

American Submariners Inc.
4370 Twain Ave.
San Diego, CA 92120-3404



The Silent Sentinel September 2019

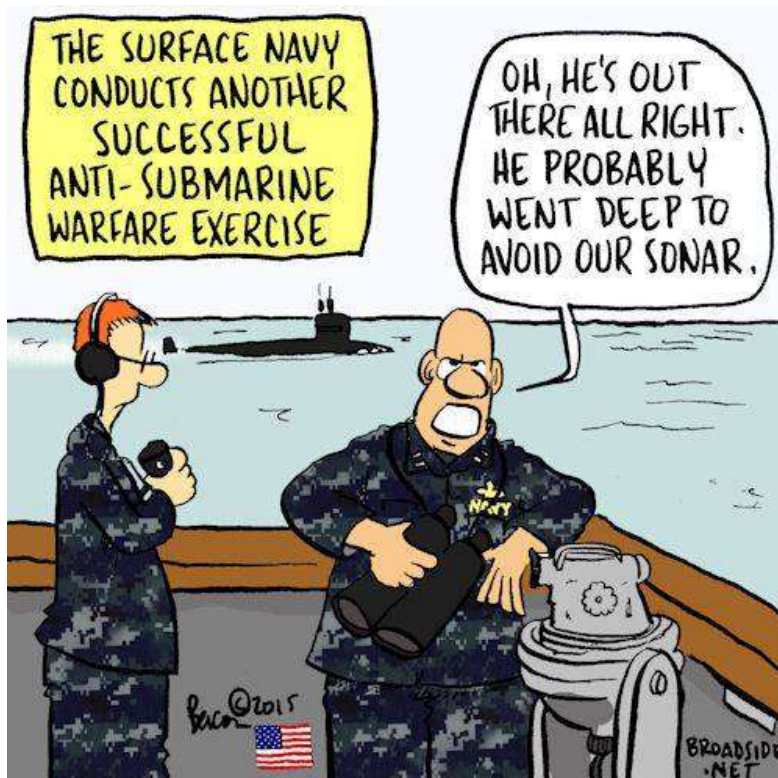


Our Creed and Purpose

To perpetuate the memory of our shipmates who gave their lives in the pursuit of their duties while serving their country. That their dedication, deeds, and supreme sacrifice be a constant source of motivation toward greater accomplishments. Pledge loyalty and patriotism to the United States of America and its Constitution.

In addition to perpetuating the memory of departed shipmates, we shall provide a way for all Submariners to gather for the mutual benefit and enjoyment. Our common heritage as Submariners shall be strengthened by camaraderie. We support a strong U.S. Submarine Force.

The organization will engage in various projects and deeds that will bring about the perpetual remembrance of those shipmates who have given the supreme sacrifice. The organization will also endeavor to educate all third parties it comes in contact with about the services our submarine brothers performed and how their sacrifices made possible the freedom and lifestyle we enjoy today.



U.S. Submarine Veterans San Diego Base

Base Commander

Warren Branges
wgbranges@gmail.com
619-461-0464

Membership – Change of Address

Ray Ferbrache
2955 lloyd St.
San Diego, CA 92117
arayz@san.rr.com
619-972-4474

Treasurer

Mike Cosgrove
619-559-4004
1557 Swallow Drive,
El Cajon, CA 92020
grover02@aol.com

Senior Vice Commander

Manny Burciaga
619-921-5877
8406 Alado Place, El Cajon
CA 92021
mpburcia@cox.net

Newsletter Editor

Mike HYMAN
3639 Midway Drive, B-320
San Diego, CA 92110-5254
(619)223-9344
stamps@fortunesofwar.com

Assistant Editor / Photographer

Jack Kane
619-602-1801
2498 Boyington Place
El Cajon, CA 92020
jkane32@cox.net
subvetparades@cox.net

Junior Vice Commander

Joe Peluso
858-693-0627
8380 Pallux Way
San Diego, CA 92126
jpeluso@pacbell.net

Base Storekeeper

Paul Hitchcock

Chief of the Boat/Middle East Liason

Bob Bissonnette
H: 619-644-8933
Cell: 619-251-7095

Secretary/Parade Chairman

Jack Kane
619-602-1801
2498 Boyington Place
El Cajon, CA 92020
jkane32@cox.net
subvetparades@cox.net

Chaplain

David Martinez
858-565-6165
4283 Mt. Herbert Ave
San Diego Ca 92117

Scholarship Chairman

Paul Hitchcock

The Silent Sentinel via Email

To all of my Shipmates and families who currently receive our Great newsletter via the mail who would like it sent via email or continue to receive it via mail, please fill out the form and mail it to the base or myself. We are trying to cut the cost of the newsletter down from \$3700 to about \$1900 a year. By receiving the Silent Sentinel via email will cut down the printing and mailing cost. The other plus to receiving it via email is you can save it on your computer and not have the paper lying around the house.

A subscription to the Silent Sentinel newsletter will be available to surviving family members via internet email, at no charge, upon notification of the Membership Chairman. If a printed hard-copy is preferred, via US Post Office delivery, an annual donation of \$5.00 will be requested to cover costs.

NAME: _____

ADDRESS: _____

CITY/STATE/ZIP: _____

EMAIL: _____

TELEPHONE: _____

Would like the SILENT SENTINEL emailed: YES _____ NO _____

USSVI Base Commander
c/o VFW Post 3787
4370 Twain Ave.
San Diego, CA 92120-3404

*DUE TO LOGISTICS CONSTRAINTS, ALL INPUTS FOR THE SILENT SENTINEL MUST BE IN MY HAND NO LATER THAN **ONE WEEK** AFTER THE MONTHLY MEETING. IF I DO NOT RECEIVE IT BY THIS TIME, THE ITEM WILL NOT GET IN. NO EXCEPTIONS! MIKE*

Our Next Meeting

Our monthly meeting is held on the second Tuesday of the month at VFW Post 3787, 4370 Twain Ave., San Diego. Our next meeting will be on *September 10th*. The post is located one-half block West of Mission Gorge Road, just north of I-8. The meeting begins at 7 p.m. The E-Board meets one hour earlier at 6 p.m.

*Check us out on the World Wide Web
www.ussvisandiego.org*

BINNACLE LIST

Len Heiselt, Sergio Frost, David Martinez, Chris Sultana and Tony Dack

Submarine Losses in September

Originally Compiled by C J Glassford



USS S-5 (SS-110)

Lost on September 1, 1920 when a practice dive went wrong and she sank bow-first, with her stern showing above the water. In a dramatic adventure, her exhausted crew was rescued during the next few days. Salvage attempts were unsuccessful, S-5 settled to the bottom and was abandoned.

USS Grayling (SS-209)

Lost on Sept 9, 1943 with the loss of 76 men near the Tablas Strait. Grayling was on her 8th war patrol and sank two ships before being lost.

USS Pompano (SS-181)

Pompano was sunk (between Sept 17 and Oct 5) with the loss of 77 men while on her 7th war patrol. Possibly lost on Sept 17, 1943. Japanese records show that a submarine was sunk in her patrol area on 17 September by air & depth charge attack off the Aomori Prefecture near Shiriya Zaki. Before being lost, she sank two enemy cargo ships. The exact cause of her loss remains unknown, but she probably was sunk by the air/sea attack above or fell victim to a mine on or after 9/25/1943. This boat's last recorded ship (Taiko Maru) sunk happened on Sept 25th, so she probably hit a mine on or after that date but before Oct 5th, when she was scheduled back at Midway.

USS S-51 (SS-162)

Lost on Sept 25, 1925 with the loss of 33 men when it was sunk after collision with SS City of Rome off Block Island.

USS Cisco (SS-290)

Lost on Sept 28, 1943 on her first war patrol with the loss of 76 men in the Sulu Sea west of Mindinao.



**San Diego Base, United States Submarine Veterans Inc.
Minutes of Meeting - 13 August 2019
At VFW Hall, 4370 Twain Avenue, San Diego CA 92120**

1906 - Base Commander Warren Branges called the meeting to order.

Conducted Opening Exercises - Pledge of Allegiance lead by **Chief of the Boat Bob Bissonnette**.

Base Commander Warren Branges lead the opening prayer. A moment of silence was observed for STSCS(SS) Michael J. Schrieber and CSCS(SS) David Schmidt. Senior Chief Schrieber went on Eternal Patrol 22 June 2019 and Senior Chief Schmidt on 2 August 2019.

Chief of the Boat Bob Bissonnette conducted Tolling of the Boats for boats lost in the month of August.

Base Junior Vice Commander Joe Peluso recognized Past Commanders, dignitaries and guests

Base Secretary Jack Kane announced 18 members and 1 guest present.

Base Treasurer Mike Cosgrove presented the Treasurer's report. A copy of the Report will be filed with these minutes. Minutes of the July 2019 meeting were published in the Sentinel.

Base Commander Warren Branges called for Committee Reports

Binnacle List - Len Heiselt, Sergio Frost, David Martinez, Chris Sultana and Tony Dack are on Binnacle.

Parade Committee - Chairman Jack Kane announced the next parade is in Poway on September 7th. Parade starts at 0900. Muster between 0730-0800. Maps and further information will be sent via e-mail upon receipt from the Parade Committee. The last parade of the year will be San Diego Veterans Day Parade on 11 November.

Membership Committee - Chairman Ray Febrache was not in attendance.

Scholarship Committee - Committee Chairman Paul Hitchcock was not in attendance.

Storekeeper - Chairman Paul Hitchcock was not in attendance.

Breakfast Committee - Chairman Base Commander Warren Branges. The Next Breakfast is 29 September 2019. The VFW Kitchen Supervisor will hold a certification/re-cert class for Food Handlers at 0700 that morning. Check the list on the bulletin board for your status.

52 Boat Memorial - Chairman Base Commander Warren Branges. - The next All Flags Day will be Friday, 20 September 2019 (POW/MIA Remembrance) and then again on 11 November 2019 (Veterans Day). We will post flags at 0700 and retrieve them at 1730 both days. The 52 Boat Memorial Board has begun procuring new polished concrete markers to replace damaged markers. All granite markers will be replaced with polished concrete on a graduated schedule. The Committee will start a fund drive soon to finance the changeover.

Float Committee - Chairmanship open. The battery on the float has been replaced.

Eagle Scout Program - Co Chairs Nihil Smith and Glenn Gerbrand. No report.

1928 - Presentations. None. The Base Commander has asked Captain Charlie McVane to give a presentation at a future meeting.

1929 - Base Commander called for a break. 50/50 Raffle held. Jessie Farley donated her winnings to the scholarship fund.

