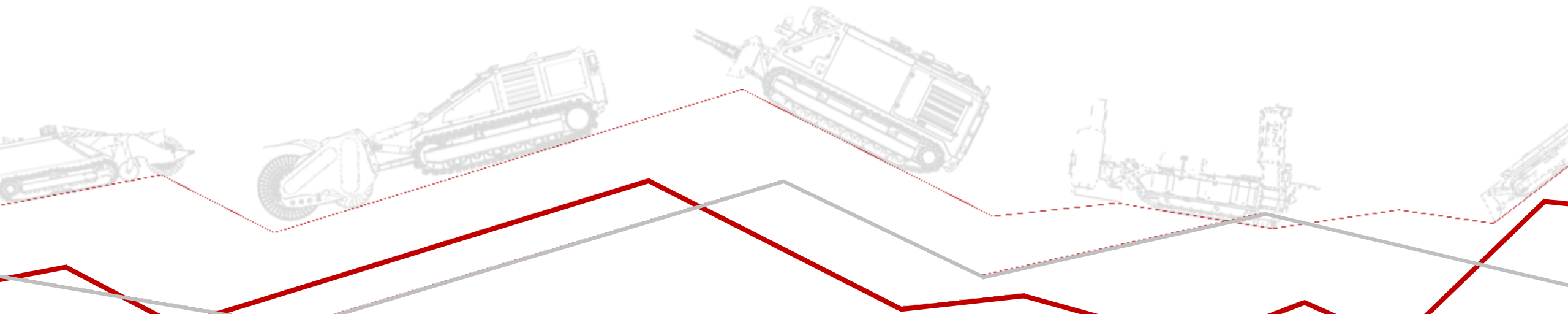


# DON'T SEND A MAN TO DO A MACHINE'S JOB

THROUGH  
INNOVATION IN  
ROBOTICS WE STRIVE  
TO SAVE HUMAN  
LIVES



## DOK-ING



# About DOK-ING

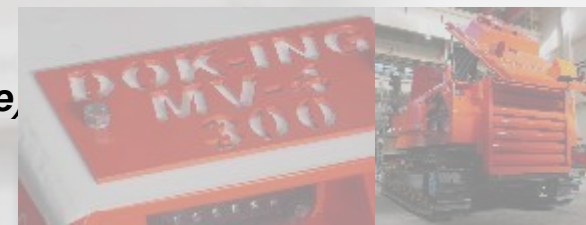
- Founded in 1991
- Headquarter: the Croatian capital Zagreb
- Branch Offices: North America, Africa, Middle East & Asia
- 250 Employees at DOK-ING + over 100 in other branches



- International market leader
- Robotic systems in 41 countries globally
- Over 500 systems sold
- Over 100 national & international awards

**2023 Milestone:**

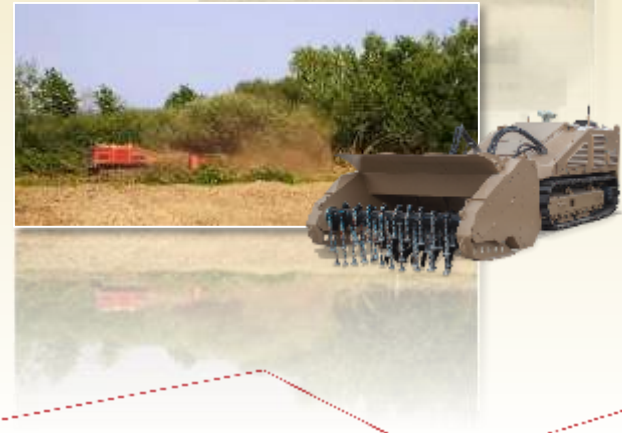
***production of MV-4  
ser. no. 300 (already in Ukraine,***





