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Construction and Modification of North Korean Naval Combatants, January 1983 through July 1986 (S)

Imagery Analysis Report

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Construction and Modification of North Korean Naval Combatants, January 1983 through July 1986 (S)

Imagery Analysis Report

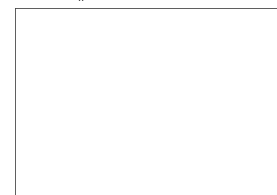
This report was written by [redacted]
and [redacted] Comments and queries are wel-
come and may be directed to North Korea Branch,
East Asia Division, Imagery Exploitation Group, NPIC,

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Construction and Modification of North Korean Naval Combatants, January 1983 through July 1986 (S)



In 1983, the amount of new construction at North Korean naval shipyards began to decline from that seen in the early 1980s. Priority was given to the completion of combatants already under construction. From 1983 to 1985, only three new types of combatants were designed and built: the 34-meter and 32-meter midget submarines and the Pipa-A inshore minesweeper. The North Koreans concentrated on completing units started prior to 1983, including Taechong-class submarine chasers; Sohung, Soju, and Chongju missile attack boats; Chongju patrol craft and torpedo boats; Sinhung torpedo and patrol boats; and Hantae utility landing craft. In addition, the series production of the Romeo attack submarines, 18- and 21-meter midget submarines, and Soju missile attack boats continued into 1986. Between 1982 and 1986, the new construction of missile attack boats had increased the number of STYX missile launchers available to the North Korean navy by approximately one-third. In 1986, the North Koreans shifted the emphasis from naval combatants to civilian merchant/fishing ships at three of the four shipyards (Najin, Nampo, and Yongampo Ri). (S/WN)

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Additionally, a combatant modification program was also started in 1983 and was probably undertaken to upgrade vessel performance and capabilities, to tailor certain vessels to specific missions, or to utilize indigenously produced weapons. Changes in the following vessel classes have resulted from the 1983-86 design modification program: the Soho frigate, Sariwon and T-class patrol ships, Taechong I and II submarine chasers, the Sinhung hydrofoil torpedo boat, the Chongjin hydrofoil patrol boat, and the Nampo patrol boat. (S/WN)

The renewed naval combatant construction program that began in the early 1980s followed a pattern similar to, but shorter than, that of the 1970s program. A high level of importance was placed on naval combatant construction in the early 1970s, and then the amount of naval construction gradually tapered off. Toward the end of the decade, the emphasis turned to civilian ship construction. Finally, after approximately one year, naval combatant construction began again. (S/WN)

If this pattern is repeated, the emphasis is expected to shift once more from civilian projects to naval combatant construction in early 1987. However, a renewal of combatant construction would depend upon pressing economic or social factors, such as those that created the need for a shift from construction of naval combatants to large fishing vessels in 1979 and 1986. It could also be influenced by the need that the North Koreans perceive for continued buildup and improvement of their naval forces. (S/WN)

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Construction and Modification of North Korean Naval Combatants, January 1983 through July 1986 (S)

Introduction

Because the east and west coasts of North Korea are isolated by the South Korean portion of the peninsula and naval craft do not transit from one coast to the other, North Korean ships remain on the coast where they are built. The four naval shipyards in North Korea are Najin Shipyard Number 28 [redacted] and Sinpo Shipyard South [redacted] on the east coast; and Yongampo Ri Shipyard [redacted] and Nampo Shipyard [redacted] on the west coast (Figure 1). (S/WN)

Najin is the major surface combatant shipyard for the east coast. Over the years, its has produced the largest number and variety of ship types of any North Korean shipyard. Other than the surface combatants, these vessel types include a large catamaran-hulled frigate, SSMs of different types, a variety of landing craft, and even an air-cushioned vehicle. Sinpo is the only North Korean shipyard where attack submarines are built. Most midget submarines and a limited number of surface combatants (Taechong-class submarine chasers) are also constructed at Sinpo. (S/WN)

Only surface combatants are built at the shipyards on the west coast. Nampo has historically been the major shipyard on the west coast; however, in 1982 when construction of the Nampo Lockgate Taedonggang [redacted] began, the amount of ship construction at Nampo decreased and large caissons for the lockgate were built. After construction of caissons had been completed in late 1983, Nampo returned to limited construction of combatants. Since the early 1980s, the focus of naval ship construction on the west coast shifted from Nampo to Yongampo Ri. As of mid-1986, Yongampo Ri still produced a larger number and greater variety of surface combatants than Nampo. (S/WN)

Figure 1. Locations of Naval Shipyards, North Korea



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The body of this report describes the current status of North Korean naval combatant construction and modification. It also updates and supplements a previous NPIC report.¹ The descriptions are arranged by ship type and class in order of strategic importance. (S/WN)

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Attack Submarine (SS)

Romeo SS

Construction of the Romeo-class SS began in 1974, and as of July 1985, 15 had been constructed and launched. Components observed in the open storage area at Sinpo Shipyard South through 1986 indicate that this program is continuing. (S/WN)

