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# SUBMARINE DEPARTMENT –SMER OFFICE



*THE ITALIAN NAVY'S COMPREHENSIVE APPROACH TO A SUBMARINE IN DISTRESS: NEW RESCUE SYSTEM- NEW CHALLENGES*

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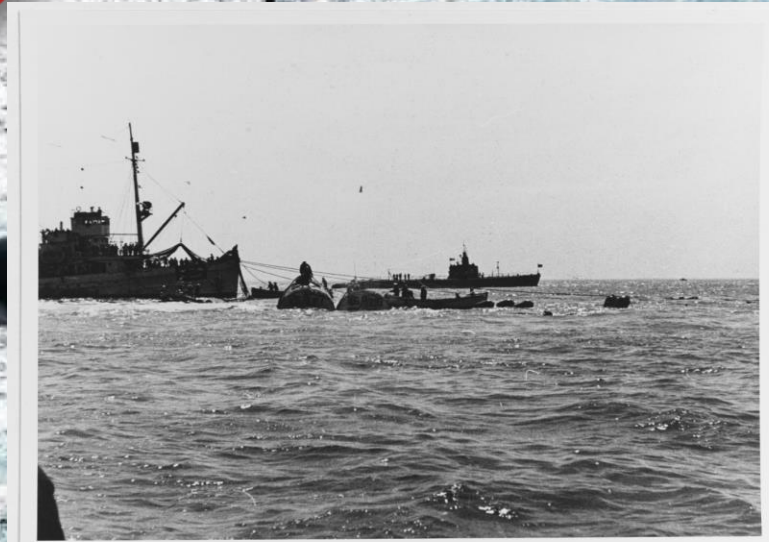


- EVOLUTION OF A SMER SCENARIO
- NEW DEPLOYABLE SYSTEM
- CHALLENGES
- OUTCOMES

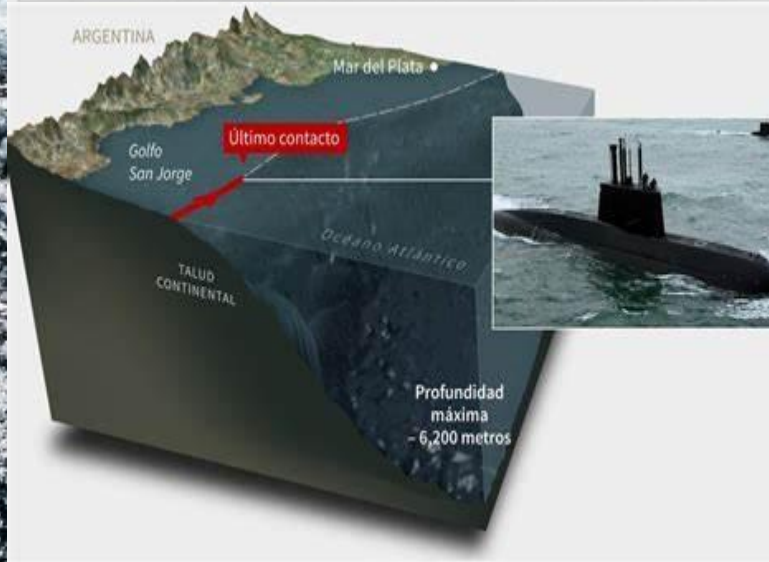


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The True Story of the Russian Kursk Submarine Disaster



