



Coastal Sea Operations: the example of EMSO Ligure-Nice: towards best practices

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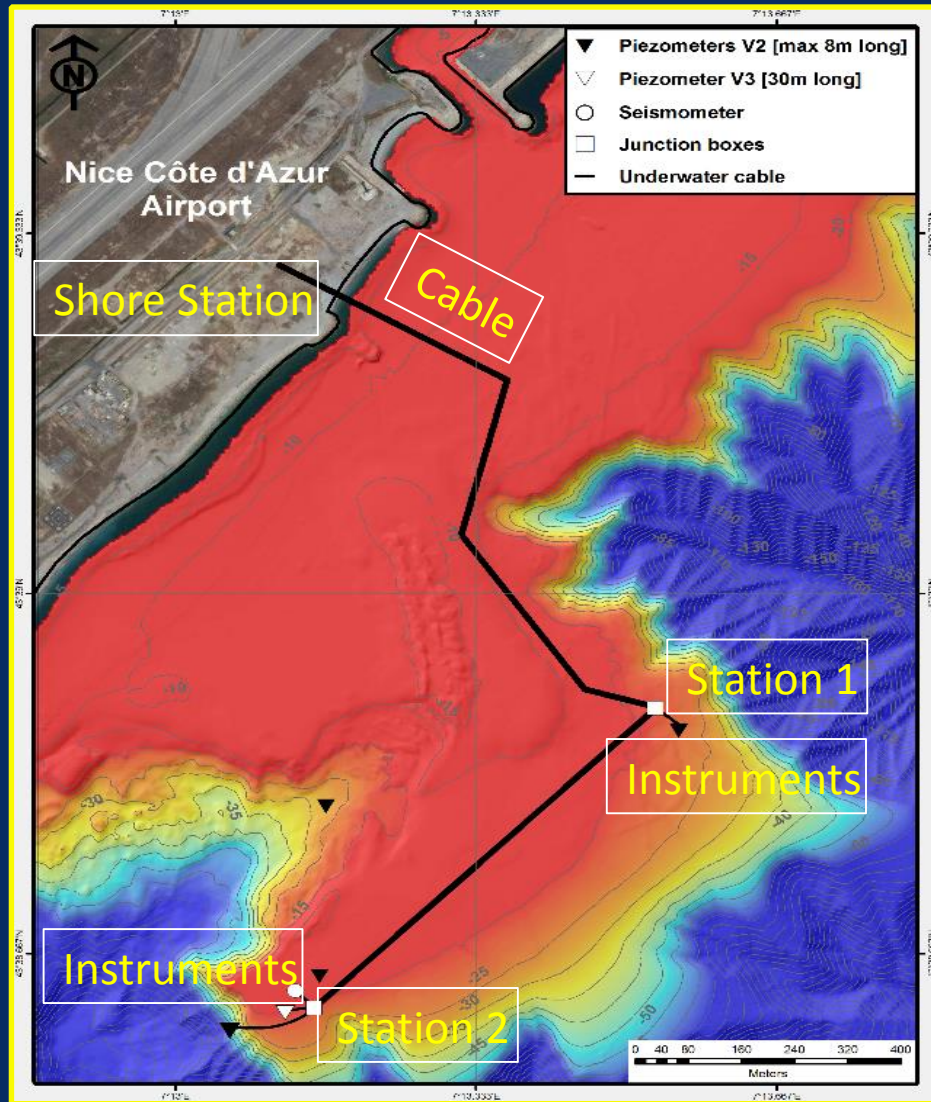


1. INTRODUCTION: EMSO-Ligure Nice, Global Situation



EMSO Ligure-Nice: a Coastal Cabled Observatory

2. INTRODUCTION: EMSO-Ligure Nice, Focus on the Observatory



MAIN CHARACTERISTICS

- ❑ One shore station (Nice airport)
- ❑ Main Cable (≈ 2 km)
 - double armored electro-optical (400 VDC)
 - 7,5 Kg/m
- ❑ Two offshore structures/stations (≈ 2 tons)
- ❑ Instrumentation (connected or not yet)
 - piezometers
 - seismometers
 - others...
- ❑ Depth: between 15 and 40 meters