The Chinese probably provided technical assistance for the first 11 Romeo attack submarines constructed at Sinpo from 1974 to 1979.² The program was suspended in 1979; the lack of submarine launches, the absence of components in open storage, and the lack of component movement indicated an interruption in the Romeo program. In May 1980, sub-

marine components were observed in the open storage area where they remained until February 1982, when they were moved to the large, inclined building ways adjacent to the submarine construction hall. (S/WN)

The three-year hiatus in submarine launches ended in April 1982 when Romeo SS unit 12 was observed in the fitting-out basin (Figure 2). This submarine was probably not constructed using the Romeo components moved from the shipyard to the building hall in February 1982 because it would take longer than two months to assemble those components, finish, and

Figure 2. Romeo SS Construction, 1982 through June 1986

UNIT	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC	JAN-MAR	APR-JUN	JUL-SEP	OCT-DEC	JAN-MAR	APR-JUN		
	82				83				84				85				86			
12																				
13																				
14																				
15																				

- ESTIMATED TWO-YEAR PERIOD FOR CONSTRUCTION
- FITTING OUT/SEATRIALS
- OPERATIONAL

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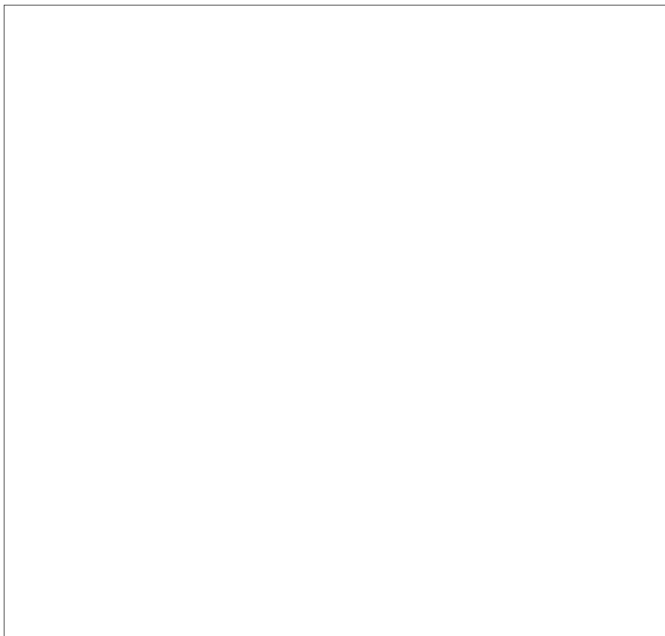
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launch a submarine. Thus, unit 12 was probably an unfinished unit from the 1974-1979 construction program and was probably completed by the North Koreans without Chinese assistance. (S/WN)

Unit 12 was the first Romeo SS to be returned to the building hall for a brief period during fitting out. The same fitting-out procedure was followed by each subsequent Romeo unit. The fitting-out/sea-trial period for unit 12 lasted eight to nine months. (S/WN)

By Romeo unit 13 had been launched. The North Koreans probably experienced problems with this unit, because the fitting-out period was unusually long—22 months. Additionally, the submarine only had a primer coat of paint for up to eight months; usually, the final coat of paint for a Romeo SS has been applied within two months after launch. (S/WN)

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Midget Submarine (SSM)

The North Koreans have the largest fleet of midget submarines in the world. Pyongyang's high interest in special operations forces and sea infiltration into South Korea accounts for the large buildup of midget submarines.³ This fleet contains one 34-meter SSM, one 32-meter SSM, and thirty-seven 18- and 21-meter SSMs. (S/WN/NF)



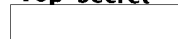
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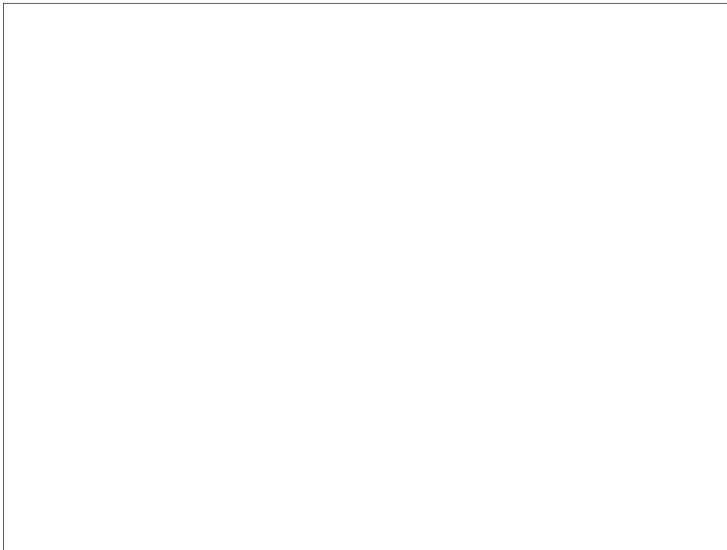
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structures on the bow and stern (Figure 5). Two narrow, raised structures on the bow extend the full beam and may divert water from the torpedo/sail area. A raised, rectangular structure on the stern has two rectangular openings in the front and could be used to propel or control the vessel. (S/WN)

