

THE SUBMARINE REVIEW

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STRATEGIC SYSTEMS UPDATE

by Rear Admiral G.P. Nanos, USN
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It is my pleasure as the Aerospace Arm of the submarine community to provide an update on our thinking and our progress.

Usually, our deployed forces are the last part of a strategic systems presentation, but they are not the end of the story, they are the beginning and I just want to remind you of what we have deployed today. I am then going to spin off of that and tell you what we can do in the future and how we are going to get there.

Of course, the mainstay of our deployed force has been TRIDENT I C4 which has the Mk 4 warhead and the W76 reentry body. With over 700 patrols, over 170 flight tests and over 17 years of operation, this system has exceeded all our expectations: for range and for reliability and in the case of accuracy we have exceeded requirements by almost a factor of two. By every measure this is an exceptional system and meets all requirements, but it is aging. Although we intend to keep C4 in service longer than we have any other fleet ballistic missile and have learned a great deal from it, we are in the last decade of its life.

Our more modern Trident II D5, with not only the Mk4, but the new Mk5 warhead, is designed to have higher accuracy, higher yield, and be able to penetrate during extreme weather. We have commissioned the ninth D5 submarine in the Atlantic, the tenth is in the water and with the eighth on patrol, the major portion of our submarine based deterrent will from now on be Trident II.

Let's talk about D5 performance. My predecessor twice removed, Admiral Ken Malley, used to say you could draw a circle around the ends of a TRIDENT submarine and could put all the warheads in that circle from 4000 nautical miles away. That sets a reasonable, unclassified scale for the performance of the D5 system. We are up to 91 patrols, 58 flight tests, and 6 plus years of operation. Now, we can describe to you about where we are going to go with this system, starting with the systems role in the strategic deterrent force. For example, we ran a test in one DASO where we demonstrated the ability to reduce the system CEP by half under certain conditions.

A comment was made and a question posed several years ago by General Lee Butler about what could be done with a single

missile. He postulated that if the National Command Authority ever elects to use strategic missiles, they may elect to do it on a one missile basis. So, we looked at something we called Super-groom. We asked the question: "If you really wanted to optimize an engagement what could you do?" It turns out if you groom a missile, freshly calibrate the guidance system, come to periscope depth, take GPS data to fill a Kalman filter with which to correct the ship's inertial navigation system, then immediately return to depth and launch it at a time such that the guide star for the stellar-aided inertial guidance system is exactly in the right place relative to the target, you can, in for certain scenarios, halve the CEP of a current TRIDENT missile. Although this has not yet been implemented in an operational sense—there's a lot of work that needs to be done in terms of doctrine and procedures—that capability is there, it is repeatable, and we have verified that.

Accuracy is really the coin of the realm in strategic deterrence in all forms, both conventional and nuclear, for the future. Let me expand on that a little bit.

We can chart the capability of our weapon system against targets and see what accuracy has done for us. The demonstrated capability of the D5 is excellent. Our capability for Mk 4, however, is not very impressive by today's standards, largely because the Mk 4 was never given a fuse that made it capable of placing the burst at the right height to hold other than urban industrial targets at risk. With the accuracy of D5 and Mk 4, just by changing the fuze in the Mk 4 reentry body, you get a significant improvement. The Mk 4, with a modified fuze and Trident II accuracy, can meet the original D5 hard target requirement. Why is this important? Because in the START II regime, of course, the ICBM hard target killers are going out of the inventory and that cuts back our ability to hold hard targets at risk. The Air Force has some plans for how to upgrade their ICBM force to restore that capability. We can do that with the Mk 4 reentry body for 10 cents on the dollar in terms of investment because of the accuracy of our system, and we have made this option available to the strategic CINC.

The D5 production schedule is an important issue for us because it equates to a large amount of submarine force dollars. There are two important aspects of the program that relate to this cost. Number one, the level of production for D5 missiles is low. It turns out that we have gone from the rate of six a month

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production down to one a month production with only a 25 to 30 percent increase in unit cost. I think this is a real tribute to your strategic industrial base, because by doing that, they have opened up the dollars in the top line for other submarine programs. I feel really good about the contributions of Lockheed-Martin and others in terms of realizing this level of control. I think that a decrease factor of six with only a 25 to 30 percent increase in unit cost is extraordinary and probably without precedent. Another key cost factor is that the reliability of the D5 weapon system has allowed the missile inventory number to be kept very low. I fly two less D5 missiles a year than I do for C4 based solely on the reliability of the D5 system; this equates to over 50 million in savings a year. The capability of the D5 system is hitting us in the pocket-book in a very beneficial way.

The schedule for the D5 conversion of our TRIDENT I submarines is in place. Of course as we enter into force with TRIDENT II, there is a question mark about what we do with the last four Trident I submarines: the ones not scheduled for backfit. Everything is being driven by the START treaty entry into force in terms of our plans. That is what will drive the elimination of the four non-D5 converted TRIDENTS, or conversion of those to other uses.

There is a continuing need in the Navy for covert special operations capability, for mine warfare capability and also the need to introduce more survivable vertical strike modules capable of handling Tomahawk and tactical ballistic missiles. We have worked very closely with N87 and NAVSEA to come up with affordable options for doing this, using converted Trident I submarines. You can have a broad range of options, anywhere from 125 to almost 200 strike missiles, combine that with special operations capability and even support all three missions in the same submarine. This is an extremely capable platform and we have worked very hard to come up with solid affordable options to allow us to extend its life.