1940 - Unfinished Business

FLOAT STORAGE STATUS - Naval Base San Diego will be opening a new RV storage lot adjacent to the Mini Mart at Rosecrans and Nimitz. We will be moving the float to that lot when it opens. When we make the move we will obtain and install a new float cover. The Base anticipates opening the lot in September or October (or later).

BASE ROSTER AND EMAIL VERIFICATIONS are continuing. If you a verification email please respond. We are still reconciling the Base List with National List.

MEMBERSHIP DUES. If your dues are lapsed please see the Base Commander. COB Bob Bissonnette will bring up the National data base inadequacies at the National Convention.

VFW STORAGE AREA. We will help the VFW rehab the storage garage after the Solar Parking Area is completed.

WREATH LAYING AT 52 BOATS. The Wreath Laying tentatively scheduled for 7 December 2019 will have to be moved to 6 December 2019. The Park is being used on 7 December for The Jingle Bell Run. Base Commander will work out details of the event with the Point Loma Association. We do have funds from last year to cover most of the anticipated cost for this year's event. We will still put out flags on 7 December.

SOUTHERN CA SUBVETS PICNIC - The Picnic was a success. We had 104 attendees. Tours of the Alexandria were a big hit. Holland Club Certificates were presented to Shipmates Dennis Mortensen and Kip Casper. We consumed less beer and more ice cream than years past. Shipmates attended from USSVI BASES throughout California. WWII Submarine Veteran George Kinnison and his son were in attendance.

PROPOSED CHANGE TO MEMORIAL DAY CEREMONY/TOLLING OF THE BOATS. We are looking at ways to increase participation at the ceremony. An option to move the ceremony to 52 Boat Memorial is a non-starter due to conflicts with other events, insurance and permitting problems, etc. One option is move the ceremony to the afternoon vice morning on Memorial Day. This would help eliminate the inherent conflict with the concurrent ceremony at Rosecrans National Cemetery. The Base Commander will discuss this time change with CSS-11 who co-sponsor the Ceremony. The Commander will also discuss base access with CSS-11 and Naval Base Point Loma for the event. We may be able to use pre-approved access list rather than escorts.

1956 - NEW BUSINESS

USSVI SAN DIEGO BASE PARTICIPATION IN SUPPORTING NEW CPOs AND SUBMARINE HOMECOMINGS. After a long discussion it was decided that the Base Commander will discuss participation in both with the CSS-11 Command Master Chief.

LIVE STREAMING OF OUR MEETINGS. It was suggested that we live stream our meetings so that members not able to attend can see what goes on. The COB will look into equipment/platforms/services to be able to stream the meetings on the Internet.

MOTION TO SUSPEND MEETINGS AT VFW 2787. A motion was made to suspend USSVI SAN DIEGO BASE Meetings until the parking lot at VFW POST 2787 is resolved. A long and spirited discussion was held. The Question was called and a vote was taken. The motion failed. A motion was made to look into alternate meeting places. Chief of the Boat Bob Bissonnette will coordinate this effort. Several shipmates volunteered to look into alternate meeting places in and around San Diego and East County.

2028 - Good of the Order

2019 National Convention starts tomorrow in Austin TX. San Diego Base participants are Bob Bissonnette, Bill Earl, Jack Kane, Greg and Vanessa Paulson and Jerry and Doris Kochert.

OUTYEAR CONVENTIONS - 2020 will be in Tucson and 2021 will be in Orlando at Rosen Shingle Creek.

SILENT SERVICE TV SHOW is available at olgoat.com

DEEP SUBMERGENCE REUNION will be held in San Diego 25-27 September 2020 in San Diego.

A MODEL OF A MK-48 Torpedo donated by Kip Casper will be auctioned at the next meeting. (The Secretary forgot to bring it for this meeting).

THRESHER MEMORIAL at Arlington National Cemetery. The USS Thresher ANC Memorial Foundation will hold a dedication ceremony and reception on 26 September to dedicate the THRESHER National

Commemorative Monument at Arlington National Cemetery. If you would like to donate to cover the cost of the ceremony go to

<https://threshermemorial.org>.

The Meeting was adjourned at 2036.

/s/ **Jack E. Kane**

Jack Kane, Secretary

Sailing List for 12 August 2019

Members

Matt Baumann [*Matt will be having brain surgery on Wednesday, 11 September 2019—heal quickly shipmate! M.H.*]

Bob Bissonnette

Warren Branges

Kip Casper

Mike Cosgrove

Nicholas Dirx

Joel Eikam

Ed Farley

Bob Farrell

Fred Fomby

Jack Kane

Steve Lamprides

Dennis Mortensen

Joe Peluso

William Pickering

Jim Pope

Mert Weltzien

Greg Vechinski

Guests

Jessie Chang Farley

Silent Sentinel

EXCLUSIVE!



Judith and Gary Murphy have graciously consented to allow the Silent Sentinel to republish their collection of USS Whale, SS-239, ship's newspaper, "THE RAG," from the WW-II era! Gary's father, Rex Murphy, served as Whale's Engineering Officer. The Silent Sentinel will now include a copy of The Rag in each issue. The Murphy's and I hope that you will find it an interesting reading experience.

On the evening of 19 March, *Whale* sighted two large freighters and one torpedo boat or destroyer as escort. Just after daylight the next morning, the submarine finally worked into a favorable attack position; she fired spreads of three torpedoes at each freighter, and hit both. The first target, tentatively identified as *Mogamigawa Maru*, sank rapidly by the stern. The second, a cargo ship resembling *Arizona Maru*, was plagued by several heavy internal explosions following a second torpedo hit. *Whale*, mistaking these secondary explosions for bombs, went deep. Upon discovering her mistake, she started to surface but was greeted by a barrage of depth charges from the escort. *Whale* dove again but again came under attack – this time from the air – when she attempted to return to examine the wreckage. The submarine suffered extensive damage during this attack. This was by far *Whale's* closest escape.. It is now 28 March 1943: "The Rag" No. 12.

 * * * * *
 * * * * *
 * * * * *

TWENTIETH EDITION

MARCH 28, 1943

"FOR WHERE YOUR TREASURE IS, THERE WILL
 YOUR HEART BE ALSO".....Matt.6:21

The following is a poem submitted by one of the newer coal heavers from the After Engine Room:---J. HUNTER.....

-A SAILORS' DREAM-

One nite I lay upon my bed,
 I dreamed my love and I were wed
 and in a voice so gentle said,
 "DOOD IT"
 As I blushed, my rapture arose
 and I lifted up her underclothes
 She said, "My dear, no one knows"
 "DOOD IT"
 'Twas but a dream so short and sweet,
 as I awoke in a sweated sheet,
 I found that there upon the sheet,
 "I DOOD IT"

MINUTE BIOGRAPHIES
 OF
 WHO'S WHO ON THE WHALE
By Bummy.....

No. 4 LOVER MARTINI

Martini, the Sweetheart of Sand Street, is the true lover aboard the Whale. Bimbo, as his friends know him, (his enemies have a few different titles) is a Ladies man from way back.

When he goes ashore the rest of the fleet doesn't stand a chance. He can always be heard telling how he pushes the babes aside when he enters a beer joint.

Some of his more recent conquests have been, Nellie the Horse Dirty hairy Helen, Coast Guard Nora, Breakwater Bertha (formerly associated with the Rex rooms)

Aboard the boat he is THE KEY MAN, the only trouble being that as yet, no one has been able to locate the hole in which he fits. (The girls in No. 2 firehouse will gladly give him a hint)

He also has his own ideas on how to win the war. Reads WAR COMICS to get the front line dope. Also finds KIDDIE COMICS interesting and exciting.

Before the war, Bimbo, (In Italian, freely translated, it means, I quote; "The south end of a horse heading North." He was anchor man on the Vassar daisy chain. When the present conflict is over, he's going to attain his life's ambition, modeling girdles in MACY'S basement.

P.S.--Listen kid, the air compressors are still in the pump room, in case you want to carry out your threat to show the Aux. gang how to put in an air charge.

TOMORROW: VANSTRANDER.....

HEAR YE.....HEAR YE.....HEAR YE!

HAVE YOUR HAIR DONE BY GIRLIE NASH!!!

Girlie Nash proprietor of the MAN. room beauty saloon, just aft of the After Engine House, disclosed today, that a late shipment of LEFT handed curlers Now makes it possible to do the finest hair in the late now up-swing style, to suit any mood.

She also disclosed, that dapper Bones Backhien's main sweep down the back is one of her own brain children, not to forget other living examples of her ability such as; The shimmering shade shine thru model sported by that famous T. Thompson. Moody's I can't do a thing with it, style, and Lady Little's windblown hashabout style. Also to mention the eyeshade model, worn by Buck Rogers. The 78 turns, four engines on the line and the exotic parallel to series updo may be had at slightly higher prices.

If you wish, you may do your flim-may-flammy shopping there. If you have nothing to do, and for want of a better place to do it, see her latest new brown striped scivvie pants. At present, this lace brown with stripes is very much in demand. So come early and avoid the rush. Girlie Nash also carries a full line of the late fancy-paney french yellow and blue green striped lip sticks and rouges.

This is a paid advertisement.
 "OLD FOLKS"

FLASH! FLASH! LATE NEWS BULLITON*****
 \$AP) Tonight at 2100, the unbelievable happened. That super stupid rap-scillion, under water head light, has been from Wisconsin, that King of the buss bars that Asp choker of ill repute, that bladder footed stand out from under low lid person, and I mean his lid is low, in the Manuevering room, broke out his last and seventh carton of smokes, to the amazement of all hands, since his leaving Mare Island 9 months ago. CONGRATULATIONS TOMMY, we didn't think you had them. (We still don't think they're yours. Who did you bum that carton from??)