KAPAL SELAM NANGGALA 402 HILANG DI PERAIRAN BALI



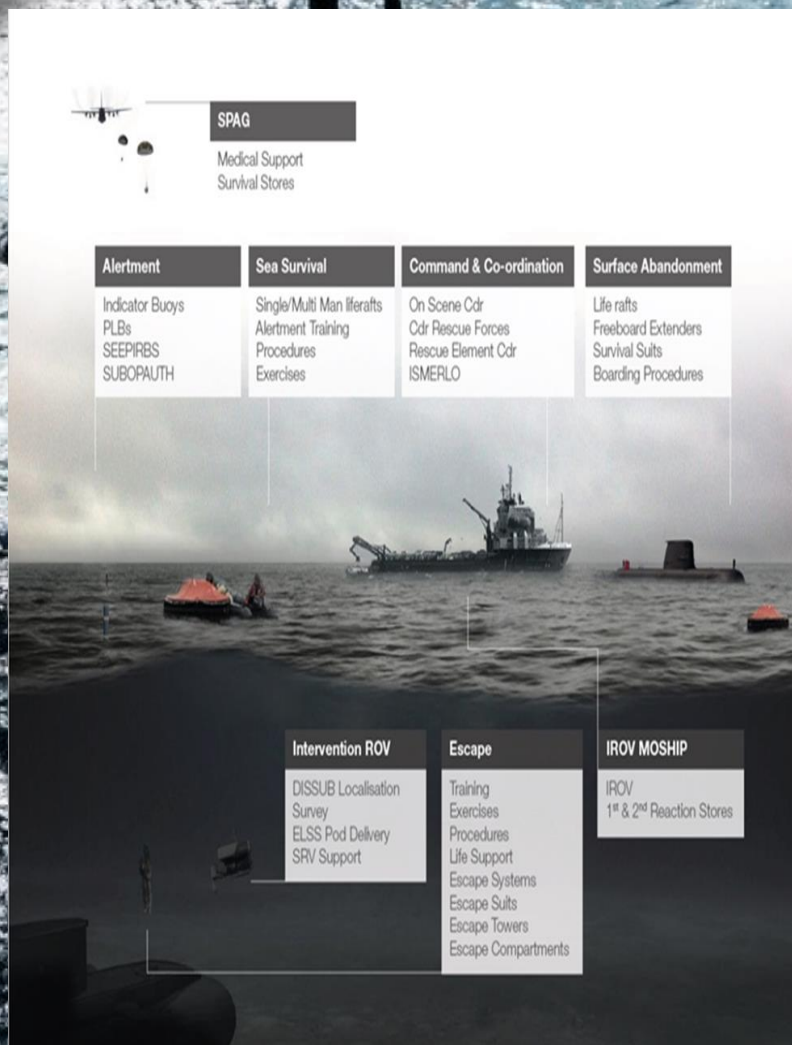
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## ✓ COMPLEX SITUATION