We can also put some conventional warfare bite into this submarine and into the 688 with the vertical launch tubes. We have adopted a partnership role with the Army and have signed up to work with them very closely in a broad number of areas associated with missile technology. The Army tactical missile people are extremely competent, steadfast and good partners with extensive experience in tactical missiles. We bring to the game

underwater-launch strategic missiles and perhaps, most important from the Army standpoint, expertise in hypersonic vehicles that can be used to deliver lethal force, particularly hard target penetrators on the battlefield. The Army, aside from a broad range of capability in tactical missile systems, also has extensive capability in the area of brilliant anti-tank munitions, multi-sensor terminal guidance and sensor fuzed weapons. We have been doing a lot of work with the Army and I'm going to update you on that. First of all, we did actually price a program to put ATACMS in a 688 submarine. We are continuing to work that hard, with particular emphasis on cost. We have also signed up, with our Army partners, to pursue the JROC approved mission need statement for hard and deeply buried targets. This program has gone to Milestone 0 and the Army is working with us to provide both sea-based and land-based weapons that can work with that. Perhaps the most important thing that has happened year is that we have an approved, OSD funded technical demonstration where we and the Army will demonstrate capability against hardened counter proliferation targets and weapons of mass destruction. As part of that activity we will fly a hard target penetrator in a Mk 4 reentry body from an ATACMS missile in 1999. // Y

For submarine launched ATACMS, there is no magic involved. It involves taking existing operational systems and putting them together. Clearly, the trick is to make that missile fit the Tomahawk launch tube and to do that you have to make it a little bit longer and redesign the fins so that they will tuck in tighter. It turns out that the former Loral, now Lockheed Martin Vought, is going to invest their own funds to reduce development risk further.

As an example, a casting was required to extend the missile so that the fins can fold into a smaller diameter. Again, this was done by Loral on their IR&D funding and they are going to build this up into a mockup of a Submarine Launched ATACMS Missile.

In addition, we have an actual prototype of a casting of a submarine launched ATACMS fin which will go into that mockup missile that they're putting together. My only commitment on the government side is to say if they build it I will wheel it into the Pentagon and around the E-ring one time to show everybody the commitment of industry to this program and the Submarine Force.

One other piece that has to be done is a new cable tunnel to

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allow the missile to fit into the launch tube. This also represents a significant commitment on the part of the Army. This is a type of modification to the missile which will not affect the Army's employment of the missile and the Army is willing to incorporate the change into all versions of the ATACMS missile, even their own. If we do the development for SLATCMS, they are willing to introduce modifications like this into their production missile to make it more affordable for us to get online with their production. So the Army is also playing very strongly and very supportive of our use of their missile.

The counter proliferation demonstration that I spoke about earlier will involve firing an ATACMS missile from the only launcher we have available, the M270, against a cut and cover bunker of the type used to house counter-proliferation targets. The missile will incorporate a Navy Mk 4 reentry body modified to carry a conventional earth penetrator and a control system, into a target out at White Sands Missile Range. After the tests prove the capability, a residual capability consisting of one Army artillery platoon equipped with penetrators will be available. There is no reason that the residual capability couldn't be a 688 submarine, but unfortunately we have to get the missile adapted to the submarine in order to make that happen. Once we become ATACMS capable, this capability will be available for us.

It turns out that in some areas this type of weapon plays very heavily. There was a joint multi-warfare analysis game run in the MRC-West scenario. It showed that although we turned back the tide, we did it at great cost, because there are a lot of the North Korean targets that we need to suppress that were just unattainable with our current order of battle.

The original game showed that against Seoul, for example, the North almost took Seoul and attained 90 percent of their objectives before they were turned back. By being able to take out the strategic artillery, the Nuclear Biological and Chemical capabilities, the C4I with the ATACMS penetrator the attack was turned back very quickly. They never attained more than 25 percent of their goals and it took eleven days out of that particular campaign. Overall in the MRC, it took eight days out of the campaign. In this game, the weapon was deployed from submarines, surface ships and from Army units in country.

Is it always going to be this good? Well, it's like automobile gas mileage; it depends on how you drive the car or in this case

what scenario you are in. If you have hard targets that are a key to battlefield success and you can patrol along the coast to get within range and wait covertly, the submarine ATACMS combination plays very, very heavily. It really makes a dramatic impact on this particular MRC. This is the most impact, I understand, that they ever had from the introduction of a single weapon into a war game like this in terms of its affect on the outcome.

In going after hard targets, we have discussed how we are going to fly a new warhead on ATACMS. That has been funded. Although we are building it for ATACMS, it is built in a Mk4 reentry body and we can use a version of it on a strategic missile to address conventional targets at long range. This would allow a penetrator to be deployed out to four to six thousand nautical miles, delivered accurately, and be able to be gotten on target in the first hour of a conflict. In fact just a tungsten plug in a reentry body at full reentry velocity will do a great deal of ground shocking and cratering.

The Army likes our approach. We are working closely with them. It's a good effort. I think we have a lot of promise in both the long and the short range missile. Of course the strategic CINC has to agree to use of his strategic assets for conventional use. This is because, under the START treaty he is going to give up a weapon in the SIOP for each conventional weapon deployed.

In summary our main line programs are doing extremely well. Performance is in good shape. The team of the Type Commanders and the Fleet are working hard to keep the strategic force deployed and capable.

The existing off-the-shelf technology that's available to us today means that we can really extend the capability of these systems both in the strategic venue, as I mentioned with what a simple fuzing change will do for the Mk 4 reentry body, and also by expanding the role of submarines and submarine-launched missiles to other critical mission areas and conventional deterrence. I think there's a great future for ballistic missiles, aerospace and the Submarine Force together.