PACIFIC LENDING
Phone: 619-871-8085
Email: central@pacificlending.com
Web: 619-221-6375
NMLS: 1161521
Gary Wetzel
Mortgage Loan Officer
1410 South Pine Road, Suite 207, Chesham, AZ 85286
Pacific Lending LLC/NMLS 1150796
1 Corporate Park - Suite 100
Irvine, CA 92616
OFFICE: 1-866-431-4328


**PT. LOMA
POSTAL PLUS**
Quinlin R. Holmes
Owner / Notary Public
3539 Michewy Drive, Suite B
San Diego, CA 92110
pplp@rocketmail.com
M-F 9-5; Sat 9-5
TEL 619 221-8004
FAX 619 221-8005


Coast
Appliance Parts & Service
Co., Inc.
M-F 9:00am to 5:00pm
Sat 10:00am to 1:00pm
4816 Trueno Avenue
San Diego, CA 92121
619-466-1210
619-466-1199 Fax

THE COLD WAR ERA FILES

REGULUS

SUBMARINES 1959-1964

The first nuclear guided missile global deterrent force

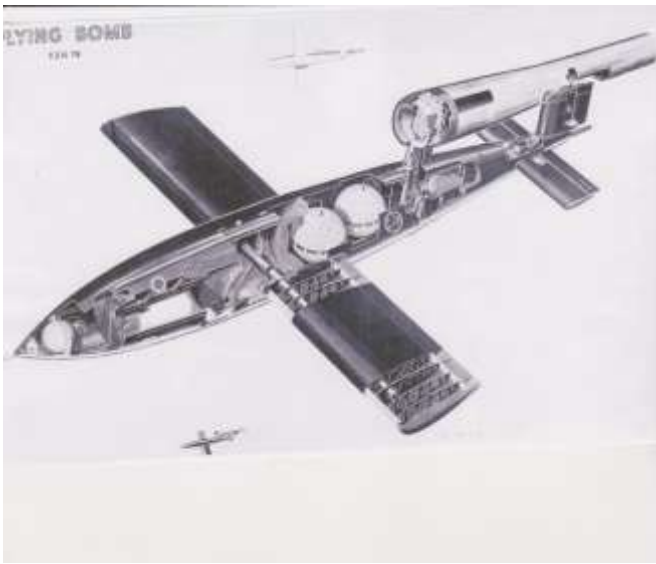
By Wayne T. Nelson

Just after the dust was settling from World War 2 the country was thrown into a Cold War with nuclear implications with the former Soviet Union. In Hollywood the witch hunt was on for card carrying Communists and sympathizers to expose and black ball. In the cities and small towns fast buck artists feeding on the rampant fear of nuclear annihilation were going door to door selling bomb shelters for the sure to

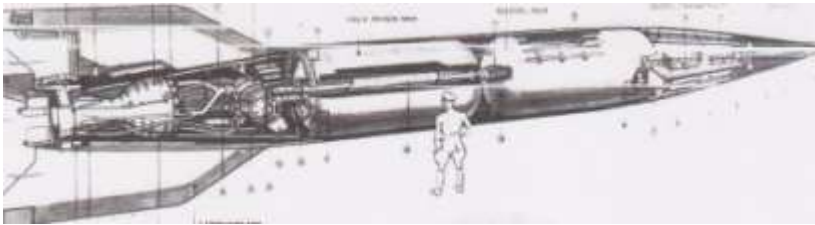
happen atomic bomb attack and with those horrible images of those Japanese bombings fresh in their minds, those who could afford it bought them. In schools we learned to “duck and cover” and almost weekly the ear drum penetrating early warning siren blared out from atop our school giving us its warnings and even though it was just a test warning everyone thought the day was coming soon when it would be for real. The basements of schools and public building were designated bomb shelters and the yellow and black signs with the alternating triangles told you the capacity and how many people might be saved from incineration.

Meanwhile over in Washington and the nearby Pentagon the big brass and government officials pondered national security and what to do with those wonderful inventions that came to be during the last few months of the war. Atomic bombs, jet propulsion and rockets that carry explosives.

The Nazi, especially Hitler, often made errors in judgement and one of those was, how to utilize the V-1 and V-2 rockets. They probably had their reasons but they also lead to their downfall when they decided to build firing stations for the V-2's that were permanent. German Army officers argued that the weapons would be better utilized if they were mobile and the launch sites where positioned where needed. But the permanent launch sites won out due to the fact that they could store dozens of the rockets as well be able to service and build them in one location.



Cutaway of the V-1 rocket. It was as noted called the “Flying Bomb” and also the “Buzz Bomb”. It was from these designs that the American JB-2 Loon missile and ultimately the REGULUS was developed.



Cutaway of the German V-2 rocket. Testing and studying this design lead to the design and creation of rockets used in the various space programs.

The idea was to be able to rapid fire the weapons. But they also failed to realize even though the launch site was heavily fortified it was once discovered an easy target to bomb and like those massive submarine pens once discovered relentless bombing raids didn't fully destroy the facility but damaged the roof enough to prevent any weapons from being launched.

So after the Army generals said “I told you so!” the remaining V-2 rockets were turned over to them and became mobile launched weapons of mass destruction. Just had to put that in there. But these weapons were not nuclear because for all intents and purposes sabotage had stopped their nuclear research progress. As a side note a submarine was discovered a few years ago in a Norwegian ford that per records was

believed to have carried “heavy water” to their research facility there. That sinking by dive bombers is believed to have ended the progress to build an atomic bomb. So the V-1 and V-2 carried only conventional explosives.

But for the Nazi war machine it was too little too late and although the weapons were effective causing about 2,700 deaths and massive destruction there were just too few to make a noticeable difference. About 1,000 were launched. Plus even though the rockets were mobile it required a circus parade of vehicles to deliver the goods. The rockets, 3 to one location, were on separate transports. There were 2 fuel tankers. One with alcohol and the other liquid oxygen for fueling all 3 rockets. There was also a radio car, troop transports and various staff cars in the procession. It must have been a very noticeable movement.

When the war ended we acquired whole V-2 rockets and parts to assemble 70 units. These were tested at White Sands New Mexico firing off 2 a month until they were exhausted. What was learned went into future rocket designs.

HOW THE V-2 WORKED:

Since the V-2 was a rocket and not a guided missile they were fired in a general direction of a target area. The fuel and distance of travel were calculated and pre-determined so when the fuel ran out the rocket simply fell to earth destroying randomly whatever it landed on. It was more of a surprise terror weapon than an effective way to destroy an enemies military resources. In Sept 1944 the first of two V-2 rockets were launched at Paris. One fell short and the other hardly even noticed due to other war activities.

POST WAR WEAPON DESIGNING:

So back to the big war rooms at the Pentagon. They probably at first took a lesson from the Nazi blunder and considered ways to making our rockets and missiles based on German designs and blueprints to be mobile and somewhere in their thinking came up with the idea for carrying the weapons on the deck of a submarine. But before that came to be the REGULUS submarine project there was extensive testing. I will get back to that in a minute but first I wanted to mention a missile program that was oddly similar to the Nazi one of permanent locations. Of course I am referring to the brainchild to build missile silos around some cities. My family home was in Tucson and as I recall they built at least a dozen silos around our city. As I understand just one remains and is sort of a Cold War museum.

As a little history lesson, during World War 2 the Brits installed hundreds of fake inflatable tanks along their coast to confuse the Germans and they worked. I think all they had to do with those missile silos was to build the fancy top and say there was a missile in there. I think the trickery would have worked considering both sides were scared to death during the Cold War.

Do I have 4 aces or am I bluffing?

THE REGULUS PROGRAM A BRIEF HISTORY:

The Regulus missile is often referred to as the “forgotten weapon” and hold onto your hats you “boomer” sailors the Regulus was fitted with a nuclear warhead of 40 kilotons and those first diesel boats were the first to make nuclear deterrent patrols.

Land testing of the captured V-1 rockets were carried out at Edwards Air Force base in the Mohave Desert of California. If you are interested you can read page after page of information but since that is pretty boring we will jump to the meat of the celery.

In May of 1947 (my birthday month and year) the Army awarded a contract to build a guided missile called the MATADOR. This action ruffled the feathers of the Navy brass who considered themselves to be the sole operators of guided missiles since they had the German ones and in retaliation began the REGULUS program in August 1947 by awarding a contract of their own.

With the contract were provided the specifications of what was needed. They were as specified below:

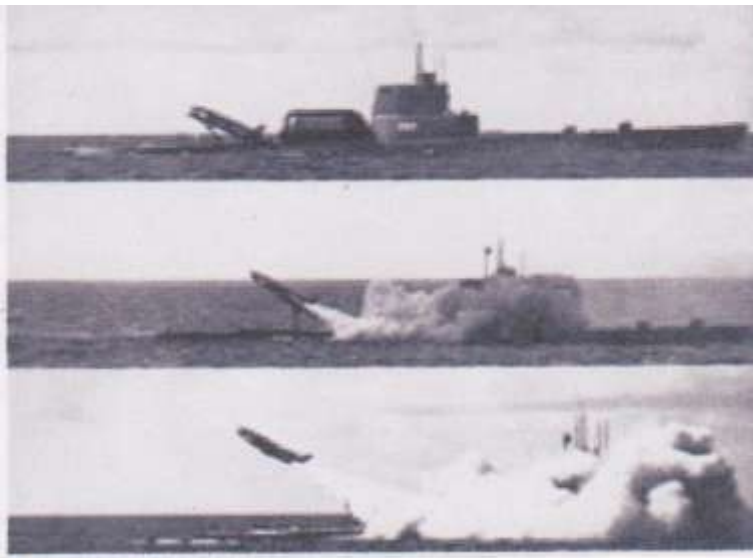
- A. Must be able to carry a nuclear warhead of 3,000 pounds.
- B. Must have a range of 500 miles.
- C. Must have a speed of at least MACH 0.85 or 652 miles per hour.

Since 1945 the Navy had been experimenting with the JB-2 also called the LOON which was a direct design of the German V-1. It was called the LOON short for lunatic because it was very unpredictable. Submarine tests were conducted on the USS Cusk SS-348 and USS Carbonero SS-337. For these tests launch ramps were installed on the deck, but the storage hangers were not yet used. The boats stayed on the surface.



This absolutely gorgeous photo is of the first Loon missile being launched from the USS Cusk off of the coast of Southern California.

Once the Regulus was developed testing on land and air continued from 1950-1951. The first launch of a Regulus was in March 1951 but not from a submarine. But it was after that first successful land launch that submarines were reconsidered and conversions of the USS Tunny SS-282 began. Part of the conversion was to install a round hanger tank behind the sail. This hanger was water tight to test depth and because it was a guided missile, communication was possible to the missile while the boat was submerged. Everything was designed so that the missile could be easily rolled out of the hanger and the launch ramp elevated quickly.



These 3 sequential photos of the first launch of a Regulus missile from the deck of the USS Tunny have appeared in many books and publications.



This is an interesting model put out by Revell in the 1960's. It is the USS Nautilus SSN-571 firing a guided missile. First thing the missile looks like a Loon. And a very big problem is that the Nautilus was not part of the Regulus program or testing. I wanted to be sure and searched the history of the Nautilus. It also occurred to me that the model was a ruse and sort of misdirection to protect the actual submarines involved.