The 32-meter SSM also is similar in some aspects to the Italian COS MO S SX-404 submersible; both have three large, circular limber holes on either side (those on the COS MO S SX-404 are forward of the sail; those on the 32-meter SSM are aft of the sail); a flat, pointed bow; and a squared stern (Figure 6). However, the COS MO S SX-404 is only 17 meters long.⁴ (S/WN)

32-Meter SSM

The 32-meter SSM was first observed on [redacted] while it was under construction at Najin Shipyard Number 28. In late April 1984, this SSM was moved back into the building hall and was not seen again until it was launched late that year. Other than one transit to Najin Naval Base, 8 kilometers (km) south of Najin Shipyard Number 28, the SSM has remained at the shipyard. [redacted]

This unusual midget submarine was the first North Korean midget submarine to be fitted with external torpedo tubes, which were mounted onto the hull, one on either side of the small sail. This configuration resembles a World War II German UCIII U-boat design. (S/WN)

In addition to the torpedo tubes, the midget submarine has other unique features, such as the raised

18- and 21-Meter Midget Submarines

The North Koreans have a large midget submarine force including thirty-seven 18- and 21-meter SSMs. Only six of the 21-meter SSMs have been confirmed; the remainder of the inventory appear to be the 18-meter version. The 18- and 21-meter SSMs have been under construction since the 1970s. They are probably an indigenous design that may have been derived from the six 16-meter SSMs imported from Yugoslavia during the 1973-74 period.^{3*} (S/WN/NF)

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These midget submarines are constructed at Sinpo Shipyard South and repaired at Mayangdo Ri Naval Repair Yard ([redacted]). By mid-1983, 19 SSMs were in the inventory. This number indicates a production rate of four vessels per year. In 1984, this production rate tripled and resulted in a total of 33 midget submarines. [redacted]

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*These six SSMs are included in the count of 18- and 21-meter SSMs because the size difference is very difficult to detect on imagery, especially when the submarines are in the water. (S/WN)

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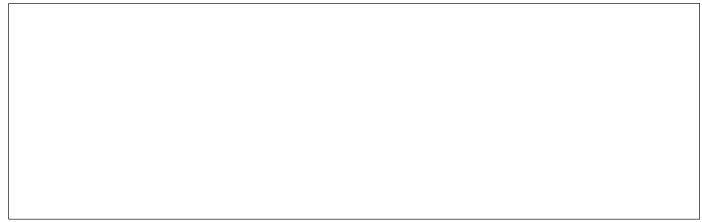
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Frigate (FF)

Soho FF

The Soho FF is the only catamaran-hulled vessel in the North Korean naval inventory and is equipped with cruise missiles and a helicopter pad. It was laid down in 1980 at Najin Shipyard 28 and operational by December 1982. In March 1983, the Soho FF was first observed with an Mi-4 HOUND helicopter on deck. During 1983, the Soho FF conducted a few brief patrols from its home port of Toejo Dong Naval Base (BE [redacted]). The Soho was returned to the shipyard in late 1983 where it remained for two and a half years.



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Armament for the Soho FF includes four SS-N-2 (STYX) launchers; four Soviet-type RBU-1200s, one 100-mm forward gun, two twin 57-mm dual-purpose guns, two 30-mm antiaircraft (AA) guns, one DRUM TILT radar, one unidentified radar, and two twin 25-mm AA guns (Figure 8). (S/WN)

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Patrol Ship (PGF)

Sariwon and T-Class PGF

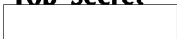
In the early 1950s, the North Koreans acquired two T-class fleet minesweepers from the Soviet Union and converted them into patrol ships.⁵ In the late 1960s, the construction of the four Sariwon PGFs in the North Korean inventory began at Najin Shipyard Number 28.⁶ (S/WN)

Because the Sariwon design was based on the T-class, both classes are similar in size and structure; however, the original armament configuration was different. This difference may have been because of the

type of guns that were available to the North Koreans at that time.⁵ Both classes have a superstructure forward of amidships and a stack with two quad 14.5-mm AA guns on either side located amidships. However, the classes differed in weapons suites. The Sariwon had one 85-mm gun forward, four quad 14.5-mm AA guns around the stack, and one twin 57-mm dual-purpose gun aft. The T-class had one 85-mm gun forward, two quad 14.5-mm AA guns on either side of the stack, and three 37-mm AA guns aft. (S/WN)

During the 1970s, the forward gun of Sariwon unit 513 was changed to a twin 57-mm dual-purpose gun,

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and in 1983, the addition of two RBU-600s and depth charges gave this vessel an antisubmarine warfare capability (Figure 9 and Table 1).⁵ Between late 1979 and late 1984, units 511 and 512 had been modified differently at Munchon Up Naval Base and Shipyard (BE



