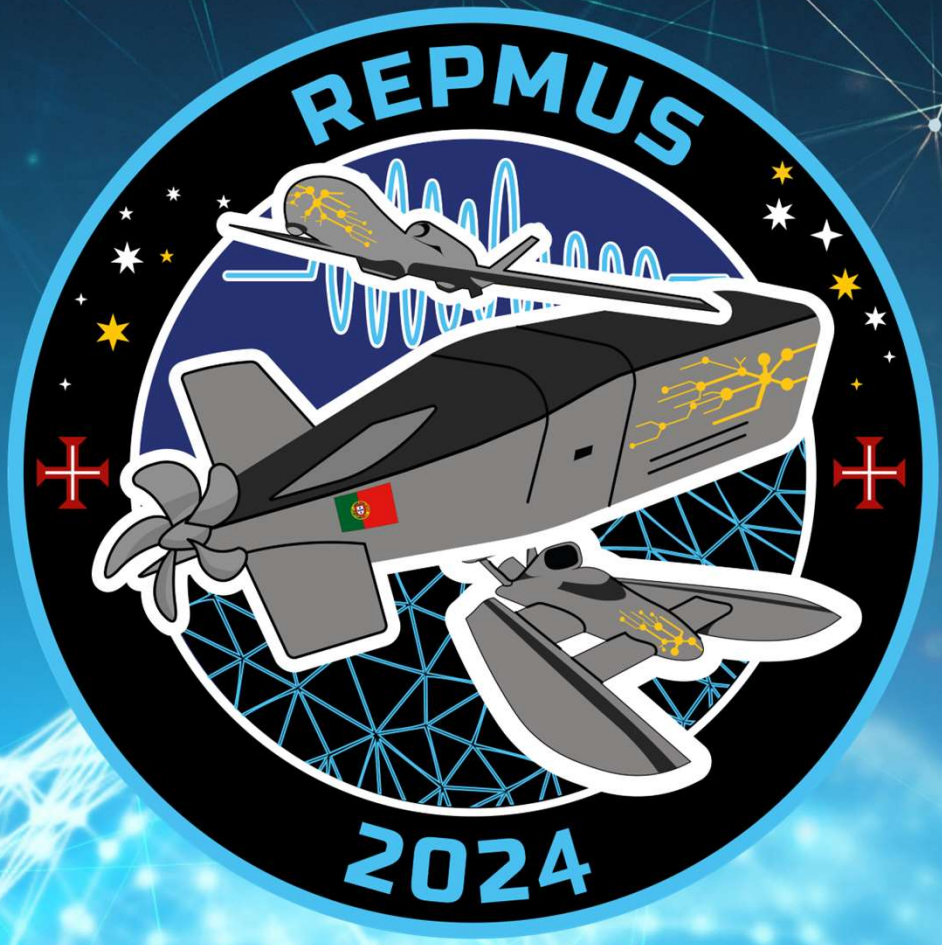


REPMUS24 - Robotic Experimentation and Prototyping with Maritime Unmanned Systems

Lessons Learned

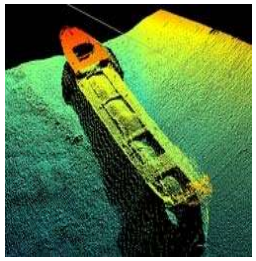
CAPT (N) Nuno Palmeiro Ribeiro

Marinha

Marinha

TODAY

Robotics Experimentation and Prototyping with Maritime Unmanned Systems 2024



REP MUS

REPMUS 24 – CO-ORGANIZERS

ACADEMY NATO EU

U.PORTO

FEUP FACULDADE DE ENGENHARIA UNIVERSIDADE DO PORTO

NATO OTAN

Joint Capability Group Maritime Unmanned Systems (JCGMUS)

Brussels | Belgium

NATO OTAN

S&T organization CMRE

EUROPEAN DEFENCE AGENCY

REPMUS 24 – CO-ORGANIZERS

ACADEMIA NATO EU

Marinha

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FEUP FACULDADE DE ENGENHARIA UNIVERSIDADE DO PORTO

NATO OTAN

S&T organization CMRE

NATO OTAN

Joint Capability Group Maritime Unmanned Systems (JCGMUS)