THE FIRST LAUNCH:

The first launch of a Regulus missile occurred on 15 July 1953 off the deck of the USS Tunny. With that successful launch the next of 5 total submarines became fitted for the Regulus missile. The original plan called for 15 boats but by 1964 the Poseidon program was in full swing and the Regulus submarines became obsolete. I read somewhere that my boat the USS Medregal SS-480, which was identical to the Tunny, was at one time a choice for the program.

Following the Tunny and Barbero the Navy looked to bigger boats to carry the Regulus. The next 3 boats were built for the Regulus not existing fleet boats that were converted. First was the USS Grayback SS-574 which was commissioned in 1958. The bow compartment was designed to carry as many as 5 Regulus missiles or 2 Regulus II missiles which had been developed by then.



The USS Grayback heading out to sea. Note the 2 round objects near the bow are the covers to the missile hangers. Also note that Grayback was diesel powered. One of the last such submarines.



Revell model of the REGULUS II. Notice the landing gear that was installed on the test missiles so that they could be used over and over. Two planes flying alongside the missile controlled its flight once in the air and landings.

The Regulus II was obviously bigger but it also had twice the range and speed of the Regulus. Next built was the USS Growler SS-577 in 1959 and last the nuclear submarine USS Halibut SSGN-587 which was the high water mark of the entire program. All the boats together carried a possible total of 18 missiles.

USS Growler as a museum ship



USS Halibut sailing into San Francisco Bay during the Vietnam War era.

41 PATROLS

From the first patrol of the Tunny to the phasing out of the program the 5 submarines of the Nuclear Deterrent Fleet carried out 41 patrols from 1953-1964. The pattern for the patrols was to sail from Pearl Harbor up to Alaska to refuel then down the coast of Russia and patrol the coast for 60 days before sailing to Guam to refuel for the trip back to Pearl. It was also done in reverse. The objective was to have at least one submarine with nuclear capabilities stationed off Russia 24/7 365 days a year. As mentioned this program was phased out as more and more nuclear submarines with Poseidon missiles joined the fleet.



The Deterrent Patrol Insignia: The silver pin is used until 20 patrols have been made then the gold pin is awarded.

REWARDING A JOB WELL DONE:

It took forever but in 1997 the crews of the first deterrent fleet were awarded the Deterrent Patrol Insignia after there was a change in policy as to who could earn the right to wear it. The pin featuring a modern nuclear submarine with a Poseidon missile was designed for the modern nuclear Navy but who

can deny the incredible impact the first fleet had in maintaining World Peace?

SPECS AND INFORMATION OF THE REGULUS:

Length: 34 feet

Diameter: 4 feet

Wing span: 20 feet

Weight: 12,000 pounds

Guidance was by remote control with 2 stations required. The boat itself and another ship or aircraft. After extensive drilling the crew of the Tunny was able to load the Regulus for launch from surfacing to battle ready in 15 minutes.

BONUS SECTION:

On the 8th of June 1959 the USS Barbero SS-317 fired a Regulus missile down range containing US Mail. On board prior to the launch a special US Post Office was setup to cancel the mail which was placed in 2 canisters of “missile mail” and loaded into the missile. The special mail thus became the first official US Mail delivered by a missile. Probably the last as well as far as I know.



USS Barbero putting out to sea



One of the famous "Missile Mail".

As a young teenager I seem to remember seeing the USS Tunny (maybe it was that Nautilus one) Regulus missile model in a hobby shop in either Racine Wisconsin or Tucson Arizona. Of course I never had money for those things but those images played a major part in my joining the submarine service when the time came.

THE FATE OF THE 5 REGULUS SUBMARINES:

You would hope with a program as unique as the Regulus program that all five boats would have been saved as they were. But after the phase out period only one boat was spared and that was the USS Growler. Tunny was converted into a troop carrying boat for service in Vietnam and used as a target in June 1970. USS Barbero was used as a target off Hawaii in June 1964 just after the program ended. USS Grayback served during the Vietnam War transporting Navy Seals and in 1984 was used as a target in the South China seas. USS Gowler in May of 1964 was decommissioned and put in reserves. Then she was scheduled to be a target boat but the order was changed in 1988 and she was donated to the Intrepid Sea, Air and space museum in New York City

and there she is on display to this day. She is proudly alongside the aircraft carrier USS Intrepid. Such a deserving fate and one of only few locations where you can see a Regulus missile.



THIS IS NO WAY TO TREAT A LADY!

The once proud USS Grayback now painted a hideous orange is towed to her doom. With the orange color it must have been like shooting fish in a barrel.

Author's Thoughts and comments:

With all the issues a diesel boat can have you have to admire these pioneering sailors who went to sea with a 40 kiloton nuclear warhead strapped to the deck. Not to mention the long patrols in waters constantly patrolled by enemy warships who know damn well you are out there. How long would it take for Russian intelligence to figure out the plan? If you sailed on any of these 41 patrols I salute your bravery and endurance level. Unless you were on the USS Halibut which per reports was pretty comfortable. Just kidding. Come to think of it sailing with 20 live torpedoes was pretty dangerous. So I salute all you sub sailors! May your contributions to World Peace never be forgotten!

Wayne T. Nelson EN2 (SS) USS Medregal SS-480

1967-1970

Current News

**"Plataginet, I will; and like thee, Nero,
Play on the lute, beholding the towns burn" (Henry VI, Shakespeare)**

In first, MDA remotely launches a missile

Jen Judson, Defense News, August 30

WASHINGTON -- The first-ever test of the Terminal High Altitude Area Defense system's ability to remotely fire an interceptor was deemed a success by the U.S. Missile Defense Agency.

Following the test in the early hours of Aug. 30, the Lockheed Martin-made THAAD has now had 16 successful intercept tests in a row. But the significant milestone is proving the ability to remotely engage the system with a government-developed remote launcher kit.

The capability provides extended range of a defended area, an MDA statement notes.

"Preliminary indications are that planned flight test objectives were achieved and the target was successfully intercepted by the THAAD weapon system," the statement reads.

"This test demonstrates the expanding capabilities of the THAAD weapon system and its ability to intercept and destroy ballistic missile threats in defense of our nation, deployed forces and allies," MDA Director Vice Adm. Jon Hill said in the statement.

THAAD operators from the E-62 Battery conducted radar operations as well as launcher and fire control operations employing a procedure used in combat and were unaware of the target-launch timing.

The ability to launch an interceptor remotely achieves a more layered — and ultimately less stove-piped — approach to regional ballistic missile defense and to increase the battlespace.

The U.S. Army is also working to integrate the Patriot medium-range air-and-missile defense system with THAAD in response to an urgent operational need on the Korean Peninsula.

That effort uses some of the same principles of decoupling launchers and radars so an operator can, for instance, use a THAAD radar (which can see farther than a Raytheon-made Patriot radar) but decide to engage a Patriot interceptor depending on the threat picture.

The ability to use the THAAD radar also gets more out of the Patriot Advanced Capability-3 Missile Segment Enhancement (PAC-3 MSE) missile fired from Patriot units, which outperforms the organic Patriot radar.

Earlier, in an Aug. 29 Army test also at White Sands Missile Range, a PAC-3 Cost Reduction Initiative interceptor took out an air-breathing threat "at a record distance," according to a Lockheed Martin statement. The company builds the missile as well as the PAC-3 MSE.

The test also showed it can be integrated into the Northrop Grumman-made Integrated Air and Missile Defense Battle Command System, the command-and-control system of the Army's future air and missile defense architecture.

The test demonstrated the Northrop system's ability to detect, track and engage a low-flying threat at a distance that exceeds the range of the current Patriot system, according to a Northrop Grumman statement.

Navy's Knifefish Mine-Hunting Drone Sub Approved for Production

Matthew Cox, Military Times, August 29

The Navy recently approved low-rate initial production (LRIP) for a special, underwater drone system designed to conduct counter-mine operations for the service's littoral combat ship.

Program Executive Officer for Unmanned and Small Combatants recently granted Milestone C approval to the Knifefish Surface Mine Countermeasure Unmanned Undersea Vehicle Program, according to a news release from Naval Sea Systems Command.

The Navy is expected to award an LRIP contract to Knifefish prime contractor General Dynamics Mission Systems, the release states.

The Knifefish system is designed to deploy from an LCS as well as from other offshore vessels to detect and classify "buried, bottom and volume mines" in highly cluttered environments, according to the release.

Knifefish consists of two unmanned undersea vehicles, along with support systems and equipment. It uses cutting-edge low-frequency broadband sonar and automated target recognition software technology to act as an off-board sensor while the host ship stays outside the minefield boundaries, the release states.

The Navy hopes to approve a full-rate production decision for the system in fiscal 2021 after additional testing of LRIP systems, according to the release. The service plans to buy 30 Knifefish systems in all -- 24 in support of LCS mine countermeasure mission packages and an additional six systems for deployment from other vessels.

The Navy conducted formal developmental testing and operational assessment from January through May 2019 in multiple locations off the coast of Massachusetts and Florida, according to the release. The Knifefish tests involved operational mine-hunting missions against a simulated target field.

The Knifefish was developed from technology designed for General Dynamics' Bluefin Robotics Bluefin-21 deep-water Autonomous Undersea Vehicle, a system that was involved in the unsuccessful search for the missing Malaysia Airlines Flight 370.

Huntington Ingalls Industries Completes Initial Sea Trials of Virginia-Class Submarine Delaware

Not Attributed, HII-NNS, August 31

NEWPORT NEWS, Va., -- Huntington Ingalls Industries' (NYSE: HII) Newport News Shipbuilding division successfully completed the initial sea trials on the newest Virginia-class submarine, Delaware (SSN 791).

The submarine, in the final stages of construction, spent three days at sea proving all of its systems, components and compartments. Delaware submerged for the first time and performed high-speed maneuvers on the surface and underwater.

"Delaware performed well during sea trials, which is a testament to the skill and craftsmanship of the incredible team of shipbuilders who are working to uphold our high standards of quality," said Dave Bolcar, Newport News' vice president of submarine construction. "We look forward to continuing our testing program to deliver the submarine to the U.S. Navy later this year."

The submarine is scheduled to undergo a round of acceptance trials before it is delivered. More than 10,000 shipbuilders from Newport News and teaming partner General Dynamics Electric Boat and thousands of companies across 48 states have participated in Delaware's construction since the work began in September 2013.

Nuclear gravity bomb and warhead upgrades face new delays

Joe Gould, Aaron Mehta, Defense News, September 4

WASHINGTON -- The United States' B61-12 nuclear gravity bomb may come in as much as 18 months late, with the W88 submarine-launched ballistic missile warhead facing a shorter delay, a top National Nuclear Security Administration official confirmed Wednesday.