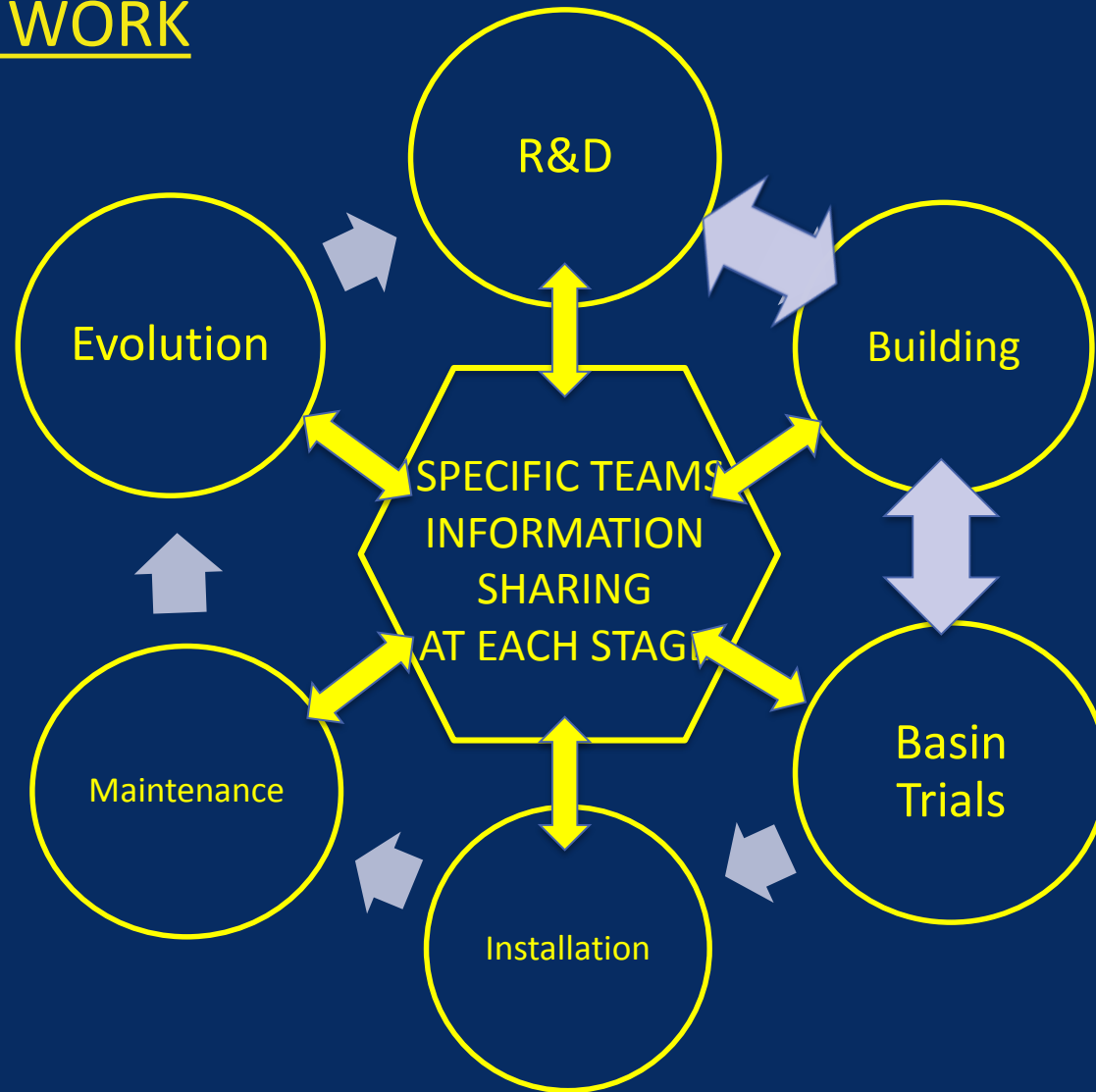
3. SIX ESSENTIAL PHASIS DURING THE LIFE OF PROJECT

1. RESEARCH AND DEVELOPMENT (Ifremer)
2. BUILDING (Ifremer)
3. BASIN TRIALS (Ifremer)
4. INSTALLATION (Sub contractors & Ifremer)
5. MAINTENANCE (Ifremer : long term≈10 years)
6. EVOLUTIONS (Ifremer : long term≈10 years)

4. MAJOR CONCEPTION CHOICE: MAINTENANCE PACKAGES

- ALL DEVICES UNDERWATER REPLACEABLE
- INDEPENDANT ELEMENTS
- UNDERWATER MECHANICALY « PERMUTABLE »
- UNDERWATER ELECTRICALLY REPLACABLE): WET METABLE

5. COLLABORATIV WORK



6. REPARTITION OF SEA INTERVENTIONS / OPERATIONS

6.1 « HEAVY » MARINE OPERATIONS (SUB CONTRACTORS O.M.)