Brussels | Belgium

EUROPEAN DEFENCE AGENCY

ALLIED COMMAND TRANSFORMATION

COMBINED JOINT OPERATIONS FROM THE SEA

EUROPEAN FISHERIES CONTROL AGENCY EFCA

CRISIS MANAGEMENT AND DISASTER RESPONSE CENTRE OF EXCELLENCE

ANACOM AUTORIDADE NACIONAL DE COMUNICAÇÕES

siresp

EMSA European Maritime Safety Agency

CENTRE OF EXCELLENCE NATO MARITIME GEOMETOC

NAVAL MINE WARFARE NATO CENTRE OF EXCELLENCE

CENTRE OF EXCELLENCE COE CSW Operations in Confined and Shallow Waters

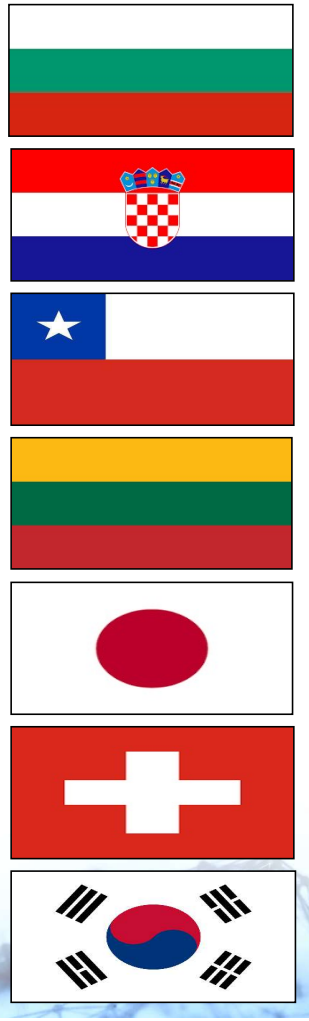
MARITIME SECURITY CENTRE OF EXCELLENCE TURKEY

FRONTEX EUROPEAN BORDER AND COAST GUARD AGENCY

SatCen European Union Satellite Centre

REPMUS 24 – PARTICIPANTS

30 NATIONS



REPMUS 24 – > 200

Industry & Academia

SDT

ECA GROUP

QINETIQ

CONNECT ROBOTICS

OceanScan Marine Systems & Technology

iqua ROBOTICS

uavision AERONAUTICS

RTsys Underwater Acoustics & Drones

THALES

SHIELD AI

TELEDYNE TECHNOLOGIES Everywhereyoulook

marine instruments

U.PORTO

FEUP FACULDADE DE ENGENHARIA UNIVERSIDADE DO PORTO

vodafone

IAI ELTA

AeroVironment

SwAtter

gmv

ALSEAMAR

INESCTEC

ATLAS ELEKTRONIK

blueOASIS ocean sustainable solutions

AIRBUS

CAE

FINCANTIERI MARINE GROUP

thinklogical

instituto de telecomunicações

ORACLE

Telefónica

K2D Knowledge and Data from the Deep to Space

EDISOFT

SCHIEBEL

TEKEVER

REPMUS 24 – AREA OF OPERATIONS

CEOM & TFZ

REPMUS 24 – AREA OF OPERATIONS

CEOM & TFZ

REPMUS 24 – AREA OF OPERATIONS

CEOM & TFZ

REPMUS 24 – PARTICIPANTS

PORTUGUESE MILITARY ASSETS

BDIA

ARPA

SINE /SETU

P3C Cup +

ANDR

DCAR

TEJO

KC-390

UPF/UAC/UMD

AGRUMERG

ORIO

LYNX MK95A (Baseado BA6)