Modifications to the two T-class PGFs were first observed in 1984 at their home ports; it is unknown when or where the modifications took place. Unit 571 appears to be similar to the modified Sariwon PGF; this T-class has one 85-mm turret gun on the bow, two additional quad 14.5-mm AA guns (for a total of four around the stack), and two 37-mm AA guns aft (Figure 10). The only modification to T-class unit 1003 was the replacement of the 100-mm forward gun with a much smaller unidentified gun; the other armament on unit 1003 remained the same (Figure 11). (S/WN)

These modifications to the weapons suite do not substantially alter or improve a vessel's firepower and may have been made to tailor a vessel to a specific mission or to utilize indigenously produced weapons. (S/WN)

Table 1.
Changes to Weapons Configuration of Sariwon and T-Class PGFs

Class	Unit	Remarks
Sariwon	511	Forward gun changed to 85-mm turret gun Twin 57-mm dual-purpose gun aft replaced with two probable 37-mm AA guns
	512	Same configuration as 511
	513	Two RBU-600s added behind the forward gun Forward gun changed from 85-mm to a twin 57-mm dual-purpose gun Retained the twin 57-mm dual-purpose gun aft
	514	
T-Class	571	Forward gun changed to 85-mm turret gun Deckhouse aft of the stack modified for two more quad 14.5-mm AA guns One 37-mm AA gun removed aft; two remain making the appearance similar to the Sariwon
	1003	Small unidentified gun installed as main gun Retained three aft 37-mm guns and two quad 14.5-mm AA guns


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Submarine Chaser (PCS)

Taechong-Class PCS

Construction of the Taechong-class PCS began in the mid-1970s. All the Taechong PCSs—including the Taechong I and its follow-on, the Taechong II—have a length of [redacted] Both classes have a superstructure amidships and a deck-house aft; however, the armament and electronics vary between the classes. Features of the weapons suite common to both include one POT HEAD surface-search radar on the main mast, one 85- or 100-mm forward gun; two RBU-1200s, and one twin 57-mm dual-purpose gun aft. (S/WN)

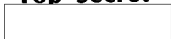
Taechong I

Nine Taechong I units were constructed; the last five are slightly different in design and armament from the first four units of the class. Units 1 through 4, constructed at Najin and Nampo shipyards, are configured with an 85-mm turret gun forward, two RBU-1200 antisubmarine rocket launchers aft of the forward gun, two twin 14.5-mm AA guns on the forward edge of the 0-1 level, one twin 25-mm AA gun on the small deck-house, one twin 57-mm gun aft, and one POT HEAD surface search radar (Figure 12). One east coast unit constructed at Najin has been slightly modified; the RBUs are forward of the main gun. (S/WN)

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Units 5 and 6 were constructed at Najin and Nam-po shipyards concurrently, and both were operational by the fall of 1982. Unit 7 was begun in late 1979 at Yongampo Ri Shipyard and was not operational until



These three vessels differ from the original four; a 100-mm gun is forward, and the two RBU-1200s are in front of the forward gun. However, on units 1 to 4, the 85-mm turret gun is forward and two RBU-1200s are aft of this gun (Figure 13). (S/WN)

Two units were identified under construction in May 1981 and early 1982 at Sinpo Shipyard South. They were originally given the NPIC interim designator Sin-A, but further analysis indicates that they have the same weapons suite as units 5 through 7 and are the

same length. Therefore, these combatants can now be confirmed as Taechong I PCSs. The only design change is the extension of the 0-1 level of the superstructure aft. (S/WN)

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In 1983, a cover was constructed over the building ways at Sinpo, so the Taechong I units with the aft superstructure extension were not observed again until



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Taechong II PCS

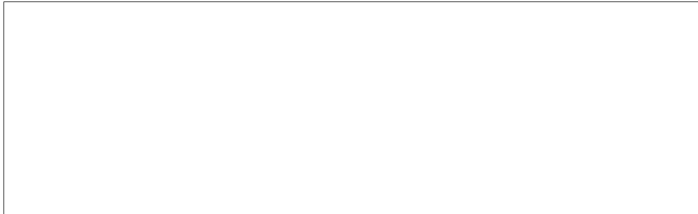


Two Sohung PTGs were built at Nampo Shipyard 25X1
in the mid-to-late 1970s and home-ported at Chodo
Naval Base South. Construction of four more units be-
gan in 1980 at Najin. Although two of these were
launched that year, one was returned to the building
ways and relaunched in 1981. Construction of the two
remaining units resumed in mid-1983; two were com-
plete in May 1984. All four units were at their home
port of Puam Dong Naval Base by July. (S/WN)

Soju PTG

In 1983, a Taechong-class PCS at Najin Shipyard
had been identified as Taechong I unit 8; however, af-
ter a review of imagery, this unit was confirmed as a
Taechong II. The combatant was last observed in mid-
August 1984, when it had one 30-mm AA gun position
on the 0-1 level and one 30-mm AA gun position aft of
the 57-mm gun on the stern. It also had a DRUM TILT
mount on the deckhouse and an extended 0-2 level on
the superstructure (Figure 15). (S/WN)