- ❑ Installation of Stations (2 tons)
- ❑ Installation of Main Cable / Barge (2000 meters & 7,5 Kg/m)
- ❑ Cable Shore laying (500 meters)
- ❑ «Industrial » way of work

6.2 « SURGICAL / CAREFULL » INTERVENTIONS (IFREMER TEAMS)

- ❑ Connexion of Cables Connectors (50 Kg)
- ❑ Installation of Underwater delicate devices (20 Kg)
- ❑ Cables for Instrumentation Connexion (200 meters & 1,5 Kg/m)
- ❑ « Artisanal »

7. REASONS OF SEA INTERVENTIONS SHARING

7.1 « HEAVY » MARINE OPERATIONS

Huge Maritime Facilities

EXPERIENCE

COSTS

(SUB CONTRACTORS)

(Barge and Supply vessels)

(Cables laying « orange marine »)

(Very high)

7.2 « SURGICAL/CAREFUL » INTERVENTIONS

Light Maritime Facilities

Connexion of Connectors Cables

EXPERIENCE

COSTS

Connexion of Cables Connectors

(IFREMER TEAMS)

(Semi Rigid Vessel)

(Careful operations)

(Instrumentation)

(Reasonable)

(Carefull operations)

8. ILLUSTRATIONS OF HEAVY SEA OPERATIONS: Sub Contractor



Offshore Stations

Barge



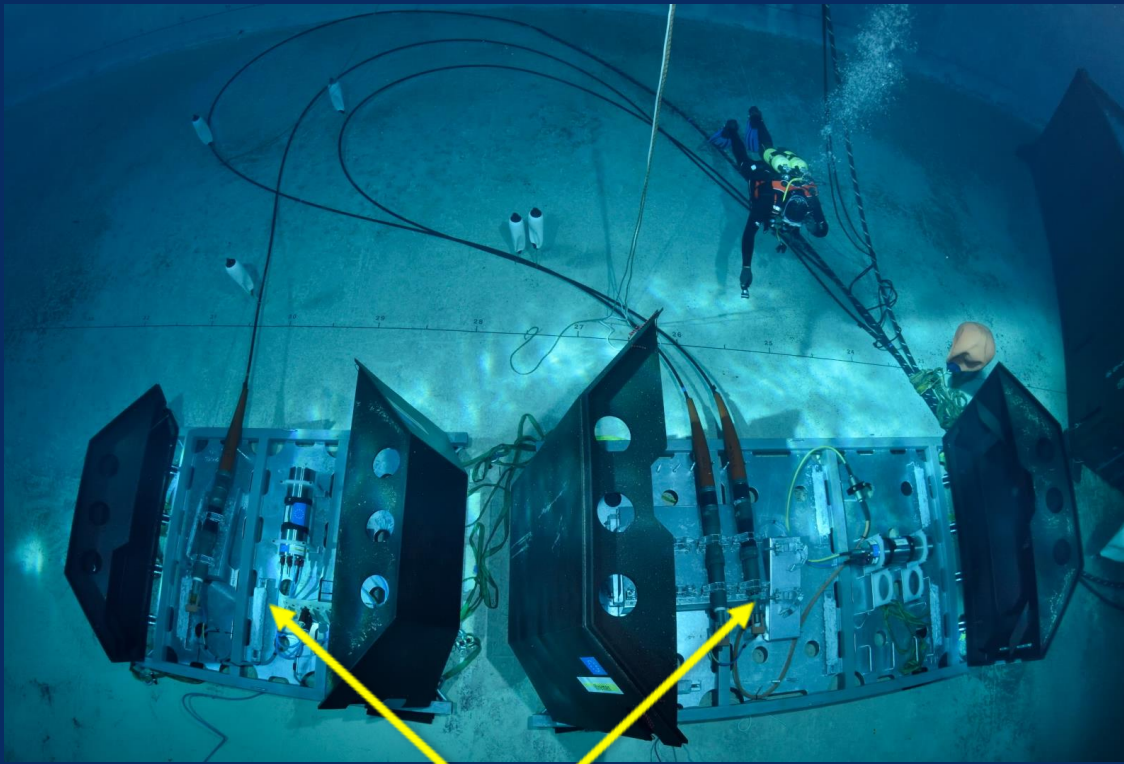
Light vessels

Cable laying

