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DPRK Infiltration vessel ("mother ship") attempting to escape from Japan Coast Guard vessels. The stern clamshell doors enclosing the "wet well" are just visible as vertical lines on either side of the hull. (Japan Coast Guard)

In This Issue

KPA Engineer River Crossing Forces[1]

In any future war on the Korean Peninsula one of the underlying principles of the Korean People's Army's (KPA) offensive strategy is speed—known variously as the "one-blow-non-stop-attack" or "Occupying South Korea, All the Way to Pusan, in Three Days." The KPA must penetrate the DMZ, surround Seoul and drive down the peninsula in the shortest possible time to preclude the arrival and deployment of U.S. and any allied reinforcements. A critical element in this offensive strategy is the army's ability to both rapidly cross numerous river systems and protect its lines of communications which, from necessity, must cross numerous additional river systems. To address this crucial aspect of its strategy the KPA deploys one of the world's largest engineer river crossing (ERC) forces consisting of approximately 12,000-18,000 troops.

These troops are equipped with a wide range of specialized imported and domestically produced river crossing equipment including approximately 2,200 S-type pontoon bridging sections, 760 K-61 and domestically produced tracked amphibious vehicles and an unknown number of older Soviet pontoon bridging sets (TPP, LPP, etc.), GSP ferries and powerboats.[2]

Missions

The ERC force is tasked with both offensive and defensive missions. During offensive operations ERC units will support KPA first echelon infantry and exploiting armor and mechanized corps by providing assault river crossing capabilities and by establishing and maintaining bridges across water obstacles within the forward zone of operations. Defensive missions include maintenance of lines of communications across water obstacles within the first and second echelon corps areas.

The strategic importance of the ERC missions is heightened by the restricted terrain on the Korean Penin-

sula and because lines of communication cross a number of significant rivers. Within the DPRK alone the corridor from P'yongyang to Kaesong is intersected by five large river systems (i.e., Hwangju-ch'on, Imjin, Nam-dong, Taedong and Yesong). All of which are vulnerable to aerial interdiction.

Because of these responsibilities the majority of ERC assets are deployed between the capital P'yongyang (e.g., P'yongyang Defense Command and III Corps) and the city of Kaesong on the DMZ (e.g., II Corps).

The wartime maintenance and repair of railroad bridges, highway bridges (both over water and land) and lines of communication tunnels within the strategic rear is believed to the responsibility of a combination of specialized units subordinate to the General Staff Department's Engineer, General Construction, and Military Construction Bureaus, as well as the Ministry of People's Security's Railway Security and Engineer Bureaus.

Organization

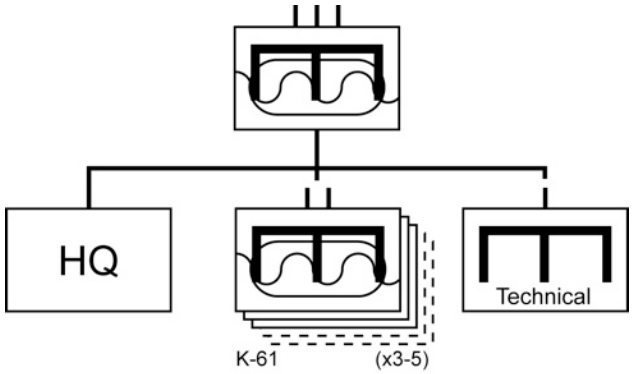
The General Staff Department's Engineer Bureau is responsible for providing combat engineering support, including river crossing capabilities, to the KPA. It also oversees, in cooperation with the Second Economic Committee, the development and procurement of engineering equipment. Subordinate to the bureau is a combat engineering school, an unknown number of engineering and ERC units of various types.

The most recent ROK Ministry of Defense estimates are that the KPA ERC equipment inventory includes 2,200 S-type pontoon bridging sections and 760 K-61 and domestically produced tracked amphibious vehicles. This represents (depending upon the number of subordinate companies) approximately 10-13 tracked amphibian (K-61 and domestically produced) and 15-20 S-type pontoon bridging battalion equivalents.

