



## The role of the Military Institute of Armament Technology in the process of modernisation of the Polish Armed Forces



Presented by:  
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# WITU ACTIVITY COMPLEXES



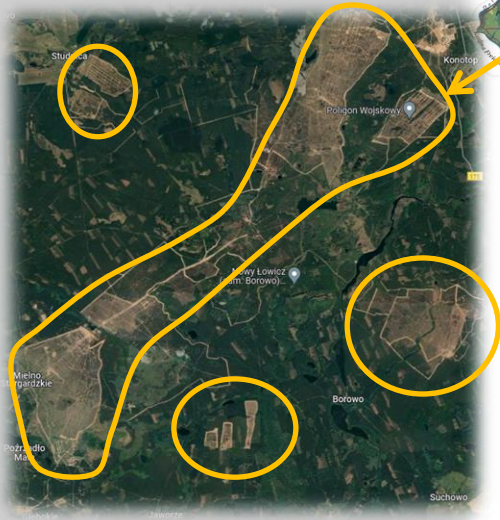
HQ in Zielonka



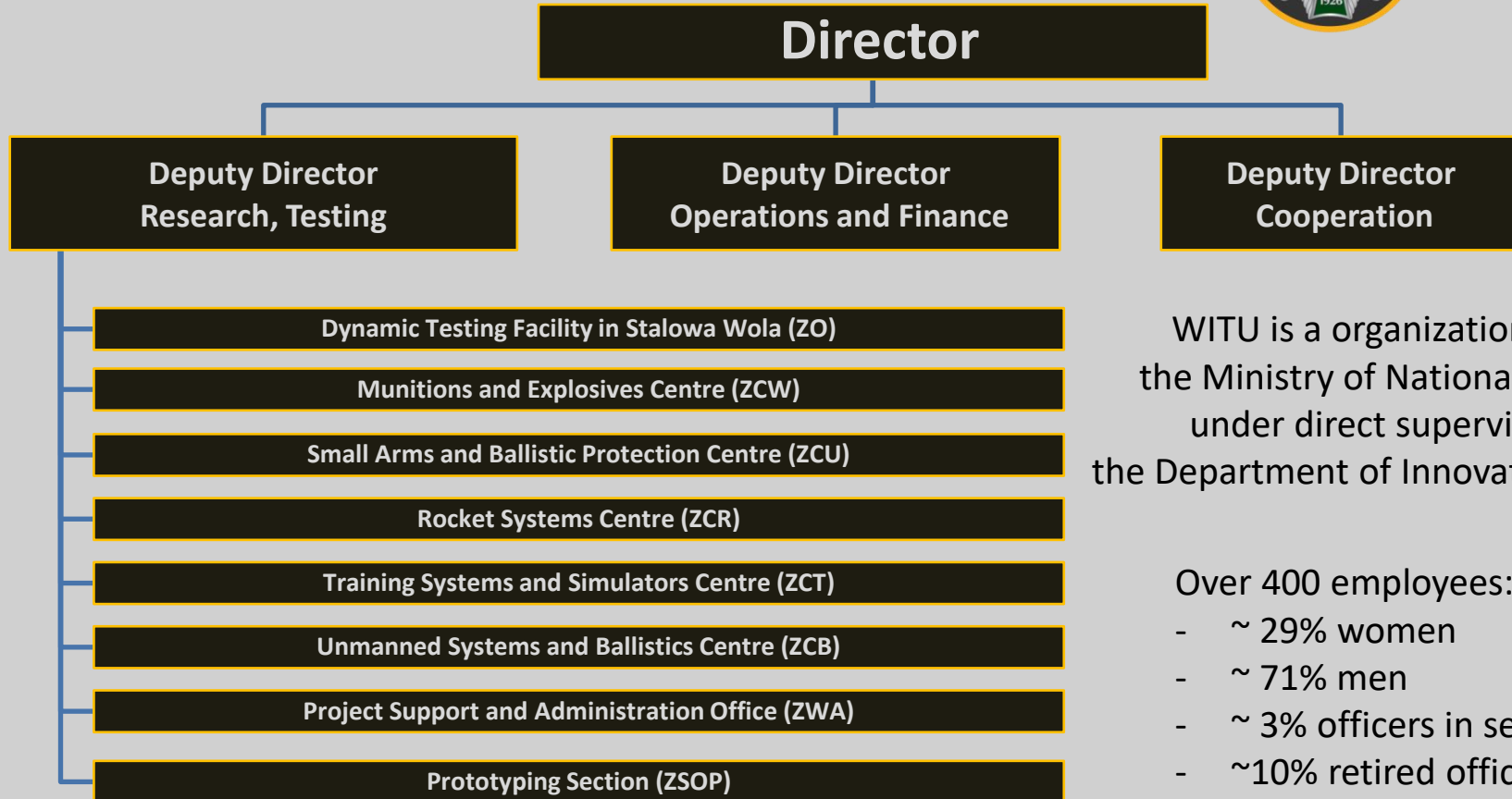
OBD Stalowa Wola  
ARTILLERY testing facility