Construction of the Soju-class PTG began in mid-
1980, [redacted] 25X1
[redacted] It is an indige- 25X1
nous copy of the [redacted] Soviet Osa-I PTG, which 25X1
has four STYX launchers, two 30-mm AA guns (one
forward and one aft), one DRUM TILT radar, and an
elongated superstructure. The only difference is that
the Soju is 4 meters longer with a more sharply point-
ed bow. (S/WN)



Missile Attack Boat (PTG)

Construction of units 1 through 3 began in mid- 25X1
1980 at Najin Shipyard 28. In 1982, unit 1 was de-
ployed to its home port of Toejo Dong. Unit 2, which
was completed in mid-1983, transitted to Munchon Up
Naval Base and Shipyard in mid-1984. [redacted] 25X1
[redacted] 25X1
[redacted] Soju unit 3 was launched in August 1984 25X1
[redacted] After fitting 25X1
out and seatrials, unit 3 should join the other two Soju
PTGs at Toejo Dong. Both units 2 and 3 underwent
long fitting-out and sea-trial periods, which could indi-
cate that problems were encountered with these units.
(S/WN)

Sohung PTG

North Korea's version of the Soviet Komar PTG is
the steel-hulled Sohung missile attack boat, which car-
ries two STYX missile launchers. The east coast So-
hungs have a 25-mm AA gun like the east coast Komar.
However, the west coast Sohungs have a twin 14.5-
mm AA gun. (S/WN)

The construction of units 4 and 5 began in mid-
1982 at Yongampo Ri Shipyard, and they were moved
to Nampo Shipyard in mid-1983, when they were in
the midstage of construction. After a long final con-
struction period, [redacted] 25X1
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Multiuse Hulls**Chongju-Class Hull**

Nine Chongju-class hulls were originally constructed, five at Nampo on the west coast and four at Najin on the east coast. The Chongju-class hull was originally designed to be used for fire support with an 85-mm turret gun forward, a multiple rocket launcher amidships, and a reload magazine aft. However, only one of the nine units that had been laid down in 1974 and 1975 ever had this fire-support configuration, and it was disassembled at Nampo in 1976. Of the nine hulls, three were converted to missile attack boats, four were converted to patrol craft, one was converted to a torpedo boat, and one remains in the building hall at Najin. (S/WN)

Sinhung-Class Hull

Three types of vessels use the Sinhung-class hull: hydrofoil torpedo boats (PTHs), torpedo boats (PTs), and patrol boats (PBs). In the early construction phase, they appear to be the same externally with the deck plating, gun mounts, and deckhouse on the hull. After this stage, whether the torpedo tube mounts and sponsons are added or left off indicates which type of Sinhung is being constructed. (S/WN)

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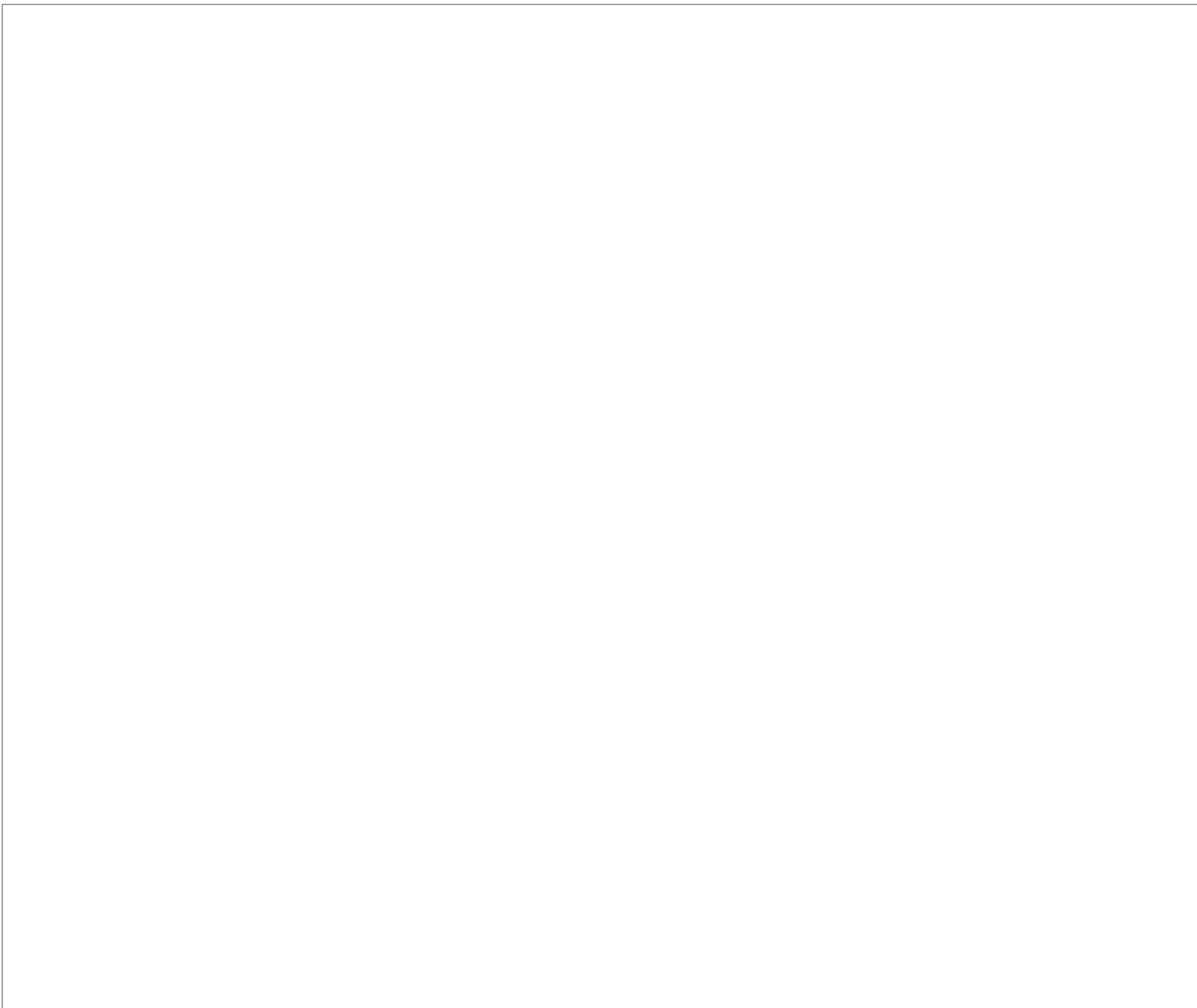
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Chongju PTG