REPMUS 24 – PARTICIPANTS

FOREIGN MILITARY ASSETS

ESPS TORNADO

HNLMS JOHAN DE WITT

FGS KALKGRUND

FGS KRONSORT

FS ACHERON

GEOSEA

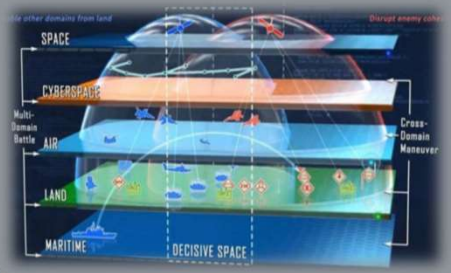
PATRICK BLACKETT

Marinha

FOCUS AREAS

MULTI-DOMAIN & C2

- ✓Testing Mission Sync
- ✓STANAG 4817

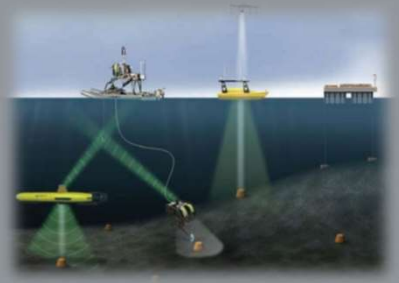


C-UxV

- ✓Harbour Protection
- ✓Ship / Force Protection

UW BATTLE-SPACE

- ✓ASW Barrier
- ✓CUI
- ✓NMW



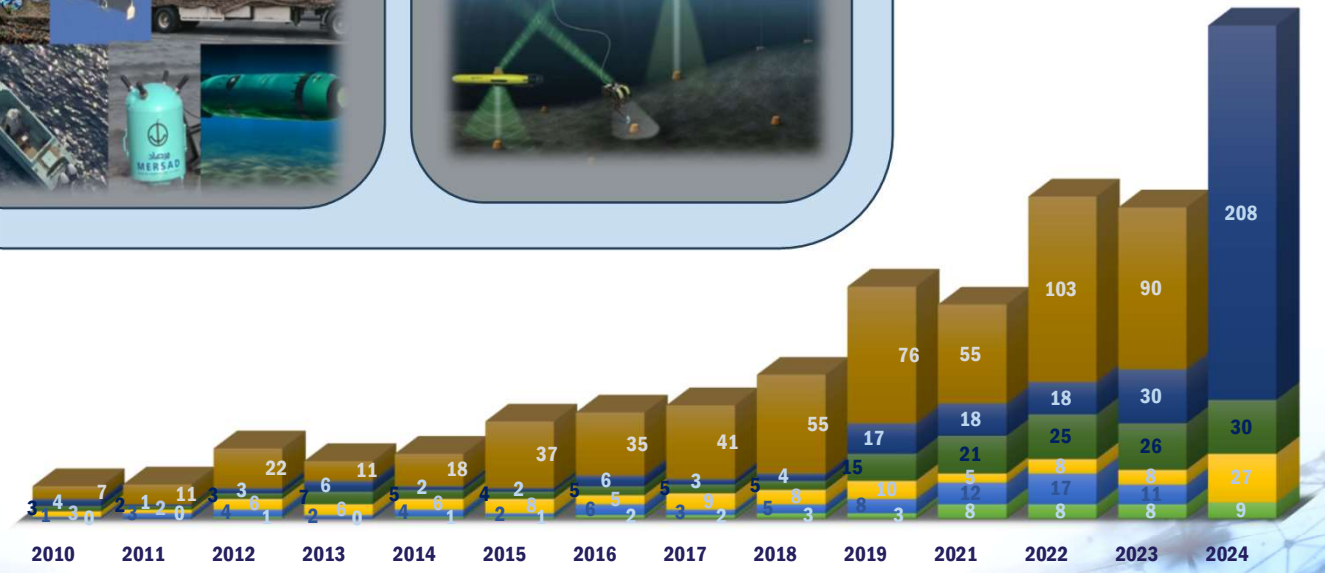
REPMUS 2024

U.PORTO
FEUP FACULDADE DE ENGENHARIA UNIVERSIDADE DO PORTO

NATO OTAN S&T organization CMRE