OBD Drawsko Pomorskie  
testing facility for  
MANPADS, ATGMS, TANKS



# WITU STRUCTURE



WITU is a organization within the Ministry of National Defence, under direct supervision of the Department of Innovation of MoND

Over 400 employees:

- ~ 29% women
- ~ 71% men
- ~ 3% officers in service
- ~10% retired officers

# AREAS OF THE MODERNIZATION OF THE POLISH ARMED FORCES



- insensitive munitions;
- new high explosives materials;
- 3D printing technology of explosives and munitions parts;
- new compositions of rocket propellants and propellants;
- system of exploitation (surveillance) of combat means;
- reactive armour;
- missile technology;
- shape- and EFP charge;
- small arms designs;
- simulators and trainers.
- air defence system;
- combat means;
- UAV;
- radio-electronic reconnaissance systems;
- loitering ammunition;
- thermobaric ammunition



# SURVEILLANCE ON THE AMMUNITIONS QUALITY AND TECHNICAL CONDITION



**CARRYING OUT AMMUNITION DIAGNOSTIC TESTS**



**CHECKING QUALITY NEW AMMUNITION FOR COMPLIANCE WITH MILITARY STANDARDS**

**CLASSIFICATION OF AMMUNITION IN ACCORDANCE WITH ADR**

**PREPARATION OF REPORTS ABOUT THE AMMUNITION TECHNICAL CONDITION**

**INVESTIGATING THE AMMUNITIONS PERFORMANCE FAILURE AND AMMUNITIONS ACCIDENT**



**TESTING OF AMMUNITION USED ON PEACEKEEPING MISSIONS**

**CONDUCTING DATABASE WITH RESULTS OF AMMUNITION TESTS**



**IDENTIFYING CRITICAL PARAMETERS OF AMMUNITION THAT CHANGE WITH STORAGE**

# EDUCATION AND TRAINING



- Construction and operation of domestic and foreign ammunitions;
- Identification of ammunitions;
- Ways of safe neutralization of ammunitions and dangerous objects;
- Training of EOD teams;
- The rules of safe work with explosives materials.
- Battle Area Clearance .



# DYNAMIC TESTING FACILITY IN STALOWA WOLA



Tasks / capabilities:

- Medium caliber armament testing
- Barrel artillery testing
- Rocket artillery testing
- Explosive tests with use of up to 1,5kt of TNT
- Equipment presentations

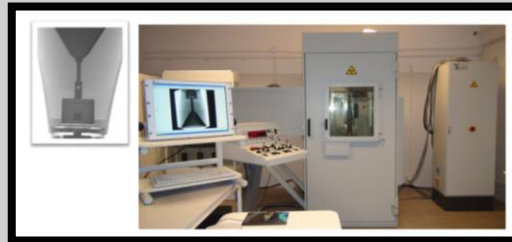




## AMMUNITIONS AND EXPLOSIVES CENTRE

Tasks / capabilities:

- HE testing and development;
- ammunitions assesment and lifecycle extension;
- pyrotechnics certification;
- ADR/RID certification.



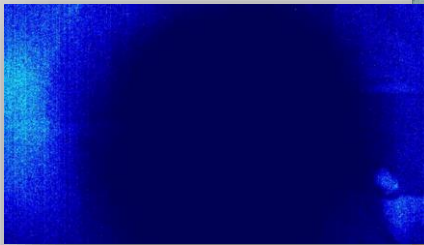


# SMALL ARMS AND BALLISTIC PROTECTION CENTRE



## Tasks / capabilities:

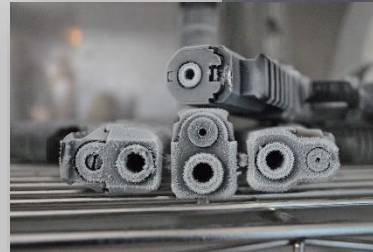
- Small arms R&D and testing
- Aerial weapons testing
- Ammunition testing and R&D up to 23mm
- Ballistic protection R&D and testing
- Environmental testing
- Equipment presentations
- Expert opinions





