Complicity - North Korean Missile Support in Russia's Ukraine Campaign

North Korea has provided missile systems and personnel to Russia, supporting its military operations in Ukraine. These transfers include advanced missile systems such as the KN-23, KN-25, Hwasong-5/6, and Pukguksong-2, with North Korean military units from the KPA Strategic Rocket Forces and Missile Corps deploying skilled personnel to assist in missile operations. North Korean technicians and missile operators are believed to be involved in the deployment and maintenance of these systems, stationed both in Russian-held Ukrainian territories and strategic Russian locations.

North Korean missiles are bolstering Russia's missile capabilities in the ongoing war against Ukraine, targeting critical infrastructure and military assets. The KN-23 and KN-25 systems, which feature solid-fuel technology and rapid-fire capabilities, are likely being used near the frontlines in Russian-occupied territories, while the Hwasong-5/6 and Pukguksong-2 systems are deployed further from the frontlines for longer-range strikes. North Korean personnel, including missile operators and technicians, are essential for maintaining these systems and ensuring their operational readiness. For instance, the KN-25's ability to overwhelm air defenses makes it particularly effective in supporting Russian offensive operations.

The transfer of North Korean missile systems to Russia marks a significant development in the war, potentially shifting the balance of power in Russia's favor. North Korean missile systems, such as the KN-23, provide Russia with advanced strike capabilities, while the Hwasong-5/6 enables long-range targeting, making Ukrainian defense against missile strikes more challenging. The presence of North Korean personnel further enhances Russia's ability to sustain missile operations, reducing downtime and improving strike precision. These developments complicate Ukrainian efforts to defend its territory and place additional pressure on Western allies to provide more advanced defensive systems.

North Korea's involvement in supporting Russia with missile systems is a calculated move aligned with the geopolitical interests of both nations. Russia is increasingly isolated due to international sanctions and needs to replenish its dwindling missile stockpile for sustained operations in Ukraine. In exchange, North Korea benefits from deeper ties with a powerful ally and potential economic or military concessions. This timing also reflects Russia's strategic need for immediate support in response to Ukrainian counteroffensives that have strained its logistical capabilities.

The impact of North Korean missile systems in Ukraine has been noticeable, with enhanced Russian missile capabilities allowing for more frequent and precise strikes. The KN-25's rapid-fire salvos have overwhelmed Ukrainian air defenses in certain regions, while the

Pukguksong-2's long-range capabilities have enabled strikes on strategic targets far from the frontlines. North Korean personnel have ensured that missile systems remain operational despite the high demand placed on them, minimizing delays between launches and increasing Russia's overall firepower.

North Korea's continued missile support will likely prolong and intensify Russia's ability to conduct missile strikes in Ukraine. As North Korea's involvement deepens, Russia may further integrate these systems into its broader military strategy, potentially increasing the frequency and lethality of missile attacks. This collaboration may also lead to more sophisticated technology transfers, further complicating Ukraine's defensive capabilities. Over time, this could lead to greater international scrutiny of North Korea's actions, potentially escalating regional tensions.

Significant intelligence gaps remain regarding the full extent of North Korean personnel involvement and the precise number of missile systems delivered to Russia. We are unsure whether North Korea is supplying additional weapons beyond those already identified or if the systems are being modified for specific operational needs in Ukraine. Further information is needed on the terms of the North Korea-Russia agreement and any potential secondary effects, such as technology transfers or increased military cooperation between the two nations.

Primary Evidence

Transfer of KN-23 and KN-25 Systems- North Korea has sent KN-23 SRBMs and KN-25 MRLS to Russia, providing highly mobile, solid-fuel missile systems capable of rapid strikes on Ukrainian targets.

Deployment of North Korean Personnel- North Korean missile operators and technicians are actively involved in maintaining and operating these systems, ensuring that Russia's missile capabilities are sustained despite ongoing combat.

Strategic Locations of Missile Systems- The KN-23 and KN-25 are deployed near the frontlines, while longer-range systems like the Hwasong-5/6 and Pukguksong-2 are placed further back to target Ukrainian infrastructure, allowing Russia to increase its operational flexibility and reach.

Supporting Information

North Korea has provided Russia with a variety of missile systems to aid in the ongoing war against Ukraine. These systems include both solid-fueled and liquid-fueled missile types, each offering unique operational advantages and deployment flexibility-

KN-23 Short-Range Ballistic Missile (SRBM)

- Capabilities- The KN-23 is a highly mobile, solid-fuel missile capable of carrying conventional and nuclear warheads. It has a range of up to 500 km and is designed to evade missile defense systems through advanced terminal flight maneuvers, including a "pull-up" maneuver, making it difficult for interceptors to engage.
- Location in Russia- Likely deployed near key frontlines in occupied Ukrainian territories, targeting Ukrainian military installations and supply lines.

