

A SHIELD ABOVE US

North Korea, Iran and other hostile countries are actively developing and deploying missile technology. Lt. General Henry A. Trey Obering III, USAF, outlines the status of America's ballistic missile defense program.

Edited by Richard H. Wagner (originally published in *The Log*, Navy League of the United States, New York Council, Spring 2007)

On 24 January, Lt. General Henry A. "Trey" Obering III, USAF, Director of the Missile Defense Agency ("MDA"), addressed a luncheon of the New York Council of the Navy League of the United States. The MDA is Presidentially-chartered and mandated by Congress to acquire highly effective ballistic missile defense systems for forward-deployed and expeditionary elements of the United States Armed Forces. In addition, the MDA develops options and acquires systems for ballistic missile defense of the United States. General Obering is a graduate of Notre Dame University and also holds a Master of Science degree in astronautical engineering from Stanford University. He is a pilot, having flown operational missions in the F-4E Phantom and his past assignments have included work on the Space Shuttle Program and with the Air Force Inspector General. His talk to the Council was extremely timely coming as it did a few days after the Chinese had tested an anti-satellite weapon and a few days before another successful test of the United States' missile defense system. The following is excerpted from General Obering's remarks.

What I am going to talk about is what I consider to be the emerging threat of the 21st Century - - ballistic missiles, especially when they are married with weapons of mass destruction. When we entered into a missile defense treaty with the Soviet Union in 1972 there were only about eight countries around the world that had this technology or these missiles and many of those countries were friendly to us such as France and Britain. When we pulled out of the treaty in 2002, for very good reasons, it turned out that there were more than 24 countries around the world that have this technology today and many of them are hostile to the United States, our allies, and our interests around the world. What is so devastating about these weapons is that they are capable of very long range, they are capable of instantaneous launch with very little warning, and up until just a few years ago, we had no defense against these weapons. What we have been busy doing in the Missile Defense Agency is building that defense.

The Threat

Many of these countries around the world have been very busy [building ballistic missiles]. Many Americans saw last July fourth and fifth what the North

Koreans are doing and what happened in Iran last fall. In all, there has been an average in the past several years of about 90 launches around the world. In fact, just last year, there were more than 100 foreign nations launching these missiles and testing them.

North Korea has hundreds of Scud launchers. These are Russian-built missiles, Russian technology, that has proliferated around the globe. [The Koreans] have taken this technology and they continue to improve and expand it. They actually took a Scud missile, stretched it, gave it new guidance and new propulsion capability so that it has about a 1,000-mile range.

Of more concern is that back in 1998, they launched what they call a space-launch vehicle. This weapon over-flew Japan and for a large portion of the flight of this missile the predicted impact point was on Japan. It was a significant emotional event for the Japanese and in fact, today, [the Japanese] are spending about \$1.5 billion a year on missile defense alone. What the North Koreans showed was that they have all the building blocks for intercontinental ballistic missiles. They have a three-stage missile that they launched so they were able to show that they could stage a missile, they could control it through staging and that they have all of the technology necessary for an ICBM.

[For the larger version] which they attempted to launch this last July, they ran into some problems. But, I believe that they are going to continue their very robust test program because, what was not widely reported in the press, was that in addition to the long range attempt they fired six missiles of shorter range and those operated very reliably and they were very accurate. So,

it is a growing concern that we have - - their ability to attack the United States.

Finally, just recently over the last several years, we have seen a qualitative improvement in what the North Koreans have done. They actually have been able to inject technology into their program which we use on our Space Shuttle Program.

The Iranians have also been very, very busy. In fact, just this past November they conducted a series of launches, many of them were shown on Iranian television, in which they fired dozens and dozens of missiles, many of them simultaneously into the same target location. So, what they are showing is a willingness to operationalize these missiles and to employ them.

[They Iranians] buy missiles from North Korea. They are collaborating together with the North Koreans, and therefore, it is hard to judge how quickly they are going to develop a capability because they kind of leap-frog based on that assistance.

