


A satellite with solar panels is shown orbiting the Earth. The Earth is illuminated from the left, showing continents and oceans. The satellite is positioned in the center, with its solar panels extended. The background is a dark space filled with stars and other celestial bodies, including a crescent moon and a reddish planet.

Hanwha Aerospace Europe

 Hanwha Aerospace



DEFENSE & AEROSPACE

Wspieramy Potencjał Obrony Polski
poprzez trwałą współpracę technologiczną z
Polskim Przemysłem Obronnym

Hanwha Aerospace

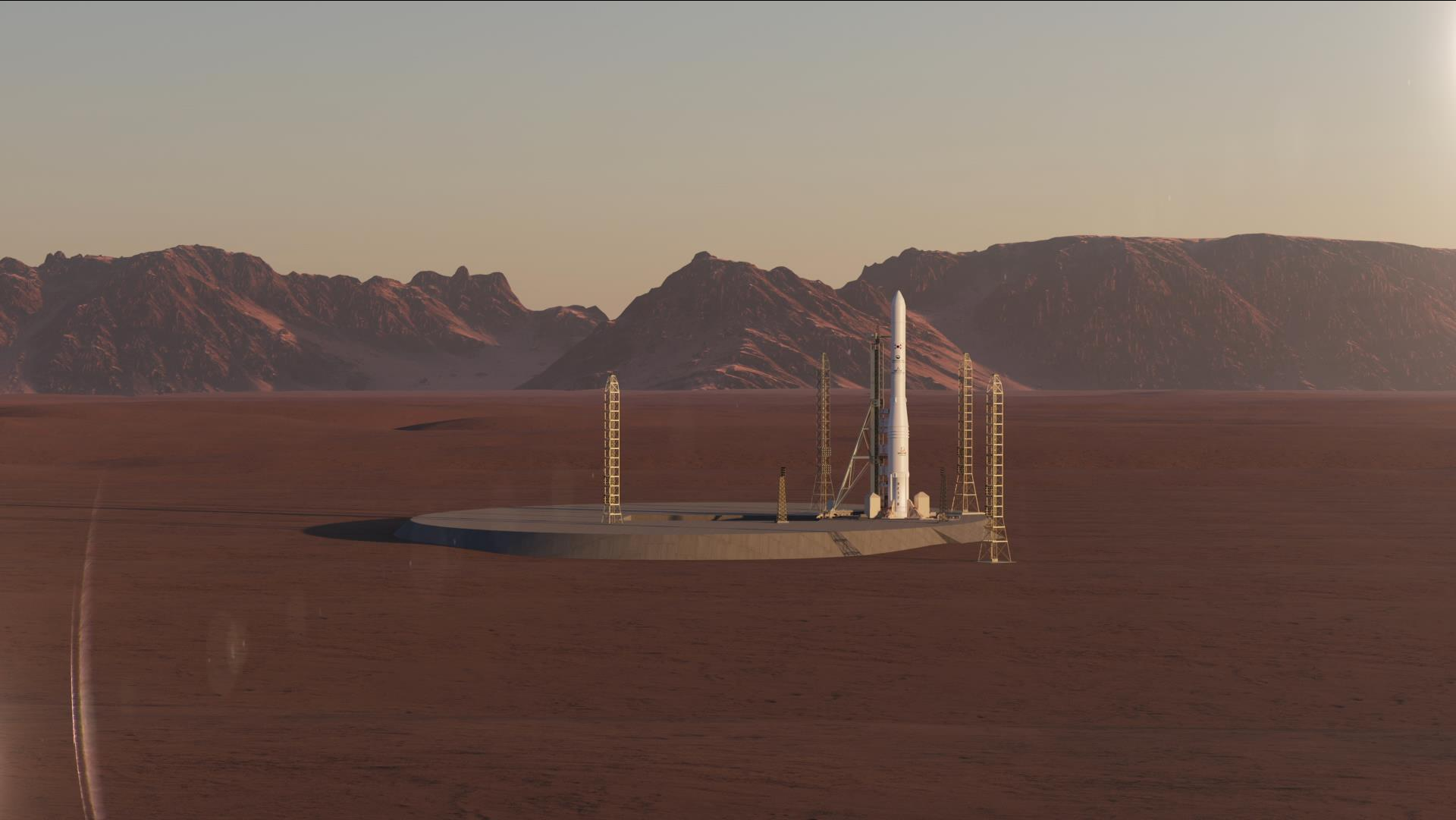
Hanwha Ocean

Hanwha Systems

Święto Wojska Polskiego 15.08.2023
(Źródło: Zoom, Z Obiektywem Obok Munduru)

st.chor.szt.mar.Arkadiusz DWULATEK







Hanwha Aerospace Europe

K9 THUNDER

The world leader of 155 mm/52Cal. Self-Propelled Howitzer

- Over **2,300 units** in operation globally
- High accuracy and long range rapid fire
- High maneuverability in mud, snow, or desert