KN-25 Multiple Rocket Launcher System (MRLS)

- Capabilities- The KN-25 can rapidly fire multiple rockets, launching four in 20-second intervals. With a range of about 380 km, this system is designed to overwhelm air defense systems. It is particularly effective for rapid strikes on critical infrastructure and military assets.
- Location in Russia- Similar to the KN-23, the KN-25 is likely deployed near frontlines in Ukraine to exploit its rapid-firing capabilities and support Russian offensive operations.

Hwasong-5/6 SRBM (Short-Range Ballistic Missiles)

- Capabilities- Based on Soviet Scud technology, the Hwasong-5 and Hwasong-6 are liquid-fueled missiles with 300 km and 500 km ranges, respectively. While these systems require longer preparation times, they are still effective at delivering conventional payloads to strike Ukrainian infrastructure.
- Location in Russia- Given their longer ranges, the Hwasong-5/6 systems are likely stationed further back from the frontlines, targeting strategic infrastructure across Ukraine.

Pukguksong-2 Medium-Range Ballistic Missile (MRBM)

- Capabilities- The Pukguksong-2 is a solid-fuel missile with a range of 1,300 km, capable of delivering either nuclear or conventional warheads. It is launched from tracked vehicles, providing significant mobility and survivability.
- Location in Russia- This missile is likely deployed further from the frontlines, where its long range can strike distant targets within Ukraine while remaining in a relatively secure position.

Units Operating the Missile Systems

KN-23 SRBM

- Operating Unit- Managed by the KPA Strategic Rocket Forces, particularly the 5th Missile Division under the Missile Guidance Bureau. This unit specializes in solid-fuel systems like the KN-23.
- Location- KN-23 units are stationed in Sariwon, North Hwanghae Province, around 100 km from the DMZ.
- Personnel & Skills- Each missile battery includes 10-15 personnel, comprising missile operators, drivers, technicians for missile guidance systems, and solid-fuel specialists.

KN-25 MRLS

- Operating Unit- Likely operated by the 425th Artillery Division, known for handling advanced artillery systems. This division is vital to North Korea's elite artillery forces, which are highly trained in rapid-firing operations.
- Location- Units are likely deployed in underground facilities near Pyongyang and Kangwon Province, particularly in Chiha-ri and Pan'gyo-kun.
- Personnel & Skills- Similar to the KN-23, each battery requires 10-15 personnel to operate the launcher system, including technicians for satellite-guided launch precision.

Hwasong-5/6 SRBM

- Operating Unit- Handled by units from the KPA Missile Corps, specifically the 4th and 5th Missile Brigades under the Missile Guidance Bureau. These brigades have experience in liquid-fueled missile operations.
- Location- These missiles are stationed in Chiha-ri (Kangwon Province) and Sariwon (North Hwanghae Province), operating primarily from underground facilities to enhance survivability.
- Personnel & Skills- Each Hwasong-5/6 battery consists of 20-30 personnel, including fuel handlers, engineers, missile operators, and meteorological teams to adjust for launch conditions.

Pukguksong-2 (KN-15) MRBM

- Operating Unit- Operated by the Strategic Rocket Forces, potentially by the 5th Missile Brigade, given its role in handling mobile, solid-fuel systems.

- Location- Likely stationed around Pyongyang, with coordination from the Pyongyang General Satellite Control Center.
- Personnel & Skills- To ensure mobility and operational readiness, crews consist of 10-15 personnel, including guidance system engineers, solid-fuel propulsion experts, and vehicle drivers.

Missile Bases and Facilities in North Korea

- No. 125 Factory (Pyongyang)- This facility produces Hwasong and Nodong missiles, with units performing final assembly before deployment to other bases.
- Chamjin-ri Munitions Factory- This site manufactures some of North Korea's longer-range systems, such as the Taepodong-2, and transports them to launch sites like Musudan-ri.
- Sariwon (North Hwanghae Province)- A key base for Hwasong SRBM units, likely housing both the Hwasong-5 and Hwasong-6 brigades.
- Chiha-ri (Kangwon Province)- Hosts road-mobile launch units for KN-23 and KN-25 systems. These units operate from hardened underground facilities, allowing them to survive preemptive strikes.

Personnel and Skills Required to Operate and Maintain the Missile Systems

KN-23 and KN-25 (Solid-Fuel Systems)

- Personnel Required- Approximately 10-15 personnel per missile battery.
- Skills Required-
    - Missile Operators- Responsible for launch operations, including inputting trajectory data and monitoring flight paths.
    - Guidance System Technicians- Ensure the missile's onboard guidance systems, including satellite and inertial guidance, are correctly calibrated.
    - Maintenance Engineers- Handle routine checks on propulsion and guidance systems and ensure mechanical readiness of the mobile launchers.

