permanent solutions can be developed or identified.

The UAS Executive Committee (ExCom)

In response to the 2009 NDAA language, the Deputy Secretary of Defense and the Deputy Secretary of Transportation agreed to form a multi-agency executive committee to:

1. Act as a focal point for the resolution of pertinent UAS issues between the DOD and the FAA; and

2. Identify solutions to the range of technical, procedural, and policy concerns arising in the integration of UAS into the NAS.

In addition, the Deputy Secretaries agreed to expand the membership of the Executive Committee to include the Department of Homeland Security and the National Aeronautics and Space Administration, which after DOD, represent the two largest stakeholders in Federal UAS operations.

Membership in the ExCom consists of two representatives each from the Department of Defense and the Federal Aviation Administration, and one representative each from the Department of Homeland Security and NASA. DOD representation consists of the executives from of the two major organizations charged with oversight of UAS issues: The DOD Policy Board on Federal Aviation, represented by Act-

ing Executive Director Steven Pennington, and the OUSD UAS Task Force, which I chair.

The first meeting of the ExCom was in October of last year, and we have continued to meet approximately bi-monthly since. One of our first tasks was to create a Charter to outline how we are organized and how we would coordinate our efforts and report on progress. I'm pleased to report that Charter has been finalized and is currently being signed by the Deputy Secretaries of the three departments, as well as the NASA Administrator. Contained in that Charter are the four key goals of the ExCom:

Goal 1. Coordinate and align efforts among key Federal Government agencies (FAA, DOD, DHS, and NASA) to ultimately achieve routine safe Federal public UAS operations in the National Airspace System.

Goal 2. Coordinate and prioritize technical, procedural, regulatory, and policy solutions needed to deliver incremental capabilities.

Goal 3. Develop a plan to accommodate the larger stakeholder community, at the appropriate time.

Goal 4. Resolve conflicts among Federal Government agencies (FAA, DOD, DHS, and NASA), related to the above goals.

With our goals identified, we of course have not waited on Charter signature to begin work. At our very first meeting, we stood up a Senior Steering Group to manage the activities of the ExCom, primarily through the establishment of Working Groups that are chartered to tackle specific issues that relate to increased NAS access for Federal public UAS. To date, two Working Groups have been established: The first Working Group is tasked to improve the FAA's Certificate of Authorization (CoA) process that authorized UAS flight in national airspace; and the second Working Group is charged with creating a National Airspace Access Plan for Federal public UAS.

While there is significant work being done to both optimize the CoA process, and to minimize the operational restrictions that encumber UAS operations conducted under CoAs, you asked specifically for an update on the National Airspace Access Plan. I will thus focus the remainder of my statement on that plan.

The ExCom NAS Access Plan

The NAS Access Working Group was initiated by the ExCom SSG in December of 2009, and first met in late February of this year. Since then, they have worked to develop a process by which the ExCom member agencies will first identify and prioritize their access requirements; and subsequently how the NAS Access Working Group will analyze those requirements to determine viability and applicability of potential approaches to address them. That process has been captured in a joint NAS Access Plan that is designed to address the requirements laid out by Congress in Section 935 of the 2010 NDAA. That Plan is tasked to the Secretaries of Defense and Transportation, and was tasked to include:

1. A description of how the DOD and FAA will work together to expand NAS access for UAS;

2. Milestones for expanded access, and a Transition Plan for DOD UAS sites programmed for 2010–2015;

3. Policy recommendations for UAS access policies, standards, and procedures; and

4. The resources required to execute the above.

Task 1 was addressed through the creation of the ExCom, as reported to Congress in April of this year. The remaining tasks were designed to be captured in the NAS Access Plan, or the separate Department of Defense Transition Plan. Both of these documents will be finalized and submitted to Congress in October of this year.

The NAS Access Plan is a joint document, submitted to Congress by the Department of Defense on behalf of the Departments of Defense and Transportation. The Plan was reviewed and coordinated with the Department of Homeland Security. As previously mentioned, the NAS Access Plan is largely process-focused, providing a "roadmap" of how the ExCom member agencies will work together to identify and address common NAS access requirements for Federal Public UAS. The Plan also contains joint recommendations from member agencies for specific policy, regulatory, procedural, and technological approaches to addressing the increasing needs for access on a permanent basis.

The NAS Access Plan also includes a recommendation from the Department of Defense to establish a broad-based framework that categorizes groups of airspace

needs into potential solution sets. This framework is currently being adopted by the DOD, and forms the basis for the Department's own Airspace Integration Plan.

Partnered with the NAS Access Plan is the DOD Site Transition Plan, which describes the Department of Defense's intended implementation of NAS access approaches at bases that have existing or programmed UAS activities between now and 2015. Also based on the DOD's common airspace integration framework, the Site Transition Plan identifies the required level of capability, the planned approach, and the intended implementation of UAS NAS access at over a hundred locations across the US. The Site Transition Plan is currently being coordinated with the Services for validation of locations, priorities and timelines, and we expect to have it finalized in early October.

It is important to note that the schedule contained in the DOD Site Transition Plan is greatly dependent upon the rapid approval and adoption of policies, regulations, procedures, and technology to meet the NAS access requirements identified by the ExCom member agencies. Without rapid progress on NAS Access Plan initiatives, the milestones contained in the Site Transition Plan entail significant schedule risk.

Conclusion

In closing Mr. Chairman, I'm pleased to report steady progress in the advancement of NAS access for Federal public UAS. The establishment of the ExCom, and subsequent work by its Senior Steering Group and associated Working Groups, has already borne fruit in greatly improved relationships and communication at the appropriate levels of each member Department or agency. We have seen measurable improvement in many existing UAS access process, and look forward to upcoming reductions in some of the operational restrictions placed on UAS today. The creation of the NAS Access Plan, and accompanying DOD Site Transition Plan, represents a significant milestone in inter-agency cooperation. While we recognize that there is much work to be done, the outlook for improvement in routine NAS access has never been brighter.

Thank you for the opportunity to testify before the Committee. I would be happy to answer any questions you and the members of the Committee may have.

Senator DORGAN. Mr. Ahern, thank you very much.

Major General Marke Gibson. General Gibson, is your title just Director of Operations, Air Force?

Major General GIBSON. Sir, it's Director of Current Operations and Training——

Senator DORGAN. Thank you.

Major General GIBSON.—at the Headquarters Air Force.

Senator DORGAN. You may proceed.

STATEMENT OF MAJOR GENERAL MARKE GIBSON, DIRECTOR OF OPERATIONS, DEPUTY CHIEF OF STAFF FOR OPERATIONS, PLANS AND REQUIREMENTS, HEADQUARTERS U.S. AIR FORCE

Major General GIBSON. Sir, with your indulgence, I have prepared comments to begin my testimony.

Senator DORGAN. Yes.

Major General GIBSON. Chairman Dorgan, Representative Pomeroy, and members of the Subcommittee, I thank you for this opportunity to speak with you today on this matter of pressing military and national concern and for today's purpose, remotely piloted aircraft.

I must first express my personal thanks and that of both my Air Force Secretary Donnelly and Chief Schwartz, to you and your staffs for your unwavering support of the basing of Global Hawk and Predator in North Dakota. As you are aware, both of these systems are critical to our operations in Iraq and Afghanistan. And as we speak, the men and women of the North Dakota Air National Guard are flying Predators and providing our commanders with in-

valuable intelligence and combat capability from here in North Dakota.

RPAs are now playing and will continue to play a key role in our Nation's defense and homeland support missions. These systems were developed over the last 15 years, with now over 1 million hours of operations, of technology—involving technology development and operational experience, all the while held to the same exacting Air Force safety standards of manned aircraft.

Since 9/11, the Air Force RPA experience has been one born of necessity. The majority of our experience and program development has resulted directly from combat operations in Iraq and Afghanistan. That experience has produced the most accomplished and combat-capable RPA force in the world. In our support to the war fighter, the Air Force has been successful in providing training opportunities and operating airspace at selected sites. Our challenge now, as we expand and normalize RPA force, is to provide our RPA operators local training environments that will sustain and hone their skills as they remain available for both defense and homeland support missions at a moment's notice. Concurrently, this will enable us to drive the technology and further improve safety.

Historically, new weapon systems have been developed and matured in parallel with the test and training space required to support that development. This is currently progressing in such a way with the F–35 and F–22. But as you know, this was not the case with RPAs due to the fundamental disconnect between unmanned system and FAA guidance and policy that couldn't have anticipated such a technological leap. As we have seen in the RQ–4 Global Hawk at Beale Air Force Base and MQ–1 Predator at Cannon Air Force Base, hard work and cooperation between the Air Force and the Federal Aviation Administration has shown progress in providing access for RPAs to special use air space and the national airspace system. Nonetheless, I believe we all agree that collectively we have not achieved the normalized and routine access that was envisioned at the February 2009 Grand Forks meeting and that underpins the mission of the Red River Operations Workgroup.