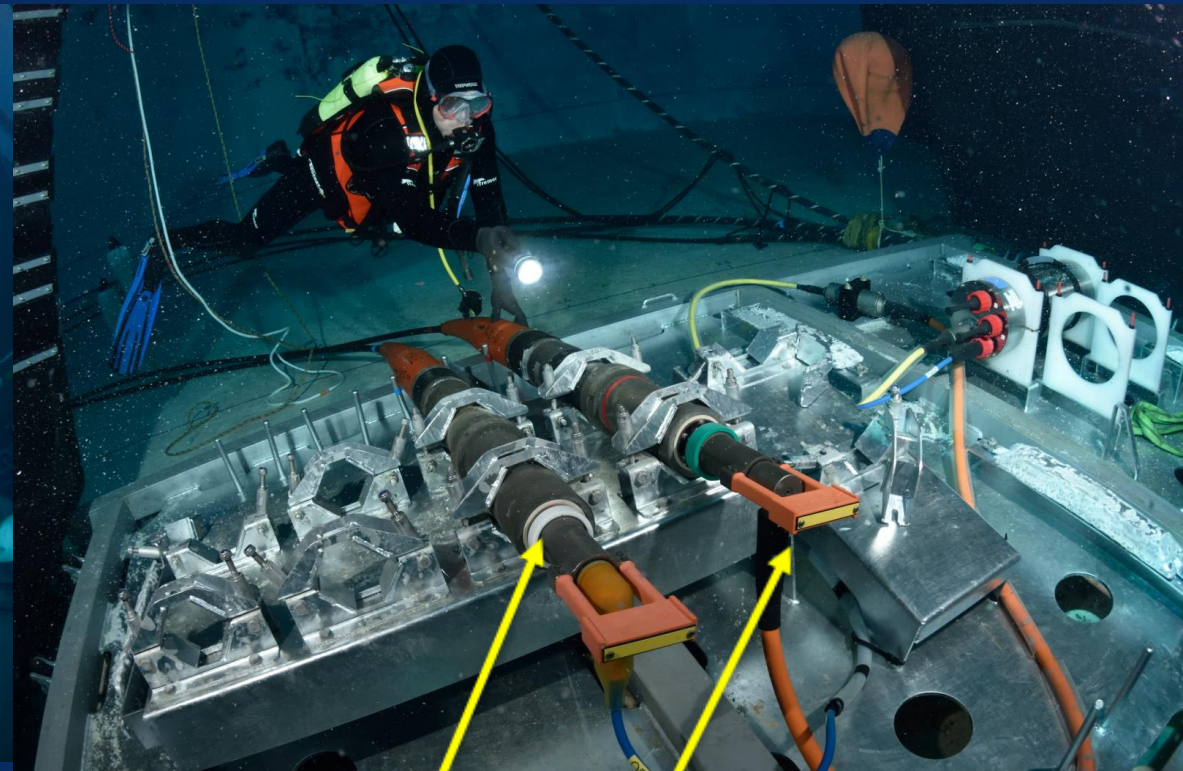


9. ILLUSTRATIONS OF « CAREFULL » SEA OPERATIONS: Ifremer

9.1. SPECIAL TRAINING in Ifremer Deep Basin (10 & 20 meters)



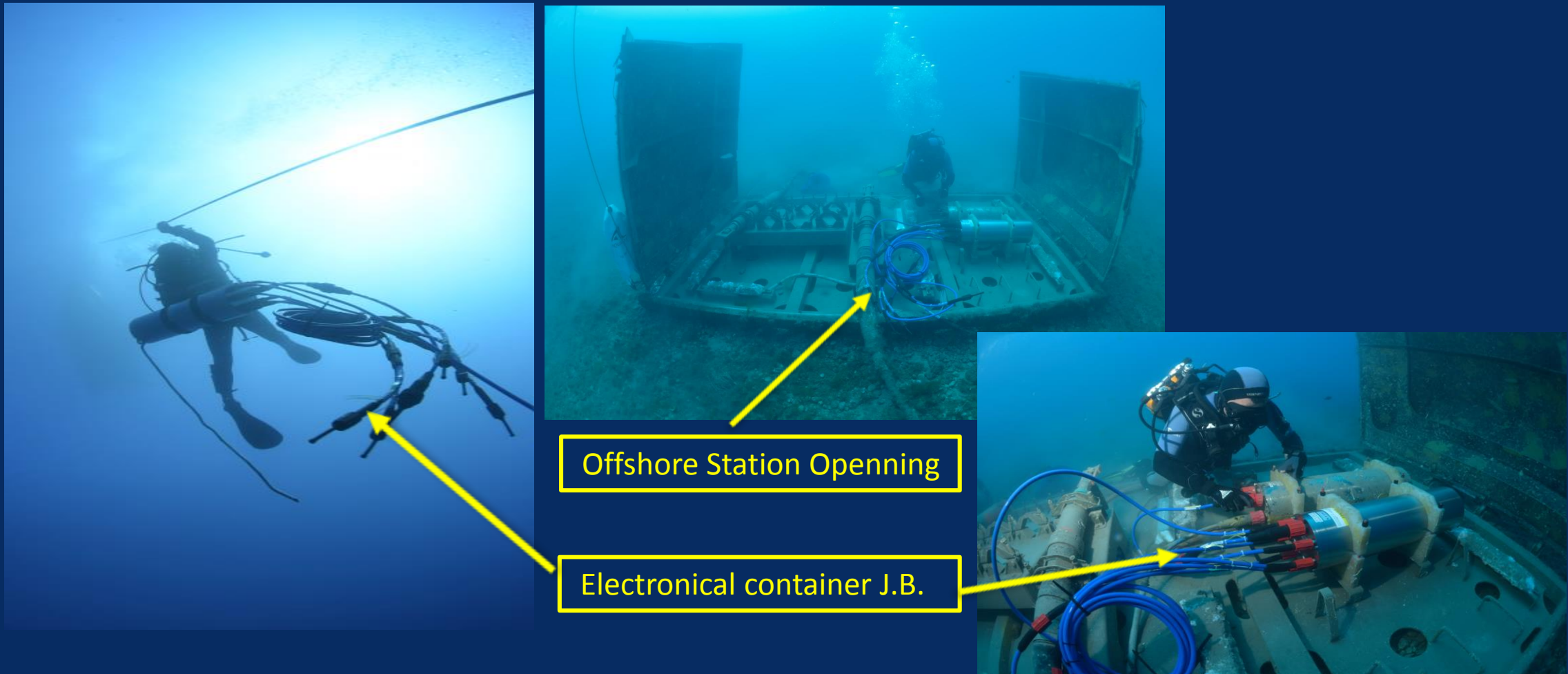
Two Offshore Stations



Two O.D.I. Connectors

9. ILLUSTRATIONS OF « CAREFULL » SEA OPERATIONS: Ifremer

9.2 SPECIAL SEA OPERATIONS ENGAGED BY IFREMER



10. MAJOR CHARACTERISTICS for Coastal Observatories

10. 1. GEOGRAPHICAL POSITIONNING

Distance from shore

Depth

(REGULATIONS)

(Shipping Areas)

(Diving classifications)