Hwasong-5/6 (Liquid-Fuel Systems)

- Personnel Required- Approximately 20-30 personnel per missile battery.
- Skills Required-

- Fuel Handlers- These specialists are critical to safely handling and loading liquid propellants before launch.
- Missile Engineers- Oversee pre-launch preparations, including fuel loading, engine checks, and missile assembly.
- Meteorological Teams- Provide weather and atmospheric data to ensure optimal launch conditions and trajectory accuracy.

Pukguksong-2 (Solid-Fuel System)

- Personnel Required- Similar to the KN-23 and KN-25, 10-15 personnel.
- Skills Required-
  - Solid-Fuel Propulsion Experts- These technicians maintain the solid-fuel systems, ensuring consistent performance.
  - Missile Operators and Drivers- Ensure that the tracked vehicles used for missile launch maintain mobility and survivability.

Maintenance and Operational Requirements

- Solid-Fueled Missiles (KN-23, KN-25, Pukguksong-2)- These missiles require less frequent maintenance than liquid-fueled systems. Maintenance personnel mainly focus on electronics, guidance systems, and ensuring the mobility of the launch platforms.
- Liquid-Fueled Missiles (Hwasong-5/6)- Regular maintenance of the fuel tanks and engines is essential. Strict safety protocols for handling hazardous materials are also required, necessitating larger maintenance teams.

North Korea's transfer of missile systems to Russia, including the KN-23, KN-25, Hwasong-5/6, and Pukguksong-2, has provided significant firepower to support Russia's operations in Ukraine. These systems are operated by highly skilled units from North Korea's Strategic Rocket Forces and Missile Corps, with personnel stationed in critical areas such as Pyongyang, Chiha-ri, and Sariwon. The expertise required to maintain and operate these systems ranges from missile operators and guidance technicians to fuel handlers and propulsion engineers, reflecting the complexity and scale of North Korea's ballistic missile operations.

Supply Chain Support for North Korean Missile Systems in Russia and Occupied Ukrainian Territories

To sustain missile operations in Ukraine, North Korea's missile systems require a robust supply chain that includes the provision of spare missiles, repair parts, fuel (for liquid-fueled systems), and specialized personnel. Below is a comprehensive breakdown of the supply chain requirements for each missile system and how these materials likely make their way to Russian and occupied Ukrainian territories.

KN-23 Short-Range Ballistic Missile (SRBM)

Missiles Likely on Hand

The number of KN-23 missiles sent to Russia is estimated to be 50-100 units. Given the solid-fuel nature of these missiles, they are easier to store and transport than liquid-fueled systems. Russia is likely using these missiles strategically for high-priority targets, ensuring they remain operational throughout the conflict.

Parts and Repair Systems

- Guidance Systems- KN-23 requires advanced inertial and satellite-guided systems for precision strikes. Spare parts for these systems include gyroscopes, accelerometers, and control electronics.
- Propulsion Components- Solid-fuel motors require maintenance parts, including seals, casings, and ignition mechanisms.
- Chassis and Launchers- The KN-23 is mounted on mobile launch vehicles (Transporter Erector Launchers, or TELs), which need regular maintenance for mobility, such as spare tires, hydraulic systems, and vehicle electronics.

Supply Chain and Logistics

- Transport Routes- KN-23 missiles and spare parts are likely transported from North Korea to Russia via overland routes through China, given the proximity and the established land-based transport networks. China may turn a blind eye to these shipments, making this the most efficient route. Alternatively, sea routes could be used via the Russian Far East ports, such as Vladivostok, before being transported by rail or truck to the frontlines.
- Distribution in Russian-Occupied Territories- Once in Russia, the missiles and components are likely moved by rail to bases near the Donetsk or Luhansk regions,

where they are distributed to frontline artillery and missile units. Given their mobile nature, KN-23 TELs can be relocated as needed.

KN-25 Multiple Rocket Launcher System (MRLS)

Missiles Likely on Hand

Russia is estimated to have received around 20-30 KN-25 launchers from North Korea, with each launcher potentially carrying up to 40-60 rockets. Given its rapid-firing capability, KN-25 launchers require frequent re-supply, especially during heavy artillery operations.

Parts and Repair Systems

- Rocket Motors and Warheads- Each rocket requires solid-fuel motors and warheads, and Russia must ensure a steady flow of these munitions. Spare rocket motors and explosive charges are essential for continued operations.
- Launcher Components- The rapid-firing KN-25 system involves complex mechanical components like firing rails, loading systems, and electronic targeting systems. Regular maintenance is required to ensure the smooth operation of these mechanisms.
- Mobile Platforms- Like the KN-23, KN-25 systems are mobile, requiring parts to maintain the mobility of the TELs, such as replacement tracks, engine parts, and communications equipment.

