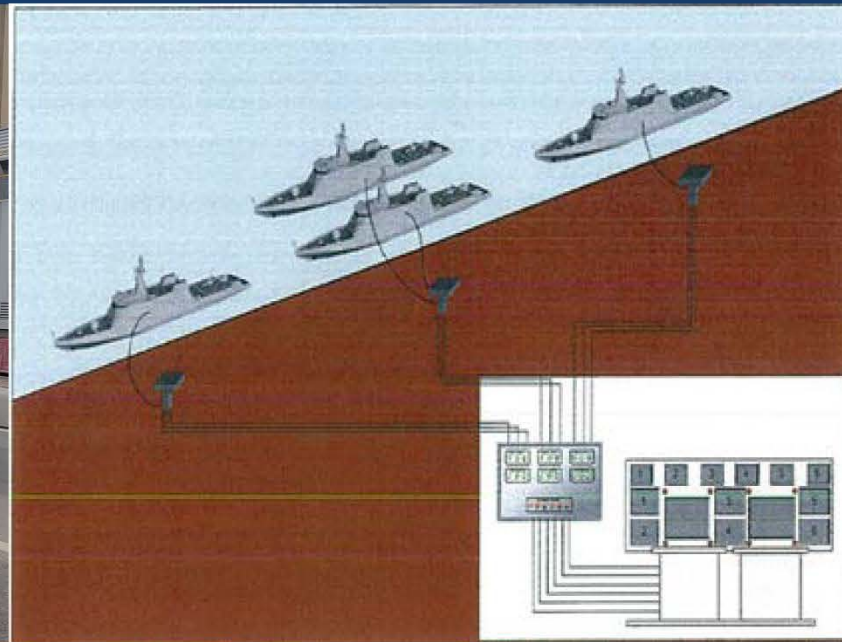




SOUTHAMPTON 23rd OCT 24



# SHORE-BASED INTEGRATED SURVEILLANCE SYSTEMS FOR SHIPS IN PORT



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# AGENDA



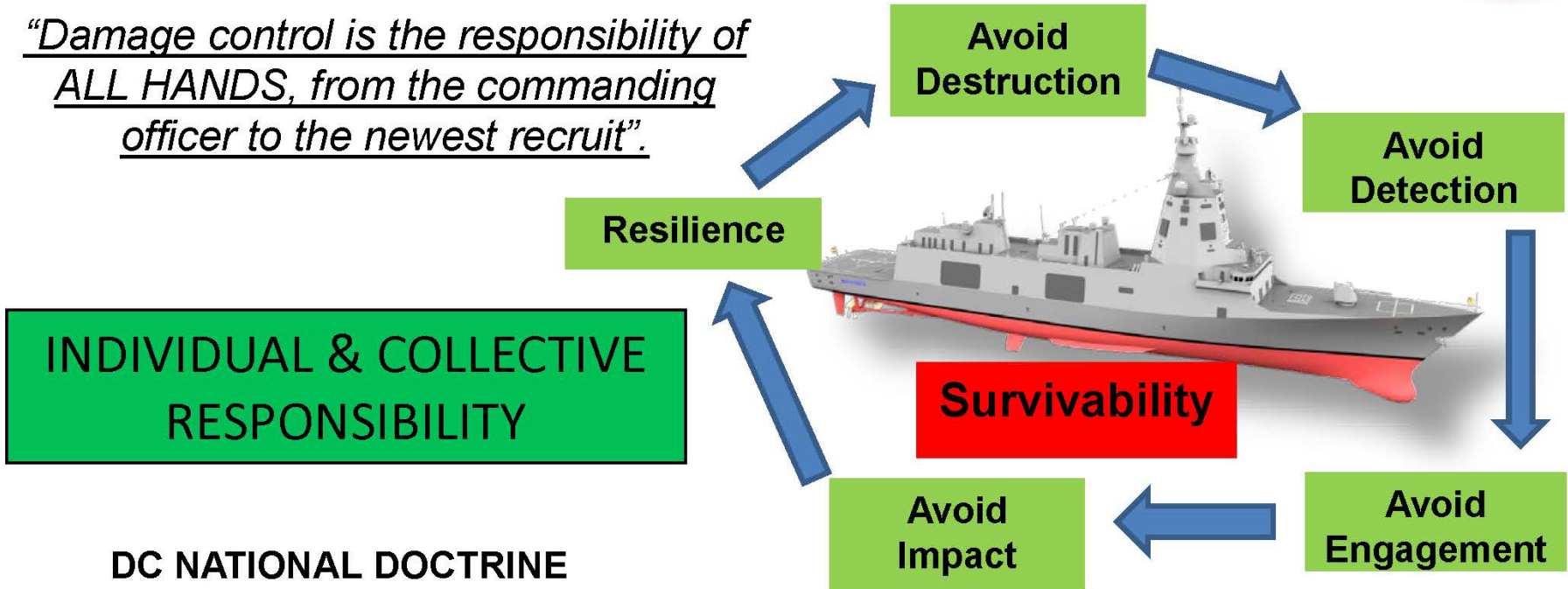
1. INTRODUCTION
2. IPMS
3. IN-PORT SURVEILLANCE CAPABILITIES
4. TRAINING
5. INCIDENT REACTION
6. NEW DEVELOPMENTS
7. CONCLUSIONS