10. 2. ENVIRONMENTAL CONDITIONS

Nautical Facilities

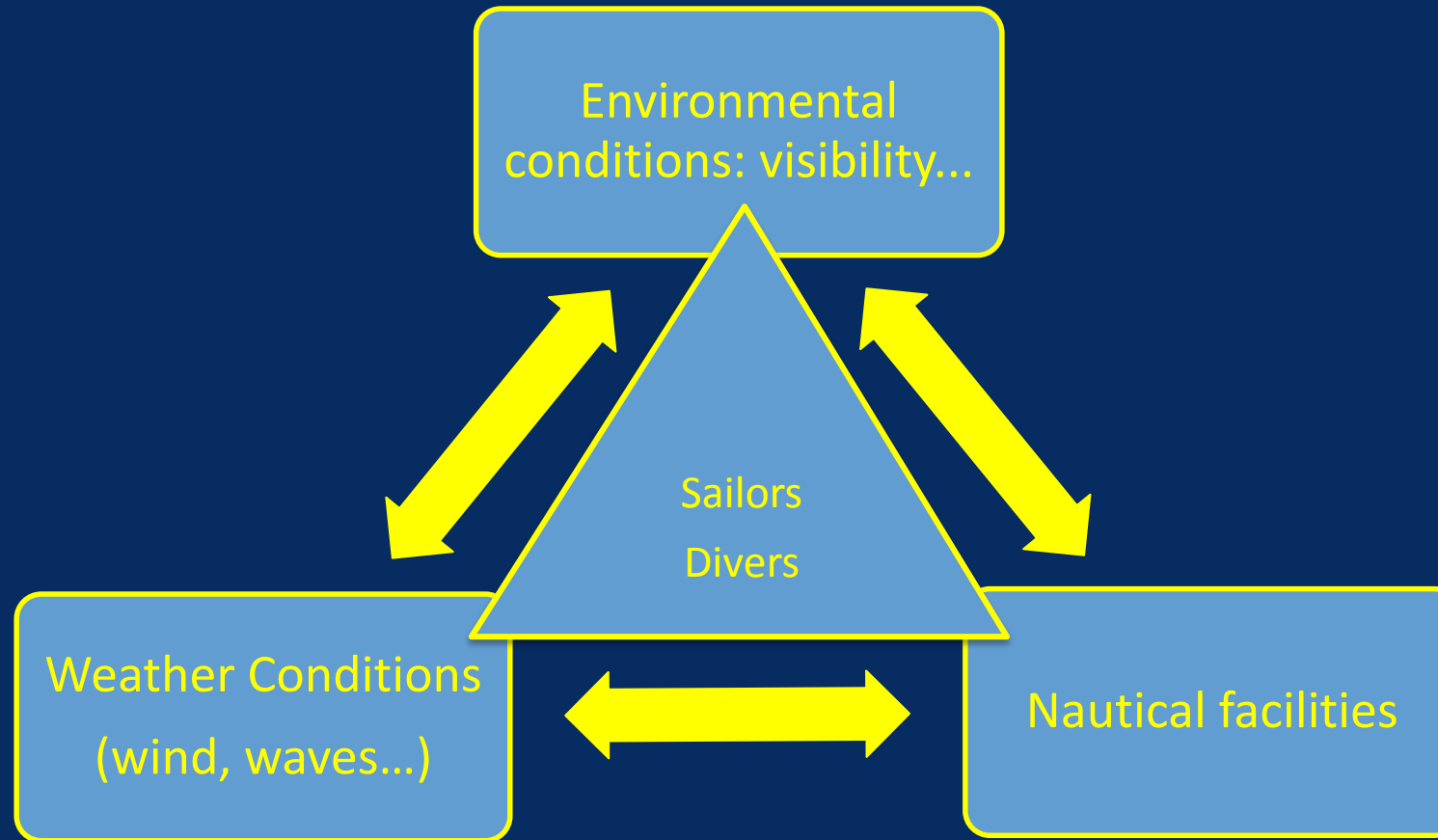
Technical Choices

(OPERATIONAL CHOICES)

(Light or Heavy)

(Operations duration)

11. SUCCESS CONDITIONS FOR SEA OPERATIONS



12. SEA OPERATIONS ORGANISATION

- ❑ Preparation (technical view and risks management)
Guide lines/tools/nautical facilities/diving...SAFETY FIRST
- ❑ Anticipation (potential shifts)
Always having a « B » PLAN in advance...
- ❑ Training of the operational team (check list of tools and tasks)
Basin Trials and operation repetitions
- ❑ Capability of reaction in front of « unexpected » events, flexibility
Practice is very often different from Theory...

14. CONCLUSIONS

- ❑ 20 YEARS OF EXPERIENCE FOR COASTAL SEA OPERATIONS
 - Sharing and feed back from all the different teams

- ❑ CONDITIONS FOR SUCCESS OF SUCH SEA OPERATIONS (Required but not Sufficient!)
 - Knowledge of marine regulations
 - Accurate and operational shared Conception
 - Know-how of sea environment
 - Know-how of instrumentation
 - Know-how of diving
 - Decision is always a human decision...!

Thank you for your attention

Unexpected guest...not the conger eel...but the diver!

Any Questions?