Supply Chain and Logistics

- Transport Routes- KN-25 systems are likely shipped from North Korea by sea to Vladivostok, then transported to Russian logistics hubs by rail. North Korea may also be sending individual rocket components to be assembled in Russia or Russian-occupied regions before deployment.
- Distribution- The re-supply of rockets is a key logistical challenge, with frequent shipments needed to maintain the high firing tempo of the KN-25. Once in occupied Ukrainian territory, these systems likely have designated logistics bases for rearming, possibly in Mariupol or other areas under Russian control near the frontlines.

Hwasong-5/6 Short-Range Ballistic Missiles (SRBM)

Missiles Likely on Hand

North Korea likely supplied 50-75 Hwasong-5/6 missiles to Russia. Given their more extended range and use for targeting infrastructure, these missiles are expected to be reserved for strategic strikes rather than frequent use.

Parts and Repair Systems

- Liquid-Fuel Components- The Hwasong-5/6 are liquid-fueled missiles, requiring large quantities of fuel (typically IRFNA—Inhibited Red Fuming Nitric Acid—and kerosene). Spare tanks, fuel pumps, and pressurization systems are crucial for pre-launch operations.
- Guidance and Control Systems- Like other ballistic missiles, these systems need spare parts for the guidance computers, gyros, and stabilizers. Given the age of these systems, parts could be more challenging to come by, requiring regular maintenance.
- Mobile Launchers- Hwasong-5/6 missiles are often transported on older mobile platforms or fixed launchers. Spare parts for these launchers, such as hydraulic lifts and launch stabilizers, must be on hand for proper operation.

Supply Chain and Logistics

- Transport Routes- These older missiles and their support equipment are likely shipped from North Korea by sea, potentially through Vladivostok, before moving overland to Russian military depots near Rostov-on-Don or Volgograd. From there, they are transported to bases in occupied Ukraine.
- Fuel Supply- Given the specialized nature of the liquid fuel needed for the Hwasong series, North Korea may have also provided logistical support or fuel storage facilities near the operational bases. These hazardous fuels require proper handling, necessitating additional transport security and specialized personnel.

Pukguksong-2 Medium-Range Ballistic Missile (MRBM)

Missiles Likely on Hand

North Korea likely provided 10-15 Pukguksong-2 missiles to Russia, given their strategic value and long-range capabilities. These missiles are likely held in reserve for high-value, long-range targets.

Parts and Repair Systems

- Solid-Fuel Components- The Pukguksong-2's solid-fuel system requires less frequent maintenance, but spare parts for solid-fuel propulsion systems, including nozzle assemblies and igniters, are essential.
- Guidance Systems- Advanced satellite and inertial guidance systems require regular calibration and replacement of sensitive electronics, such as accelerometers and gyros.
- Mobile Launch Platforms- These tracked vehicles require regular maintenance to remain mobile. Spare tracks, engines, and hydraulic systems ensure these launchers can be repositioned as needed.

Supply Chain and Logistics

- Transport Routes- The Pukguksong-2 may have been transported via sea routes from North Korea to Vladivostok, where it is transferred by rail and moved deeper into Russia for deployment near strategic bases. Before arriving at the frontline, the missiles may be moved through military logistics hubs in Volgograd or Rostov-on-Don.
- Distribution- Pukguksong-2 systems require secure locations for storage and maintenance, likely in Russian-held regions of Luhansk or Donetsk. These bases are likely fortified and well-equipped with specialized facilities for missile storage and repairs.

Overall Supply Chain Challenges

- Long Supply Lines- Given the distance between North Korea and the Russian-Ukrainian front, maintaining a steady supply of missiles, fuel, and spare parts is logistically complex. Supply lines are vulnerable to interdiction, and delays in replenishing stock could disrupt Russian missile operations.
- Sanctions Evasion- Russia and North Korea are subject to international sanctions, making direct shipment difficult. These countries likely rely on clandestine routes through third-party nations like China to avoid detection and sanctions enforcement.
- Personnel and Expertise- North Korean technicians and military personnel are likely stationed in Russia or occupied Ukraine to provide on-site maintenance and training. These personnel need secure transit and logistical support to maintain North Korean missile systems.

North Korea's supply chain to support the missile systems provided to Russia is critical for sustaining Russia's missile strike capabilities in Ukraine. These missiles—KN-23, KN-25, Hwasong-5/6, and Pukguksong-2—require complex logistics networks involving transport

routes through China and Russia, specialized maintenance personnel, and secure storage facilities. While solid-fueled systems like the KN-23 and KN-25 require less maintenance, liquid-fueled systems such as the Hwasong-5/6 need substantial logistical support, particularly in handling fuel and spare parts. Ensuring a continuous flow of missiles and components will be essential for Russia to sustain its missile strike capabilities in the ongoing conflict.