Since then, the Air Force has worked with the FAA to develop new models of operations that challenge convention and explore procedural options and leverage technology. Everyone understood it was a difficult task and that old paradigms were subject to challenge. To that end, the Air Force in cooperation with the University of North Dakota, the National Air and Space Administration, the Air Force Weather Agency, and others, have diligently provided significant amounts of data and research to support the effort. As a result, the area west of Grand Forks Air Force Base is perhaps the most completely and accurately characterized airspace for developing testing RPA access to the NAS.

Admittedly, with any new endeavor, there has been no shortage of challenges. The original vision that would enable independent operations in a military operating area, without technical mitigation, is not currently available. It is evident that the technology component of a solution would require additional years of analysis and could still provide a less than optimum operating environment for training. It is our recommendation therefore, that a baseline certification of air traffic control radars for separation, combined

with the analysis and other mitigations captured by the workgroup, be a first step. The goal is to provide North Dakota with an exceptional degree of access to non-segregated airspace. However, in the interim, we recommend a solution based on the current tools we have, such as restricted airspace.

The current aeronautical proposal of restricted airspace, designed for climb and transit to airspace over Camp Grafton, we think meets safety requirements and is compatible with MQ–1 performance and given your North Dakota weather.

Over the last 2 years, working with the FAA's Minneapolis Center on Central Service Area, this proposed airspace was voluntarily scaled back by us to the minimum required to support the basic MQ–1 pilot and sensor training. This reduction balances Air Force training requirements with FAA policy and minimizes the impact to other aviation assets. It should also be noted that it contains a sunset provision to divest the climb and transit airspace as soon as other technical means are introduced, such as our ground-based sense and avoid efforts. This aeronautical proposal is partly through the rulemaking progress, and if given priority, could be ready for flight operations somewhere around January of 2012.

In closing, your Air Force recognizes that RPA technology has, and will continue to play, a key role in our Air Force's efforts to help defend a nation and our ability to respond to emergencies. In fact, 35 percent of our aircraft acquisition over the next 5 years is programmed to be unmanned. We have, and will remain, dedicated to safe RPA operations as we continue to develop the technology and our operational concepts. We look forward to working with the FAA, the Air National Guard, and our political leadership to enable RPA operations now and into the future.

Thank you, I look forward to questions.

[The prepared statement of Major General Gibson follows:]

PREPARED STATEMENT OF MAJOR GENERAL MARKE GIBSON, DIRECTOR OF OPERATIONS, DEPUTY CHIEF OF STAFF FOR OPERATIONS, PLANS AND REQUIREMENTS, HEADQUARTERS U.S. AIR FORCE

Chairman Dorgan, Ranking Member DeMint, distinguished members of the Subcommittee; I am grateful for the opportunity to appear before you today to discuss an issue of true National Security, the integration of remotely piloted aircraft (RPAs) into the National Airspace. The Air Force is working diligently to advance standardized, procedural and technical solutions that provide all families of RPAs safe and routine access to the National Airspace System.

Following 9/11, these aircraft were rushed to war and the vast majority of our experience and program development has resulted from combat operations in Iraq and Afghanistan. That experience has produced the most accomplished and combat capable RPA force in the world. In our effort to support the warfighter, the Air Force has been successful in providing training opportunities and operating space at selected sites. Our challenge now, as we expand and normalize the RPA force, is to provide these battle-tested operators local and regional test and training environments that will sustain and hone that combat edge so they remain available to our Combatant Commanders at a moment's notice. Concurrently, this will enable us to drive technology and improve safety.

Historically, new weapon systems have been developed and matured in parallel with the test and training space required to support the mission. That is currently progressing in such a way with the F–35 and F–22. Progress toward access for unmanned systems has been slower. As we have seen with the RQ–4 Global Hawk at Beale AFB and MQ–1 Predator at Cannon AFB, hard work and cooperation between the Air Force and Federal Aviation Administration has shown progress, in providing access for RPAs to Special Use Airspace and the National Airspace System. Nonetheless, I believe we all agree that collectively we have not achieved the normalized

and routine access that was envisioned at the February 2009 Grand Forks meeting and underpins the mission of the Red River Operations Workgroup.

Since the 2009 Grand Forks meeting, the Air Force has worked with the FAA to develop new models of operations that challenge convention, explore procedural options, and leverage technology. Everyone understood it was a difficult task and that old paradigms were subject to challenge. To that end, the Air Force, in cooperation with the University of North Dakota, the National Air and Space Administration, the Air Force Weather Agency, and others, has diligently provided significant amounts of data and research to support the effort. As a result, the area west of Grand Forks Air Force Base is perhaps the most completely and accurately characterized airspace for developing processes and technologies that enable routine RPA access.

Admittedly, as with any new endeavor, there have been delays and difficulties. Air Force and Air National Guard struggled with completing a Concept of Employment document. Used elsewhere in efforts to provide RPAs limited access to the National Airspace System, this document, by its nature and intent, relies on detailed descriptions and implementation strategies of mitigations and methodologies designed to achieve access at a specified location. In Grand Forks, our direction was to explore a wide range of solution sets and provide near term alternatives for effective training; as such, the Concept of Employment does not fit easily in that paradigm. We have delivered final draft to the FAA and continue to work with them and Air National Guard to craft a final product that meets the technical demands as well as the spirit of the Red River effort.

It has become apparent that the original vision for a wide-area solution that would enable independent operations in Military Operating Areas without technical mitigations is not immediately available. The technology components of the solution set routinely require years of analysis and provide an operating environment that is less than optimum for training. It is our recommendation that a system-wide, baseline certification of Air Traffic Control Radars for separation assurance combined with the data, analysis and other mitigations captured by the workgroup will provide North Dakota an exceptional degree of access to non-segregated airspace.

In the interim, there are a number of promising options that provide a target level of safety. We are exploring these options with the FAA.

We will continue to work with the Federal Aviation Administration, the Air National Guard and our political leaders to enable Remotely Piloted Aircraft operations throughout North Dakota.

This proposed standardized and templated solution for Air Force access to airspace in North Dakota represents an important step toward meeting the eventual needs of education, commercial and other governmental organizations as unmanned capabilities continue to expand.

Thank you for the opportunity to be here today. I look forward to your questions.

Senator DORGAN. General Gibson, thank you very much.

And finally we'll hear from Brigadier General Leon Scott Rice, Co-Chairman of the USAF and Air National Guard Airspace and Range Executive Council.

General Rice, thank you for being with us.

STATEMENT OF BRIGADIER GENERAL L. SCOTT RICE, CO-CHAIRMAN, USAF/ANG NATIONAL AIRSPACE AND RANGE EXECUTIVE COUNCIL, NATIONAL GUARD BUREAU

Brigadier General RICE. Chairman Dorgan, thank you, as well, and Representative Pomeroy, I thank you for this opportunity to provide a few remarks on behalf of all those serving in the Air National Guard.

I'd like to really start with my sincere appreciation of what you two have done for the Air National Guard. Your recent visit, sir, this past spring to the deployed Guardsman in Kosovo has been tremendous. Sir, your support in 2005 of that Iraqi soldier that provided defense for our own Guardsman at risk of his own life was breathtaking. So, we're pretty impressed with your support of the Air National Guard and the National Guard in general, and, as you know, citizens within our own community.

The Air National Guard anchors the Total Force team though, proving trained and equipped personnel to protect domestic life and property, preserve peace and order and public safety, as well as provide capabilities to our overseas contingency operations. Currently we have about 13,000 Air National Guard members deployed to Iraq, Afghanistan, and other regions throughout the world.

At 16 alert sites, 3 air defense sectors, the Northern Command has about 1,200 Guard Airmen standing watch over American skies today—24 hours a day, 365 days a year. And, amazingly, about 75 percent of our deployed Airmen—75 percent—are all volunteers, and about 60 percent are on their second or third tours and rotations to combat zones since 9/11.

The face of aviation has certainly, irrevocably changed with the entry of remotely-piloted aircraft into the mainstream of our warfighter support and combat ops. The Air National Guard is on the frontline of this new and emerging capability. And our ability to meet the demand of Combatant Commanders, and warfighters and, as well, concurrently, the domestic response, requires a flexible National Airspace system that facilitates the training of our Airmen.