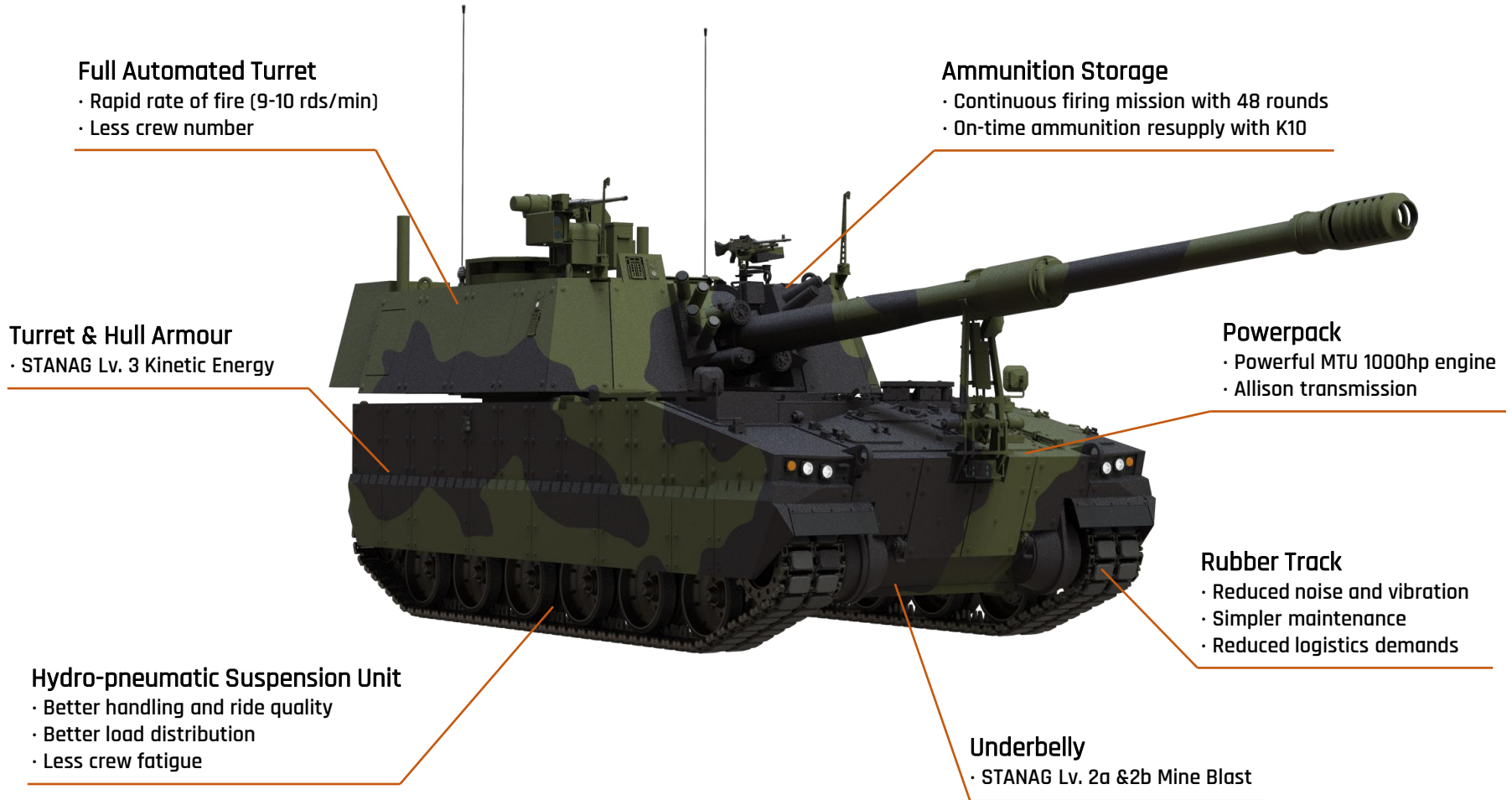
PART 1 - ARTILLERY



WE HAVE THE ANSWER FOR THE FUTURE

FUTURE – Next Generation Artillery System

[FULL AUTOMATED TURRET+ Extended Range Ammunition]





K9A1

5 Crews / Manned



K9A2

3 Crews / Manned



K9A3

2 Crews + Unmanned & Autonomous

Barrel Length

K9 THUNDER
Self-Propelled Howitzer

K9A1



52Cal.