Additionally, It appears that aside from active duty ERC units there may be a small number of such units within the KPA's reserve military training units. The number and type of reserve units is unclear. Any such reserve units are likely to be equipped with older bridging equipment and vehicles (e.g., GAZ-46, GAZ-47, ZIL-485 BAV) that have been withdrawn from active service. This could potentially provide for an additional 4-8 bridging battalion equivalents.

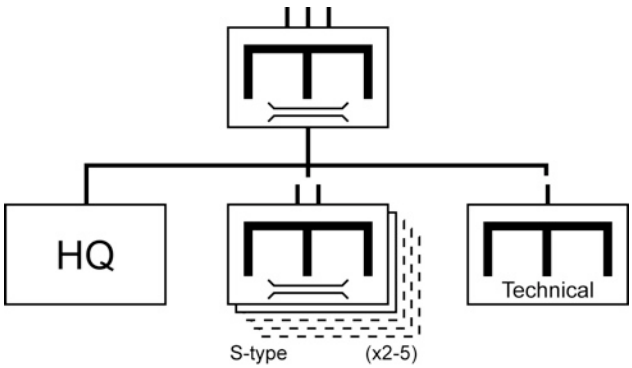
While the organization of ERC units at battalion level appears to be somewhat standardized, that for regiments and brigades appears to be mission organized and thus flexible. The following should be considered as representative organizational structures.

- *S-type Pontoon Battalion*: consists of a headquarters and two-three S-type pontoon companies (approximately 120 x S-type pontoon sections and 3-6 x BMK-K/-150/-160 powerboats each).

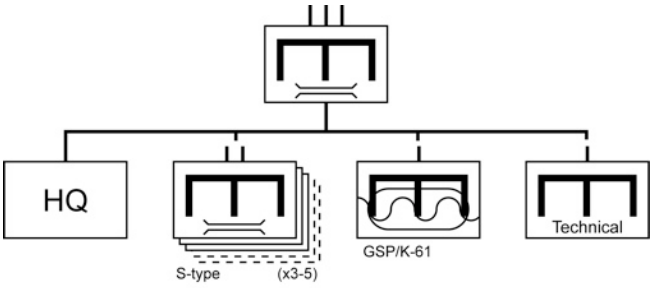


Engineer Bureau, Tracked Amphibian Regiment.

- *Light Pontoon Battalion*: consists of a headquarters, three light pontoon companies (12 x LPP sections and 3-6 powerboats each), and one technical company.
- *Heavy Pontoon Battalion*: consists of a headquarters, two heavy pontoon companies (24 x TPP sections and 3-6 powerboats each), and one technical company.
- *Tracked Amphibian (K-61) Battalion*: consists of a headquarters (1 x K-61) and two-three tracked amphibian companies (approximately 30 x K-61 each).
- *River Crossing Regiment, Forward Corps*: consists of a headquarters (1 x K-61), two-three S-type pontoon battalions (approximately 120 x S-type pontoon sections and three-six powerboats each), one-two tracked amphibian battalions (90 x K-61 each) and one technical company (3 x K-61).



Engineer Bureau, S-Pontoon Bridging Regiment.



Engineer Bureau, Engineer River Crossing Regiment.

- *River Crossing Regiment, Engineer Bureau*: consists of a headquarters (1 K-61), three-five S-type pontoon battalions (approximately 120 S-type pontoon sections and three-six powerboats each), one ferry company (12 GSP, 6 K-61) and one technical company (3 K-61).[3]
- *S-type Pontoon Regiment, Engineer Bureau*: consists of a headquarters, two-five S-type pontoon battalions, and a technical company (3 K-61).
- *Tracked Amphibian (K-61) Regiment, Engineer Bureau*: consists of a headquarters (3 K-61), three-five tracked amphibian battalions (90 K-61 each) and a technical company (3 K-61).

The K-61s in any of the above units may be replaced with the domestically produced tracked amphibian.

Deployment

Most ERC battalions are garrisoned at a single installation with site selection apparently based upon access to good roads for flexible commitment and proximity to likely areas of employment. Considering the KPA's concerns with the threat of ROK and U.S. air preemption and satellite reconnaissance capabilities significant quantities of ERC equipment are stored in tunnels or covered multi-vehicle storage faculties. This is most noticeable for units deployed closer to the DMZ.