# INTRODUCTION



"Damage control is the responsibility of ALL HANDS, from the commanding officer to the newest recruit".



- Intense Training
- Properly and Ready Equipment
- Refined & Smart Organization
- On board Automation

**Successful Key Factors**

Effective Damage Control (DC) requires the correct use of equipment and techniques to prevent or minimize the damage effects caused by battle (weapons, strikes, CBR attack, etc), fire, collision, grounding, explosion, and so forth.



# INTRODUCTION



## DC IMPLEMENTATION & EVOLUTION

### Doctrine

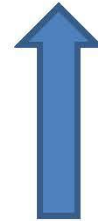
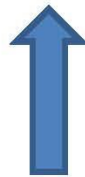
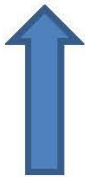
- Quicker reactions.
- Easier procedures.
- Semi-automatic stages.
- Higher standarization.

### Training

- Virtual context.
- IPMS training module.
- IPMS community.
- Complex scenarios.

### Organization

- More simple structure.
- Easier DC material control.
- Well-defined roles.



## INTEGRATED PLATFORM MANAGEMENT SYSTEM (IPMS)



End user



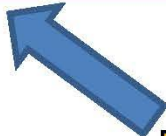
Navantia

Tech Partner



1990's

MATURE TECHNOLOGY

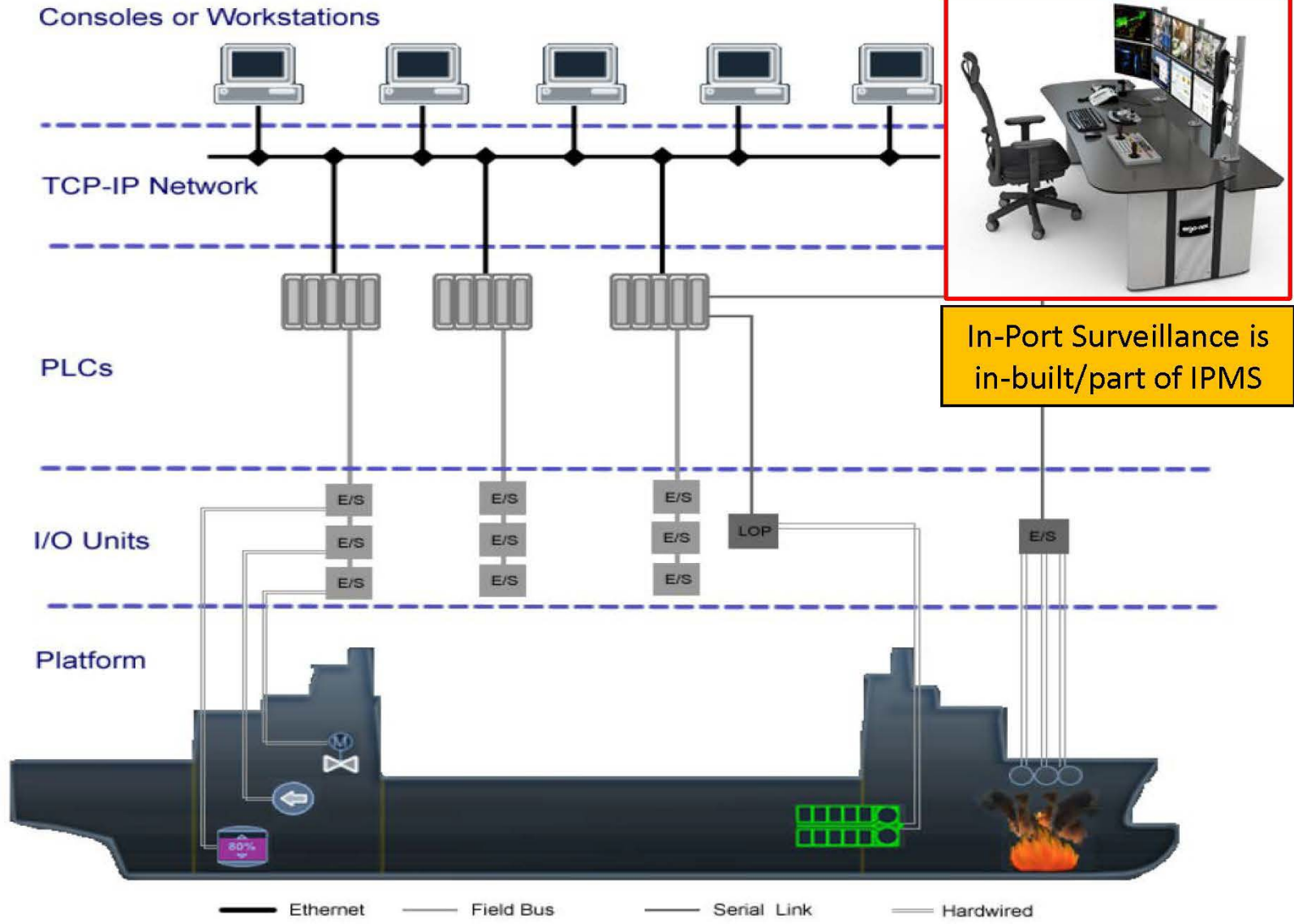


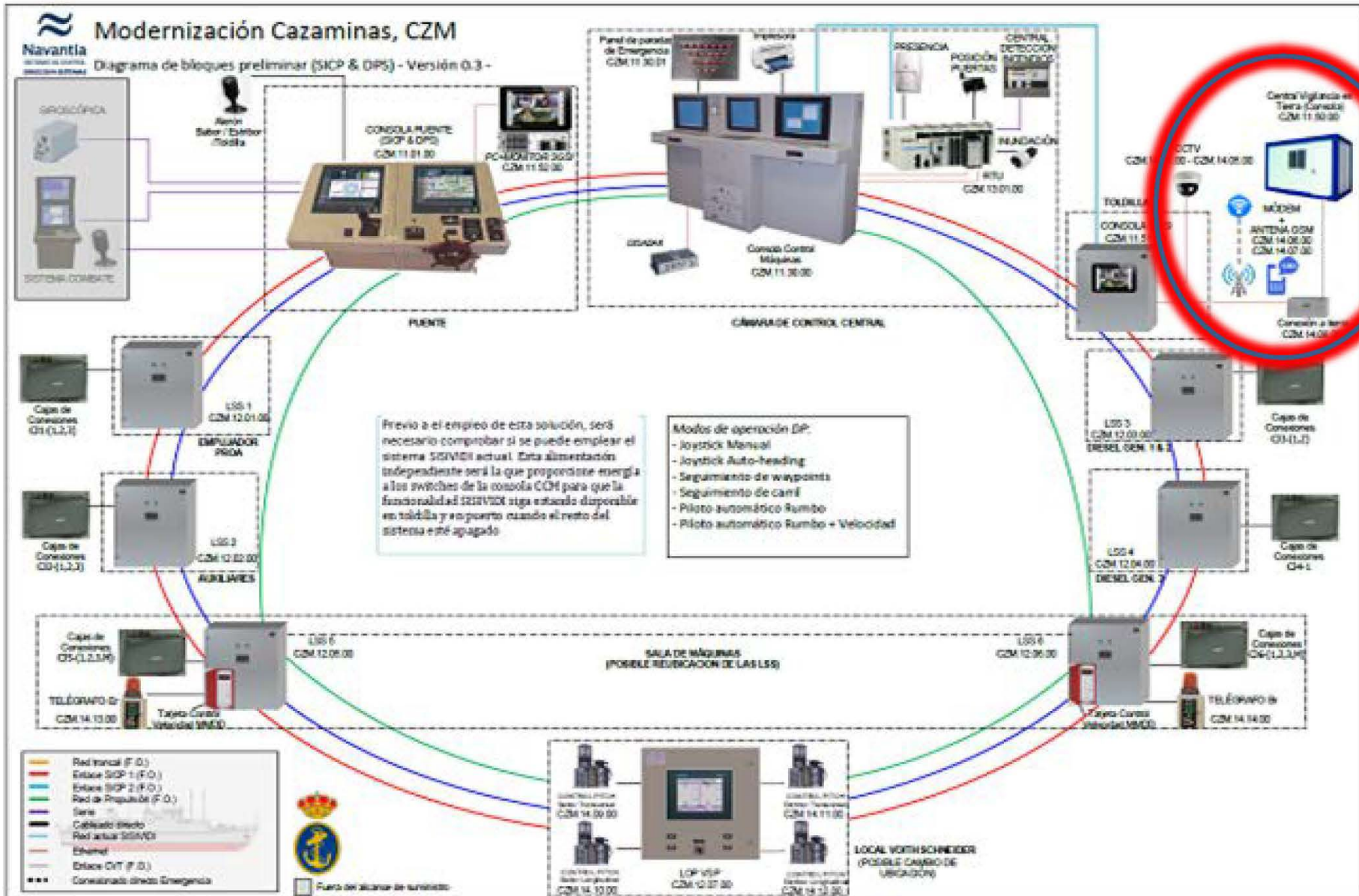


# IPMS



## IPMS ARCHITECTURE







# IPMS



## OPV REQUIREMENTS

- Reduced Crew
- Less Lifecycle cost
- Highest Automation
- Making-Decision Process Aid Tool



### IPMS DC Service

#### DAMAGE CONTROL

- FIRE DETECTION
- FLOODING DETECTION
- NBC DETECTION
- FIRE FIGHTING
- BILGE & BALLAST
- HVAC



Incident

#### Identification/ Warning

- Type of incident
- Priority
- Status
- Affected Compartments

ACCURATE STATUS

Reaction

#### Kill Cards

- Tightness Integrity
- Electrical & Mechanical isolation
- Fire-fighting material status.
- Reconfiguration of Vital Systems
- Immediate answer & continous feedback
- Operator Guidance Tool



# IN-PORT SURVEILLANCE CAPABILITIES



## CONDITIONS

### Goals

- Physical security.
- Reduced activity aboard.
- Saving resources.
- Increasing crew's quality of life.
- Higher crew's availability.

## FEATURES

Monitoring Capability

Remote Control of Equipment

Requirements

### Non-working time

- No personnel on board
- External electric power
- CCTV & IPMS On
- DC equipments and Systems On
- HVAC equipment On
- A set of auxiliary equipments On
- Minimum illumination On
- DC material available
- Shortened Duty team

### Special Scenario

- No personnel on board
- Electric power Off
- IPMS Off & In-port CCTV On
- No ammunition & weapons on board
- No danger material on board
- No food & water on board
- External DC equipment & material
- Full equipments & systems Off
- Minimum Duty team