K9A2

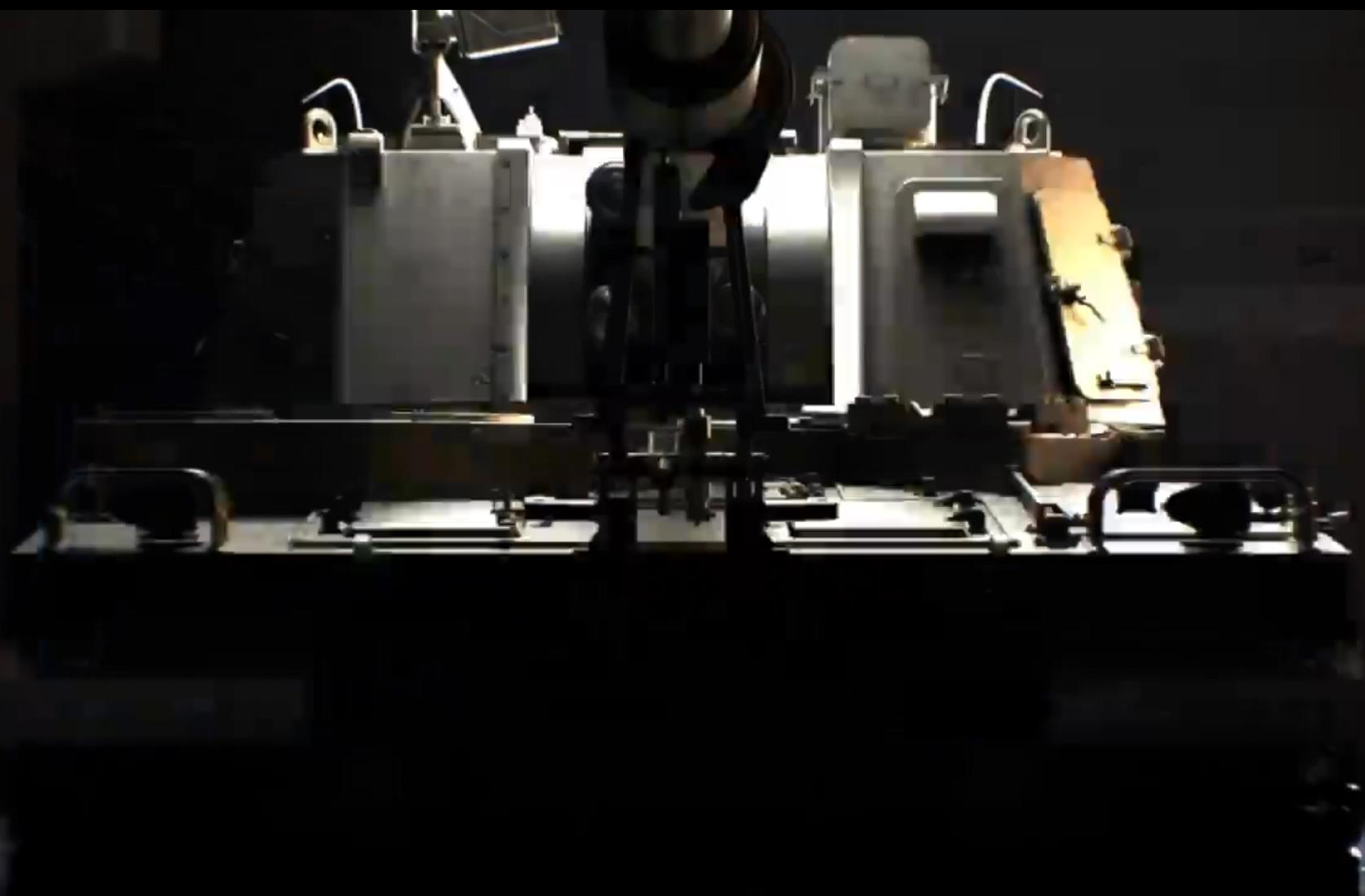


52Cal.

K9A3



58Cal.



CHUNMOO MRLS (Homar-K)

Highly Lethal Multiple Rocket Launcher

- Proudly **serves the Korean Army**
- Shoot-and-Scoot tactics
- **Scalable** and flexible
- High **tactical mobility**
- Quick self-loading and unloading



CHUNMOO | Multiple Rocket Launcher System

1. System Summary

- Short ready sequence (7 min.)
- On-board fire control system using INS
- Self-loading and unloading

2. Lethality - Interoperable with a Variety of Rockets

	UNGUIDED-122 MM	CHUNMOO I Guided-239 mm	CHUNMOO II Guided-400 mm	ETAMS Guided-600 mm
Guidance	-	GPS/INS	GPS/INS	GPS/INS
Warhead	HE	HE Enhanced penetration and lethality	HE Fragmentation and thermobaric	HE Fragmentation and thermobaric
Propulsion	Composite propellant	Composite propellant	Composite propellant	Composite propellant
Max. range	40 km	80 km	160 km	290 , 500km
CEP	70 m (at max. range)	10 m (typical)	10 m (typical)	5 m (typical)
Rounds/POD	20 rounds	6 rounds	2 rounds	1 rounds