As best as can be determined an engineer river crossing regiment is attached to the II, IV and V Corps deployed on the DMZ, and possibly to the remaining mechanized corps. The remaining ERC units subordinate to the Engineer Bureau are deployed throughout the II, III, IV, V, VII and XII Corps and the P'yongyang Defense Command—with the heaviest concentrations being found within the II and III Corps. There does not appear to be any significant ERC deployment within the I Corps area due to the mountainous terrain in its area of operations. ERC support to rear area (e.g., 2nd and 3rd echelon) corps is unclear.

K-61s during a river-crossing training exercise.

The domestically manufactured version of the K-61.

Training

In general, the KPA bases its combat training program on a yearly cycle. At the end of a yearly cycle a unit is considered fully trained and qualified to perform its assigned combat mission. Specialized units (e.g., special operations forces, electronic warfare units, etc.), however, may sometimes require a more complex training cycle lasting up to two-three years. It is believed that ERC units also fall into this latter category.

The annual training program begins in December and lasts until October of the following year. It is divided into two cycles, with each training cycle in turn being divided into two or three phases. Initial ERC training is conducted at battalion level or below. This is believed to consist of classroom exercises, theoretical lessons and limited local training. This local training utilizes a small specifically designated "training set" of engineering equipment, while the unit's operational equipment remains in storage. As the

Although poor in quality this still frame from a KPA film shows a M-1995 light tank crossing what appears to be an S-type pontoon bridge on the Taedong-gang, supported by a BMK-K powerboat. (KPA)

annual training cycle continues, units appear to rotate through either training facilities specific to ERC units or river crossing areas of larger training facilities. Here they practice company and battalion level tasks—also with a specifically designated "training set" of equipment. At the culmination of the annual training cycle army and corps level field-training exercises are held. During these exercises battalion level and larger ERC units deploy with a portion of their operational equipment to conduct river crossing and bridging operations.

Another poor quality still frame which shows several VTT 323 M-1973 AFVs crossing what appears to be an S-type pontoon bridge on the Taedong-gang, supported by BMK-150 powerboats. (KPA)

One notable ERC training exercise appears to be conducted by units located within the P'yongyang Defense Command. On a number of occasions during the past fifteen years these units have constructed a floating bridge on the Taedong-gang (i.e., Taedong River) in the center of the capital P'yongyang for military parades. Such bridges have been built using S-type pontoons and BMK-150/-K powerboats that spanned approximately 400 meters.

An additional aspect of ERC training is noteworthy—pontoon carrier and K-61 driver training. Such training apparently occurs on a regular basis (depending upon fuel availability) on specialized driving courses. Besides traditional driver training it includes backing, turning, and maneuvering to launch pontoons or enter water obstacles at simulated river approaches.

A Look at a DPRK Infiltration Vessel ("Mother Ship")

On 22 December 2001 Japan Coast Guard (JCG) vessels identified and pursued an unidentified vessel in the East China Sea (see *KPA Journal* Vol. 1, No. 1). After a ten hour chase, which exceeded 35+ knots at times and witnessed gun fire from both sides, the unidentified vessel was suddenly racked by an explosion due to a scuttling charge and sunk. Following extended diplomatic talks with China the JCG conducted a salvage operation in September 2002, raised the vessel, and confirmed it as a DPRK infiltration vessel. The recovery operation and subsequent public displays have provided the best open source details on this interesting class of vessels.[4]

One of the defining the features of this vessel is its large internal "wet well," which provides a wet berth to carry, deploy and recover a smaller 11 m long high-speed infiltration landing craft (i.e., ILC—frequently referred to as a "daughter" or "child" craft). The wet berth or "wet well"—which extended partially into the rear engine compartment, was accessed by two large "clam shell" doors which occupied the entire stern of the vessel.

To deploy or recover the ILC the seas had to be relatively calm and the infiltration vessel had to come to a stop. The two rear "clam shell" doors were then unlatched and opened using large pistons.[5] Due to the relative sizes of both vessels the doors had to be opened completely to 90° angles to the stern. With the aid of the water now flooding the wet berth and raw human strength the ILC was pushed out the stern. Once the ILC had cleared the larger vessel the stern doors were closed and latched, and the wet berth pumped out—although evidently it was never truly dry.