They are beginning to be able to range Europe. Most of the intelligence experts believe that they will have a long range capability capable of reaching the United States by 2015. We are proposing to locate a missile site and a radar site in Europe. I briefed the NATO council just before Thanksgiving. I spent about two hours with the Secretary General, and he is very concerned about this and was very excited of the possibility of our collaboration in preparing a defense for Europe.

What we have seen and what people often do not understand is that countries like North Korea and Iran don't have to even fire these missiles for them to be effective. We saw what happened in Iraq when a terrorist group captured

and held hostage Spanish citizens and how it changed the national policy of Spain. Imagine if a country like North Korea or Iran or a terrorist organization gets their hands on these missiles, they could hold entire cities hostage. Just imagine the geo-political impacts of being able to do that. So, this idea of coercion and blackmail is very much on the minds of these countries. We saw this past summer in the Hezbollah attacks against Israel, we know that the Iranians provided rockets and missiles to Hezbollah. We are seeing basically the transition of missile technology to a terrorist organization from a state actor, in this case Iran.

Several nations are also pursuing ballistic missiles around the world and they are interested in improving them from a complexity standpoint. [They are seeking] to build what we call "countermeasures" - - decoys and that type of thing. We have to deal with that in our missile defense program and we are doing that.

Finally, the Lebanese crisis was remarkable. What was remarkable about it is that the Israelis have been known for having a very effective defense force for many, many years. For the first time that we can remember, they were faced with a situation that they had no control over. There were more than 4,000 rockets launched from southern Lebanon into northern Israel and almost all of them were launched remotely or were launched with timers. So, there was nobody around to strike back to try and prevent them from launching again. They were parked in very heavily populated civilian areas and, in fact, they had rocket rooms attached to some of the homes that they were firing these rockets out of. This presented a tremendous problem in terms of trying to take out

these rockets before they were launched. Of course, once they were in the air, the Israelis had no defense against them and were completely helpless. This basically shut down operations in Haifa and much of northern Israel for many, many days and caused a lot of casualties amongst the civilian population.

The Missile Defense Program

In 2002, President Bush pulled us out of the Anti-Ballistic Missile Treaty and I think that was a very, very prescient and very, very right thing to do. He saw that we were trapped into a treaty with the Soviet Union that did not exist any longer and which was preventing us from building an adequate defense against these threats. He directed us to begin deployment, when we had proven the technology, of an additional ballistic missile defense system. We did that deployment. We began it in the summer of 2004 and everything you are going to see from now on, we have done since the summer of 2004 - - a little over two and a half years.

I have been given the mission of developing a single integrated program that is to defend not only the United States and our deployed forces but also our allies and friends, from all ranges of missiles, from the very long range missiles to the short range missiles, and in all phases of their flight, while they are boosting, while they are coasting, and as they come in for the attack.

This is the strategy that we have been pursuing. We were very concerned about the North Koreans and I think last summer bore that out so our first intent was to try and provide a protection against that threat and that is what we have laid the foundation of. Next, was to turn our attention to the Iranians and

the Middle Eastern threat because they are coming along and will have the capability to attack us within the next 10 years.

[In addressing these threats, the MDA did not] wait until we got something that was perfect before we put it out. As soon as we got something that we thought offered a modicum of protection, we would put it in the field and then improve it over time. It saves many, many years in being able to do that. Now, this is a concept that is foreign to many folks on Capitol Hill and to many of our critics but I think it is beginning to catch on and they are beginning to understand it.

The System

There are three phases of flight of any threat missile whether you are talking about a short range Katusha rocket or a long range intercontinental ballistic missile ICBM - - a boosting phase, a mid-course phase, and a terminal phase. The boosting phase mostly occurs in the atmosphere and just outside the atmosphere. The mid-course phase for almost all of these threats except for the very short range rockets occurs in outer space. The terminal phase is a re-entry into the atmosphere and honing in on the target.