※ HE: High Explosive | CEP: Circular Error Probability | ETAMS : Emirates TActical Missile System

Part 2: Heavy IFV, for Future Armed Forces

A Bridgehead for the Future IFV



Heavy IFV, for Polish Armed Forces

Combination of State-of-the-art technologies from three on-going IFV Projects

- [AUS/Redback] Land400 Phase 3 IFV program with the goal to replace the M113AS4
- [ROK/Future IFV] Acquisition of Korean version of Redback to deploy next gen. IFV earlier than the schedule
- [ROK/UGV] Arion-SMET UGV for MUMT operation, including Hanwha for next Generation UGV

Heavy IFV



Redback H-IFV



Futuristic NG IFV



Next Generation UGV





Why H-IFV | Polonization

Expanding of Industrial Cooperation based on successful collaboration in the past

[Integration] 'KRAB SPH' Experience

- Success in previous project delivers project stability



[Turret] 'ZSSW-30' - Borsuk IFV

- Same business model with KRAB
- Spike ATGM / 30mm MK44 / 7.62 Gun



[Training] Simulator

- Deliver Simulator before 2024 for the User's preliminary training



[C2] K9, CHUNMOO Partner

- C2 integration based on the cooperation through K9PL, CHUNMOO

WB ELECTRONICS 
WB GROUP

Future of Heavy Infantry Fighting Vehicle

Polish H-IFV (ZSSW30+RedBack]



Diesel Power-pack : 1000 HP

Polish ZSSW-30 Turret

- 30mm MK44 Gun , Spike-LR ATGM
- UnManned turret from PGZ

Rubber Track + In-arm passive suspension

GVA Network

Next Generation -IFV



Hybrid Power-pack : 45 Tons

The Next Generation Turret System

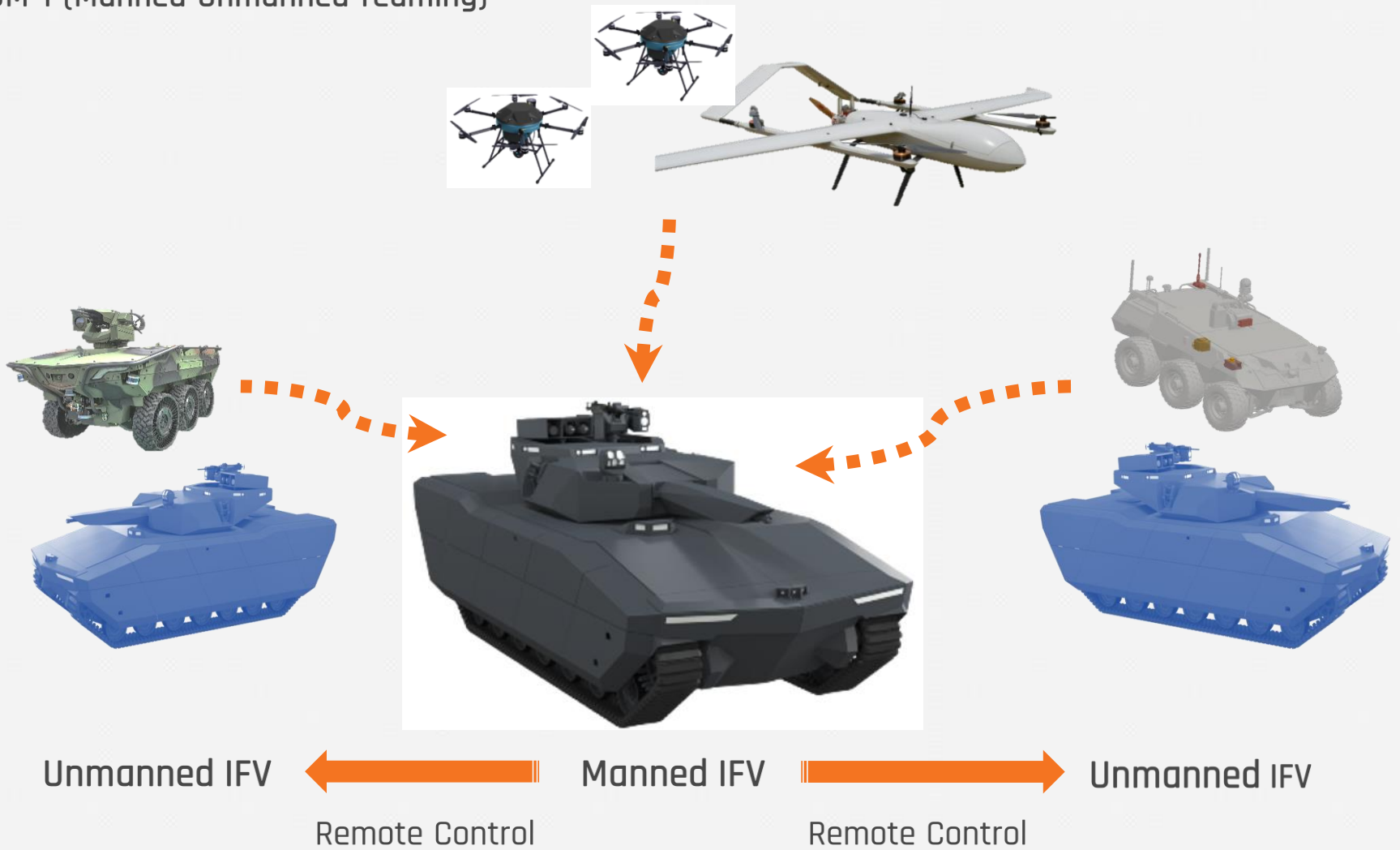
- 40mm CTA Gun, Taiper Extended Range ATGM
- MUM-T+ Full Remote Controlled By AI