## SMALL ARMS AND BALLISTIC PROTECTION CENTRE

- 400 m indoor shooting range (up to 14,5 mm)
- 200 m indoor shooting range (up to 8,6 mm)
- 100 m indoor shooting range (up to 12,7 mm)
- 2x50 m indoor shooting range (up to 8,6 mm)
- open 100 m, 1000 m and 3000 m open ranges
- durability shooting range
- vertical shooting range
- velocity measurement equipment
- pressure measurement equipment
- defetoscopy equipment
- climate chambers
- wide range of NATO and Soviet test weapons



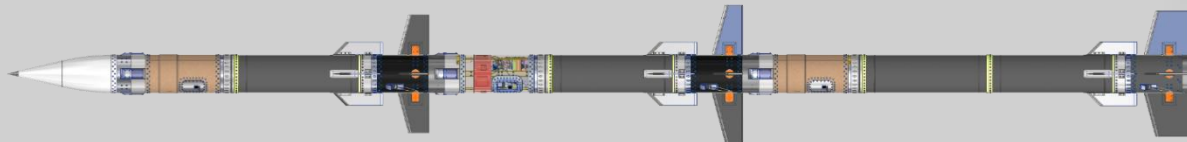
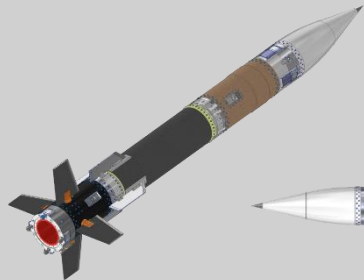
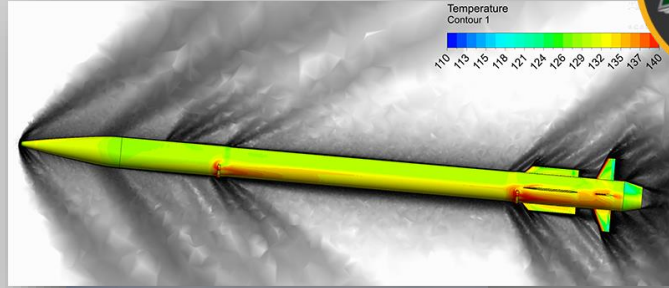


## ROCKET SYSTEMS CENTRE

Tasks / capabilities:

- life cycle assessment
- extension of life cycle
- current production testing
- design
- radar systems certification
- EMC testing

All above regards rockets and missiles  
(i.e. ATGM's and MANPAD's)

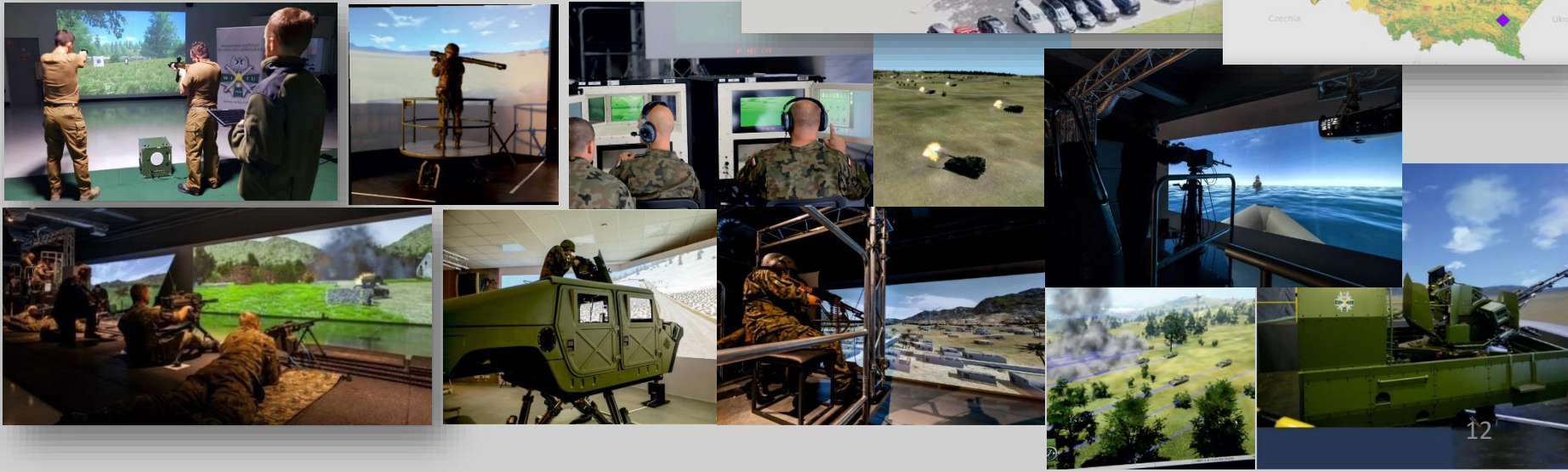
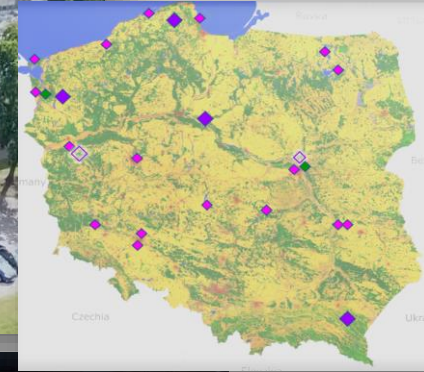