In May 1982, at Nampo Shipyard, three Chongju hulls were being converted to missile attack boats. Like the Soju PTG, these were indigenous copies of the Soviet Osa-I-class PTG. The Chongju class is similar to the Soju in that both are [redacted]. However, unlike the Soju and Osa, the Chongju PTG has a slightly narrower beam, an ogive bow, cruise missile launchers mounted aft of amidships, and a slightly elongated superstructure (Figure 19). (S/WN)

Conversion of all three hulls was complete by late 1983, and deployment of the Chongju-class PTG was completed in November 1984, when the third boat joined the others at Tasa Ri Naval Base [redacted]

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Patrol Craft (PC)

Chongju PC

Of the five Chongju-class hulls at Nampo, two were converted to patrol craft and retained the original 85-mm forward turret gun. Additional weapons include two waist-mounted twin 25-mm guns behind the superstructure, two bridge-wing-mounted probable RBUs, two 37-mm guns on centerline aft, and depth-charge rails on the stern. By late 1981, these two units had been deployed at their home port of Chodo Naval Base South. (S/WN)

Of the four Chongju hulls at Najin, two were converted to patrol craft; however, each has a different weapons suite. The first unit launched from Najin in

mid-1981 has a weapons suite and configuration like the west coast patrol craft, except it has two twin 14.5-mm AA guns instead of probable RBUs on the bridge wings (Figure 20). This unit was operational by [redacted] and is home-ported at Toejo Dong. (S/WN)

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The second unit from Najin was launched in mid-1982. This patrol craft has a different weapons suite that includes an unidentified small-caliber gun on the bow replacing the 85-mm turret gun and two unidentified small-caliber guns aft of the deckhouse (Figure 20). This vessel is home-ported at Chongjin Naval Base [redacted] and may be associated with the maritime coastal defense force. (S/WN)

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Torpedo Boat (PT)

Chongju PT

Armament for the Chongju PT includes one unidentified small-caliber gun on the bow and two torpedo tubes approximately 10 meters long. These new 10-meter torpedo tubes are longer than the standard

[redacted] tube found on all other North Korean PTs. This longer torpedo tube suggests that a new type of torpedo, possibly with a longer range, has been developed. In addition, sponsons have been added on either side of the hull to support the outboard-canted torpedo tubes. (S/WN)

On [redacted] the third of four Chongju hulls at Najin was being reconfigured into a PT. This hull was outside the building hall, and torpedo tube mounts and side sponsons were being added (Figure 21). In addition, a smaller forward gun mount had been installed. [redacted]



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Sinhung PT

The Sinhung is the most numerous PT in the North Korean inventory. In the fall of 1982, the number of Sinhung PTs, both operational and under construction, was at least 92. Construction continued at a rapid pace in 1983, and at least six new Sinhungs (which is a conservative figure due to limited coverage) were constructed at Najin. Also in 1983, at least 14 were built at Yongampo Ri Shipyard on the west coast. In addition to the units constructed at these two shipyards, eight Sinhung PTs were the first new naval units laid down at Nampo Shipyard since 1978. In 1983, the last year Sinhung PTs were constructed, the total was 120. (S/WN)