NATO MARITIME UNMANNED SYSTEMS

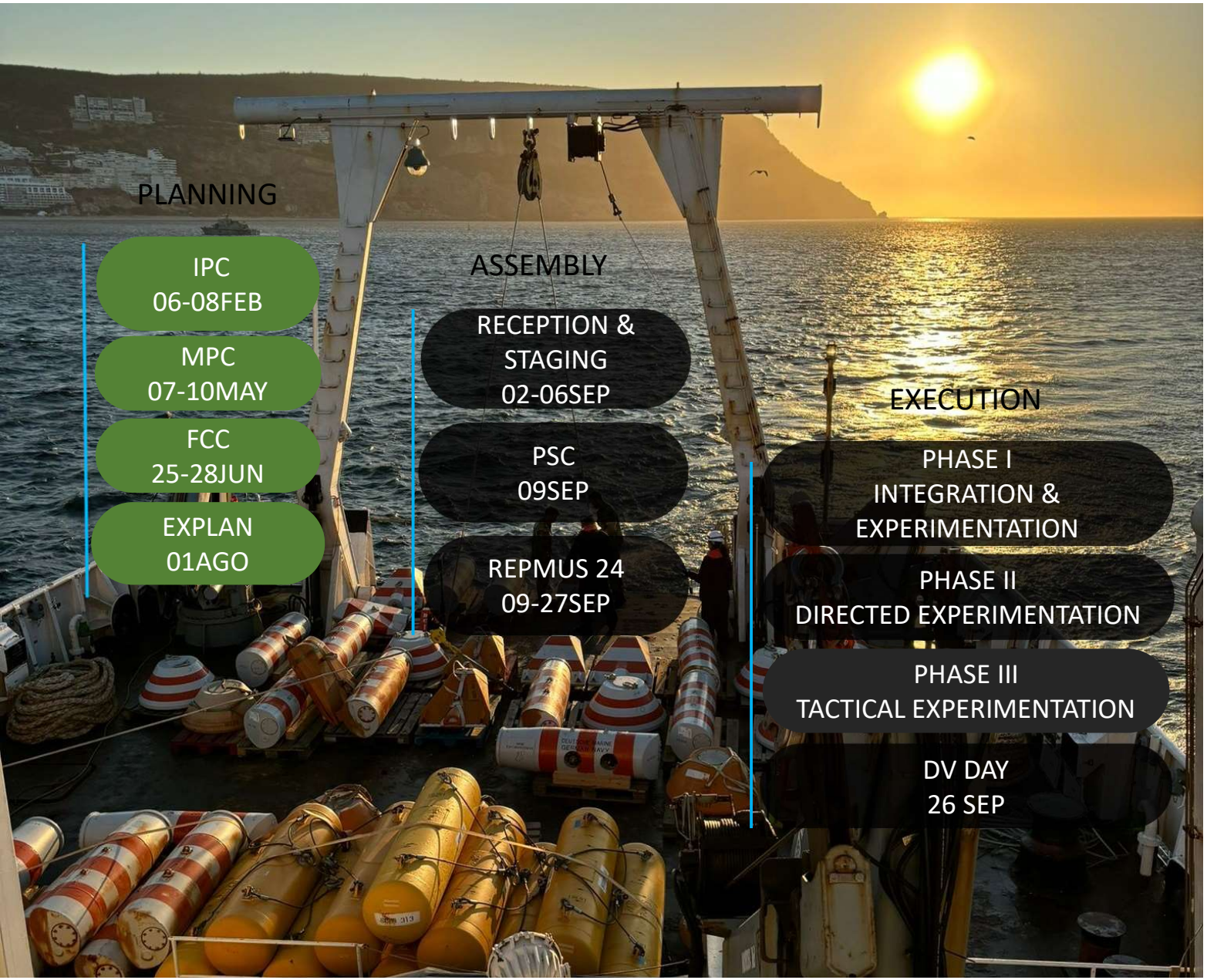
EUROPEAN DEFENCE AGENCY



REPMUS 24 – MAIN GOALS

EXPERIMENT

- Support national and multinational MUS development programs and projects.
- Interoperability to interchangeability of MUS and their integration
- Fulfill the maritime capability gaps, aligned with the NATO Defense Planning Process (NDPP) capability targets, and EU Capability Development Plan (CDP).
- Demonstrate NATO, EU, Nations and Agencies technological and operational MUS Capabilities in multi-domain and multipurpose operations.