# TRAINING SYSTEMS AND SIMULATORS CENTRE



Tasks / capabilities:

- Development of new training systems
- Design of new training systems
- Implementation of training systems
- Support in life cycle of equipment





## UNMANNED SYSTEMS AND BALLISTIC CENTRE

Tasks / capabilities:

- Development of
  - UAV
  - UAV warheads
  - tank, mortar and artillery munitions
  - ERA / NERA
  - advanced vehicle protection solutions



## ACCREDITED RESEARCH LABORATORIES



Institute's laboratories are certified by both civilian and military accreditation bodies

**LBUSO** – Small Arms and Protection Systems Testing Laboratory

**LBAR** – Artillery, Rocket and Missile Systems Testing Laboratory

**LBŚB** – Ammunition and Explosives Testing Laboratory

**LBEMC** – EMC and Field Measurement Testing Laboratory

**LBP** – Laboratory for Testing Equipment in Field Conditions

**LBSO** – Optoelectronic Systems Testing Laboratory



# NATIONAL AND INTERNATIONAL COOPERATION



WITU participates in the followings projects:

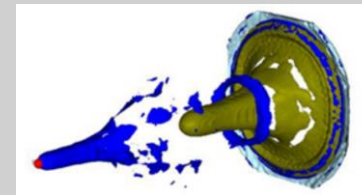
## EDA Cat.B:

- RECBALL „Reverse calculation method in interior ballistics and improvement of multiphysics models”
- PREMIUM „Prediction Models for Implementation of Munition Health Management”
- AMTEM „Additive Manufacturing Techniques for Energetic Materials”



## EDF :

- NEWHEAT „New European Warhead Technologies”



# INTERNATIONAL ACTIVITIES



## WITU takes part in multiple NATO working groups:

- Munitions Safety Information Analysis Center (MSIAC)
- NATO Army Armaments Group
  - Land Capability Group Land Engagement
    - Team of Experts STANAG4569 – Passive Protection
    - Team of Experts STANAG4860 – Armour Ageing
  - Land Capability Group Dismounted Soldier Systems
    - Sub-Group 1 (SG1 - small arms ammunition)
    - Sub-Group Weapons & Sensors (W&S)
    - Sub-Group Combat Clothing, Individual Equipment and Protection (CCIEP)
    - Sub-Group Land Combar Missiles, Rockets & Loitering Munitions (LCMR&LM)
- NATO Industry Advisory Group (NIAG)

## WITU takes part in multiple EU panels:

- European Defence Agency:
  - European Network of National Authorities on Ammunition (ENNSA) - chairman
  - Defence Test and Evaluation Base (DTEB)
  - CapTech Missiles & Munitions – Governmental Expert
  - CapTech Materials & Structures
  - CapTech Ground Systems
  - CapTech Cyber Research & Technology
  - CapTech Aerial Systems
  - CapTech Radio Frequency Sensors Technologies

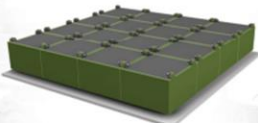


# DEVELOPMENT OF NEW ERA (*explosive reactive armour*) FOR MILITARY EQUIPMENT



## PANGOLIN K2PL FOR BLACK PANTHER TANK POLISH REPLACEMENT FOR KOREAN REACTIVE ARMOUR MODULE

MODULE MASS [kg]: 7.4  
MODULE DIMENSIONS [mm]:  
1 156 x w 156 x h 105  
SURFACE MASS:  
304 kg/m<sup>2</sup>



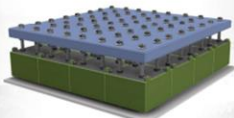
PANGOLIN K2PL enhances vehicle protection against cluster munitions, UAV's and rounds with HE and HEAT warheads, EFP projectiles, artillery ammunition fragments and small arms ammunition.