# 4 INDUSTRIES

## MILITARY ENGINEERING



## EMERGENCY RESPONSE / CBRNe



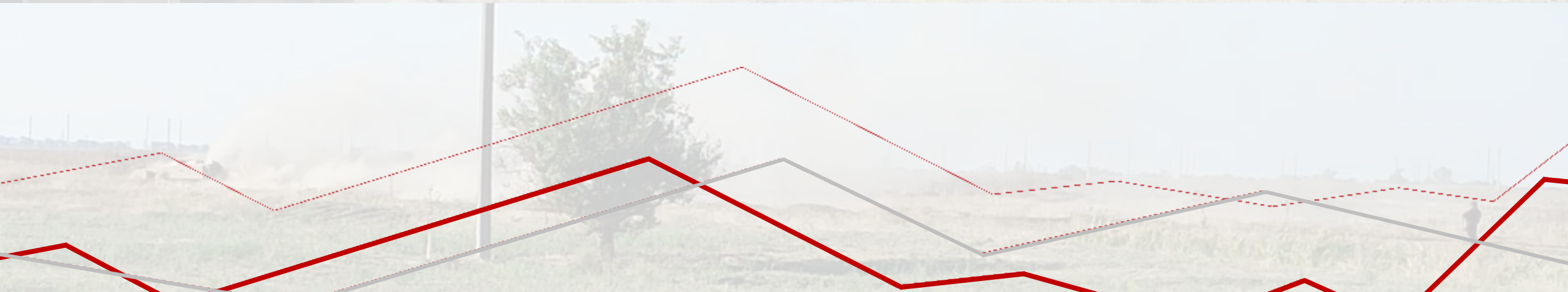
## COUNTER TERRORISM



## UNDERGROUND MINING



# Robotic Systems in EOD: Advantages, Challenges, and Best Practices





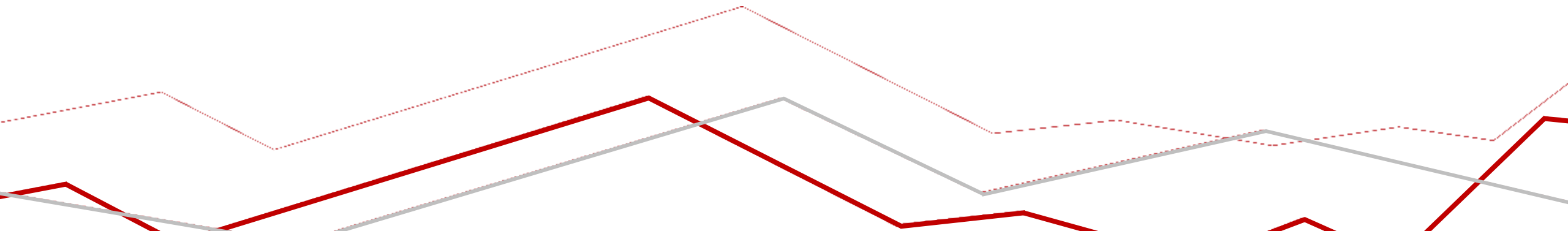
# Characteristics of Modern War Conflicts

- Modern battlefield is again evolving from asymmetric threats to classical war conflicts
- Artillery, rocket, and missile exchanges occur at unprecedented rates
- Approximately 10% of EO could stay unexploded on target by malfunction or other reasons
- Extensive usage of AP and AT mines as well as IEDs (Area Denial)



# Challenges Encountered Within the Existing EOD Practice

- Limited Information
- Risk to Operators
- Lack of adequate EOD equipment
- Complex Environments
- New and Evolving Threats
- Psychological Impact





# EOD Robotic Systems DOK-ING



**MV-10**  
BISON



**MV-4**  
SCORPION



**MV-2**  
HONEY BADGER





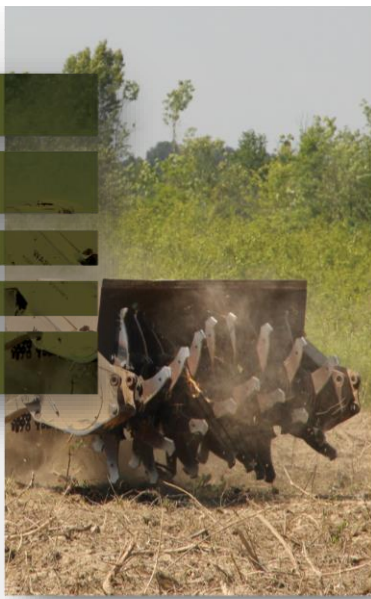
Mechanical Ground  
Preparation & Demining

Mechanical Tehnical Survey  
& Clearance

Deep Interrogation Tasks

Mobility / Counter Mobility

Reconnaissance &  
Surveillance Tasks



Digging Tasks

Route Clearance

Breaching Tasks

EOD Tasks in C-IED

General C-IED Tasks

**Flail**



**Tiller**



**Segmented Roller**



**Dozer Blade**



**Rear Shovel**



**Rear Forklift**



**EOD Arm**



**Rotational Gripper**





# Industry in Support of Defence Capacity Building

**B2G** Joint development through national and international projects

- EDA/EDF projects to provide future capabilities through joint development and funding
- DOK-ING is active CAPTECH LAND, CBRN & HF, Energy & Environment

**B2B** Joint development through technology integration and innovation

- Development of quick solutions to meet immediate force readiness requirements
- Integration of existing technologies into a single comprehensive system based on end user inputs