The B61-12 life-extension program consolidates and replaces the older B61-3, -4, -7 and -10 variants, while the W88 Alteration 370 is meant to replace the arming, fuzing and firing subsystem for the W88 warhead for the Trident II sub-launched ballistic missile. The two are among five major modernization programs underway at the agency.

Both had been due for production in 2020, but neither will be on time, according to Charles Verdon, the National Nuclear Security Administration's deputy administrator for defense programs. NNSA is working with the Defense Department to minimize the delays, but Congress has been informed both will be ready "roughly around the same time," Verdon said at the at the 2019 Defense News Conference.

The issue stems from over-the-shelf parts used in both weapons. Both systems are planned to work for 20-30 years, and heavy stress testing of the parts raised questions for NNSA officials about whether the parts would survive for three decades. Rather than risk the pieces failing years in the future, officials decided to seek replacements now and delay moving forward with the program.

However, Verdon said the 18-month delay for the B61-12 might shrink in the future, as the agency gains more insight on parts procurement and integration.

Kingston Reif, director for disarmament and threat reduction policy at the Arms Control Association, warned that the first production unit's target date is likely to increase the estimated \$7.6 billion cost of the program. The delay could also hinder NNSA's ability to execute several other planned life-extension programs on time and on budget, he added.

While NNSA's Office of Cost Estimating and Program Evaluation in 2017 projected a total program cost of approximately \$10 billion and a two-year delay to the agency's first production-unit date, the agency maintained that the B61-12 life-extension program was on time and on budget.

"The delay to both the B6-12 and W88 ALT 370 highlights the enormous scope of work already on NNSA's overburdened plate and the significant execution challenges facing the modernization effort," Reif said.

The fate of another modernization program, a low-yield variant submarine weapon known as the W76-2, is expected to be determined as the House and Senate resolve their separate versions of the National Defense Authorization Act. Among a range of differences on nuclear issues, the Democratic-led House bars funding for the deployment of the W76-2, cutting the entire \$19.6 million Defense Department request and \$10 million Energy Department request for the program.

On Wednesday, Robert Soofer, the deputy assistant secretary of defense for nuclear and missile defense policy, pointed to support for the W76-2 from both current leaders and former Obama administration officials, predicting

Pentagon Shelves Neutral Particle Beam Research

Patrick Tucker, Defense One, September 4

Defense officials are taking a step back from one of its most ambitious research goals: launching a massive neutral-particle-beam generator, essentially a ray gun, into space to fry the electronics of enemy missiles. The funds will go instead toward more fundamental research aimed at making lasers more powerful, according to Michael Griffin, defense undersecretary for research and engineering.

It marks a return to Earth for one of the biggest ideas that the Department has broached in recent years. Griffin first publicly floated the idea of a neutral particle beam in space in March 2018, while highlighting potential directed-energy weapons beyond high-powered lasers.

“High-powered microwave approaches can affect an electronics kill. The same with the neutral particle beam systems we explored briefly in the 1990s,” he said.

In March, Defense and military officials announced their intention to test a neutral particle beam in space in 2023, and requested \$34 million to develop it in the 2020 budget.

Congressional Democrats weren’t pleased. In May, the House Appropriations Committee stripped the beam’s funding from their version of the defense authorization bill.

Kingston Reif, who leads disarmament and threat reduction policy at the Arms Control Association, summed up the view of the project’s detractors. “Congress made it clear it wouldn’t fund the project, so the writing was on the wall. But this begs the question of why Griffin included \$34 million for the gambit in the FY 2020 budget request — and \$380 million over the next five years — in the first place. Space-based interceptors, whether kinetic or non-kinetic, would be costly and massively destabilizing. The costs and risks vastly outweigh any potential benefits,” Reif told Defense One in an email.

On Wednesday, Griffin acknowledged the hard truth. “We are deferring work on neutral particle beams, indefinitely,” he said at the Defense News conference in Virginia. “It’s just not near-term enough.”

But Griffin added that the Pentagon is still pursuing directed energy research in lasers and microwave energy, aiming eventually to deploy them on combat aircraft, with ground units, and aboard satellites..

“My own opinion is we need to get systems built and put onto platforms so we can see what they do how they do it,” he said, meaning how the weapons interact with their platform(s) and environment. “We need to understand the lethality of those systems, things like beam control. We need to know how to scale them up in practical ways. If you have 250 kilowatts of, say, laser, and you are operating at best at 50-percent efficiency, you have to figure out what to do with the other kilowatts of heat.

“So there are a lot of practical problems with real-world weapons systems,” he said. “We are spending money on it.”

Iran acknowledges rocket explosion, says test malfunctioned

Nasser Karimi, Jon Gambrell, Associated Press, September 2

TEHRAN, Iran (AP) — Iran acknowledged for the first time on Monday that a rocket at its Imam Khomeini Space Center exploded after satellite photos showed the blast last week, with an official saying a technical malfunction during a test caused the explosion.

The comments by government spokesman Ali Rabiei were the first explanation offered by Iran for Thursday’s explosion, which came ahead of a planned satellite launch by the Islamic Republic that the U.S. has criticized.

Rabiei also criticized President Donald Trump for tweeting what appeared to be a surveillance photo of the aftermath of the explosion shot by a U.S. spy satellite.

The explosion marked the third failure involving a rocket at the Iranian center, which has raised suspicions of sabotage in Iran's space program.

However, Rabiei dismissed that, saying that "this has been a technical matter and a technical error. Our experts unanimously say so."

"The explosion happened at the launchpad and no satellite had yet been transferred to the launchpad," Rabiei said. "It happened at a test site, not at the launch site."

Commercially available satellite images by Planet Labs Inc. and Maxar Technologies showed a black plume of smoke rising above a launch pad Thursday, with what appeared to be the charred remains of a rocket and its launch stand. In previous days, satellite images had shown officials there repainted the launch pad blue.

The photo released Friday by Trump appeared to be a once-classified surveillance photo from American intelligence agencies. Analysts said the black rectangle in the photo's upper-left-hand corner likely covered up the photo's classification.

The image showed damaged vehicles around the launch pad, as well as damage done to the rocket's launcher. It also clearly showed a large phrase written in Farsi on the pad: "National Product, National Power."

"The United States of America was not involved in the catastrophic accident during final launch preparations for the Safir SLV Launch at Semnan Launch Site One in Iran," Trump wrote in his tweet, identifying the rocket used. "I wish Iran best wishes and good luck in determining what happened at Site One."

Rabiei criticized Trump's decision to tweet about the rocket explosion.

"We don't understand why the U.S president tweets and posts satellite pictures with excitement. This is not understandable," he said. "Maybe this is because lack of Iran-related subjects that they raise such issues."

The blast followed two failed satellite launches of the Payam and Doosti in January and February. A separate fire at the Imam Khomeini Space Center in February also killed three researchers, authorities said at the time.

Over the past decade, Iran has sent several short-lived satellites into orbit and in 2013 launched a monkey into space.

Iran is preparing to launch the Nahid-1, a communication satellite, into space.

The U.S. alleges such satellite launches defy a U.N. Security Council resolution calling on Iran to undertake no activity related to ballistic missiles capable of delivering nuclear weapons.

Iran, which long has said it does not seek nuclear weapons, maintains its satellite launches and rocket tests do not have a military component. Tehran also says it hasn't violated the U.N. resolution as it only "called upon" Tehran not to conduct such tests.

The tests have taken on new importance to the U.S. amid the maximalist approach to Iran taken by President Donald Trump's administration. Tensions have been high between the countries since Trump unilaterally withdrew the U.S. from Iran's nuclear deal over a year ago and imposed sanctions, including on Iran's oil industry. Iran recently has begun to break the accord itself while trying to push Europe to help it sell oil abroad.

Defense Ministry says North Korea fired 2 new types of missiles

Not Attributed, The Asahi Shimbun, September 4

North Korea likely tested two new types of short-range ballistic missiles in more than half of the 18 projectiles it has launched since May, according to a Defense Ministry analysis.

Ministry officials studied various factors surrounding the North Korean missiles, including the outer shape, launching method, flight distance, altitude and course, to reach their conclusion.

Defense Minister Takeshi Iwaya told a Sept. 3 news conference that the two new types were likely used in five rounds of launches that fired off a total of 10 missiles.

Since May, North Korea has conducted nine series of ballistic missile launches in violation of U.N. Security Council resolutions.

All eight missiles fired on May 4, May 9, July 25 and Aug. 6 are of the same type, the ministry said. Their outer shape is very similar to the Russian-made short-range missile called the Iskander.

The ministry suspects this was a new type of short-range missile that uses solid fuel rather than liquid fuel. Solid-fuel missiles can be launched in a much shorter time than it takes to prepare to fire a liquid-fuel missile.

The two missiles launched on Aug. 24 are also believed to be another new type that uses solid fuel, but ministry officials did not divulge further reasons for their estimation.

The four missiles launched on Aug. 10 and 16 appear very similar to the U.S.-made surface-to-surface Army Tactical Missile System (ATACMS) missile that the South Korean military also possesses.

Defense Ministry officials said the remaining four missiles could also be a new type, but a definite conclusion will have to await further analysis, including the likely source of the technology used by North Korea.

S. Korea seeks global support for N.K. denuclearization, peace on Korean Peninsula

Not Attributed, Yonhap News Agency (South Korea), September 4

SEOUL-- South Korea's vice defense minister on Wednesday held a series of bilateral talks with his counterparts from foreign countries and asked for their continued support for efforts to denuclearize North Korea and build peace on the peninsula, his office said.

On the sidelines of the 8th Seoul Defense Dialogue under way in Seoul, Vice Defense Minister Park Jae-min met with his counterparts from Singapore, Uzbekistan, the Philippines and Ethiopia, to share their assessment on the recent security situations in the region and discuss ways to deepen their defense ties, according to the ministry.

During the meeting with Singaporean vice defense chief Chan Yeng Kit, Park asked for Singapore's proactive support and cooperation to encourage North Korea to give up its nuclear program and continue to engage in the ongoing peace process.

Hailing Seoul's endeavor to build peace and trust, the Singaporean minister stressed the security cooperation among players in the region for stability, according to the ministry.

The two sides also agreed to boost bilateral exchanges and cooperation in the military and defense industries, it added.

Park also met Uzbek Deputy Defense Minister Azizbek Ikramov and agreed to further strengthen their "strategic communication" by expanding exchanges in education fields and among high-level officials.