What we would love to do is to destroy all these threats in the boosting phase because, if you think about it, you are protecting the entire world from that single threat missile by being able to do that. Most of the programs that we have in development today seek to do that. We have the airborne laser that has been extremely successful to date and I believe has a good chance of succeeding. However, it is a very risky technical program. Then, we have what we call a

"kinetic energy interceptor." This is a very, very fast acceleration rocket that can get off very quickly in order to knock down a missile while it is still in the boosting phase.

In the mid-course region, we have a long range interceptor, which we call a ground-based mid-course defense or GDI system. These are the interceptors that we have loaded in silos in Alaska and California. The [land-based] interceptor is about 60 feet long and roughly 60 inches in diameter. We do not use explosives. We do not use warheads, we use nothing of that sort. We use pure kinetic energy. What I mean by that is that we have a kill vehicle that weighs about 150 pounds, about four feet high, and it destroys the nuclear weapon by speed. When we impact these warheads we are hitting them at anywhere between seven to ten miles a second. What that does is completely pulverize the warhead.

We are not as lethal with an explosive warhead as we are with the actual hit-on-hit. A lot of the investment since 1983 that went into the program has resulted in the breakthroughs that we needed in processing power, computer power, sensing and propulsion capability and control. Now we can reliably hit contact-on-contact. What you see happening is actually what you see happening in other areas of defense where we are making smart bullets that can go out and hit what they are aimed for. We are doing the same thing just on a larger scale. The technology has caught up and is much better than that proximity fuse.

[The Russians] have nuclear-tipped interceptors. It is the proximity fuse argument. They just say they are going to rely on that. But, as they become more reliant on electronics and

sophisticated electronics in their society and in their economy, I think at some point they are going to have to re-think that.

Then, we have a sea-based Aegis ballistic missile defense system that can handle the shorter range and medium range missiles. What does Aegis bring to us? First, it brings persistent long range surveillance and tracking that we can move around. It is flexible and it is mobile. It also is able to conduct autonomous operations when needed and also offensive operations as it relates to the missile strike. So, when North Korea launches a missile, we can understand where it came from and the ships can also launch counterstrikes into that area. Of course, it has a surge capability so we can move it where we need to with respect to the threat.

We are also building what we call a volume threat interceptor so that with one interceptor we can take out more than one credible object. That helps us as enemies start to develop countermeasures and decoys and that type of thing. We can take all of that out without having to decide what is the warhead and what is the decoy.

In the terminal phase, we have three programs. We have the Patriot Attack III that we developed with the Army and actually transitioned to the Army just in time for Iraqi Freedom. We have a terminal area defense ("TAD") weapon that operates just inside and just outside the atmosphere. Then, we have a sea-based terminal system where we can basically protect the fleet and protect the ports from the shorter range missiles.

All of these interceptors are pointed by a family of sensors to include upgrading existing radars like we have in Alaska, California, Greenland and other

places, It includes [mobile systems] that we can transport and put into place like we did in Japan. Sea-base radars like the Aegis SPY radar as well as the world's largest X-band radar. Then, space - - today from space all we can do is give early warning that says a missile has been fired, it is coming in this direction, and it is going to land roughly in [an area] the size of New York. That is about it. What we would like to be able to do is to take a track from space and be precise enough on that track that we could send an interceptor to intercept that missile and that is what we are building in the Missile Defense Agency.

Finally, we have a command and control and battle management and communications foundation that we build this on that allows us to do something that almost no other mission area has to do. Think about this: the Commander of U.S. Forces Pacific, the Commander of U.S. Forces Japan, the Commander of U.S. Forces Northern Command for the Protection of America - - all of those commanders have to be presented with the same information simultaneously across ten or twelve time zones and be able to deconflict the battle because this occurs in missile defense in minutes. So, we have to provide that kind of situation awareness and tools to the commanders.

The chain of command goes directly to the President to the Secretary of Defense to the combatant commander for North COM for the Protection of North America. Because of the timing that is involved, often times you only have several minutes to decide, those authorities are delegated depending upon the situation.