Today, the Air National Guard operates Remotely Piloted Aircraft in six states and represents 25 percent of the current ops over in Iraq and Afghanistan. So, over the last 2 years, the Air Force has increased the number of remotely piloted aircraft fielded by about 330 percent. This rapid growth is outpacing, significantly, our training pipelines, and exponentially increasing our need for home station training. As more sites come online around the country, we will need effective and safe solutions to place these vehicles in transit, concurrently, with other platforms through the National Airspace System.

The National Guard Bureau stands ready to work with the Federal Aviation Administration, the Air Force, State and local officials, as well as the universities here in North Dakota to examine solutions and meet the training needs of our Airmen.

Thank you, sir, thank you both, and I look forward to any questions you might have.

[The prepared statement of Brigadier General Rice follows:]

PREPARED STATEMENT OF BRIGADIER GENERAL L. SCOTT RICE, CO-CHAIRMAN, USAF/ANG NATIONAL AIRSPACE AND RANGE EXECUTIVE COUNCIL, NATIONAL GUARD BUREAU

Chairman Dorgan, Ranking Member DeMint, distinguished members of the Subcommittee; I appreciate the opportunity to appear before you today to discuss the integration of unmanned aerial systems into the National Airspace. The National Guard continues to work to develop a safe and secure program for Predator and Global Hawk training within the continental United States.

The Air National Guard anchors the Total Air Force team, providing trained and equipped units and personnel to protect domestic life and property; preserving peace, order, and public safety; and providing interoperable capabilities required for Overseas Contingency Operations. The Air National Guard, therefore, is unique by virtue of serving as both a reserve component of the Total Air Force and as the air component of the National Guard.

By any measure, the Air National Guard is accessible and available to the Combatant Commanders, Air Force and our Nation's Governors. Currently, the Nation has over 13,000 Air National Guard members deployed in Iraq, Afghanistan, and other overseas regions. At 16 alert sites, 3 air defense sectors, and Northern Command, 1,200 Guard Airmen vigilantly stand watch over America's skies. Amazingly,

75 percent of our deployed Airmen are volunteers, and 60 percent are on their second or third rotations to combat zones.

In the past year, Air Guard members helped their fellow citizens battle floods, mitigate the aftermath of ice storms, fight wild fires, and provide relief from the devastating effects of a tsunami. Early in the year, Guard members from Kentucky, Arizona, and Missouri responded to debilitating ice storms, which resulted in the largest National Guard call-up in Kentucky's history. Last spring, North Dakota, South Dakota, and Minnesota Air National Guard members provided rescue relief and manpower in response to Midwest flooding. In September, the Hawaii Air National Guard sent personnel from their Chemical, Biological, Nuclear, Radiological and High Yield Explosive Enhanced Response Force Package (CERFP), a command and control element, and a mortuary affairs team, to American Samoa in response to an 8.4 magnitude earthquake-generated tsunami. These are just a few examples of how the Air Guard provides exceptional expertise, experience, and capabilities to mitigate disasters and their consequences.

The face of aviation has irrevocably changed with the entry of Remotely Piloted Aircraft into the mainstream of warfighter support and combat operations. The Air National Guard is on the frontline of this new and emerging capability. Our ability to meet the demands of the Combatant Commanders, warfighters and growing domestic response needs require a flexible National Airspace framework that facilitates the training of our Airmen.

Today, the Air National Guard operates Remotely Piloted Aircraft in six states and represents approximately 25 percent of the total Air Force capability. This critical Intelligence, Surveillance and Reconnaissance platform is in constant demand by our warfighters and its growth is a top priority for the Department of Defense. In fact, during the past 5 years, we have more than tripled our overall capacity. The Air Force continues to rapidly increase its Intelligence, Surveillance and Reconnaissance capability and capacity to support combat operations. Air Force Intelligence, Surveillance and Reconnaissance provides timely, fused, and actionable intelligence to the Joint force, from forward deployed locations and globally distributed centers around the globe. The exceptional operational value of Air Force Intelligence, Surveillance and Reconnaissance assets has led Joint force commanders in Iraq, Afghanistan, and the Horn of Africa to continually increase their requests for these forces. Over the last 2 years, the Air Force increased the number of remotely piloted aircraft fielded by 330 percent. This rapid growth rate is outpacing our training pipelines and exponentially increasing our need for home station training. As more sites come online around the country, we will need effective and safe solutions in place for transiting National Airspace.

Remotely Piloted Aircraft have a defined requirement and a need for equal access to the National Airspace System to meet mission training. The Federal Aviation Administration has defined what types of airspace these assets are currently able to operate within as restricted areas, warning areas and non-joint use Class D airspace. The preferred lateral dimensions for Remotely Piloted Aircraft Operating Space are 50 nautical miles by 100 nautical miles with a minimum of a 5,000 foot altitude block below 18,000 feet. A minimum of five nautical mile "cylinder" of airspace is required over Air-to-Ground Range impact areas for air-to-surface laser operations and weapons deliveries. Minimally, Remotely Piloted Aircraft can operate within a lateral dimension of 20 nautical miles by 20 nautical miles within a 5,000 foot altitude block below 18,000 feet. The Remotely Piloted Aircraft will use the Operating Space to train with other air and ground assets to accomplish the missions of both assets.

We stand ready to work with the Federal Aviation Administration, the Air Force and state/local authorities as they examine solutions for meeting the training needs of our Airmen.

The men and women of the Air National Guard greatly appreciate the cooperation and support you have provided in the past and look forward to working with you as we meet today's challenges.

Thank you for the opportunity to be here today. I look forward to your questions.

Senator DORGAN. General Rice, thank you very much.

Let me go through a list of questions that I will try to put on the record, here, what I see as some of the difficulties.

My understanding is that the FAA says the Unmanned Aerial Vehicles at Grand Forks cannot train in regular airspace, that would be the FAA's position—you correct me if I'm wrong, Mr. Krakowski, because of current regulations. The Special Operations

indicates UAS operations should normally be conducted within restricted areas, that is, the FAA essentially says, "If you're going to train, you have to train in restricted areas," and except for a small box near Camp Grafton for laser operations, which is a restricted area, I believe the FAA has largely opposed—up until this point—establishing restricted air space.

So, let me ask a question. My understanding now is the Air Force is seeking a box, 35-mile by 45-mile box, south of Camp Grafton—that's the Air Force current request. What I'm going to do is take this from the specific local to the national issue. But, my understanding is the Air Force currently is wanting a 35-mile by 45-mile box adjacent to Camp Grafton, south. Is that accurate?

Brigadier General RICE. That's correct, Senator.

Senator DORGAN. And let me ask you—that has come down substantially from what was originally requested, is that correct?

Brigadier General RICE. Yes, sir. To the graphic, we have reduced from the northern box and transit areas, simply to the southern red square and transit to and from the base.

Senator DORGAN. So that's the request, at this point?

Brigadier General RICE. Yes, sir.

Senator DORGAN. All right. And my understanding is the FAA has indicated that's too big, at this point, and the National Guard has said, anything smaller is not acceptable. And let me read if I might from a June 15 submission from the 119th, in Fargo, they indicated that the small restricted area, which is the area for hazardous, where lasers are—the laser activities are allowed—have said that, "This would leave the wing in a position with little recourse to accomplish realistic training for a new mission that is Congressionally-mandated." So, what the 119th is saying is that this box of 35 by 45 miles is what is, what they believe is necessary for training, is that correct?

Brigadier General RICE. Yes, sir, according to Wing Commander Rick Gibney, and the National Guard, that's our position. That picture on there, that 35 by 40 box with a small circle around Camp Grafton is the minimum amount of area.

And this picture doesn't do justice to the request, because there's also a three-dimensional portion of that; it's a 4,000-foot block that can be adjusted down, as well.

But that is the minimum airspace from a God's-eye view, and then you can stratify it and look at the side. There's a 4,000-foot block, up or down.

Senator DORGAN. And where is the current restricted airspace that allows operations with laser training? There is—that's a very small area; where is that?

Brigadier General RICE. Currently, the restricted airspace is a very small circle inside of that circle which is in the box. There's a very small Army range down there, and we're expanding that circle. That circle that you can see, that's cut off at the top in the middle of the box, represents the minimal laser area required for remotely piloted aircraft training.

Senator DORGAN. So, that is currently restricted airspace?

Brigadier General RICE. No, that's not currently restricted. There's a very small area within that, that's currently restricted.

Senator DORGAN. OK, inside of that.

So, the question we're talking about here is the large—the larger box, which is substantially reduced from what was originally requested and required.