REPMUS 24

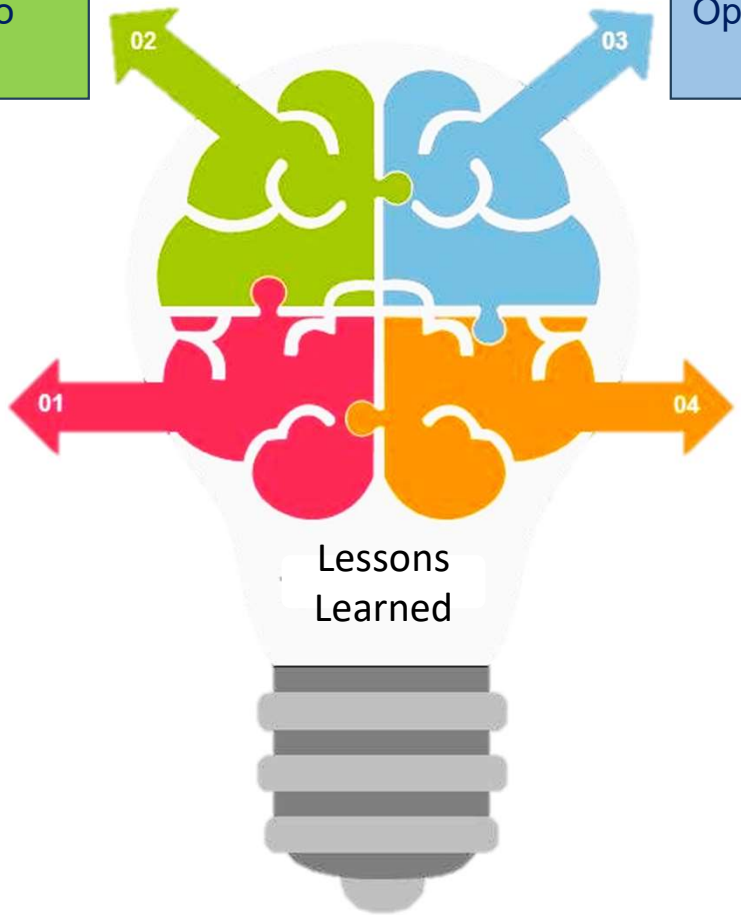
THE PROCESS

REPMUS24 LI/LL

Planning

Tactical Phase (Ph III) too scripted/serialized

Operational Experimentation or Military Exercise



Integration planning needs to be stronger

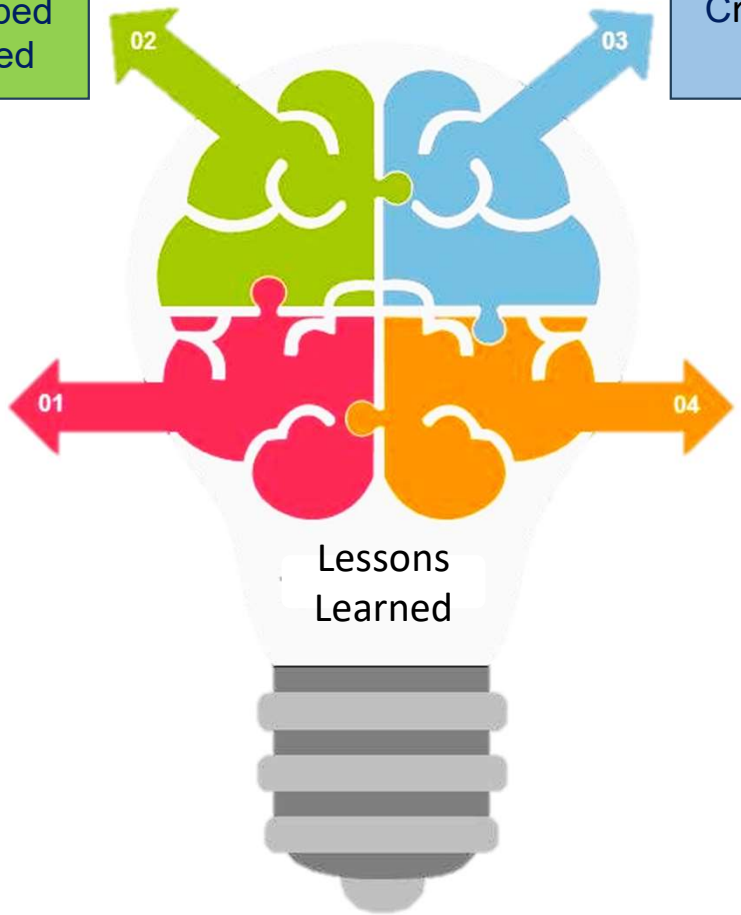
Unit vs National vs Exercise objectives

REPMUS24 LI/LL

Planning

Task Org more fully developed with Warfare staffs identified

Create CTU HP team as main function