- RANGE
- ASSETS
- LOGISTICAL ADHESION SUPPORT
- DURABILITY

## ✓ COMPLEX RESPONSE :

- NATIONAL SOLID AND SETTLED STRUCTURE
- READINESS
- STAKEHOLDER TRAINING AND DEFINITION



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*SYSTEM*



TRAINING



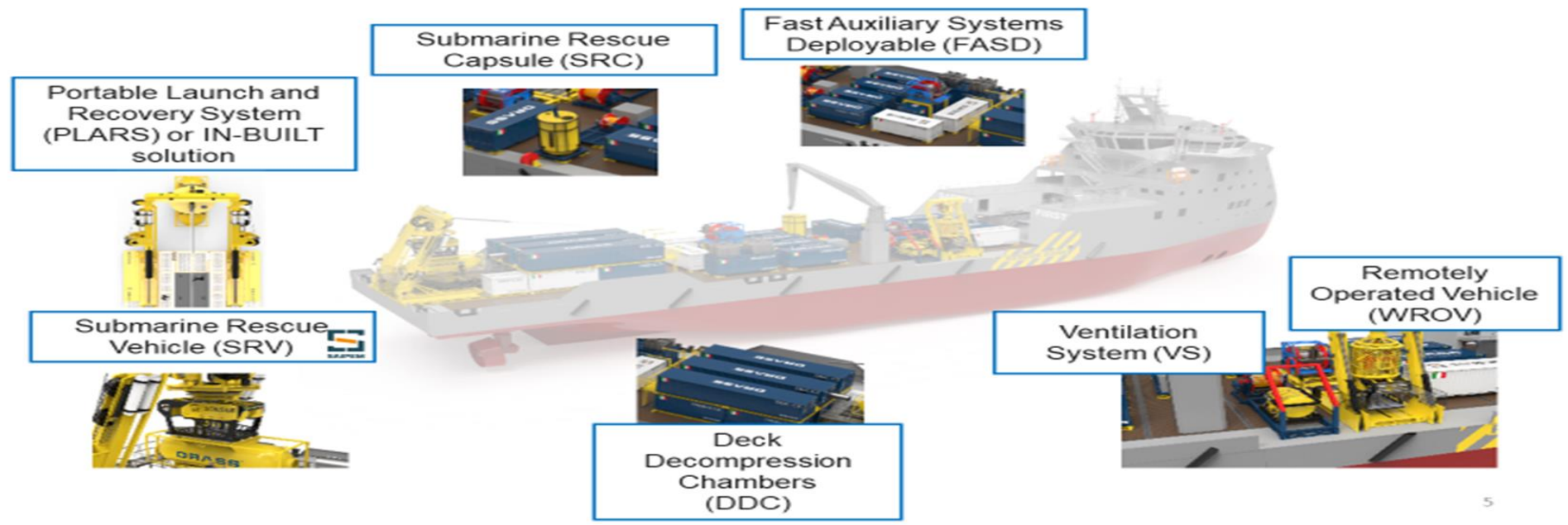
*NETWORK*





- ✓ **ASSETTS**
  - **FLYABLE**
  - **MODULAR**
  - **INTEROPERABLE**
  - **ENDURING**
- ✓ **MANPOWER**
  - **TRAINED**
  - **READINESS**

## S.A.V.E.R. COMPOSITION OF THE SYSTEM









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## SRV: OPERATIVE DATA

Max rescue depth:	600 msw
CIRO max internal pressure:	up to 6 ATA
Max current:	3 knots
DISSUB Mating Angle:	40 deg (pitch & roll)
Crew:	3 (operators)
Rescues Capacity:	24 (survivors)
Life Support System:	96 hrs
Weight in water:	0 kg

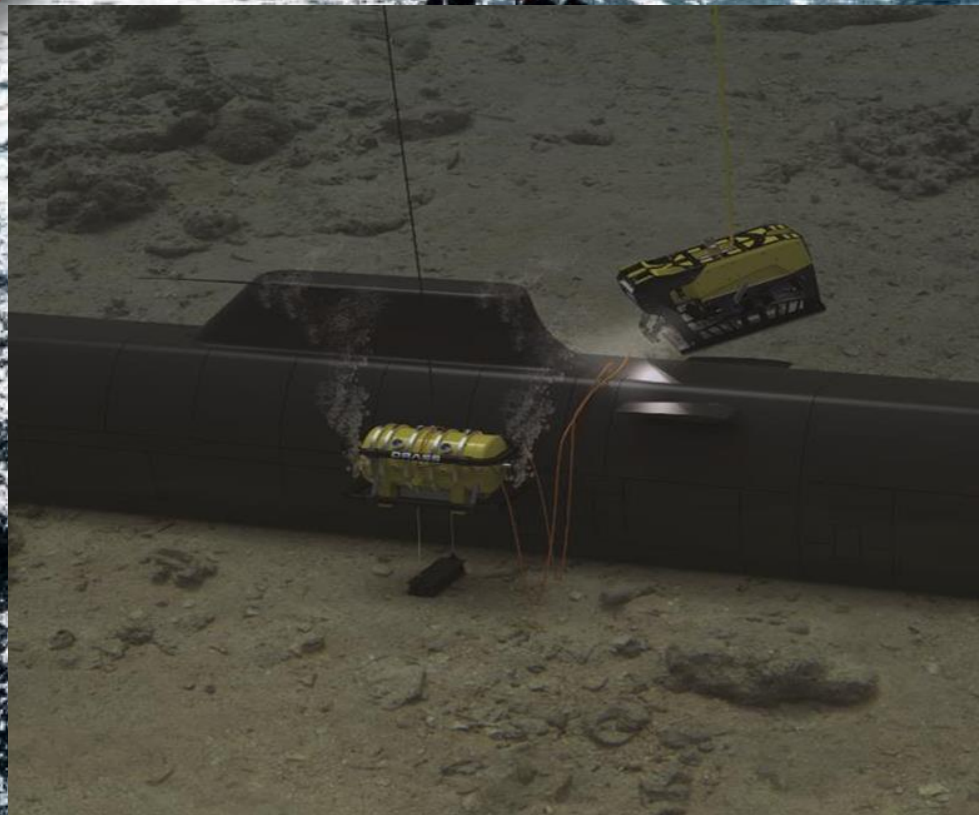
## ADDITIONAL

- Fully tested & qualified
- Human factor de-risking
- Mission endurance
- Multiple Payload Configuration
- Deployable & In-built configuration
- Multiple contingency plans for recovery