European Structural  
and Investment Funds



EUROPEAN  
DEFENCE  
AGENCY



# Next-Generation Universal Platform



Project funded by the EUROPEAN UNION



European Union European Structural and Investment Funds



EUROPEAN DEFENCE AGENCY



AUSTRIA



HUNGARY



SLOVENIA

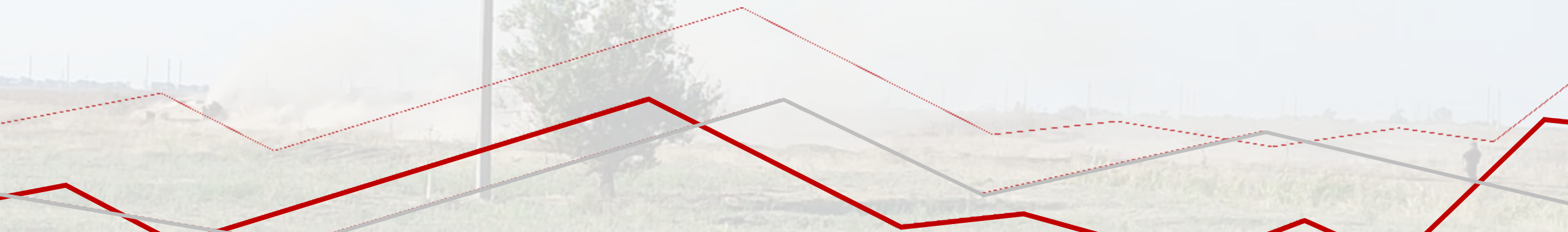


CROATIA





# **Operational Realities: Practical Challenges, Success Stories, and Lessons Learned – Ukraine Case Study**





**DOK-ING**

**DON'T  
SEND A MAN  
TO DO A  
MACHINE'S  
JOB**





# DOK-ING Activities in Ukraine



- From September 2022 DOK-ING delivered 27 robotic systems to Ukraine:

- ✓ Kharkiv (FSD) = 1xMV-4 & 1xMV-10
- ✓ Kharkiv (SESU) = 1xMV-4 & 1xMV-10
- ✓ Sumy (SESU) = 1xMV-4 & 1xMV-10
- ✓ Chernihiv (SESU) = 1xMV-4 & 1xMV-10
- ✓ Kyiv (SESU) = 1xMV-4
- ✓ Mykolaiv (SESU) = 1xMV-4
- ✓ Mykolaiv (NPA) = 1xMV-10
- ✓ Kherson (SESU) = 2xMV-4 & 3xMV-10
- ✓ Dnipro (SESU) = 1xMV-4 & 1xMV-10
- ✓ Vinnytsia (SESU) = 1x MV-4 & 1xMV-10
- ✓ Khmelnytsky (SESU) = 1xMV-4 & 1xMV-10
- ✓ Khmelnytsky (Armed Forces) = 3 x MV-4 (Swedish MOD)
- ✓ Khmelnytsky (A3TEH-Ukraine) = 1-x MV-4
- ✓ Dnipro Region (SSTS) = 1xMV-10



# DOK-ING Plan for 2024

To deliver extra:

- MV-10 -33
- MV-4 -1
- ✓ MV-4 - G2G donation:
  - 2 Army of Korea for AF Ukraine
  - 2 Irish MOD for AF Ukraine