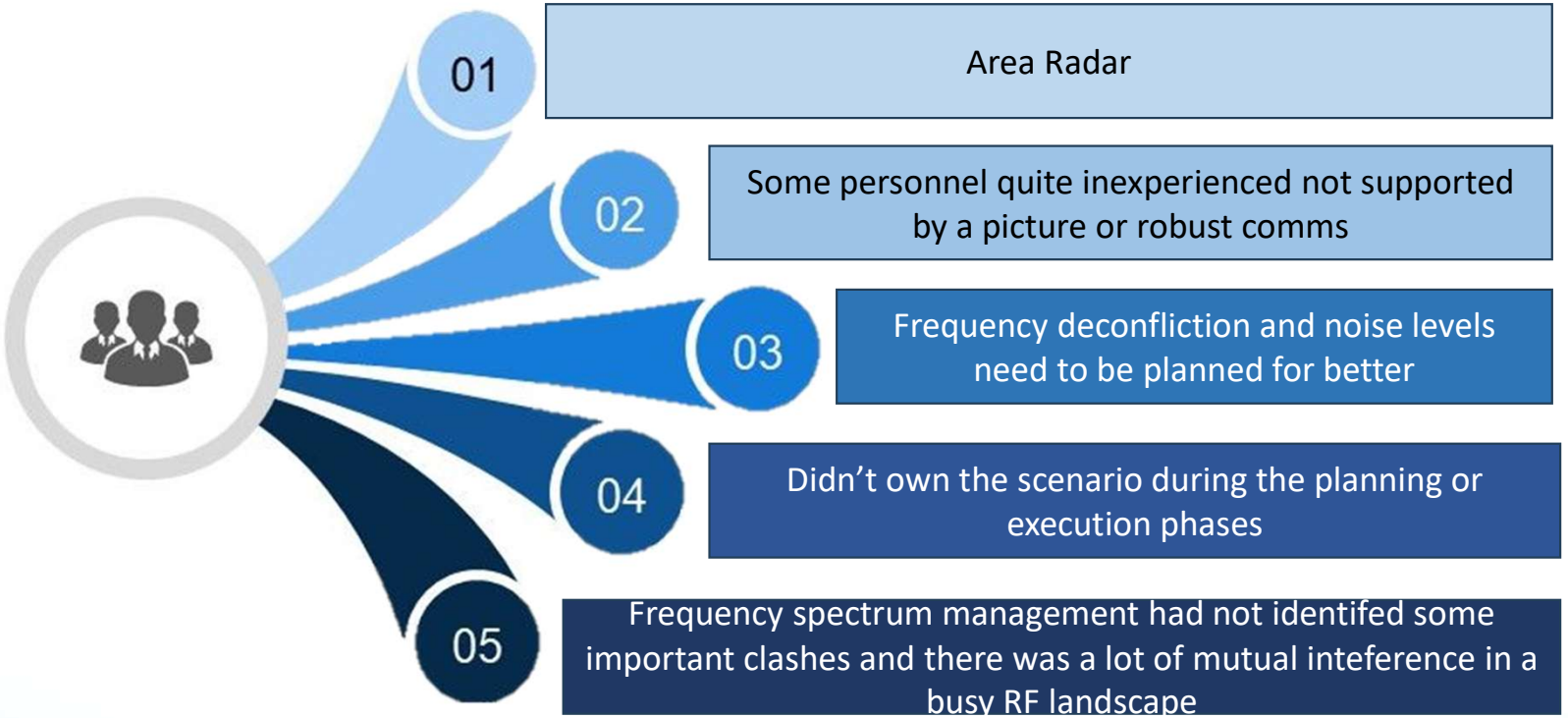


More connectivity between WGs

Establish fixed daily window in the SOE for jamming systems

REPMUS24 LI/LL

EXCON AND AIR SAFETY

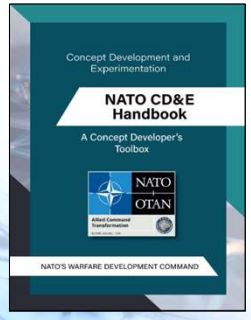


EAA CONCEPT

E **A** **A**

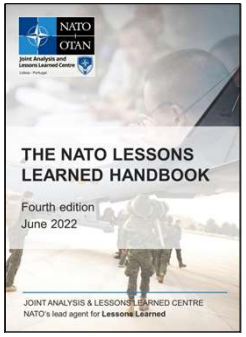
Experimentation

A controlled investigation to discover information, confirm or refute a hypothesis or formally validate (part of) a solution.