To recover the ILC the above process was repeated in reverse.

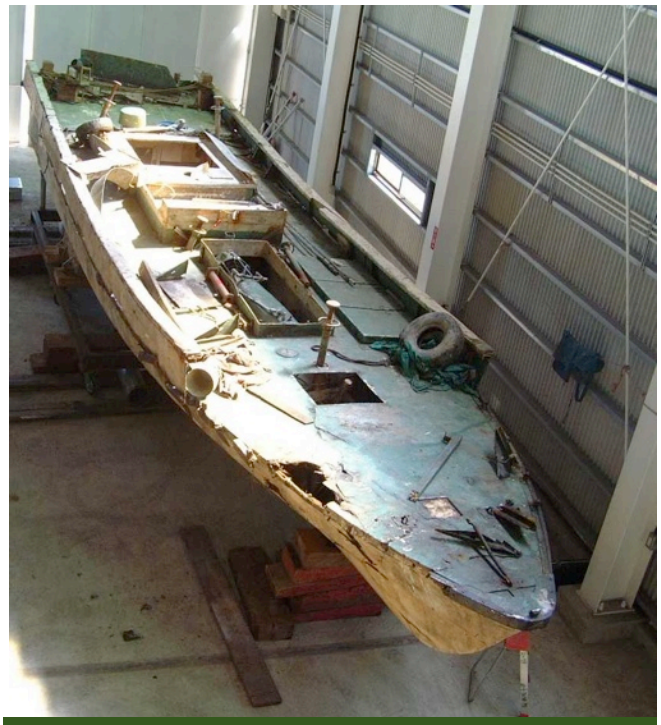
Stern view of infiltration vessel immediately after being salvaged. Note the high-speed infiltration landing craft (i.e., "daughter craft") and debris inside the wet berth. (Japan Coast Guard)

Now on temporary outside public display, this view shows the details of the clam shell doors. Not the hinges on the side of the hull, the hydraulic pistons and the gasket on the lip of the starboard door. (Ryoko Urakawa)

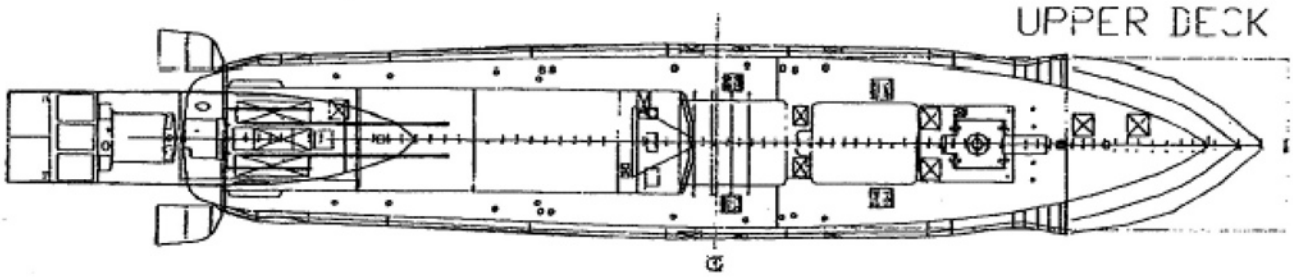
With the infiltration vessel now on permanent indoor display, a view looking aft showing details of the structure above the stern doors and how the deck was designed to provide the wet berth with head room. (Joseph S. Bermudez Jr. collection)

Details of the stern doors interiors. Note the gasket on the lip of the starboard door. (Joseph S. Bermudez Jr. collection)

Detailed view of the upper hinge and hydraulic ram for the port door. (Joseph S. Bermudez Jr. collection)



View of the salvaged high-speed infiltration landing craft. (Japan Coast Guard)



Drawing illustrating how the infiltration landing craft was carried. Note the position of the stern doors and the forward end of the "wet well" was extended into the rear engine compartment to accommodate the ILC's bow. (Japan Coast Guard)

View of rear engine compartment looking aft at the extension to accommodate the ILC's bow. (Japan Coast Guard)