**IN TOTAL in UKRAINE:**

**20 x MV-4**

**45 x MV-10**



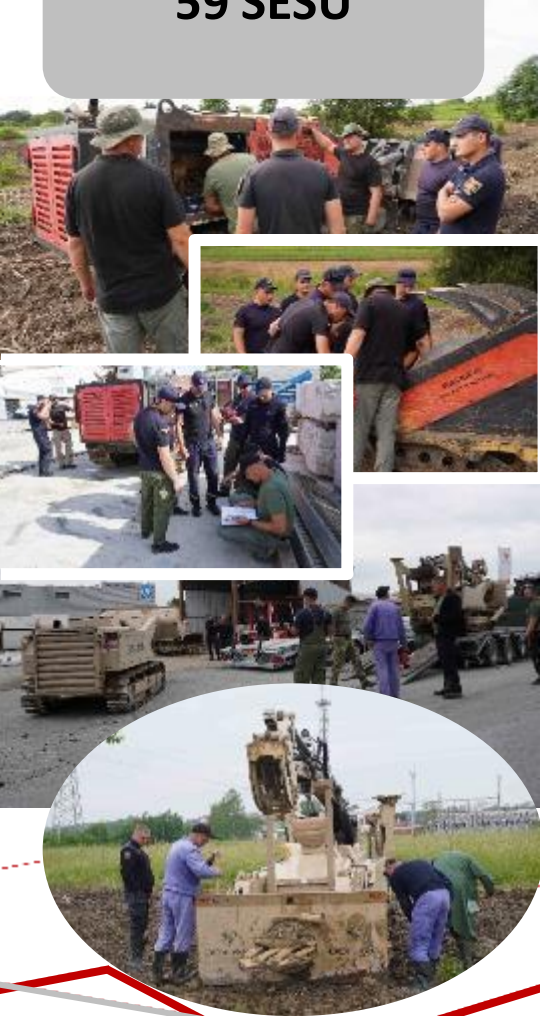


# DOK-ING Training



Completed the training of:

59 SESU



15 FSD, 12 NPA  
9 SSTS



12 Armed Forces  
of Ukraine



6 local factory  
technicians



- **Extra personnel to be trained by DOK-ING in 2024:**

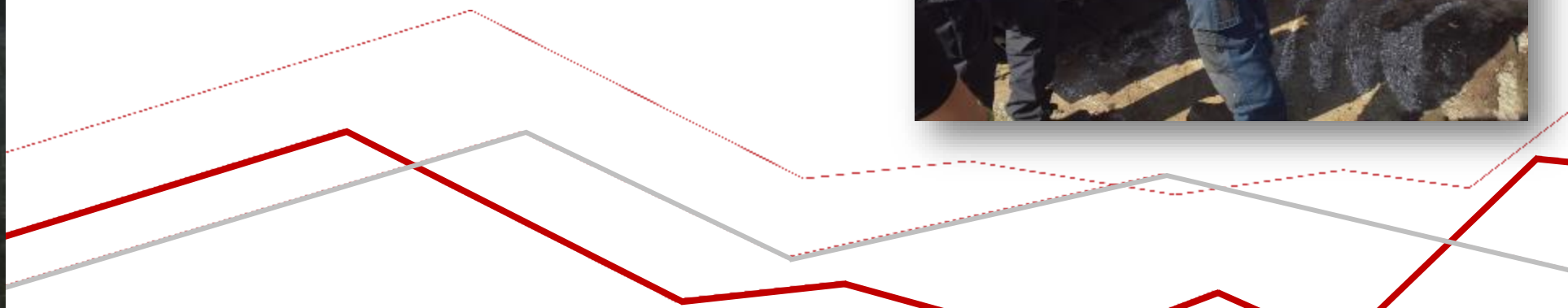
- ✓ 5 FSD (18 March - 10 April 24)
- ✓ 12-15 SESU (22 April – 17 May 24)
- ✓ SESU supervision (May – June 24)
- ✓ 20-25 SSTS (June - July 24)
- ✓ 20-25 SSTS (August – October 24)
- ✓ 6-8 SESU trainers (Oct – Dec 24)
- ✓ 25-30 SESU (Nov – Dec 24)

# Local Partner & After Sales Support

Since 6 July 2020 Demining Solution Ltd. has been DOK-ING's official representative

Open hotline 24/7 between DOK-ING and end-users – a direct connection between each SESU mechanical team leaders and DOK-ING

28 Aug – 28 Sept 2023 - mentoring and supervision in Ukraine (close cooperation between DOK-ING, A3TEH & FSD in full coordination with SESU)





# Sustainability In Ukraine

- By end Q1 2024:
  - **First MV-4 has been already assembled in Ukraine, going for the national certification**
  - Serial manufacturing of DOK-ING MV-4 & MV-10 parts and components (localization)
  - Organization of spare parts and running consumables stockpile at A3TECH
  - Reserve machines available for end-users in Ukraine (MV-4& MV-10)





# ERW/UXO Complex Environment

- 3 543 518 m<sup>2</sup> cleared area by 31.01.2024
- Neutralised cluster munition/mines/UXO:

✓ 1622 cluster munition:  
3B30, PFM-1, 9H210, 9H235

✓ 95 AP mines:  
PMN-2, PMN-4, POM-3



✓ 25 Hand grenades  
F1, RGD-1, RGD-5



✓ 57 VOG-17/VOG-25 grenades



✓ 34 AT mines TM-62/62M, 204 mine's fuses, 292 x UXOs and 38 x fuses of different calibers





# High-level IED Threat

- 18.10 – MV-4 291 in Mykolaiv Region
- 2.5-3.0 kg in TNT equivalent next to the drive gearbox
- MV-4 high survivability proof
- Machine was back to service in 10-day time