Brigadier General RICE. That's correct, sir. It represents about an 80-percent reduction of our original request.

Senator DORGAN. All right.

Mr. Krakowski, my understanding is, you know, I wrote the provision that requires Section 935 of the National Defense Authorization Act. I included that provision which required DOD and FAA to develop a national solution for military U.S. access in the National airspace. It is, I guess, what caused the Executive Committee to be formed.

In the legislation I had requested a report, April 2010, this year—in April of this year—that has not been submitted. But, I understand it will be submitted within the next month, or so, according to you, Mr. Ahern, is that correct?

Mr. AHERN. Yes, sir.

Senator DORGAN. All right.

Now, having created an Executive Committee, having worked on this and understanding what I just described about the requirement for restricted airspace, of the 35 by 45, my understanding of the FAA's position, at this point, is they don't like restricted airspace, and don't want to create restricted airspace. And yet, in your testimony, you talked about how you might create restricted airspace.

So, tell me, if you can, what's your—what the FAA's thinking is on creating restricted airspace, here?

Mr. KRAKOWSKI. OK.

Senator, I think it's a mischaracterization to say that we don't want to try to work a restricted airspace solution out here. We're ready to move on that path. We're waiting for those two issues that I talked about, the final concept of employment, and the safety study that needs to be submitted to us, so we can start moving that forward. Again, that is a one- to two-year process of public comments and all of the different regulatory things, and docket issues that you have to deal with to create that.

Senator DORGAN. But how—sorry to interrupt you, but you're waiting for two things, when might you expect to receive that, before you begin a process that will take another couple of years, at least?

Mr. KRAKOWSKI. I understand within a month. That's my understanding, although I'll ask the DOD to respond to that.

Major General GIBSON. Sir, it's my understanding it's ready to be submitted.

Senator DORGAN. All right. Let me, then—I interrupted you, but can you tell us, if you begin to proceed in a rulemaking for restricted airspace, what's the minimum and maximum time you would expect that to take?

Mr. KRAKOWSKI. One to two years, going through all of the different comment processes and docket processes that you have to go to do that.

Senator DORGAN. Is it the desire of the FAA to move in that direction?

Mr. KRAKOWSKI. Absolutely. We consider any submission as a request that we take seriously, and want to move forward through the process appropriately.

In fact, I want to commend DOD and the Air Guard for taking that larger hunk of airspace that was first proposed, and scaling it down to something that they can use, without capturing too much airspace from the other users in the system. I think this is going to be helpful in moving this forward in a more positive vector.

Senator DORGAN. And if restricted airspace is not accomplished by the time we have the bed-down of Global Hawks, or Predators, here, how would you anticipate the training and operations be made available in front of a time when restricted airspace is made available?

Mr. KRAKOWSKI. I think I'll ask the DOD to talk about the training impacts.

We can fly the missions now, using the Customs and Border Protection techniques to get up into what we call Class A airspace. There are abilities to actually do some training. Now, it doesn't satisfy the requested needs of the Air Guard and the Air Force and DOD at this time. Obviously, once we get the restricted airspace in place, we'll be able to do that.

But, to the extent that some training could be done, literally, now if the machines were available, we think that we could start moving it forward.

Senator DORGAN. You know, I've worked a lot with the FAA, including the new administrator, and have a lot of respect for the FAA. But, the one thing that seems to me to stand out with respect to the FAA is that generally it's very, very hard to meet time deadlines. And I understand, I mean, we're talking about safety and, you know, things that are very serious. But, one of my concerns is this—if it takes, let's say, 2 years to finish a rulemaking, then let it slide some, because almost everything slides, as far as I'm concerned, with the FAA. And you've got operations necessities here with Global Hawks or Predators, because they're here, and they don't have training capability. My guess is that I'm going to ask the Air Force, is there a disconnect, here, between one—we might get restricted airspace, when that might happen, and the rather minimum training capabilities that would exist under what Mr. Krakowski has just described?

Major General GIBSON. Sir, it's my understanding that as we proceed down that path either, and we term this "restricted airspace," I think in the lexicon, it's some form of segregated airspace. It may end up being the term "restricted," it might be part of the TFR that DHS is currently flying under, but some sort of segregated airspace that we would be able to operate in. That, being tied to the DHS operational hours that they're doing in support of Homeland Security, or being required, initially, to go to 18,000 feet and above to get into the class of airspace, we have a number of concerns with that—both with the aircraft and its ability—if it got into the area out there and had any kind of malfunction, or in fact, the weather dictates it. If we have to go to that altitude, given North Dakota's statistical review, we lose 63 percent of our ability

to fly and train in that environment. Therefore, we're back to asking for lower altitudes to work into transit.

Senator DORGAN. Would you, and perhaps General Rice and Mr. Ahern, describe in layman's terms for people who may wonder, how is it that you can put a vehicle up in the airspace with no pilot in it, anywhere, at any time, and feel that it's not going to diminish the safety with respect to general aviation and commercial aviation? So, I mean, I think I understand the answer to that question, but why don't you describe how that can be accomplished in a way that does not, in any way, diminish safety?

Major General GIBSON. Well, sir, first of all, I mean, there's always some level of risk involved in aviation, but we think this, again, with the experience that we've had, now, flying in fairly dense environments in our combat operations, mixing with other manned assets, I think one of the numbers we threw out were the numbers at Kandahar on an annual basis, approximates the Miami International, the number of traffic counts. And we move our unmanned systems in and out of that airfield without shutting it down, without any special segregation—they move like any other aircraft.

You have several sensors with the vehicle and ability to identify where it is—just like any other aircraft, using transponders to air traffic control, and others you have the sensor ball that you can slew, and help clear the flight path. And we have, as we mentioned, some of the new technology with ground-based sense and avoid, we're actually able to pull into the operator's cockpit, if you will, those radar feeds to give him a sense of what is going on around him in 360 degrees. So, there are a number of ways——

Senator DORGAN. You mentioned operations at Kandahar and that integrates UAVs directly into a very busy airport in which fighter planes and C–130s and all kinds of aircraft are coming in and out? I assume that we have learned an enormous amount, operating UAVs in that region?

Major General GIBSON. Yes, sir. Yes, sir.

Senator DORGAN. And integrating it into airspace control?

Major General GIBSON. And again, we don't shut down and I would also offer, there is also some civil traffic that arrives in and out of that airfield routinely, as well. But we have learned a great deal there, and perhaps even more so as we move into a combat arena, where we're mixing these types of assets—very close proximity to other aircraft that enter there—other manned fighter aircraft—and how to deconflict those and to maintain situational awareness.

Senator DORGAN. Tell us, if you would, what, specifically do you need at this point? As a result of BRAC, we now have, in this region, Global Hawks and Predators coming. Homeland Security is here, of course. What do you need to make sure that you don't have a situation that you have aircraft that you can't train with? And when do you need it?

Major General GIBSON. Well, sir, I think we've stated along with the support of the Guard and as we have operated elsewhere, much like DHS, I think the first step with the FAA to meet everyone's safety concerns is some form of segregated air space. We kind of see this in kind of a three-phased approach, if you will, the first

phase is to segregate them from other known traffic, so that we can guarantee some level of safety and security.

The second portion is work with the FAA and our technology that we're developing forward, to use a ground-based sense and avoid, in other words the ability to see into that airspace with radar and help sanitize the airspace so we can deconflict conflicts early.

And then as we move into the next generation system of air traffic control, beginning to put sensors—kind of a sense and avoid—airborne sense and avoid—system on these platforms that will give them, essentially, an end-game ability to avoid, even if it surpasses the operator.

Senator DORGAN. And I asked, by when do you need these things in place, and are we on track to do all of that?

Major General GIBSON. Sir, I think we have a number of those in place already at some of our other locals. But, as I mentioned earlier, 2012 is our current plan for when we think we'll be prepared to fly predators out of Grand Forks—in early 2012—so a little over a year from now.

Senator DORGAN. Are we on pace to be able to meet the needs for training and for airspace necessary for that training at that point?

Major General GIBSON. Sir, that's kind of a speculative point, I would say we're certainly against the cusp of being able to make that happen as we've outlined our need and the concerns that the FAA has with their processes that they have to go through.

Senator DORGAN. So, let me interpret what you—are you worried that we may not meet that test?

Major General GIBSON. Yes, sir. Yes, in fact I am, and I defer to local Guard position.

Brigadier General RICE. Yes, sir. I definitely think at this point, we're late. If we look at January 2012 as our line in the sand when we require segregated airspace to do training, we're late to need.