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## VS: OPERATIVE DATA

Air Flow rate per person: 30 NI pm  
Max working depth: 600 msw  
Standard design DISSUB crew composition: up to 60 pax  
DISSUB Mating Angle: 40° (pitch & roll)  
Maximum continuous flow: 200 Nm3Hh for each compressor module

## ADDITIONAL

Patented System based on the use of a “pressure resistant ventilation capsule” that works in deep avoiding the need of the outlet hose till the surface.

Innovative and modular system  
Fully road and air transportable  
Fully tested & qualified  
Modular Ballast tanks emergency external blowing system available



## TECHNOLOGIES COMPARISON

### DRASS INNOVATIVE SUBMARINE VENTILATION SYSTEM

1. HP surface to DISSUB hose with small diameter
2. Small umbilical winch
3. Deep ventilation capsule allows having only few meters of local hoses
4. The DISSUB is kept atmospheric
5. Exhaust gases are locally vented underwater
6. Absence of a suction hose to surface.
7. Easy transportable (20' ISO Containers)
8. Heating of the air supply to the DISSUB
9. Flexibility of DRASS SVS Air Distribution

### CONVENTIONAL SUBMARINE VENTILATION SYSTEM

1. Air reclaim system to surface needs hoses with a bigger diameter from DISSUB. NATO ATP 57.1 recommends at least 50 mm, with increasing technical issues due to the deformation of the hose shape with the external pressure, reducing overall performance
2. Bigger Umbilical winch
3. Vacuum pumps on surface can generate only a portion of 1 bar of suction pressure
4. A pressurization of the DISSUB is always needed



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## RCC: RESCUE CONTROL CENTER

Standard monitoring consoles: 4  
(customizable one for each asset)

Online assets monitoring

Rescue Operations Communication Center

Command of Rescue & Intervention Operations

3D assets positions monitoring for simultaneously operations


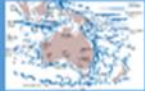




Deployable compact version available





## SUBMARINE RESCUE VEHICLE

Comparison with old manned Submarine Rescue Solutions

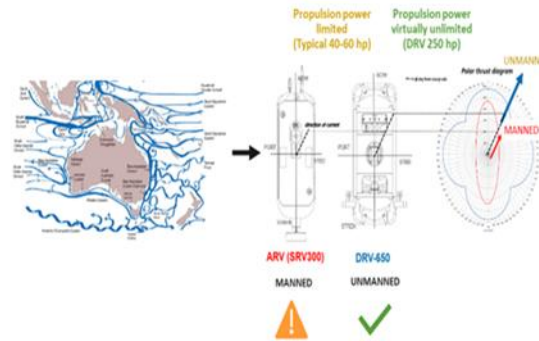
	KEY ASPECT	MANNED AUTONOMOUS (ARV)	UNMANNED TETHERED (SRV)
	Sea State	✗	✓
	Currents	⚠	✓
	Endurance	⚠	✓
	Communication	⚠	✓
	Reliability	⚠	✓
	Human Factor	⚠	✓



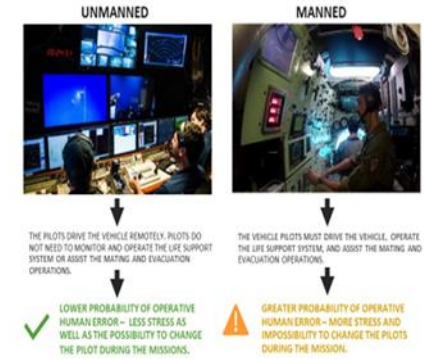
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## Subsea Currents constrain