# Extensive AT Mine Contamination



- 07.02.2024 – SESU MV-4 291 in Mykolaiv Region
- TM-62M AT mine was activated by MV-4 Flail
- MV-4 high survivability proof
- Machine was EVACUATED BY SESU and delivered to A3TEH on 08.02.2024
- Fully repaired, tested and returned back to SESU on 21 Feb 2024





# Terrain Challenges





# Combination of UGV with UAV and Armored Vehicles





# DOK-ING Partners in Ukraine



CONFLICT &  
DEVELOPMENT  
FOUNDATION  
USA

THE HOWARD G.  
**BUFFETT**  
FOUNDATION



**FSD**



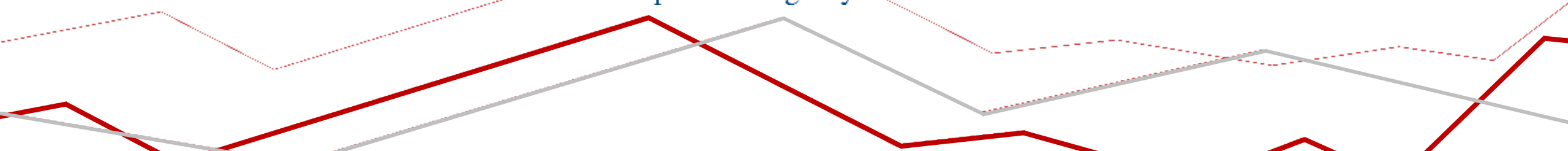
Norwegian People's Aid



**KOICA**  
Korea International  
Cooperation Agency



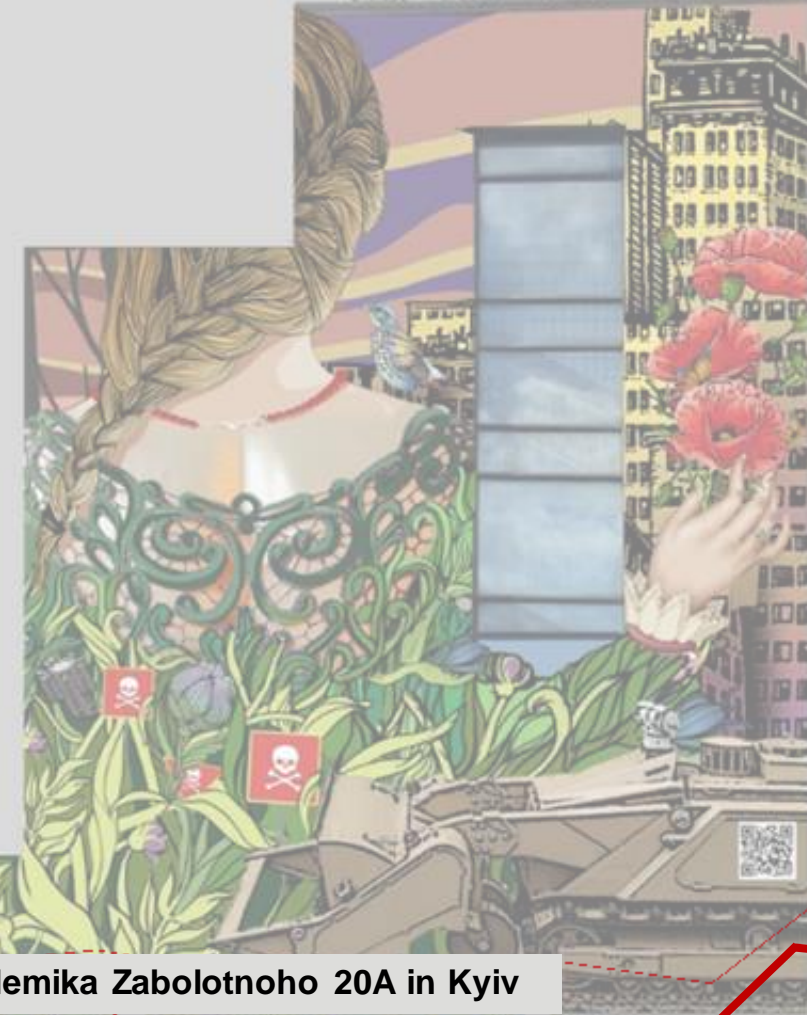
**Päästeliit**  
Estonian Rescue Association





# Recognition in Ukraine

- SESU mascotte Patron with his favourite DONATELLA MV-4 in Chernihiv



- MV-4 mural at Akademika Zabolotnoho 20A in Kyiv



# QUESTIONS?

# THANK YOU FOR YOUR ATTENTION!