If we have a one- to two-year process prior to requesting our concept of employment to get a certificate of operation to operate, with a certificate of operation taking a period of time, as well, anywhere from a few months to 6 months to 9 months, and then, prior to that, we have to have this one- to two-year process, we are late to need if you add those up sequentially.

And sir, I would like to add one more piece. We talked about the minimum required airspace, and we kind of focused in on that box of 35 miles to 45 miles around the laser area and that laser circle. General Gibson alluded to the fact that there are those other two pieces for a total of three, that we need. Not only do we need the launch and recovery element and a piece of that, that has more flexibility than Customs and Border Protection as ours, during the operation, that half-moon around the base itself, but also the transit corridor that is below 18,000 feet, as another segregated piece of airspace to get to the box. So, each one of those components are essential to conduct training operations in North Dakota.

Senator DORGAN. Mr. Ahern, did you want to add to that from the Pentagon's perspective?

Mr. AHERN. I've been listening, and this is a good summary. I think we'll learn a lot about getting the job done, with the FAA—

aside to General Gibson—there is an Air Force plan to move or to develop a ground-based sense and avoid system out here at Grand Forks, he's going to have to look into what its delivery kind of thing is, as we were talking earlier about the clearing out of the segregated area, the data on that.

The other thing I would say is the transit corridor, as well as the operations in the terminal area, along with the framework path that we have set for ourselves, Senator. It is exactly along—the current paradigm is line of sight, chase aircraft, individuals down there with the idea of moving toward ground-based sense and avoid to enable us to clear out—but it takes time. I agree with you, and I agree with General Gibson—that this technology, this way of operating is something that we can envision, but we're going to have to go carefully, to ensure that we don't get out ahead of what we can do. The fact that we have the COAA at El Mirage is just a great first step in the terminal area.

Now, you go to Cherry Point, and as I understand it, we're looking at both the terminal area and small transit area, out to the restricted area. That alone will help us to move smarter, here, at Grand Forks as we move in that direction, but I am sensitive to the time. That we have to—but we have to respect the Nation's airspace. As General Schwartz said, "We're going to get to yes." And I understand the problem, I understand the opportunity—as I said in my opening remarks, we're beginning to learn to work with each other, the FAA, the DOD, closer. Of course, we have a long history with the FAA over the manned fixed aircraft and the rotary wing. But this is a different paradigm in the use of the airspace and developing that rhythm of working with each other is taking some time.

But, we are getting that rhythm together. We have the COAs, we have a special COAA that—I mean, the new one out at El Mirage.

So, to sum up—yes, I see where we are, I see where we're going, it fits into our framework. I understand the Grand Forks timing, and now we have to begin to work on getting there.

Senator DORGAN. Yes. And actually, this then becomes a much larger issue when you talk about the Nation, the future——

Brigadier General RICE. It's an opportunity.

Senator DORGAN.—the, you talk about a third of the airplanes being ordered are UAVs, I mean, we understand that, you know, 20 years from now, we'll look in the rear-view mirror and see that the use of UAVs, integrated into the National Airspace has become routine and very safe.

Mr. Krakowski, no one is pushing the FAA to do something that would diminish, in any way, safety in our Nation's airspace—that's not the point. The point today, however, is that if we are going to, as a result of BRAC, do realignments and missions, and so on, with respect to bases, this base is now, sees all of its tankers gone and we'll see Predators and Global Hawks arrive, and has a need, then, to develop a training space, restricted, segregated—it doesn't matter what you call it—that they have substantially diminished south of Devil's Lake.

The question for me, and the reason I wanted to have this hearing is, are we moving along to accomplish what needs to be done by the time it needs to be done? Or, will we find ourselves in the

year 2012 kind of scratching our heads trying to figure out, "Well, how did we get all of that to happen? We've got the airplanes, and the crews, and so on, but we don't have the capability to do the kind of training we want."

I understand you can do ground observers, and chase aircraft and so on, but I think that is not something that the military believes would work, here, very effectively for the kind of robust training that is necessary.

So, let me now turn to you and then I'm going to turn to my colleague, Congressman Pomeroy.

Mr. Krakowski, you've just heard the circumstances of January 2012. It's now September 2010. And you just described to me, probably a 2-year—if everything works right, you said one to two, but I'm, having worked a lot with the FAA—you've described a 2-year circumstance that takes us into the end of 2012, perhaps the beginning of 2013, and so it seems to me that there's a mismatch, here, of need and capability. Tell me how you see this, because you're working on the Committee to try to find a way to solve it.

Mr. KRAKOWSKI. Yes, sir.

First of all, I agree with General Gibson and his characterization that segregation is the first thing that's practical to do. Ground-based sense and avoid, and the radars that were talked about, is really where we really want to go so we don't have to confiscate airspace and limit operations. The faster that we can learn from El Mirage and do that, the faster we'll be able to move on a much more flexible plan, here at Grand Forks.

The timeframe is tight. Candidly, we're inspecting some of the documents that we are expected to get this month, earlier in the year, and we feel that the delay in getting those documents has been hurtful to making the timeline, but we don't see any reason that once the machines come in here in 2012, that we're not going to be able to operate them, with the caveat that the restricted airspace does take that regulatory time to create. We're going to have to be patient with that, by law there's no practical way that we know of that we can accelerate that, except for us to work as hard as we can.

Using the COAs, and if we can get some ground-sensed radars, or some ground-based sensing in a timely manner, as a mitigation, we can move very quickly. But, we're here and ready to support the mission to the maximum extent possible.

Senator DORGAN. But, what I have heard the military say is that short of restricted or segregated airspace, the kinds of things you have done to accommodate Homeland Security's flights are not robust enough to allow the kind of training that's necessary in that interim period. That's what worries me.

Mr. KRAKOWSKI. Right.

Senator DORGAN. Do you understand that?

Mr. KRAKOWSKI. I don't have a good, regulatory mechanism to confiscate or segregate airspace just by kind of imminent domain. We don't really do that, unless it's a national security issue, directly threatening the homeland, which is what we do with Temporary Flight Restrictions for the President and all sorts of issues like that. Because it is national airspace and we have other uses

involved, we have to go through a process that respects all of those constituents.

We've been working in a lot of areas of the country, and as I said, we have 140 DOD COAs right now, working in our national airspace to facilitate RPAs and unmanned aircraft. We'll keep working the issue.

Senator DORGAN. Well, a report that's submitted to us under the provision I included in the Authorization Act, will that report give us timelines?

Mr. KRAKOWSKI. The report is more of a national access plan, which is kind of our overall approach to getting integrated RPAs and unmanned aircraft into the system. That was really the sense of the report—and I think it speaks to around 2018, as I recall the document.

David?

Mr. AHERN. It is phased, Senator—the 2018 that Hank mentioned is a full operational capability for the airborne sense and avoid. Back up, I think, 2013, is the ground-based sense and avoid, and come back and come back. As I mentioned earlier, there's a framework that we're working under, starting with a line-of-sight that you are familiar with, of course, and moving toward the, what we call dynamic access, with a file-and-fly kind of thing, and it is a period of time.

So, yes sir, there is a chart in there with a schedule, but it doesn't get to each one of the bases. But there is part of the report that does show the plans for the bases, as I mentioned earlier, in just 33, 35 states—a lot of states—so that is there.

Senator DORGAN. Would you submit for me, as best you can, even if it's informally, a timeline for the creation of space here that's necessary? I'd like that submission if you would, and—yes?

Mr. KRAKOWSKI. Yes, I mean,——

Senator DORGAN. That's fair, I think.

Mr. KRAKOWSKI.—once we get the documents that we're expecting this month, I think we'll have the foundation for us to be able to do that.

Senator DORGAN. All right, and one last question and I'll turn to Congressman Pomeroy. General Gibson, you've just heard this discussion, what about 2012? It's now, let's say, September of 2012, you don't have restricted airspace, how—tell me about your training operations with the fleet of Predators and Global Hawks here in this region.

Major General GIBSON. Well, sir, and I invite General Rice to follow up from a local perspective, but clearly, if you're unable to train in that mission set, then the overall readiness is not met and people are planning on that capability, both forward and, Heaven forbid, in a homeland support effort if it were to arise. So, I'm sure if we got to that point, first of all, I would state that it's not going to meet our needs, but that we would have to go to contingencies of moving those folks somewhere else to have an ability to train, to some extent, in an interim basis until we could get there, locally.

Senator DORGAN. Yes. And that's not satisfactory, because we've had a lot of time, here, understanding what's going to happen at the Grand Forks Air Force Base. It's not as if BRAC happened yesterday.