Active suspension

Modular Open Architecture + Autonomy

FUTUER IFV Operational Concept

MUM-T (Manned-Unmanned Teaming)



The Advanced Future Land system

'KRAB SPH'
- Chassis in Krab



'K9 SPH'
- K9 + K10+ Ammunition



'Homar-K MLRS'
- 80km + 290 km Missile



[ATGM] 'Taiper'
Extended Range Missile



[H-IFV] 'Heavy Borsuk'
ZSSW30+Redback Chassis



[Future] 'Next Gen Artillery'
- Unmanned & Autonomous



[Future] 'MLRS II'
- 500 km + Moving target Capa.



[Future] 'Next Gen IFV'
- MUMT + Autonomous + Taiper

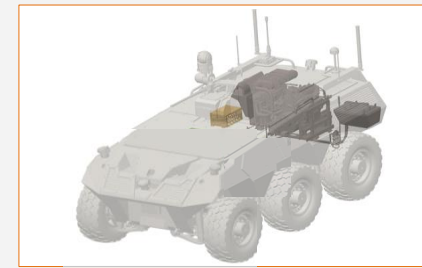


Developing the Advanced Technology

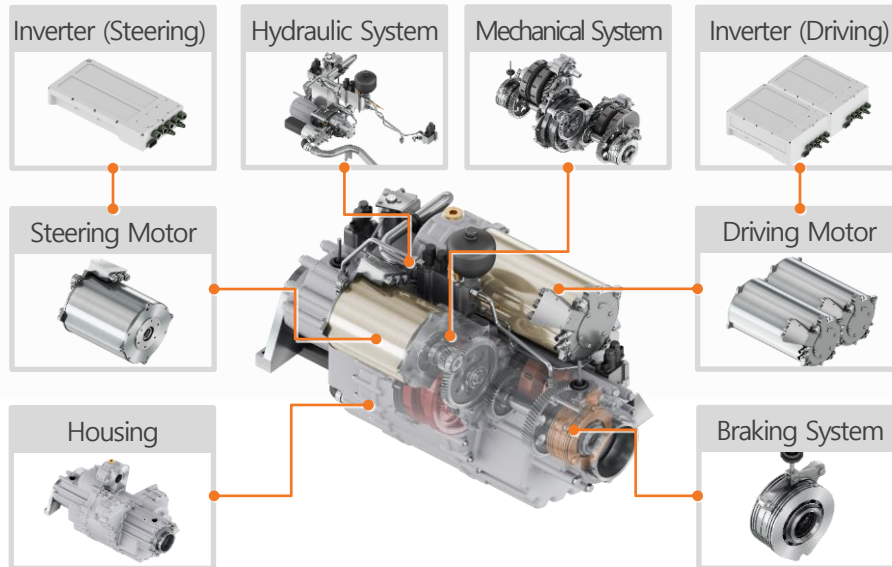
Future Land system

Co-Development and Collaboration with Poland

EMT (Electro-Magnetic Transmission)



- EMT is an electrified cross-drive transmission for a tracked vehicle.
- An EMT will increase survivability of unmanned ground vehicles by minimizing acoustic and heat signatures, enable the vehicles to execute lengthy silent-maneuver, and offer a flexibility of accommodating **battery- and hydrogen-power**.
- In our EMT architecture, three motors are used as power sources to enable various power-flow topologies, steering, and regenerative braking.