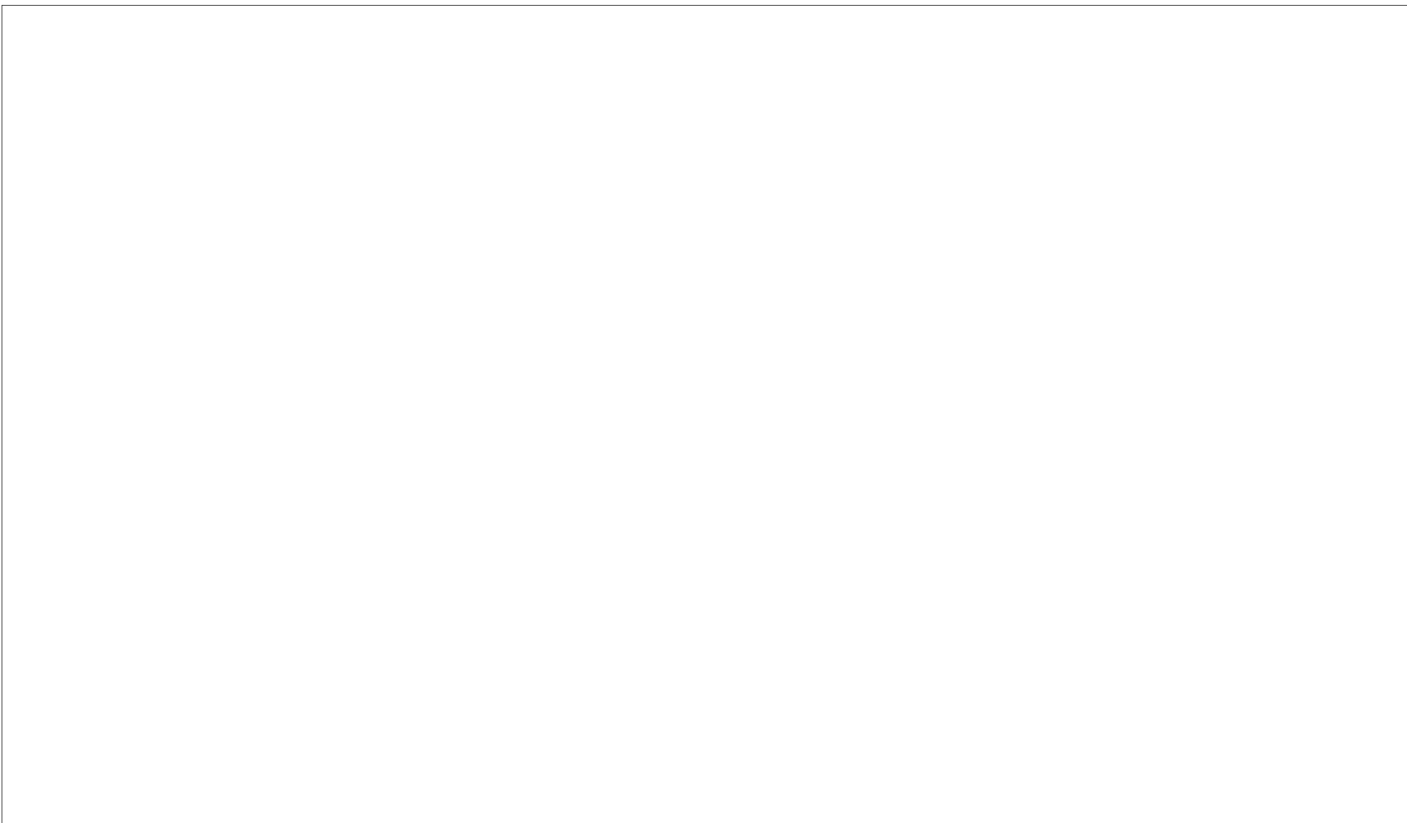
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Hydrofoil Torpedo Boat (PTH)

Sinhung PTH

In 1984 at Najin Shipyard, a new version of the Sinhung PT was identified, the PTH or hydrofoil torpedo boat (Figure 22). Larger sponsons had been added beneath the torpedo tubes to accommodate the hydrofoil mechanism.* [redacted]

(Figure 23). This hydrofoil design modification increases the speed, maneuverability, and fuel economy of the indigenously produced Sinhung PT. Eight new hydrofoil torpedo boats were home-ported at Sanjin Dong Naval Dispersal Area Southeast [redacted]

*Since the sponsons are added in the midstage of construction, it could be possible to convert a Sinhung PT to a PTH. However, no evidence has confirmed that the North Koreans are converting operational Sinhung PTs to PTHs; all PTHs appear to have been newly constructed. (S/WN)

on the east coast in 1984. During the same year, three hydrofoil torpedo boats were also observed at Pipa Got Naval Base and Ship Repair Yard [redacted] and seven at Tasa Ri Naval Base, both on the west coast. (S/WN)

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Patrol Boat (PB)

Sinhung PB

A patrol boat version of the Sinhung hull was started at Nampo Shipyard in early 1984, when six hulls were constructed without sponsons or torpedo tubes. Two were launched in early April 1984 and remained at the wharf until late May, when they were exported to Nicaragua on the mership Monimbo. The



converted to patrol boats.