So, I think, two things—we need to, Mr. Krakowski, work with, you know, as quickly as we can to solve this problem, and I would guess, General Gibson, the military is going to have to—if there is a period of time here to patch training operations, you're going to have to find a way to do that.

But this is, you know, it's disappointing, if we find ourselves in 2012 without the capability we need. And so, from this hearing, I hope—I'm going to await anxiously, the report that was required last April, and I—hopefully I get it next month—either later this month or next month, and then have some discussions again about where do we go from here, and how do we fix this, if there's a time that's not—in which the training capability doesn't exist, here.

Major General GIBSON. Sir, I just wanted to follow up that we both realize—between us and the FAA, and Mr. Krakowski and I do exchange cell phone numbers, we have been able to work through Haiti and other contingencies with some expedition and, in making it happen. So, we realize we have to partner, and we realize both of us have components of this portion that we need to solve, you know, on our side, if you will, before we are able to achieve solutions.

So, I think with the right focus, I'm still optimistic that it can be done.

Senator DORGAN. Congressman Pomeroy?

Congressman POMEROY. Senator Dorgan, I'm very pleased that you've brought the Committee here to have this very timely hearing, and I'm concerned. I've been disappointed with the slippage of timeline with the Air Force getting the RPAs here, to fully realize that we're on a timeline where, upon their delayed arrival, they won't be able to fly, it just raises real questions about whether or not the mission plan for the base will be operative, in any kind of timely way.

The discussion across the panel tells me that in the 19 months since we last met here, progress has been made on process, but I'm not seeing sufficient product out of the process to really move things along operationally. The—I think it's quite clear that there are a measure of interim accommodations from the FAA, but that they fall short of what the Air Force needs. So, we must not take much comfort in those interim arrangements, they don't get the job done.

And I acknowledge, and I think it must be recognized, the Air Force has made some very serious accommodations to try and make this thing work. And in the meantime, as I understand it, the training need grows exponentially as the number of RPAs coming into the force structure continues to grow exponentially.

So, we're left in the situation that we've got terrific assets at Grand Forks Air Force Base, we've got the assigned mission, we've got an urgent training need, but we're not on a timeline that's going to let this all work in an orderly way, because of, essentially, the inability to get this segregated airspace issue addressed at the FAA level.

Now, Mr. Krakowski, I think Mr. Ahern used the words, this isn't your run-of-the-mill flight issue raised to the FAA. We are in a different paradigm. You are looking at things in the airspace that don't have people in them, and that has never been confronted be-

fore at the FAA. So, you've got to appreciate everything you've told us about the difficult—the importance of the questions before the FAA and the difficulty of the challenge—we have to accept that, and understand that.

At the same time, we're talking about a one- to two-year comment period. Well, what do we—what does it take to make it 1 year instead of 2 years? Obviously, have an awful lot to do with keeping us on a timeline to get us operational in early 2012.

Mr. KRAKOWSKI. Well, I think the approach is as soon as we get all of the required documentation, which we hope to get here, shortly, we'll move as aggressively as we can and try to move it as close to one year, as possible. I think that would be an effort that we would want to try to do, without question.

In the meantime, knowing that we may not make that one year goal, because of those typical government issues, we do want to have the flexibility available for the Air Force to start flying in some fashion, like we have in other parts of the country.

You've got our commitment to work both of those strains as diligently as we can.

Congressman POMEROY. But—I appreciate that, but I do think that we have to come away with this understanding from what we've heard exchanged across the panel, that those interim arrangements fall really far short. They're better than nothing, but they are far short of basically giving an ops tempo out there at the base that is really going to be required, given the kind of investment that you've got in equipment and manpower.

Mr. KRAKOWSKI. Well, one thing that could shorten it up is if we could get a ground-based radar like we're testing at El Mirage, and where we've used in other places. If something like that could be made available earlier—and that's more on the DOD side in terms of supplying it, that would be helpful.

Congressman POMEROY. Yes.

Mr. Ahern, what about that? We're getting into a real problem relative to training. Would that be some kind—would that be an infrastructure investment that might be considered to help us get through this period?

Mr. AHERN. Sir, as I mentioned earlier, not only have we wanted, at El Mirage, but at different—same, but same kind of high-fidelity 3–D radar is going with the Marines at Cherry Point, and the Air Force at Canon, yet a third one.

So, a volume search, air search radar—now, I'm going to defer to the FAA, because I'm getting out ahead of what I really know but—but air search—volume air search radars exist. And I don't think we have to make a new one for the UASs. The issue for the Air Force that we'll be working on is identifying one that's certified and what its job is, and positioning it—or several—in this area in order to do the terminal clearance first, and then the transit, because the Air Force clears out huge areas in Afghanistan and other operating areas, it's for Blue Force deconfliction, kind of thing. So, they know how to do it.

So, to answer your question, I think that that is an avenue that we would go down to ensure that we get the ground search radar in here, and certified. And I think that—I hope I'm using the right word—if not certified, validated, it will be a certified radar, but

validated for this position, here. What we expect if it's sited correctly, survey, it's traffic—I mean, it would be a period of time——

Congressman POMEROY. But that's important. If DOD makes an extra push on a range of equipment infrastructure, that might assist the FAA, if I'm hearing Mr. Krakowski right, in getting to yes on this airspace question.

Mr. AHERN. And, I think—and I've talked to General Gibson about it, and it's something that is in the plan, already, the question is how to do it.

Major General GIBSON. Just of note, Congressman Pomeroy, we—the Air Force—saw this need some time back and we grabbed a—it's termed an ASR–11, a newer version of air traffic control radar that was headed to Korea, and we've actually redirected that to Grand Forks. It will be in place around the middle of summer 2012, sited and then will begin to—it's a little late to need, still, but then we'll begin siting it and doing testing with it in conjunction with the FAA to see how well it does, in fact, survey that airspace.

There might be an opportunity to do an interim—a mobile radar that we could bring in that might be a part of this interim solution.

Congressman POMEROY. Couldn't it be accelerated? I mean, if you identified the equipment, why couldn't it be here, and operative before mid-2012?

Major General GIBSON. Sir, I really hesitate speculating whether one would be available. We have some that are in mind, as we said, we're doing tests in other locales already. We could take that for the record, to explore the possibility of being able to get one here earlier that's a mobile——

Congressman POMEROY. We've all just got to push, here. So, we try to get this 2 years down to 1 year, on the one hand, but you make Hank's job easier by trying to get this up here before mid-2012, and it seems to me that we could—if everyone is really pushing on these various fronts, we could make some real progress.

General Rice, can you give us some better sense of the mounting training need that our Nation is experiencing, the utilization of RPAs in the field and who is operating them?

Brigadier General RICE. Our—as you said, our training need is growing exponentially. And we're kind of coming to a point where technology and manufacturing of RPAs and those are ahead of our training pipeline.

Congressman POMEROY. That's right.

Brigadier General RICE. So, really, our limiting factor, now, is our training airspace for the crews themselves.

And so, right now we have 6 remotely piloted aircraft platforms, Predators in the state, in boxes, waiting to be opened up and put into the sky. And that's not the limiting factor. The limiting factor is actually the crews themselves. With a need to grow our capability, in theater, all of our crews are going right into operations, into combat operations. And they're flying right now, right here, today, in Fargo.

And so, as those crews come off of a cycle, we don't want to have these crews in a constant combat mode, we take them out of the combat cycle—particularly Guardsman—and put them back into an operational Reserve status, get them into the training programs,

that's where we foresee our cycle and our number of crews will start maturing, and we can normalize that cycle, somewhere around approximately a year from now to really get into having crews off of the operational schedule, into a training schedule in that spring of 2012. And a majority of them will start in 2012, in January.

Congressman POMEROY. I'm told we have that schedule normalized, as you say. We're asking an unacceptable level of, basically, combat duty by our Air Guard running these RPAs, right? I mean, I know that the tasking in Fargo has been very heavy, more than was originally anticipated, and I do worry about the human toll it's taking.

Brigadier General RICE. Yes, sir. And we are certainly concerned about that. But, as you set a goal, set an objective, set an operational need for the military and when you look at the sacrifices our Active Duty and Guardsmen are doing, on the ground, right now, and you take an operation like the North Dakota Air National Guard and Army National Guard, and they say, "Hey, this is easy to justify, it's easy for me to sit here in my home State and do an operational mission out of Fargo and say, I can see, real-time, my affect on this war effort," and that motivates people to keep going.

It has been really pretty impressive to see the synergy that we have as a total force, between the Active and the Guard, to get to that point.