Vehicle Performance		EMT Specifications	
1	60% Climbing (OOkph)	Driving Motor	OOO kW x 2EA
2	Acceleration (Max OOkph)	Steering Motor	OOO kW x 1EA
3	High Speed Steering	Acceleration	OOkph within Osec
		Max Speed	OO kph
		Braking	OOkph→0kph within O.Osec
		Pivot	within Osec
		Regeneration	Regenerative Braking

A.I Software

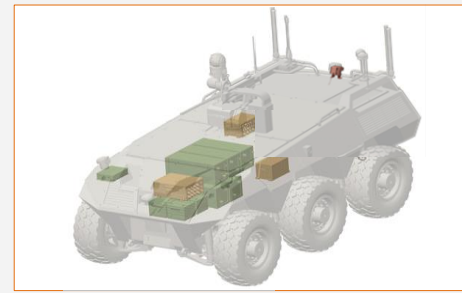


● The Software group takes care of all the SW matters in general, and currently focus on four specific areas:

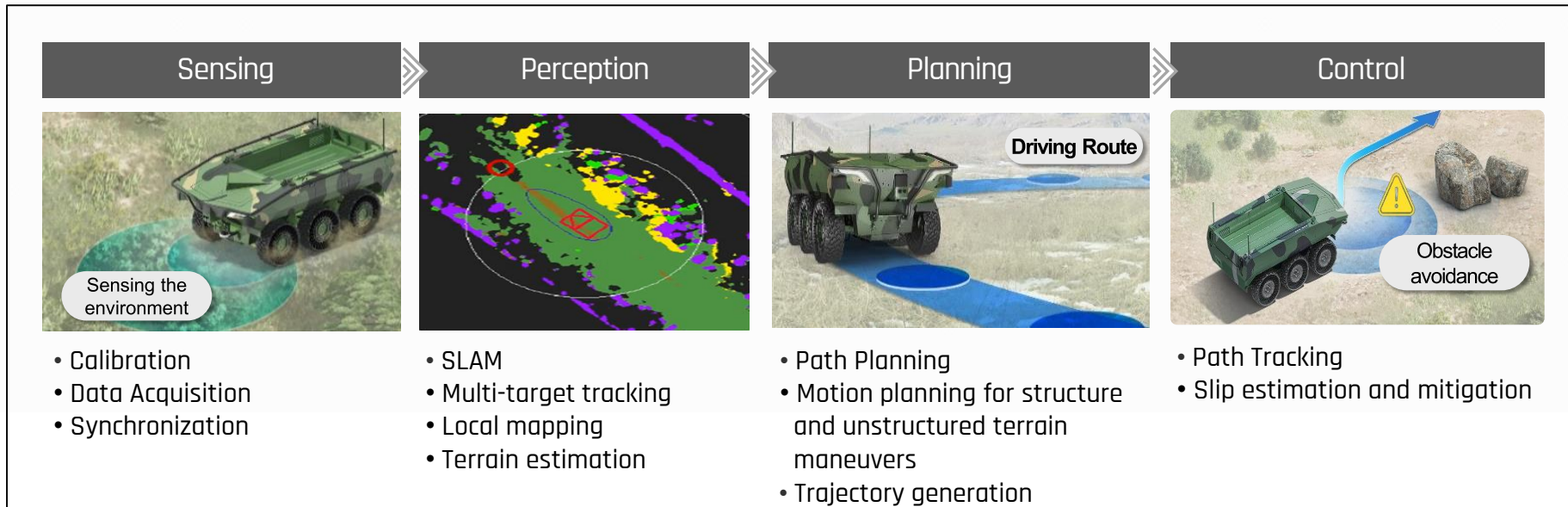
- Retrofitting existing armored vehicles into unmanned systems.
- MUM-T solutions enabling man and unmanned systems to cooperate to more effectively accomplish a given goal.
- R&D on AI technologies, mixed reality (e.g., Holo Lens), cyber security (e.g., protection for cyber attack).
- VILS (Vehicle-In-The-Loop) for building a virtual environment to test capabilities of a vehicle in various settings.

Retrofitting	<p>• Solutions for retrofitting existing manned vehicles into the unmanned systems</p>
MUM-T	<p>• Solutions for Manned - Unmanned Teaming</p>
AI & Cyber Security	<p>• AI Technologies and Cyber Security</p>
VILS (Vehicle in the Loop)	<p>• Virtual environment for testing vehicles' capabilities</p>