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The Nampo LCP is 26 meters long with a bow ramp and two twin 14.5-mm AA guns forward and aft. It is operated by opening the clamshell bow doors and extending the ramp so that the 30 to 35 people it carries can disembark. The modifications to these boats included removing the bow ramp, installing plating over the bow opening, and probably welding the clamshell doors shut. No other modifications have been observed, and the weapons suite has remained the same (Figure 25). (S/WN)

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Nampo PB

At least 22 of the 99 Nampo personnel landing craft (LCP) in the North Korean inventory have been



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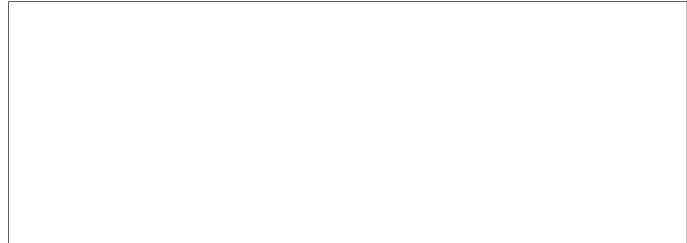
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Hydrofoil Patrol Boat (PBH)

Chongjin PBH

A Chongjin patrol boat had been converted to a hydrofoil in late 1983 at Mayangdo Ri Naval Repair Yard. When the PBH was modified, a four-foil system was added instead of the two-foil system seen on the Sinhung PTH. By July 1984, the sponsons of the PBH had probably been modified; the forward sponsons had apparently been shortened and widened.



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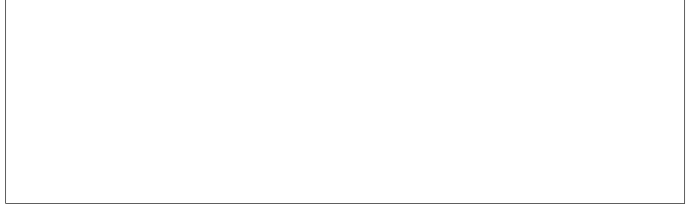
Inshore Minesweeper (MSI)

Pipa-A (21-Meter) MSI

The Pipa-A inshore minesweepers are the first minesweepers indigenously produced by the North Koreans. They are approximately 21 by 4 meters and have a cable drum on the stern. Armament includes one probable twin 14.5-mm AA gun on the bow (Figure 27). The Pipa-A is similar to the Soviet-built MO-V-class minesweeper; however, this new-class MSI is

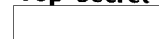
shorter and lacks a 37-mm AA gun aft.

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Utility Landing Craft (LCU)

Hantaе LCU

The rate of production for Hantaе utility landing craft has slowed considerably since 1983 (Table 2). The Hantaе LCU is 46 meters long with a beam of 7 meters and has an enclosed well deck and a bow visor (a portion of the bow raises). The first two units had been built by 1979 at Nampo and Najin shipyards. During 1981, four Hantaе LCUs were in various stages of construction at Najin. During the same year, Yongampo Ri Shipyard took over Hantaе production from Nampo Shipyard—two units had been started at Yongampo Ri. Units 1 through 5 were all operational by early 1983. Unit 7 was the next Hantaе to be deployed, in mid-1984, [redacted]

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Table 2.
Hantaе LCU Production

Unit	Shipyard	Year Operational
1	Najin	1978
2	Nampo	1979
3	Najin	1981
4	Najin	1981
5	Najin	1983
6	Najin	1985
7	Yongampo Ri	1984
8	Yongampo Ri	Ucon

This table is classified Secret/WNINTEL.

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Glossary

Amidships. In or toward the middle of a ship.

Beam. Extreme width of a ship.

Building ways. Place where a ship is constructed and launched from.

Deckhouse. A superstructure on a ship's upper deck.

Fabrication hall. Building where ship components are manufactured.

Fitting out. The period following the launch of a unit when the major constructing process is completed. The vessel is made habitable and is prepared for operational testing of all functional components.

Graving dock. A drydock consisting of an elongated basin of masonry or concrete, fitted with caisson gates at the entrance, and designed so that a ship may be floated in and the water pumped out, leaving the ship's hull exposed for repair, overhaul, etc.

Launch. The process of moving a ship into the water, either from a floating drydock or directly from a construction hall. This activity should not be confused with rollout, which is only the transfer of a vessel from

the inside to the outside of the construction hall.

Laid down. Beginning construction of a ship's hull.

Limber hole. A hole in the outer hull of a submarine that allows water into the free-flooding area.

Mership. Merchant ship.

Ogive. A pointed arch.

Platten area. Storage area for plating.

Rollout. Only the transfer of a vessel from the inside to the outside of the construction hall. This process should not be confused with launching, which is the process of moving the vessel into the water.

Sea trial. The checkout period conducted at sea when all systems and subsystems of a vessel are exercised to their design limits.

Sponson. A projection from the side of a ship.

Superstructure. The structural part of a ship above the main deck.

This glossary is Unclassified.

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