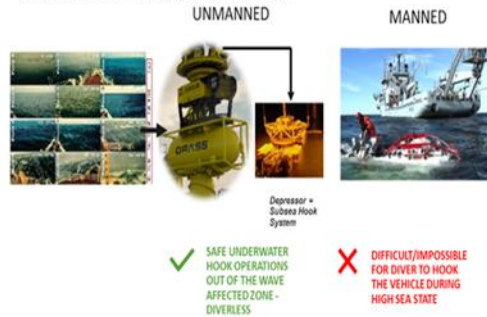


## Human Factor Dependency constrain



## Sea State constrain

The rescue operations shall be possible in high sea state (up to 6) and in variable conditions within the operative time window.



## Reliability and Proven Technology constrain



## Communications constrain







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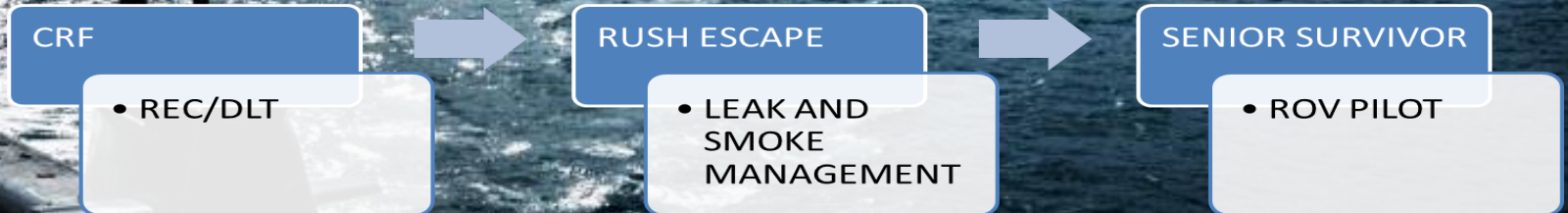
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- Courses for Coordinator Rescue Forces (CRF), carried out in cooperation with the International Submarine Escape and Rescue Liaison Office (ISMERLO);
- Survival in Distress Submarine (DISSUB) courses;
- Courses of conduct of search and rescue operations;
- ROV pilot training course.
- Personnel Exchange (to increase interoperability and integration between staff)
- Command/Unit level training



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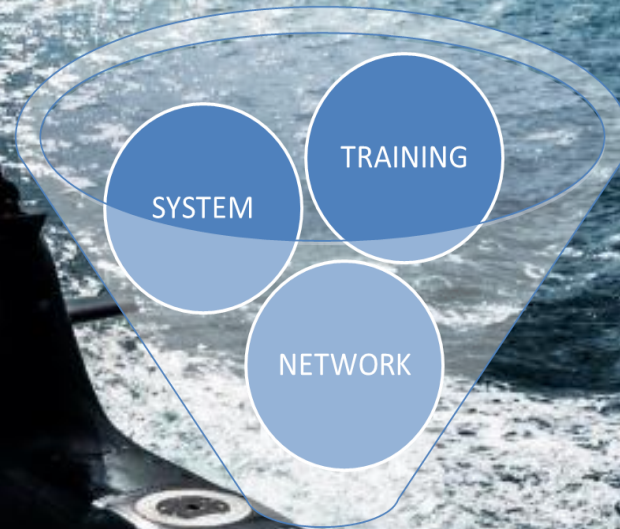


- Co-operate in SUBSAR training and instruction.
- Co-operate in exchanging information.
- Standardize certification and validation.
- Provide use of Italian Rescue Assets and SDO-SuRS Deployable Assets for training and real SUBSAR operations.