Autonomy For Land Systems

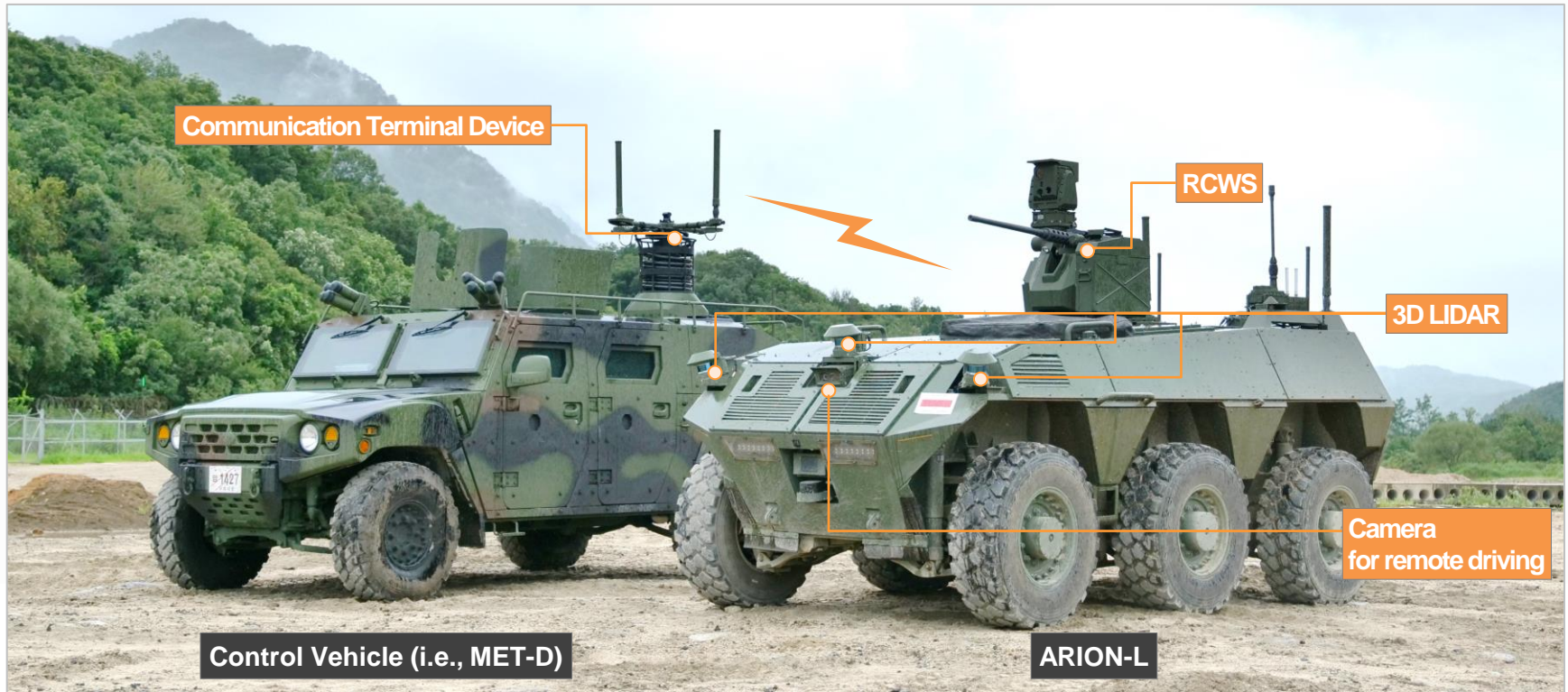


- Developing a full-scale, autonomy SW stack for all of the Hanwha's unmanned ground vehicles in any scales.
- Our autonomy stack is optimized and specialized for autonomous, off-road navigation that enables military force to 1) minimize soldiers' involvement of engagement with enemy, 2) transportation of ammunition and equipment, 3) evacuation of the wounded, 4) support many military operations.
- HAEMOS' Autonomy SW stack consists of four major building blocks : Sensing, Perception, Planning, and Control.