Expressing gratitude for Tashkent's support for Seoul's denuclearization initiative, Park asked for its continued interest and backing, to which Ikramov pledged to do so, according to the ministry.

During the talks between Park and his Philippine counterpart, Ricardo David, the two sides agreed to bring their defense ties a notch higher, marking 70 years of their establishment of diplomatic relations.

David expressed his country's strong support for Seoul's denuclearization efforts, the ministry said.

In the meeting with Ethiopian Vice Defense Minister Lela-alem Gebreyohannes Tedla, Park thanked the African nation for its sacrifice and dedication to peace on the Korean Peninsula, citing its dispatch of troops during the 1950-53 Korean War.

Speaking highly of Seoul's defense diplomacy through its diverse projects for veterans, the Ethiopian official asked for Seoul's cooperation in its push for military reform, according to the ministry.

Later in the day, the South Korean vice defense minister is scheduled to have bilateral talks with his Canadian and Kazakhstani counterparts. In a multilateral format, Park was also set for vice ministerial talks with representatives from five Central Asian countries, as well as with the 10 Association of Southeast Asian Nations (ASEAN) countries, according to the ministry.

Under the theme of "Building Peace Together: Challenges and Visions," this year's SDD set to run from Wednesday through Friday brings together hundreds of government officials and security experts from around 50 countries, as well as international organizations, and serves as a venue for their defense diplomacy to boost security cooperation.

New Missile Silo And DF-41 Launchers Seen In Chinese Nuclear Missile Training Area

Hans M. Kristensen, Federation of American Scientist, September 3

Newly acquired satellite photos acquired from Digital Globe (Maxar) show that the People's Liberation Army Rocket Force (PLARF) is building what appears to be a new type of missile silo in the missile training area near Jilantai, possibly for use by a new ICBM.

The photos also show that 18 road-mobile launchers of the long-awaited DF-41 ICBM were training in the area in April-May 2019 together with launchers for the DF-31AG ICBM, possibly the DF-5B ICBM, the DF-26 IRBM, and the DF-21 MRBM.

Altogether, more than 72 missile launchers can be seen operating together.

China is in the middle of a significant modernization of its nuclear weapons arsenal and the Jilantai training area, which has been constructed since 2014, appears to play an important part in that modernization effort.

A New Type of Missile Silo?

The most surprising new development in the training area is the construction of what may be a new type of missile silo. I want to emphasize that there is no official confirmation the structure is a silo, but it strongly resembles one. If so, it is potentially possible it could be part of a Chinese effort to develop the option to deploy some of its new solid-fuel road-mobile ICBMs – possible the DF-41 – in silos. According to the 2019 Pentagon report on Chinese military developments, "China appears to be considering additional DF-41 launch options, including rail-mobile and silo basing."

Construction of the silo began in June 2018. Initially, a roof was built over it to conceal details, but in May 2019 the roof was removed exposing the silo to satellite photography.

The layout of the Jilantai silo is very different from the silos seen at Wuzhai. Those silos, which are thought to be similar to about 20 operational silos hidden in the mountains of the Henan and Hunan provinces for use by

the liquid-fuel DF-5A/B ICBMs, consist of a rectangular retractable lid covering the silo on a concrete pad. And they have large exhaust vents to protect the DF-5's liquid fuel from the launch heat.

Instead, the Jilantai silo looks more like Russian ICBM silos. It is not yet complete but so far consists of what appears to be a 180-meter line-up path and a 30-meter missile loader pad next to the silo. The precise silo diameter is difficult to measure given the image resolution but appears to be 5-6 meters, which is smaller than the 8-9 meter diameter silos at Wuzhai. Moreover, the absence of exhaust vents hints the Jilantai silo might be intended for solid-fuel missiles.

The new silo design would offer a more efficient (and safe) missile loading. At the DF-5 silos, missiles are loaded by a crane, which hoists each stage off its transporter and lowers it into the silo. It is a cumbersome and lengthy procedure. Moreover, the DF-5 is propelled by liquid fuel that is stored separately and must be loaded before the missile can be launched. With the Jilantai silo design, however, the solid-fuel missile presumably would be brought in on a loader that backs up to the edge of the silo, elevates the missile, and lowers it into the silo in one piece (warhead payload is probably added later).

If the structure seen at Jilantai indeed is a new silo, it presumably would only be used for training. If the design is successful, it would likely be followed in the future by the construction of similar silos in China's ICBM basing areas for use by operational missiles.

Extensive Missile Training

The Jilantai missile training area, which has been constructed since 2014 and is located in the south-western part of the Inner Mongolia province approximately 930 kilometers (578 miles) west of Beijing, has undergone significant changes since I described it in January. The central technical facilities continue to expand, TEL drive-through facilities are being added, and road-mobile launchers for China's newest nuclear-capable ballistic missiles are seen more or less constantly training in the area.

This includes the new DF-41 ICBM that may be in the final phase before starting to deploy to operational PLARF brigades. The new DF-31AG ICBM is also training at Jilantai, as is the new DF-26 IRBM and the DF-21 MRBM.

All these systems are solid-fuel missiles on road-mobile launchers. But it is also possible – although at this point unconfirmed – that missile systems seen training at Jilantai include transporters for the silo-based DF-5B ICBM. This is a large silo-based missile that would not be able to launch from mobile launchers, but the images show unique two-part, truck-pulled trailers that resemble the DF-5B transports that were displayed at the Beijing parade in 2015.

It must be underscored that there is no confirmation the trailers are for the DF-5B. In one photo some of the trailers are longer and it is unclear why DF-5B transporters would be training at Jilantai given there are no DF-5B silos in the area. If the towed trailers are not DF-5Bs, they could potentially be transporters of reload missile for the road-mobile launchers seen on the satellite photos.

The DF-41 ICBM

The satellite images indicate that the DF-41 TELs started training at Jilantai in April 2019 shortly after a new TEL drive-through highbay facility was completed (a second is under construction further to the north). There appear to be 18 DF-41 launchers. In one photo from April 17, 2019, for example, a column of 15 DF-41s can be seen making its way from the new drive-through facility (two additional DF-41s can still be seen at the facility and the 18th is probably still inside) to a parade strip to join an assembly of 18 DF-31AGs, 18 DF-26s, and 5 (possibly) DF-5B transporters.

The DF-41 has been in development for a very long time. The Pentagon's annual report on Chinese military developments first mentioned the missile in 1997 and sensational news articles have claimed it has been operational for years. The DF-41 was widely expected to be displayed at the 2015 military parade in Beijing, but that didn't happen. Nor was it displayed at the PLA's anniversary parade in 2017.

The DF-41 training at Jilantai with the other launchers is probably part of the formal integration of the new missile into PLARF service, more than two decades after development began. It seems likely that the DF-41 will appear at the military parade in Beijing on October 1st. Indeed, two months after the training occurred at Jilantai, 18 DF-41 launchers (potentially the same 18) could be seen on a satellite photo of a military facility in Yangfang about 35 kilometers (22 miles) northwest of Beijing apparently getting ready for the October parade. The image first made its way onto the Internet on August 9th, when it was posted by the Twitter user @Oedosoldier. The image carried the user's logo but it was a screenshot from a Digital Globe image on TerraServer dated July 4, 2019.

Chinese Nuclear Missile Outlook

The highly visible display and clustering of more than 72 missile launchers at Jilantai in April and May indicate the PLARF wants them to be seen and is keenly aware that satellites are watching overhead. This is Beijing's way of telling the world that it has a capable and survivable nuclear deterrent.

Once they become operational, the 18 DF-41s seen on the satellite photos will probably form two or three brigades and join the existing force of 65-90 DF-5A/B, DF-31/A/AG, and DF-4 ICBMs.

Despite the visible display, there is considerable uncertainty about the future development of the Chinese nuclear arsenal, not least how many missiles China plans to deploy. It seems possible the DF-41 over time might replace one or more of the older ICBMs. It is potentially also possible that the DF-31AG will replace the older DF-31/A trailer launchers (the DF-31 is notably absent from the Jilantai images). And the old DF-4 seems likely to be retired in the near future.

The US Defense Intelligence Agency (DIA) stated in May this year that, “Over the next decade, China is likely to at least double the size of its nuclear stockpile...” Part of

that projection hinges on the DF-41 adding MIRV capability to the solid-fuel road-mobile missiles for the first time (the DF-5B is already equipped with MIRV).

Whether DIA’s projection comes true remains to be seen; the agency has been notoriously bad about Chinese nuclear warhead projections in the past. At this point, the Chinese arsenal is estimated to include roughly 290 warheads, a fraction of the U.S. and Russian nuclear arsenals. To put things in perspective, all the launchers seen on the satellite photos make up less than half of the number of launchers in one of the three US ICBM wings.

Nonetheless, China is modernizing and increasing its nuclear arsenal. And the activities captured by commercial satellites at the PLARF’s training area west of Jilantai – operations of new DF-41 and DF-31AG ICBMs, the new dual-capable DF-26 IRBM, and the construction of what might be a new type of missile silo – are visual reminders of the important developments currently underway in China’s nuclear posture.

Southeast Asian Nations Join U.S. in Naval Drills

Mike Ives, New York Times, September 3

HONG KONG — Southeast Asian countries tend to be deeply reluctant to collectively challenge China’s growing military and economic prowess in their region. But this week, they appear to be doing just that — by holding their first joint naval drills with the United States Navy.

The drills, which will take place partly in the South China Sea, a site of geopolitical tension, began on Monday. They were not expected to focus on lethal maneuvers, or to take place in contested waters where China operates military bases.

But the maneuvers follow similar exercises held last year by China and the 10-member Association of Southeast Asian Nations in an undisputed area of the sea, making them a riposte of sorts to Beijing.

During a summer of heightened tensions over territorial claims, plus an escalating trade war between China and the United States, the drills are being closely watched as the latest move in a high-stakes geopolitical chess match between the superpowers and their shared regional allies.

Some analysts see the drills as part of an incremental hardening of America’s military posture in the South China Sea under President Trump, a strategy that has not been accompanied by additional American diplomacy or incentives for its partners.

“The United States is taking a risk both that its partners will be less inclined to work with it because they are nervous about signaling security cooperation when there’s nothing else there, and that China will continue to advance in the places in which we are absent” on diplomatic and economic fronts, said Mira Rapp-Hooper, an expert on Asian security affairs at the Council on Foreign Relations in New York.

“So from a basic balance-of-power perspective, we are not holding the line nearly as well as we should be,” she added.

The United States Navy declined to comment on the record ahead of the drills, citing operational sensitivities.