Analyses

Application of scientific methods to help make decisions about equipment/sensors/systems.

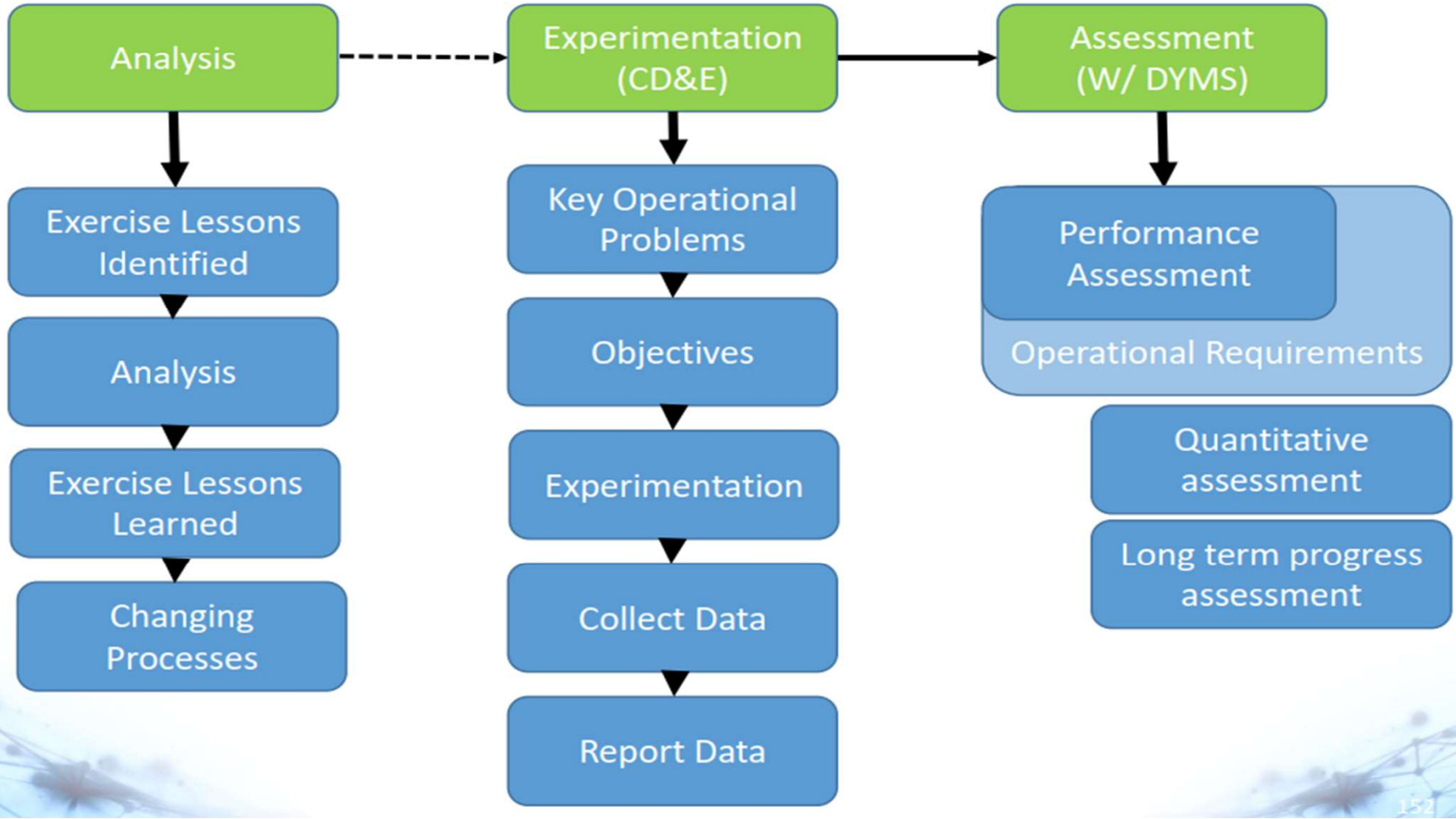


Assessment

Continuous process that quantitatively measures the overall effectiveness of the operational use of capabilities.