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**MOU SAVER**





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- **SUBMARINE IN DISTRESS IS A NATIONAL CASE;**
- **PERFORMANCE SUBMARINE ESCAPE AND RESCUE IS ESSENTIALLY A PROJECT MANAGEMENT PROBLEM; ALBEIT ONE WITH DIRECT CONSEQUENCES FOR THE SURVIVORS IN THE EVENT OF FAILURE TO MEET KEY TIME AND PERFORMANCE CRITERIA.**

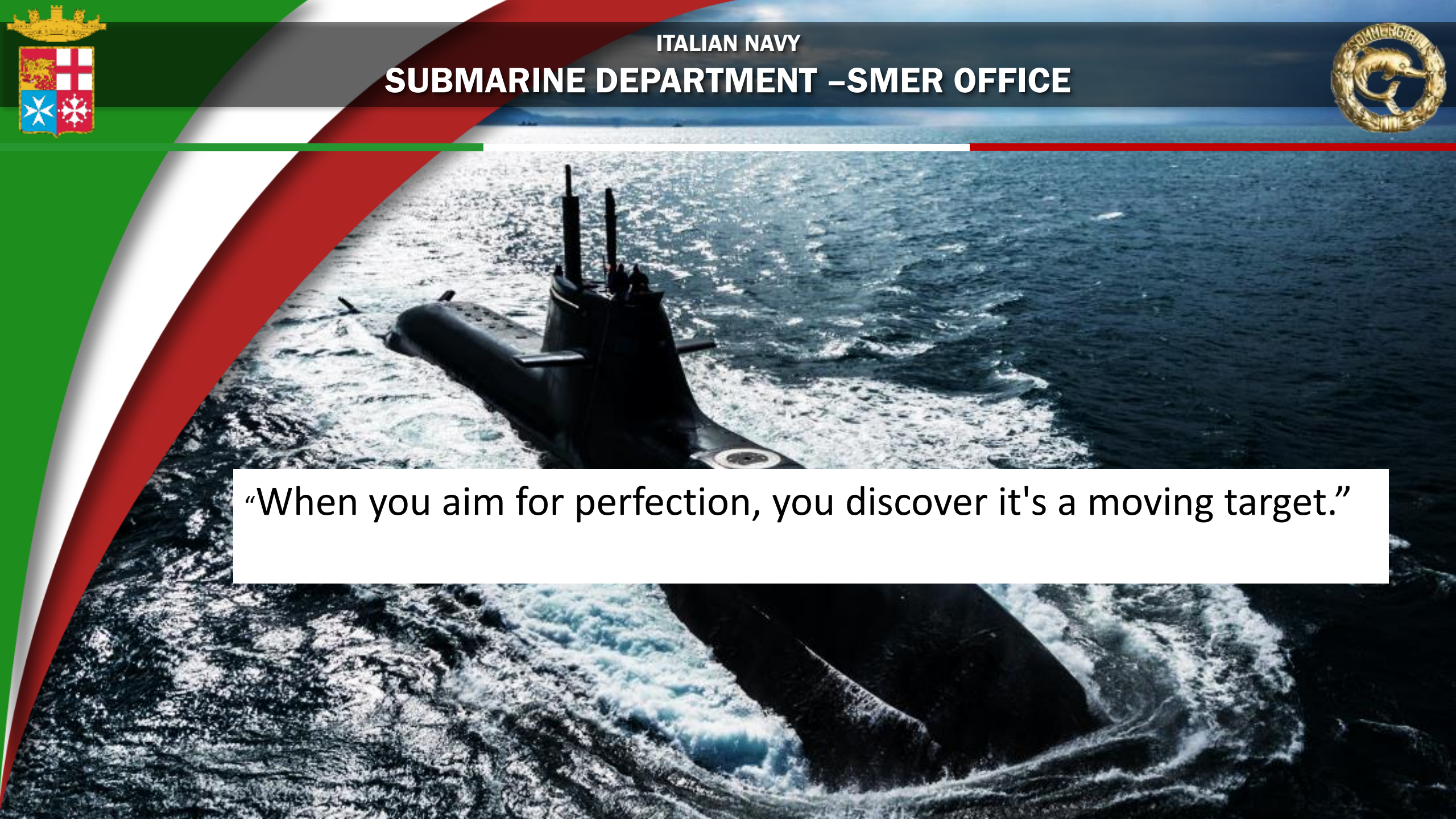


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“When you aim for perfection, you discover it's a moving target.”





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