But in a statement late Sunday, the Navy said the drills would include “a sea phase in international waters in Southeast Asia, including the Gulf of Thailand and South China Sea.” It said they would focus partly on “search and seizure,” “maritime asset tracking” and “countering maritime threats,” among other subjects.

The statement said the drills would include eight warships, four aircraft and more than 1,000 personnel. It said the American military hardware included a littoral combat ship, a guided-missile destroyer, three MH-60 helicopters and a P-8 Poseidon plane.

The Poseidon is a type of reconnaissance aircraft that the United States has used to conduct surveillance flights over the South China Sea, including around disputed reefs that China has filled out and turned into military bases.

The drills were scheduled to begin on Monday at Sattahip, a Thai naval base, after “pre-sail activities in Thailand, Singapore and Brunei,” and to end in Singapore. The Navy’s statement did not say when the drills would end.

Many of the drills will take place this week off Ca Mau Province, on the southern tip of Vietnam, said Thitinan Pongsudhirak, a Thai political analyst. He added that the drills would “reinforce the view that geopolitical tensions are shifting from land to sea.”

The timing is ideal for Vietnam, which is deeply worried about a state-owned Chinese survey ship that has been spotted this summer in what the Vietnamese regard as their own territorial waters. Last month, the State Department called the survey ship’s movements an effort by Beijing to “intimidate other claimants out of developing resources in the South China Sea,” including what it said was \$2.5 trillion worth of unexploited oil and natural gas. “Vietnam should be happy” that the drills are taking place given China’s recent “aggression in its waters,” said Luc Anh Tuan, a researcher at the University of New South Wales in Australia.

“Hanoi nevertheless will manage to downplay the significance of the drill because like other ASEAN fellows, it does not want to create an impression of a coalition against China,” added Mr. Tuan, who is on educational leave from the Vietnamese Ministry of Public Security.

The Vietnamese Foreign Ministry confirmed in an email last week that the drills were happening, but declined to answer other questions.

Beijing’s actions in the sea are hugely sensitive for Hanoi because it is under heavy domestic pressure to be tough on China, its largest trading partner and former colonial occupier. But Vietnam is also racing to find new energy sources to power its fast-growing economy.

In a sign of those tensions, there were rare anti-Chinese riots in Vietnam in 2014, after a state-owned Chinese company defiantly towed an oil rig into disputed waters near the Vietnamese coast, prompting a tense maritime standoff. Three years later, Vietnam suspended a gas-drilling project in the sea by a subsidiary of a Spanish company because the project was said to have irritated Beijing.

Yan Yan, an expert on maritime law at the National Institute for South China Sea Studies, on Hainan Island off the Chinese mainland, said that this week’s drills reflected Washington’s “concern and anxiety” about waning American influence in the region. She said the drills were not a cause for concern for Beijing, which she said planned to eventually expand the “subjects and scope” of its own naval drills with ASEAN.

“If we take a long view of these countries’ relations with the United States, we’d know that they are actually very wary of it,” Ms. Yan said.

But ASEAN countries will be more concerned about China’s reaction to the drills than they were about the American reaction to last year’s drills with China, said Gregory B. Poling, an expert on Southeast Asia at the Center for Strategic and International Studies in Washington. He said that was especially true for countries, such as Thailand, that had no territorial disputes in the sea with China.

“They don’t want to do it in a way that upsets the apple cart” of trade with China, he said of the Thai authorities. The Thai Navy declined to comment.

The United States Navy said in its statement that its joint naval drills with ASEAN were first proposed in 2017 and confirmed last October. That is the same month that China held its first joint naval drills with ASEAN, off its southern coast.

In a telephone interview, Kasit Piromya, a former Thai foreign minister, downplayed the risks for ASEAN of holding naval drills with the United States. “From Thailand’s point of view, it’s still an open sea,” he said, adding that any such exercises with any outside partner should be neither aggressive nor defensive.

But Beijing’s territorial claims in the sea have no legal basis, he added, echoing the conclusion of an international tribunal that ruled against China three years ago. He said a key question now was whether Southeast Asian leaders could summon the “guts” to confront China’s construction of artificial islands and military bases in the sea, even though some of them have been “kowtowing to Chinese pressures and financial generosity.”

“I would urge the ASEAN leaders, the 10 of them, to get together and speak in a black-and-white manner to the Chinese leadership without being blackmailed or bought out by China’s financial offers,” he said.

US Wargames to Try Out Concepts for Fighting China, Russia

Marcus Weisgerber, Defense One, September 4

A series of September and November wargames led by the Pentagon’s Joint Staff will evaluate new battle plans for fighting China and Russia, Pentagon officials say.

“What we don’t have is a concept that accurately and with rigor describes how the services will fight against a peer adversary,” Lt. Gen. Eric Wesley, deputy commanding general of U.S. Army Futures Command and director of Futures and Concepts Center, told reporters Wednesday on the sidelines of the Defense News Conference.

A key part of the Global Integrated Wargame will be testing new gear intended to help troops in the various military services to communicate more seamlessly with one another. Today, each branch generally uses stovepiped networks — meaning, for example, that a pilot over the battlefield cannot easily talk to ground troops, who cannot easily talk to a ship’s crew just offshore.

Gen. Joseph Dunford, chairman of the Joint Chiefs of Staff, referenced the exercises during a press briefing last week.

“We’re adapting how we plan, how we support the secretary to make decisions, how we prioritize and allocate resources, and how we are developing tomorrow’s capabilities,” Dunford said.

The Joint Staff-led effort is the Pentagon’s latest move to prepare itself for a future that could include a sophisticated, high-tempo war with Russia and China. The U.S. military has spent the past two decades fighting ground battles against insurgents in the Middle East and Afghanistan.

“The reason we say we need a joint concept more than ever is because the tempo of warfare, one; and two, is the complexity of all the domains,” Wesley said, alluding to the different speeds of a person, tank, ship, aircraft, and electrons.

“[Because] all of these [domains] are controlled at different echelons or by different services, you can very quickly see that if you want to rapidly and continuously integrate all domains in order to take advantage of opportunities on a very lethal battlefield, you need a different type of [command-and-control] structure,” he said.

In a war with Russia or China, Wesley said, the battlefield “will be sufficiently hyperactive.” The general said the military currently uses an “industrial approach to synchronization” during operations.

For instance, the F-22 Raptor and F-35 Joint Strike Fighter are both made by Lockheed Martin but use different communications networks that prevent them from exchanging information in the air.

“The key enablers are we gotta talk to each other,” Maj. Gen. Michael Fantini, director of the Air Force Warfighting Integration Capability, and deputy chief of staff for strategy, integration and requirements, said during a panel discussion at Wednesday’s conference.

The Global Integrated Wargame will serve a “forcing function where you bring your service concept to the table and you see how it operates,” Wesley said.

Defense officials will then come up with a “concept for joint operations that “describes capabilities that the services have to develop.”

While the result won't be determined until after the wargames, the expectations for the military services working together more in the future are high. Vice Adm. Stuart Munsch, deputy chief of naval operations for operations, plans and strategy, said during a panel discussion at Wednesday's conference. Today there is “a degree of strategic alignment,” the admiral said.

“I think you're going to see a degree of integration that you've never imagined before from the services,” Munsch said.

A North Korean sub with nuclear missiles raises the stakes

Sarah Vogler, The Hill Online, September 3

In recent weeks, North Korean media have released images of a “newly built submarine” and subsequent analyses by researchers and think tanks theorize it is a second Sinpo-class ballistic missile submarine (SSB) that might be capable of launching nuclear ballistic missiles. If these reports are accurate, North Korea is showing the world that it can continue to achieve significant developments to its strategic nuclear capabilities despite maximum pressure and diplomatic dialogue at the highest levels.

To be sure, North Korea has a long way to go before this new SSB represents an actual operational threat. We have known about North Korea's interest in developing a ballistic missile submarine and submarine-launched ballistic missile (SLBM) capability for years. The Goraе, North Korea's first experimental Sinpo-class ballistic missile submarine, has been under development for the better part of a decade. North Korea has conducted roughly a half-dozen tests of its Pukkuksong 1 and 2 SLBMs (KN-11) since 2014, though all tests have been launched from ground facilities or submerged test platforms. North Korea has yet to demonstrate the ability to launch an SLBM from a submerged or surfaced SSB.

It is reasonable to assume that Kim Jong Un will continue to prioritize the development of an SSB and SLBM capability, given the resources directed to these programs. If the submarine becomes operational — which may take several years, given North Korea's track record for fielding new capabilities — the SSB would represent a second leg of North Korea's nuclear posture. The platform, if it eventually makes it to the sea without being detected, could increase Kim's confidence in his nuclear deterrent by giving North Korea a first- or second-strike option in the event of a major conflict with the United States.

Furthermore, Kim could calculate that this SSB gives him an additional tool for coercion vis-à-vis the United States and South Korea.

While the possibility of a North Korean submarine armed with nuclear missiles making its way to within striking distance of Guam or the United States homeland is without a doubt unsettling, in the short term, Kim's options for the SSB's employment are extremely limited. He would be assuming a very high risk to deploy his only SSB. Kim likely understands that if the submarine were to sortie, it would be a main focus for U.S., South Korean and Japanese detection efforts.

Unlike North Korea's numerous ground-launch facilities and transporter-erector-launcher (TEL) vehicles, North Korea only has one SSB — and we know where it is. It is a signature national asset in that Kim personally has promoted the platform's development and success. Additionally, its employment would immediately escalate any crisis, and the threat that it could be detected, targeted and destroyed at sea are all considerations that raise the bar for its employment to a very high level.

But just because the SSB cannot be readily used to directly threaten the United States does not mean it won't serve as an asset for Kim going forward. The SSB doesn't need to make it far beyond North Korea's coastline to become an immediate threat to U.S. allies South Korea and Japan.

Submarines have served an important role in Kim's calculus. With approximately 70 submarines, North Korea has one of the largest fleets of attack and mini submarines in the world. These submarines are aging and, by almost every metric, technologically inferior to the submarines of other navies. However, while these submarines are undoubtedly noisy, slow and unable to remain submerged for long distances, North Korea has been able to employ them to operational and strategic effect in the past.

It was a North Korean "mini-sub" that sank the ROKS Cheonan in 2010. And in 2015, amid heightened tensions following the DMZ landmine attack, North Korea sortied approximately 70 percent of its submarines, or about 55 subs, from their pens in a show of force as inter-Korean negotiations were ongoing to resolve the crisis. These submarines are not going to win any prizes for modernity or stealth, but they are a significant tool for North Korea to menace navies and merchant ships operating around the Korean Peninsula. An SSB, deployed with additional North Korean submarines that could act as a screen, close to the North Korean coast could be used to target South Korean and Japanese homelands.