Congressman POMEROY. And you—it has been so impressive to watch. But, you know——

Brigadier General RICE. Now, our role as leadership is to anticipate when we feel that the normalization, the leveling off, the growing state that we're in now, becomes a normal operation where we start to cycle people. We have enough people that we can start to do our rotations, start to do our cycles.

Congressman POMEROY. Because unlike active duty, the Guards stay. They're doing this for a much longer period of time, correct?

Brigadier General RICE. That's correct.

Congressman POMEROY. And if you don't have other people to cycle through, they just keep on doing it.

Brigadier General RICE. That's correct. And as we look at the strength of the National Guard, our cost-effectiveness, our strength is our experience, and our ability to take that experience, put it into an operational reserve, train in an airspace like this, in North Dakota, and then put them right back into the fight.

Congressman POMEROY. We want this base used, and used actively. It has a long history of playing an important role in our Nation's defense structure, and we look forward to it being fully utilized in this way in the near future.

The—we also appreciate, in the broader sense, the important national contribution this base will use, will make when it's fully utilized, so we hope we quickly get there.

General Rice, I would just tell you, General Sprynczynatyk recognized the service to the Global War on Terror of 300—more than 300—at the Air Guard in Fargo. We are very proud of the role the Air Guard has played in terms of the Global War on Terror and these, just tremendous airmen served our country so well, we're very proud of them.

Mr. Chairman, that concludes my questions, thank you.

Senator DORGAN. Congressman, thank you very much.

Mr. Krakowski, let me try to clear up something, if I may. We were told by the FAA last month, as we were inquiring, that the FAA, by its own rule, cannot establish restricted areas for non-hazardous operations, and UAS flights are considered non-hazardous. Therefore, the FAA said, "We can only create restricted airspace, or approve restricted areas for laser operations," that's the very small box. Your testimony this morning seems to say something different than that, so explain to me what all of that means.

Mr. KRAKOWSKI. Well, we understand that there's a desire to have laser activity expanded in that box, as I understand.

Major General GIBSON. Not the impact point, but the ability to maneuver nearby.

Mr. KRAKOWSKI. Right, right—which we think would give us sufficient justification to consider that.

Senator DORGAN. So, the 45 by 35-mile box that the military now says it needs for training, is an area that you can, by your own rule, proceed to establish as a restricted area?

Mr. KRAKOWSKI. We are interested in trying to move the rule forward. Now, we'll get public comments, we'll go through all of the processes, I can't guarantee what the outcome's going to be, but we think we can actually go ahead and try to move it forward.

Senator DORGAN. But it is different than what the staff of our Subcommittee was told a month ago. We were told that was not a possible solution.

Mr. KRAKOWSKI. We're willing to move forward once we get the documentation this month.

Senator DORGAN. All right, so maybe we're making some progress. I just—I think I understand what you're now saying on the record, but as I said, that's different than what we were told a month ago.

Mr. KRAKOWSKI. If I may, Senator.

Senator DORGAN. Yes, please.

Mr. KRAKOWSKI. You know, this is a dilemma not just for DOD and the Air Force, but for us, as well. We've never had to do things like this with the airspace before, so we're trying to learn, we have an ExCom set up, Dave and I and the rest of the organizations. For example, NASA and DHS are part of the ExCom, to try to figure out what exactly to do with these things. And, as Mr. Ahern and I were talking earlier this morning, we're going to have to be creative, I think, moving forward.

Senator DORGAN. But, we have done some of this before. I mean, I did some small amount of flying earlier in my life, and I've flown in what are called "oil-burner routes" that are designated in North Dakota and flown out of a steep turn as I was learning to fly, to find a B–52 is bearing down on me, and I was in the wrong place, I guess. You know, the fact is, we have established areas with training capability—low-level training capability, B–52s and in the old days they were called "oil-burner routes" I think, I don't know what they're called now.

And I understand there are differences now in that there's no one in the cockpit of this airplane. On the other hand, this aircraft, in most cases, is probably even more sophisticated and has sub-

stantially more sophisticated sensors to be able to understand what is in its environment than that big old B–52 had.

So, at any rate, I am not diminishing the difficulty, because this has to be something we do nationally. On the other hand, I'm very interested in trying to match up our needs and the ability of the FAA to act in a way that's responsible to meet our training needs, here. Because as we move toward greater use of Unmanned Aerial Systems, this is going to be a center of that—a significant center. Homeland Security, Grand Forks Air Force Base, The Center for Earth and Space Science, and the UAV research—this is going to be one of those centers, and I, you know, I'm interested in the national issue, but I'm especially interested in finding out that we're not stuck up here, trying to figure out, "Well, now we have airplanes in boxes, we put them together, but no place to train them because we weren't able to figure out how hand-in-glove to work with the FAA to address an issue of a 35 by 45-mile airspace for some training."

I think we've learned some things this morning that will be helpful as we proceed, and I'm going to push very hard in the coming months to get that report, make sure we understand what is possible at the FAA and you will submit to me timelines, I believe, with the Air Force based on what you've just described on this particular issue, as well.

Governor Hoeven had requested that General Sprynczynatyk read a letter. If you would be willing, General, to summarize that letter for us, I'd be happy to have you read that into the record at this point.

General SPRYNCZYNATYK. Good morning, Senator Dorgan, Congressman Pomeroy, it's a pleasure to be here today representing Governor Hoeven. The Governor has expressed his support for FAA's integration of military Unmanned Aerial Systems into the national airspace at Grand Forks Air Base.

North Dakota serves as an ideal testing ground for a variety of UAS pilot projects. For example, the United States will need to determine how unmanned aviation can be conducted safely in national airspace.

North Dakota would be an excellent location for pilot projects demonstrating that UAS operations and private and commercial aviation can co-exist in a safe and efficient manner. In addition, our airspace could provide opportunities for testing of small-scale commercial UAS operations, such as the use of UAS technology to aid the agricultural processes. In order to conduct these pilot projects, the current National Airspace infrastructure in North Dakota would have to be modified.

One of the key factors behind the rapid growth of UAS programs in North Dakota, is the fact that our State possesses one of the Nation's premiere aerospace schools. The John D. Odegard School for Aerospace Sciences at the University of North Dakota in Grand Forks is home to the UAS Center for Education, Training and Research, which currently possesses 7 active COAs located in 5 locations for unmanned flight. This program produces well-trained graduates ready to operate unmanned aircraft, providing a labor source for UAS operations conducted within North Dakota.

There are already a number of UAS Operations being conducted in North Dakota. For example, the Department of Homeland Security's Customs and Border Protection agency is flying the Predator B from Grand Forks, providing for homeland security along the Canadian border. The North Dakota Air National Guard, based out of Fargo, is currently conducting Predator flights in the Middle East, amassing over 50,000 flight hours with operators working out of an operations center located in Fargo.

UAS operations will continue to expand in North Dakota if Grand Force Air Force Base is scheduled to receive a number of Global Hawks, which will be deployed overseas, as well. An authorized Launch and Recovery Element for the North Dakota Air National Guard at Grand Forks is scheduled for flight operations in 2012. Training missions for these operations will increase the demand for North Dakota airspace; therefore it is important to determine how airspace should be allocated in the future.

Ensuring there is ample training space within North Dakota will be critical to the future success of these programs.

I ask that the Subcommittee consider the opportunities for Unmanned Aerial Systems development in North Dakota, and find an appropriate way to integrate UAS into the National Airspace System.

Senator DORGAN. General Sprynczynatyk, thank you very much, and thanks for your service, as well.

Let me say to the witnesses, first of all, to my colleagues, Congressman Pomeroy, thanks for your continuing work on this issue. Gael Sullivan is the Staff Director for the Commerce Committee Aviation Subcommittee, Gael is back here, and Gael, thank you for the work that you do. And Gael will follow up continuously with this hearing. And Brian Moran, who works on these issues in my staff, is behind me and Jeff Carter, who works with Senator Conrad, is behind me, as well. I want to thank them for their work.

And let me just make one final comment, if I might. First of all, I appreciate, very much the witnesses coming to Grand Forks, you've travelled some distance to do this, but this is important. We care, very much, about making things happen rather than letting things happen. And, I don't mean to—well, yes, I do—I was going to say, I don't mean to be critical of bureaucracies, but the fact is the Defense Department is one of the biggest bureaucracies in the world, and the FAA, while smaller, is every bit its equal.

[Laughter.]

Senator DORGAN. And the reason I say that is, bureaucracies are often saddled by their own harnesses. And sometimes it's required to be able to strip through that and make decisions that are thoughtful decisions in a timeline that is reasonable.