The module contains an explosive.



## PANGOLIN K2-HT FOR BLACK PANTHER TANK PANGOLIN K2-HT WITH ADDITIONAL HIDDEN TRAP MODULE

1. BASIC MODULE  
2. ADDITIONAL MODULE:  
MASS [kg]: 1.0  
DIMENSIONS [mm]:  
1 156 x w 156 x h 30  
SURFACE MASS (TOTAL):  
345 kg/m<sup>2</sup>



PANGOLIN K2-HT enhances vehicle protection against cluster munitions, loitering munitions with HE and HEAT warheads, artillery ammunition fragments, small arms, EFP's as well as warheads with piezoelectric nose-base fuze assembly.



# Wojskowy Instytut Techniczny Uzbrojenia

## DRAGONFLY



## CYBERHUB



## FPV SVAROG



## CYBERHEAT



## B0



## PCHŁA





## Table Top Trainer Simulators

Table Top Trainer or TTT is a modular integrated training system available in various configurations: Leopard 2, T-72, nPT-91, BWP-1, KTO Rosomak. Due to its design it can be easily transported and rapidly deployed.

### The modules allow for configuration replicating various military equipment of Polish Armed Forces:

- crew workstations for main battle tanks such as Leopard 2, T-72, PT-91;
- crew workstations for APCs and IFVs such as KTO Rosomak, BMP family;
- workstations for engineering vehicles (eg. Leguan bridge layer);
- miscellaneous workstations, eg. RWS operators, AA systems operators, UAV operators, C4ISTAR system operators.





## MOSKIT LR Anti-Tank Guided Missile System

The MOSKIT (Long Range) anti-tank guided missile system is a precise means of firefighting against armored vehicles, i.e. MBTs and transporters and hovering

The system is developed in a portable version adapted for by two soldiers. It can also be used as a version to be mounted on a vehicle or helicopter.





### EOD Directional Charge CHELICER

**EOD Directional Charge CHELICER** is a versatile EOD tool designed for reliable use in the battlefield.

**CHELICER** design allows easy liner exchange between many options such as: conical liner, EFP liner, GEP (explosively generated plasma) and water insert.

Due to available range of liners the system can be utilized in multiple EOD tasks such as: fuses removal, deflagration/initiation of HE filling in munitions, creating openings in munition casings without initiating the HE or EED detonation.

### SHAPE CHARGE

The Shape Charge is a combat means which is designed to perform engineering work, demilitarize military equipment, neutralize explosives, etc., as well as to conduct unconventional activities (preparing IED).

The advantage of the Shape Charge is its simple construction and effective impact on objects made of various materials (steel, wood, concrete).

The way in which USC is designed guarantees complete safety of the user. USC can be handled safely by a soldier with only basic training in military engineering.

The charge performance stops unaffected after thermal or mechanical shocks.

### "PTASZNIK" / Neutral Special Cumulative Charge

Neutral Special Cumulative Charge (NSCC) is a means of destruction, which has the form of a cylindrical shell, which is used to destroy various types of armor, including: armor of tanks, armored cars, APCs, etc.

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### Explosive Device for Armament Neutralization „PULS”

**Explosive Device for Armament Neutralization „PULS”** is a device designed for depistion of combat capability of armoured vehicles.

It is used in contact with enemy vehicles, for example, in diversion operations or to destroy armament when withdrawing the battlefield.

The device can also be used to neutralize vehicles in urbanized areas, where a stealthy approach is possible.

Using the device is effortless – attaching it to the vehicle and setting the triggering time. It is possible to set the time before operation as well as after counting on the vehicle.

**Parameters:**

- Armor penetration: 200 mm;
- Standby time up to 24h;
- Trigger time: 1s – 24h;
- Two operational modes:
  - removable – timed trigger only;
  - non-removable – timed triggering and device removal protection.

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### TECHNICAL SPECIFICATION:

1. total mass: 200 g;
2. HE mass: 80 g;
3. length: 110 mm;
4. diameter: 60 mm;
5. RHA penetration: > 210 mm with copper conical liner;
6. initiation by:
  - electronic primer;
  - powder cord;
  - shock tubes system;

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**FAMILY OF SHAPE CHARGES**



## FAMILY OF WARHEADS FOR COMBAT UNMANNED AERIAL VEHICLES





**Thank You for your attention !!**



**Questions?**