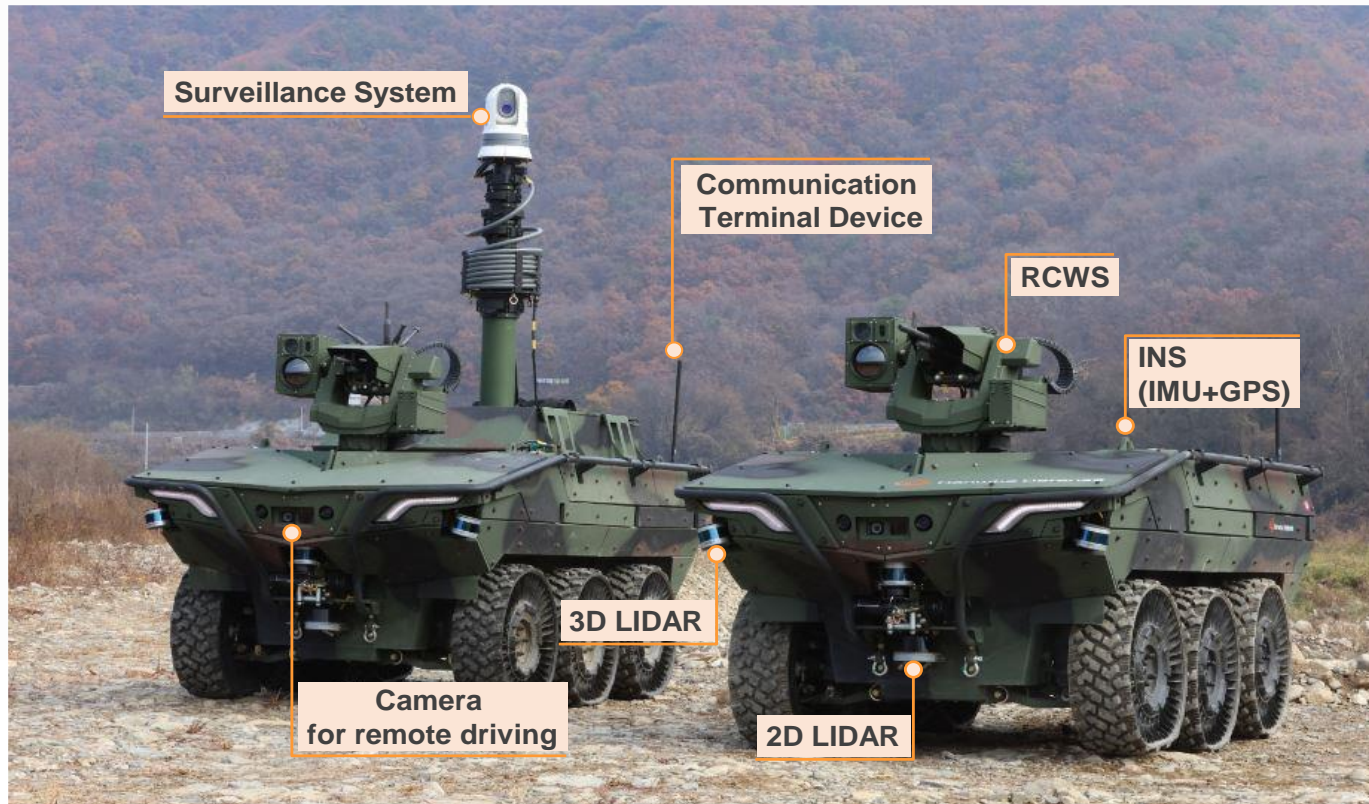
Unmanned Ground Combat Vehicle, Arion-L

- ARION-L(Light) was developed to lead manned armored vehicles for combat operations.
 - A human operator in a control vehicle (i.e., MET-D) can operate two ARION-Ls at the same time.
- It is built for primarily supporting a mechanized unit's combat operations by executing
 - Reconnaissance in the forefront of a troop by remote control.
 - Surveillance the battle field by navigating autonomously.
 - Detecting malicious chemicals by CAD (Chemical Agent Detector).
 - Engaging with enemy with RCWS (12.7mm).



Unmanned Ground Vehicle, Arion-SMET

- ARION-SMET is built primarily for supporting platoon-level operations such as
 - Transporting munition and weapons / evacuating the wounded.
 - Providing a cover.
 - Enabling high-performance maneuverability / remote operation and autonomous off-road navigation.
 - Modularity-driven design to support various missions.



Zmierzamy **razem** ku przyszłości



Team Poland

Współpraca z Polskimi Przedsiębiorstwami

Team Poland

R&D Cooperation with Polish R&D Center Manufacturing Facility in Poland, MRO center in Europe

- ✓ Trwały rozwój technologiczny
- ✓ Wzrost potencjału produkcyjnego



PGZ Stocznia Wojenna
Gdynia

Budowa okrętów podwodnych.
Rozwój i budowa okrętów marynarki wojennej
Wsparcie cyklu życia dla programu ORKA



Gdańsk

Budowa okrętów podwodnych.
Rozwój i budowa okrętów marynarki wojennej
Wsparcie cyklu życia dla programu ORKA



Ożarów Mazowiecki

Rozwój systemów C2
Integracja z systemem kierowania ogniem
Wspólny rozwój nowych platform bojowych



Kalisz

Elementy hydropneumatycznego systemu zawieszenia oraz
automatu ładowania



Wrocław

Elementy hydropneumatycznego systemu zawieszenia oraz
automatu ładowania



**Skarżysko-Kamienna /
Nowa Dęba / Bydgoszcz**

Współpraca w tematach amunicji artyleryjskiej i
Rakietowej, materiałów wybuchowych



Warszawa

Zintegrowane moduły optoelektroniczne
Kamery noktowizyjne, termowizyjne i dzienne
Systemy wykrywania opromieniowania laserem



Stalowa Wola

Produkcja i Integracja Systemów Artyleryjskich,
w tym
AHS KRAB, K9PL, WWR HOMAR-K



Jelcz-Laskowice

Produkcja podwozi 8x8 dla programu HOMAR-K
Dostawy od 2022 do 2031 roku
Potencjalny dostawca dla innych programów Hanwha
na rynek europejski



Wadowice

łańcuch dostaw części AHS



**Warsaw University
of Technology**



**Politechnika Świętokrzyska
Kielce University of Technology**



**POLITECHNIKA
POZNAŃSKA**



**Łukasiewicz
Instytut Lotnictwa**



**Wojskowy Instytut
Techniczny Uzbrojenia**

Q & A