A year ago, early 2009, we held a meeting, here, in Grand Forks and the purpose of that meeting was to talk about what needed to be done and how to get it done, and that was February of 2009. And I think what we have seen between then and now, a year and a half—and I'm not suggesting nothing has been done, but I do think that we're setting ourselves up for a problem, unless between now and the time that we have the fleets of UAVs here, needing training capabilities, unless between now and then we're able to find a new gear and new cooperation between the FAA and the

military, I think we will run into a problem. And a problem that should not exist, because we see it ahead of us, let's fix it before we get there.

Mr. Krakowski, you and Mr. Allen are critical to this, along with your administrator, and Mr. Ahern, General Gibson, General Rice, you have a stake in this, as well.

The fact is, Congressman Pomeroy and I have watched a lot of different Federal agencies work together. Sometimes they never even touch each other, let alone put their hands together and decide they're going to do something and accomplish something by the time needed. But, both the Defense Department and the FAA have the capability to make this work. And I hope today's hearing establishes the urgency with which this gets done.

So, I want to thank all of you for being here, and thank my colleague, Congressman Pomeroy.

This hearing is adjourned.

[Whereupon, at 9:30 a.m., the hearing was adjourned.]

A P P E N D I X

STATE OF NORTH DAKOTA, OFFICE OF THE GOVERNOR
September 13, 2010

Comments from Governor John Hoeven to the Senate Subcommittee on Aviation Operations, Safety and Security hearing on "The Integration of Unmanned Aircraft Systems (UASs) into the National Airspace System (NAS): Fulfilling Imminent Operational and Training Requirements."

I am writing to express my support for Federal Aviation Administration (FAA) integration of military Unmanned Aircraft Systems (UASs) into the National Airspace System (NAS) at the Grand Forks Air Force Base. This plan would allow UAS access to training areas and Class A airspace by modifying airspace design and flight rules, while implementing upgraded Air Traffic Control (ATC) radar to monitor and direct UAS traffic. These changes are necessary to satisfy the operational and training needs of the Global Hawk and Predator UASs that are scheduled to be based at Grand Forks Air Force Base. I hope that this hearing will help clarify the status of the plan to integrate UASs into the National Airspace, identify issues that arc delaying implementation of the plan, and detail any additional changes to airspace design and flight rules that are being considered.

North Dakota has the potential to serve as an ideal testing ground for a variety of UAS pilot projects. For example, the United States will need to determine how unmanned aviation can be incorporated safely into the national airspace. North Dakota would be an excellent location for pilot projects demonstrating that UAS operations and private and commercial aviation can co-exist in a safe and efficient manner. In addition, our airspace could provide opportunities for testing of small scale commercial UAS operations, such as the use of UAS technology to aid the agricultural process. In order to conduct these pilot projects, the current National Airspace System infrastructure in North Dakota would have to be modified.

One of the key factors behind the rapid growth of UAS programs in North Dakota is the fact that our state possesses one of the Nation's premiere aerospace schools. The John D. Odegard School for Aerospace Sciences at the University of North Dakota in Grand Forks is home to the UAS Center for Education Training and Research, which possesses 7 active Certificates of Authorization located in 5 locations for unmanned flight. This program produces well-trained graduates ready to operate unmanned aircraft, providing a labor source for UAS operations conducted within North Dakota.

There arc already a number of UAS operations being conducted in North Dakota. For example, the Department of Homeland Security's Customs and Border Protection agency is flying the Predator B from Grand Forks Air Force Base to provide for homeland security along the Canadian border. The North Dakota Air National Guard, based out of Fargo, is currently conducting Predator A flights in the Middle East, amassing over 50,000 flight hours with operators working out of an operations center located in Fargo.

UAS operations will only continue to expand within North Dakota. The Grand Forks Air Force Base is scheduled to receive a number of Global Hawks, which will be deployed overseas as well. An authorized Launch and Recovery Element for the North Dakota Air National Guard at Grand Forks is scheduled for flight operations in 2012. Training missions for these operations will increase the demand for North Dakota airspace; therefore it is important to determine how airspace should be allocated in the future. Ensuring there is ample training space within North Dakota will be critical to the future success of these programs.

I ask that the Subcommittee consider the opportunities for UAS development in North Dakota, and find an appropriate way to integrate UASs into the National Airspace System.

Submitted:

JOHN HOEVEN,
Governor.

RESPONSE TO WRITTEN QUESTIONS SUBMITTED BY HON. JOHN ENSIGN TO HANK KRAKOWSKI

Question 1. We know that some of the large mirror complexes can cause a great deal of glare and may have an effect on flash blinding pilots. What would that do to a Remotely Piloted Aircraft (RPA) using camera and sensor packages? What impact would large concentrated solar towers have on the cameras and sensor packages of RPAs?

Answer. The Federal Aviation Administration (FAA) Unmanned Aircraft Systems Group has not received any reports of "flashblinding" occurring. Discussions with proponents of these complexes indicate that flash could briefly render the camera portion of the aircraft sensor unusable. Other sensor packages, such as infrared, may or may not be affected, depending upon the type of sensor at issue. Currently, the FAA is not authorizing the use of any onboard sensors as a means to meet the Title 14, Code of Federal Regulations, Part 91.113. As such, any "flashblinding" would most likely have minimal impact on National Airspace System (NAS) operational safety requirements.

Question 2. Has the FAA conducted any detailed studies on how wind farms, solar arrays, or concentrated solar towers would impact RPAs or manned military aircraft operating both during the day and at night?

Answer. The FAA has not conducted any studies of how wind farms, solar arrays or concentrated solar towers would impact RPAs or manned military aircraft operating during the day or night.

Question 3. Has the FAA conducted studies the impact of wind farms on the ability of air traffic control radars to track RPAs and manned aircraft entering and exiting military training airspace?

Answer. The FAA has not conducted any specific studies addressing the impact of wind farms on the ability of radar to track unmanned aircraft entering or exiting military training airspace.

The FAA primary long range radars can not presently distinguish between the blade flash of the wind turbine and actual aircraft in the same azimuth and range. The moving target indicator processing of the radar is used to determine stationary objects from those in motion, which are passed on for further processing. The blade flash of the turbine, in motion, is identified the same as an aircraft in motion and passed through the radar system for additional processing.

The FAA is working with the U.S. Air Force to investigate mitigation options to alleviate the impacts of the wind turbines on radar. We have optimized radar sites using the existing capabilities to acquire the best performance with the processing constraints currently available. We are investigating the possibility of introducing auxiliary processing that may be able to improve the radar performance in the wind turbine impacted areas. We are also jointly researching other types of radar systems than those presently in use for FAA aircraft target detection to determine if the technology currently exists for properly dealing with the impacts to radar from the wind turbine farms.

Question 4. When approving large scale solar towers does the FAA consider airspace safety in its approval process?

Answer. Yes, airspace safety is considered in the FAA approval processes.

Question 5. When approving large scale solar towers does the FAA consider lasers emanating from them that could impact airspace safety?

Answer. No, aeronautical studies conducted under Title 14, Code of Federal Regulations, Part 77 evaluate the impact of the structure, but do not include for study of anything that may emanate from the structure such as glare, glint, or gasses.

Question 6. When approving large scale solar towers does the FAA consider glare emanating from the towers that could impact pilot safety?

Answer. No, aeronautical studies conducted under Title 14, Code of Federal Regulations, Part 77 evaluate the impact of the structure, but do not include for study of anything that may emanate from the structure such as glare, glint, or gasses.

Current FAA guidance does not address concentrated solar power (CSP) installations that use large reflective surfaces in massive arrays to focus the sun's energy on a trough or tower collection/generation system. Pending guidance is limited to non-reflective PV solar technology applied on a relatively small scale at airports. There is inadequate science on reflectivity and it will therefore take some time to establish a basis or standard for evaluating concentrated solar power facilities and their potential glint and glare effects on pilots.

Question 7. If the FAA does consider factors that could blind a pilot (civilian or military) such as lasers, shouldn't it hold that the FAA should consider other factors that could blind a pilot or white out an RPA sensor package such as glare?

Answer. Title 14, Code of Federal Regulations, Part 77 does not include for study of anything that may emanate from the structure such as glare. While the FAA does not have any standards to study glare, the agency is currently forming a team to study the effects of reflectivity on pilots.

Question 8. Shouldn't the FAA consider glare with the same rigor it does lasers, as both are a version of light amplification and both could blind a pilot?

Answer. Title 14, Code of Federal Regulations, Part 77 does not include for study of anything that may emanate from the structure such as glare. While the FAA does not have any standards to study glare, the agency is currently forming a team to study the effects of reflectivity on pilots.

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