For the very long range missiles, we have coverage from the ground-based interceptor. For the shorter range

missiles, we have coverage from the sea-based interceptors and the terminal area defense weapon. So, we are able to bring more than one interceptor to bear on these threats and to begin to layer them together and that forces the attacker to really have to fight through this kind of defense.

We are taking those sensors that I spoke about and the interceptors and we are mixing and matching. So, for example, we can take a land-based radar that's got a track and take it back to a sea-based interceptor. Or, we can take a sea-based radar like the Aegis SPY radar and provide that track to a land-based interceptor. What that does is allow us to expand greatly our detection areas and our engagement areas with these interceptors.

As I am standing here today, we have a radar that we have put in Japan that is operational. It is an X-band radar that is overlooking North Korea and keeping watch there. We have nine Aegis surveillance and track destroyers that we have modified to be able to track ballistic missiles. We have a radar in Alaska that is keeping constant watch, it is online and operational. We have radar on the coast of California that has been tested, is operational and is online. We have 14 interceptors sitting in silos in Alaska, about 90 miles southeast of Fairbanks, that are online and operational. We have two interceptors at Vandenberg Air Force Base in California for a total of 16. We have the command and control suites in Pacific Command in Hawaii, in Northern Command in Colorado, and Strategic Command in Omaha, Nebraska along with the national capital region in Washington. All of that is in place today as I speak.

The sea-based X-band radar gear is on its way to Alaska, in fact it is approaching what we call way-point nine. It will be stationed in Adak, Alaska, which is the Alaska king crab fishing capital. When that platform pulls into Adak, I think it is going to double the population of that town.

To put this in perspective, The sea-based x-band radar is 30 stories high. It is self-propelled and operates at about the speed of a World War II submarine. Each one of the pontoons, is about the size of a Trident submarine. If we put this radar in the Chesapeake Bay, we could actually track and detect a baseball size object over San Francisco. We are moving it to Alaska to keep track of all the trajectories coming in from possibly North Korea into either Hawaii or into the continental United States. The radar itself weighs about four and a half million pounds

All of this was not there two and a half years ago. So, in two and a half years, we have put this in place and we will continue to grow this.

We have had a very, very good two years, and 13 out of our last 14 flight tests have been successful. This includes by the way, successful engagements by the Aegis ship of what we call a unitary target like a Scud missile as well as a separating target where the warhead actually comes off of the rocket body. We have had successful intercepts of both of those types. We have also had a successful test of the terminal [weapon] as well as the long range tests that we did last September. In a 90-day period last summer, from June to September, we achieved successful intercepts in the low atmosphere with Patriot, in the upper atmosphere with the TAD system, just outside the atmosphere in space with

Aegis, and also outside atmosphere, very high in space with the long range system DBI. We have now had 23 hit-to-kill intercepts since 2001.

Future Improvements

Over the next several months, we are going to have a radar in the United Kingdom that we are going to modify and have operational and available to begin to protect us from the Middle Eastern threats.

We have seven ships today, three cruisers and four destroyers, that are capable of launching the sea-based interceptors and we have 18 missiles. We are going to grow that out to a total of nine with 21 interceptors by the end of this year and continue to grow that inventory.

This coming year, 2007, is a very big year [with regard to testing]. We have three Aegis intercept tests, we have three TAD intercept tests, and we have two of our long range system.

By the year 2011, we are going to have 40 interceptors in Alaska, we'll have 4 in California and we are going to put 10 in Europe. We are entering into discussions with some of our European allies today to do that. We are also going to move a large X-band radar from the South Pacific that we have used in testing and put that in Europe as well. We are going to finish upgrading the radar in Greenland. We are going to have the 18 Aegis ships with the interceptors. We are going to have two of our TAD units with 40 interceptors and the two radars. We are also going to add a sea-based terminal capability using the current Navy SM-2 Block 4 which we are modifying with the Navy to be able to handle the shorter range Scuds.