View looking forward into the "wet berth." Note the channel for a gasket on the hull stern. (Ryoko Urakawa)

A view looking aft, out of the "wet berth" taken shortly after the salvage with the debris and ILC having been removed. (Japan Coast Guard)

Correction: BTR-60 in KPA Service

A correction concerning last issue's BTR-60 article which was received from Mr. Alex van Riezen,

"A small correction it's not BTR-60 R-145BM but only R-145BM. The R-145 means the radio set and BM basically means 'armoured machine' so it's used on a BTR-60 chassis. …[I]n the past we (in the West) thought that the R-145BM was called BTR-60PU. Well we now know that there's the R-145BM and the PU-12. The PU-12 is the command vehicle used in certain AAA battalions."

Editor's Note

With this issue *KPA Journal* is now back on schedule. I presently anticipate that September's issue will be out during the last week of the month.

As noted in the August issue I will be speaking, along with some other very interesting people, at the September 1st Marine Corps University conference *Confronting Security Challenges on the Korean Peninsula*. The conference is sponsored by the Marine Corps University and Korea Economic Institute. Information can be found at: http://www.mcu.usmc.mil/Pages/Events,%20Conference.aspx

As I am sure that everyone reading *KPA Journal* is aware, imagery of the KPA is difficult to obtain. So, if anyone comes across any such imagery I would be most grateful if you either passed it along to me or provide me with directions on how to obtain it.

Reader's have expressed a strong interest in information concerning KPA COMINT during the Korean War. While I also have a great interest in the subject it is a difficult one to research and write about at the open source level. With that said, I will do my best to write something on the subject as I am updating my research on the KPA's IW and EW capabilities and need to include some background information. Perhaps, I will start with the use of radar in the DPRK and then move on to COMINT? Either will require considerable time, so they are long-term projects.

As always you are welcome to freely share *KPA Journal* with colleagues and friends. If they'd like to keep receiving the journal please have them email me so that I can add them to the mailing list.

All readers are encouraged to submit any corrections, clarifications, comments or simply share ideas of what you would like to see in future issue of *KPA Journal*.

Thank you all for your encouragement and support.

—Joseph S. Bermudez Jr.

Endnotes

1 This article draws heavily both upon interview data collected by Joseph S. Bermudez Jr. and Bermudez Jr., Joseph S. "River Crossing Forces Highlight North Korean Military Strength," *Jane's Intelligence Review*, April 2006. Additional sources included: Ministry of National Defense, Republic of Korea, *Defense White Paper*, Seoul, 1991–2009; Defense Intelligence Agency, "North Korean Armed Forces Modernization," *Defense Intelligence Digest*, December 1968, pp. 14-17; U.S. PACOM, *North Korean Army Engineer River Crossing Force (U)*, IPAC Special Study Update, PlC 1100-269-80, December 1980; Defense Intelligence Agency, *North Korea Handbook*, PC-2600-6421-94, Washington, D.C., 1994; U.S. Army. FC 100-2-99, *North Korean People's Army Operations*, Fort Leavenworth: Combined Arms Center Development Activity, December 1986; U.S. Army. FM 34-71, *Opposing Force: North Korea*, Fort Huachuca: U.S. Army Intelligence Center and School, February 1982; U.S. Army. *North Korea People's Army Handbook*, Fort Leavenworth: Battle Command Training Program, April 1992; U.S. Army. TC 30-37, *Opposing Force: North Korea*, Fort Huachuca: U.S. Army Intelligence Center and School, January 1979; and U.S. Marine Corps. *North Korea Country Handbook*, MCIA-2630-NK-016-97, Quantico: Marine Corps Intelligence Activity, May 1997.

2 There are also believe to be a number of PTS-M tracked amphibians in KPA service.

3 Some sources indicate that the Engineer Bureau's River Crossing Regiment is actually a brigade and is equipped with 6-12 TPP and LPP pontoon battalions.

4 At least one infiltration vessel (and possibly more) has been captured by the ROK in the past. It, however, has not been not been common knowledge or been made available to the public. A number of high-speed ILCs of various types have been captured by the ROK.

5 It is unclear whether these pistons used hydraulic fluid or air, although several sources say compressed air.