As with its other tests related to its nuclear and long-range ballistic missile programs, North Korea has refrained from overt testing of its nascent SLBM capability while diplomacy with the United States has been ongoing. Now that U.S.-North Korea diplomacy appears to be at an impasse, it is possible that Kim could continue to test the United States' tolerance for its incremental return to ballistic missile tests, as it has with a spate of short-range ballistic missile tests this summer. Kim could put pressure on the United States and South Korea for a favorable negotiating position by conducting new tests of the Pukkuksong, or by demonstrating the ability to mate an SSB with an SLBM.

Such actions would demonstrate North Korea's resolve to continue developing its nuclear program in spite of sanctions and the absence of a more flexible opening negotiating position from Washington. Perhaps more concerning, it would raise the stakes for the Trump administration's North Korea policy, as it would be a return to the testing of capabilities that could actually be used one day to target the United States — an apparent threshold that recent statements from administration officials seem to indicate.

North Korean propaganda surrounding the new SSB should be interpreted as a very serious signal that the window for continued negotiation between the two countries is closing, and actual testing may indicate that the window has closed.

Would a U.S. Security Guarantee Achieve Guaranteed North Korean Denuclearization?

Bruce Klingner, Nation Interest Online, September 3

An adage amongst long-time North Korea watchers is that "something is important to Pyongyang . . . until it isn't. And it isn't important . . . until it is." The saying reflects the shifting priorities the regime places on its demands of the United States and international community in return for denuclearization. Like a parched nomad chasing a desert mirage only to have it disappear, U.S. diplomats often have found that a key North Korean demand has vanished in favor of a new requirement.

Pyongyang's bait-and-switch technique seeks parallel paths to benefits while keeping diplomatic opponents off-balance. When a U.S. concession gains no traction with the recalcitrant regime, engagement advocates often suggested offering another to maintain "progress" or to "improve the negotiating atmosphere."

Pyongyang Wants a Security Guarantee

A recurring North Korean demand has been for a security guarantee. In the 2018 Singapore summit statement, "President Trump committed to provide security guarantees to the DPRK, and Chairman Kim Jong-un reaffirmed his firm and unwavering commitment to complete denuclearization of the Korean Peninsula."

Secretary of State Pompeo affirmed at the time that the United States was willing to offer North Korea "unique" security guarantees if it embarked on such denuclearization. "We will take actions to provide them sufficient certainty that they can be comfortable that denuclearization is not something that ends badly for them."

After the 2019 Hanoi summit failed to achieve progress, North Korean foreign minister Ri Yong-ho announced that “the security guarantee is more important to us [than sanctions relief] in the process of taking the denuclearization measure.” After meeting with Kim Jong-un, Russian president Vladimir Putin announced that North Korea would denuclearize. “They only need guarantees about their security,” he said. “That’s it.”

What’s In a Name?

The Trump administration discovered that North Korea has very different definitions for seemingly straightforward concepts such as “denuclearization” and “Korean Peninsula.” Equally contentious could be an agreed-upon definition of the parameters and requirements of a “security guarantee.”

Is Pyongyang seeking a security guarantee, a security reassurance, a declaration of non-hostile intent, or a nonaggression pact? Under an agreement, what would be guaranteed—no preemptive or preventive military attack, North Korean national sovereignty, or Kim family regime survivability? What form would a guarantee take—a paper declaration, an end of Korean War declaration, or peace treaty? Or would it be part of more expansive confidence-building measures and military force reductions?

Pyongyang has repeatedly declared that it will never abandon its “treasured sword” of nuclear weapons, which it depicts as the only way to deter a U.S. attack. However, Washington never attacked North Korea during the decades that Pyongyang didn’t have nuclear weapons despite repeated regime military attacks, acts of terror, nuclear threats, and incursions.

What written security assurance could President Donald Trump provide that would dissuade North Korea from possessing nuclear weapons? After all, the United States has repeatedly provided such promises in the past—to no avail. In the 1994 Agreed Framework, Washington committed to “provide formal assurances to [North Korea] against the threat or use of nuclear weapons by the U.S.”

In the 2005 Six-Party Talks Joint Statement, the United States pledged it “has no intention to attack or invade [North Korea] with nuclear or conventional weapons.” Former National Security Council official Victor Cha compiled a list of over twenty U.S. security assurances to North Korea in a 2009 study.

The Trump administration has made a number of similar statements, including then-Secretary of State Rex Tillerson’s comment that the U.S. “will not seek a regime change, a collapse of the regime, an accelerated reunification of the peninsula, or an excuse to send [U.S.] military north of the 38th parallel.”

When Paper Isn’t Enough

Given the failure of previous U.S. security assurances to deter North Korea from expanding its nuclear arsenal, is Pyongyang seeking more tangible actions from Washington? North Korea defines the Korean Peninsula not as the landmass encompassing North and South Korea (as the United States does), but adds “surrounding areas from where the Korean Peninsula is targeted [and] South Korean territory, where U.S. nuclear weapons and other forms of aggression forces are deployed.”

Therefore, Pyongyang requires “completely removing the nuclear threats of the U.S. to [North Korea] before it means the elimination of nuclear deterrence.” The nuclear threats would include deployment of U.S. “nuclear strategic assets and nuclear war exercises” and the U.S. extended deterrence guarantee (“nuclear umbrella”) to its allies. Pyongyang includes Japan, Guam, and sometimes Hawaii in its definition of the Korean Peninsula.

Think Carefully Before Getting on the Horse Again

Despite North Korea’s reluctance to engage in working-level meetings, diplomacy should be continued to determine the conditions under which North Korea would comply with the eleven UN resolutions that require the regime to abandon its nuclear, missile, and biochemical weapons programs in a complete, verifiable, irreversible manner.

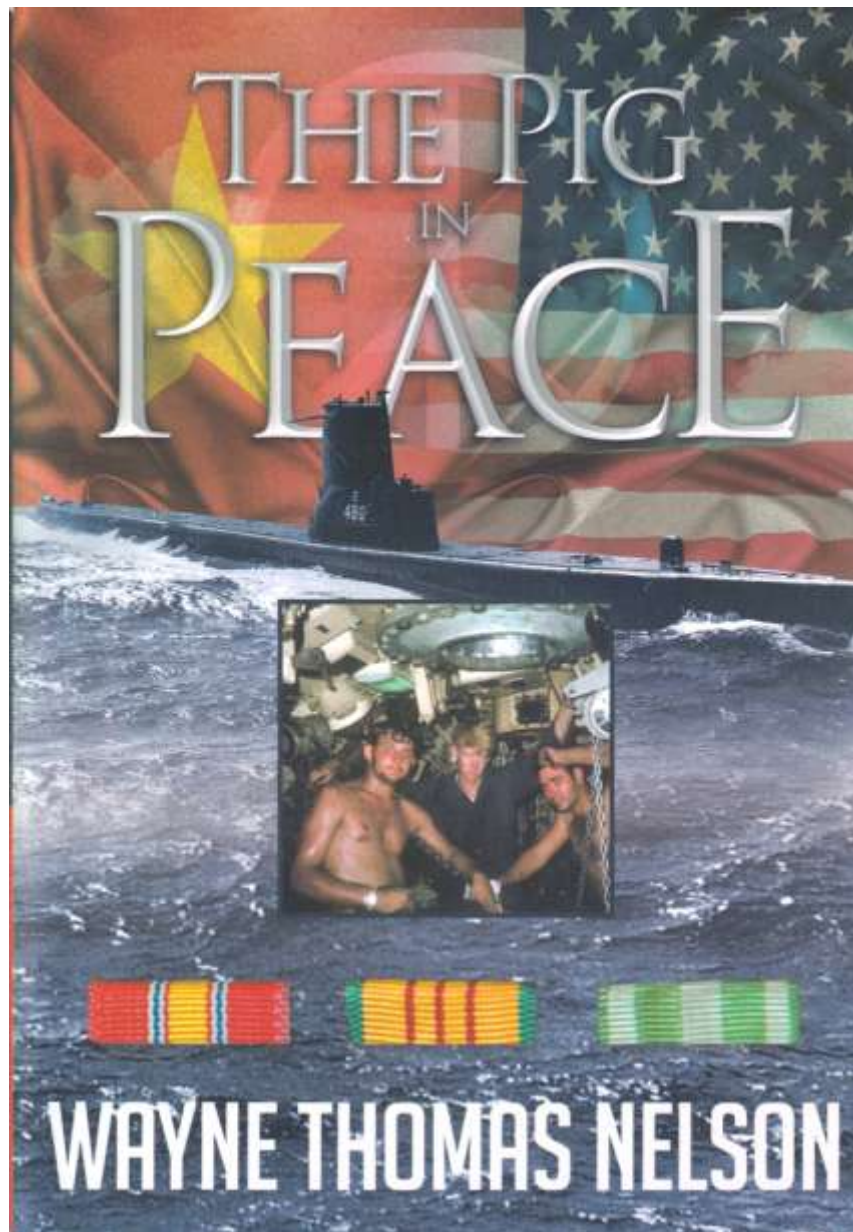
U.S. diplomats should ensure that the definition and connotations of a security guarantee are well-defined rather than presuming a common understanding. Any security guarantee should be reciprocal, since the United States and South Korea are not the ones who have repeatedly violated UNSC resolutions, conducted deadly military attacks, and habitually threatened the government and populace of rival nations.

Building Confidence and Reducing Forces

Negotiators can also explore expanding the confidence- and security-building measures of last year's inter-Korean Comprehensive Military Agreement. Provisions in the 1999 Vienna Document provide a basis for a more wide-ranging accord to reduce tensions and the potential for inadvertent escalation of hostilities.

Any North Korean demand for a change in the status of U.S. forces in South Korea must be done in the context of more comprehensive negotiations, which must also address the North Korean conventional force threat to South Korea. The 1990 Conventional Armed Forces in Europe Treaty provides an example of how to mutually cap and wean away military forces from the forward area to reduce the potential for an invasion.

The failure of all previous denuclearization agreements with North Korea does not preclude additional attempts. But, given the lack of progress since the Singapore summit, skepticism and wariness are warranted. The best policy for the United States is a comprehensive strategy of diplomacy, upholding UN resolutions and U.S. laws, and deterrence until the nuclear, missile, and conventional force threat is reduced.



(Available at AMAZON.COM, WALMART, KINDLE, & GOOGLE PLAYBOOKS in addition to other fine retailers)