We have had over 70 successful firings of the airborne laser. It consists of six laser modules, each module is about the size of a small SUV. We have to fire these modules simultaneously within milliseconds of each other to generate the laser. To give you an idea of the power of this laser, it can go out 800 miles in the atmosphere and put enough power in three gallons of water to boil it in less than a second. So, that is what we bring to bear on the booster of a missile that is heading toward us. Right now, the aircraft has got a tracking laser and an atmospheric compensation laser onboard. We are flight testing it out of Edwards Air Force Base. We will bring it down this next year and put the high energy laser on the aircraft and fly it in 2008 and 2009.

The kinetic energy interceptor has had static fire testings of the first and second stages and that is on track. Our volume kill or multiple kill vehicle capability is also on track. We have two of the satellites that we are going to launch in December for space tracking and surveillance to give us the precision that we need to be able to do this globally from space. We are co-developing with the Japanese a larger version of the Standard Missile 3 interceptor, a 21-inch diameter that will have the capability to defeat the ICBMs. The sea-based terminal program - - we have the near term program with the SM-2 Block 4 and we are going to have a longer term program that we are entering into with the Navy to develop a much more robust sea-based terminal capability to protect the fleets.

We are also funding a significant improvement to the single processor on the Aegis ships to greatly improve the resolution and capability of that SPY radar. We are going to open architecture

on that ship. Right now, we are limited to 18 ships to be modified. When we get this open architecture, we can actually open this up so that the entire Aegis fleet would be able to have ballistic missile defense capability.

Our efforts with Japan have been very robust. We have a successful cooperative test program that we have been working with them and cooperative research and development. They purchased four Kongo-class destroyers, Aegis-class, and we believe that they are going to continue to build out that fleet. They have procured the SM-3 Block 1 missile today and, of course, they are going to co-develop the Block 2 missile with us.

Finally, we have a very robust international program. We co-host an international conference every year. We have held it everywhere from Japan to Italy to the Netherlands. This past September it was in London. We had more than 24 countries there. More than 1,200 delegates - - all of them are interested in co-operating with us on missile defense because they see this threat growing around the world. So, suffice it to say we have an expanding family of allies who are working with us on this.

Value for Money

It is a large program. We are spending about nine billion dollars a year on the program. But, I would like to put that in perspective, if you go back and look at every penny that we have spent on missile defense since President Reagan started this program in 1983, it is about \$100 billion including this year's appropriation. The damage cost to New York City alone from September 11, just the damage cost, not the airline industry

cost, none of that, just the damage cost, was \$83 billion. So, if we can prevent another attack on this city or any city in the United States of that magnitude remembering that we are talking about weapons of mass destruction, we will have paid for this program many, many times over. We view this as a security investment, as an insurance policy that is even better than insurance because insurance pays you after the fact and, hopefully, we can prevent the fact from ever occurring.

The Democrats have never been big supporters of missile defense. If you go back and look when there was a Democratically-controlled Congress and either a Republican or Democratic President, we would typically, even with the Democratic President, be cut anywhere between 20 to 30 percent over what the President proposed. Having said that, if this had been a year ago, I'd be wringing my hands over what I saw as the future of the program, but three things happened over the last year. One is millions of Americans woke up and saw what happened with North Korea and it was played out on Good Morning America and Fox News for almost a ten-day period. So, a lot of people started waking up and saying this is a real threat that can emerge and we'll be faced with imminently.

Number two, our test program has been very successful. It does work, it is not pie-in-the-sky and we have been able to prove that in our test program.

Number three, people saw what happened with Lebanon and with Israel over the summer. They saw what happened when a country is not protected and cannot defend itself against that type of an attack.

Because of those three factors, we saw a lot of folks who were not

supporters begin to move over. During the campaign season, a lot of folks who really surprised me said that they were for missile defense. So, I think that we may get a reduction but I don't think it will be dramatic and we will have to deal with it because that is the way our system is. But, I think that the more information that we bring to bear and the more awareness that we can bring to bear with the Congressmen, we are better off.