EAA CONCEPT

EXPERIMENTATION



Marinha

REPMUS25 / DYMS25

FOCUS AREAS

C2 in multi-domain (STANAG 4817)

Underwater battlespace

Counter-UxV

Persistent ISR (T)

Data Exploitation

PLANNING

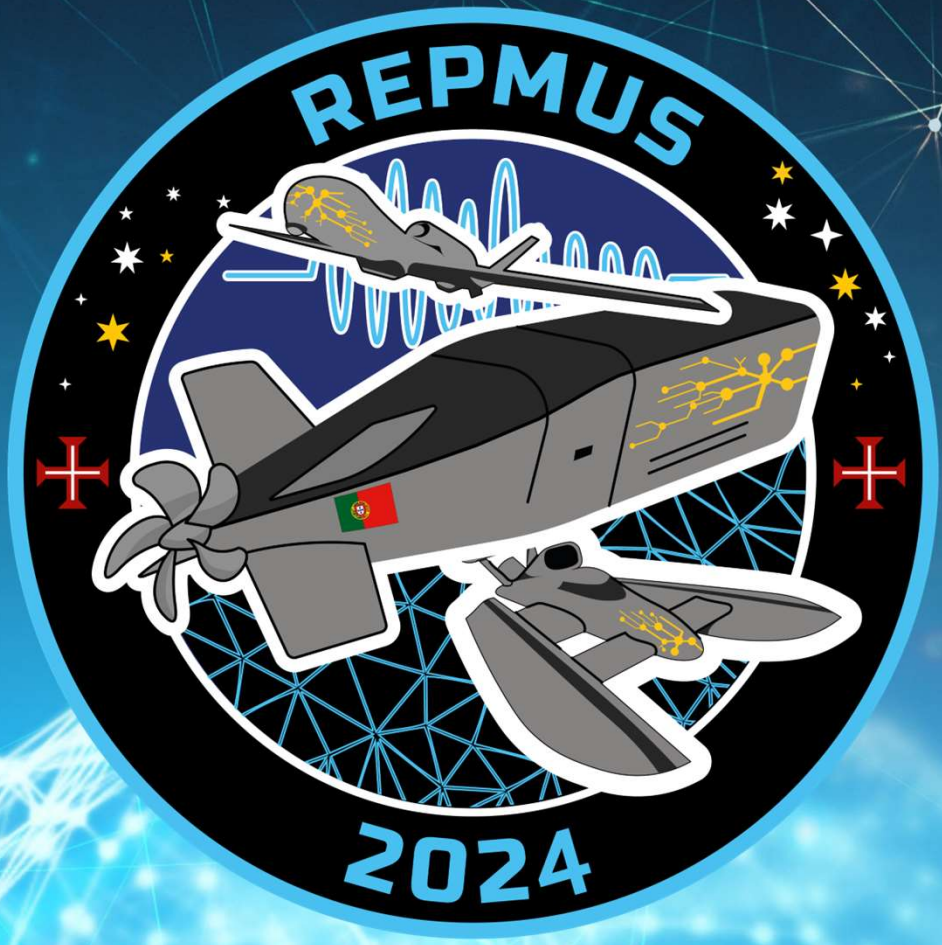
- *IPC 03-07FEV*
- *MPC 05-09MAI*
- *FCC 23-27JUN*
- *EXPLAN NLT 15JUL*

ASSEMBLY

- *RECEPTION & STAGING 01-05SET*
- *PSC 08SET*
- *REPMUS 24 09-27SEP*
- *HOT WASH-UP 09-27SEP*

EXECUTION

- *PHASE I – 08-12SET INTEGRATION & EXPERIMENTATION*
- *PHASE II – 15-19SET DIRECTED EXPERIMENTATION*
- *PHASE III – 20-26SET TACTICAL EXPERIMENTATION*
- *DV DAY 24-25SET*



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