# IN-PORT SURVEILLANCE CAPABILITIES



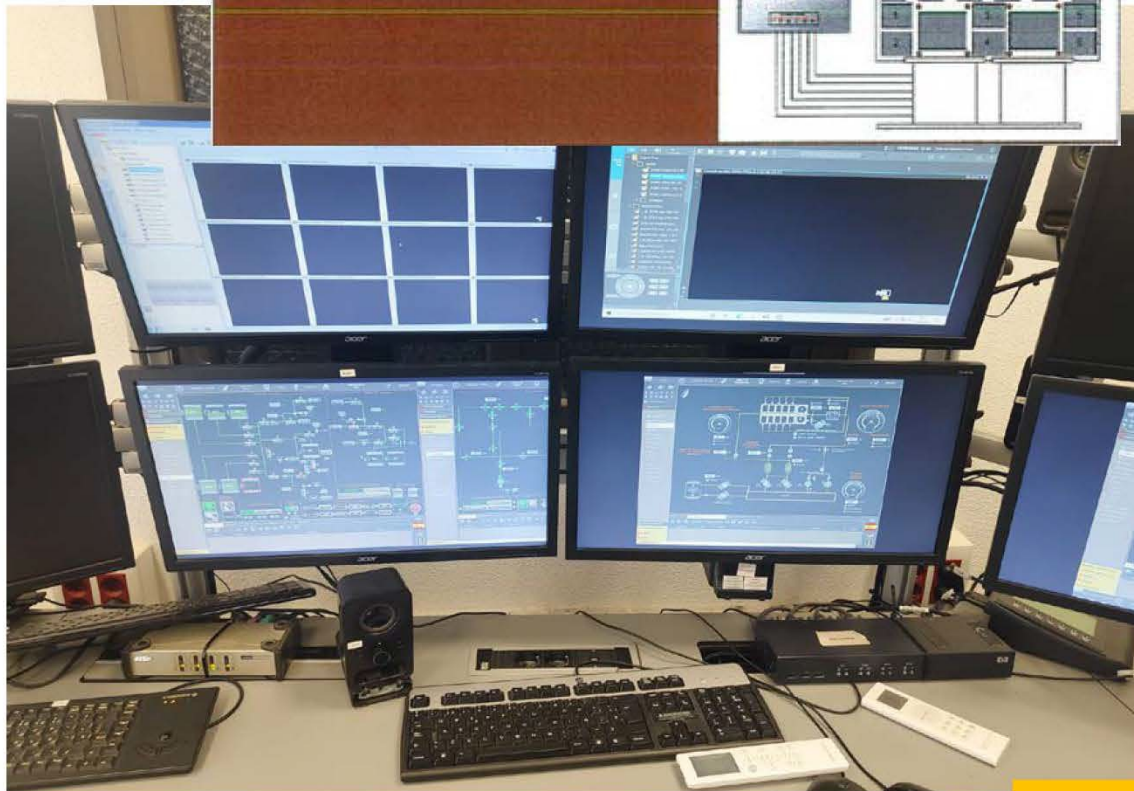
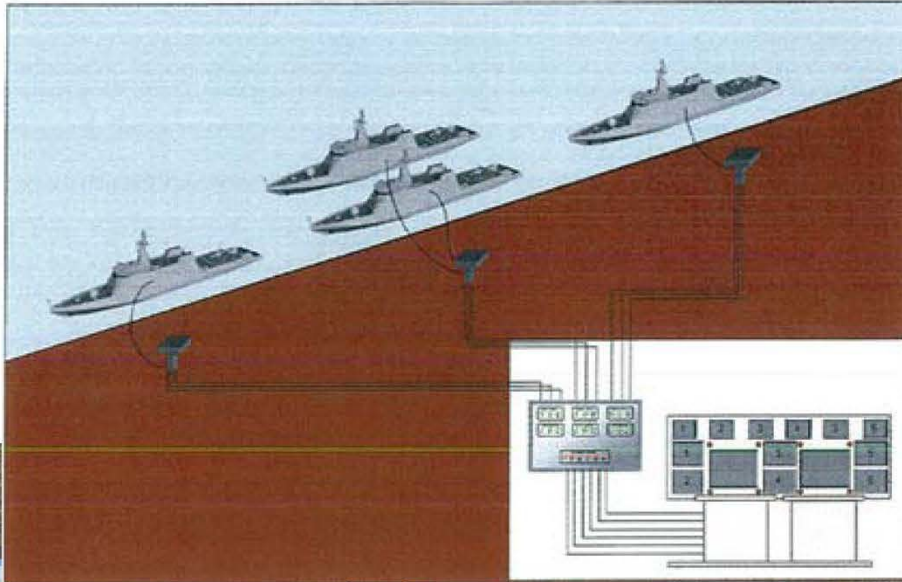
## FACILITIES

- Temporal or permanent location.
- Commercial Hardware.
- Ethernet / Gb cable & wifi Antenna.
- IPMS program loading on local stations & available Laptop connection.
- Reliable and redundant Communication link (Tetrapol network).
- IPMS network with fibre optic or wifi connection.





# IN-PORT SURVEILLANCE CAPABILITIES



**FACILITIES**



# IN-PORT SURVEILLANCE CAPABILITIES



FACILITIES

Cartagena MHC Dockside Container



- Secure framework and non-relevant operational incidents.
- Electric Energy saving around 35%.
- Decreasing the number of duty personnel between 35% to 70% & depending on the Naval Authority.
- Greater crew's motivation and responsibility.
- Higher awareness about incident detection & preparation.

**OPV ( Since 2014 )**



**MHC ( Installed 2024 )**



**Foreseen for Frigate F-110 / Submarine S-80 / Subacuatic Intervention Vessel**



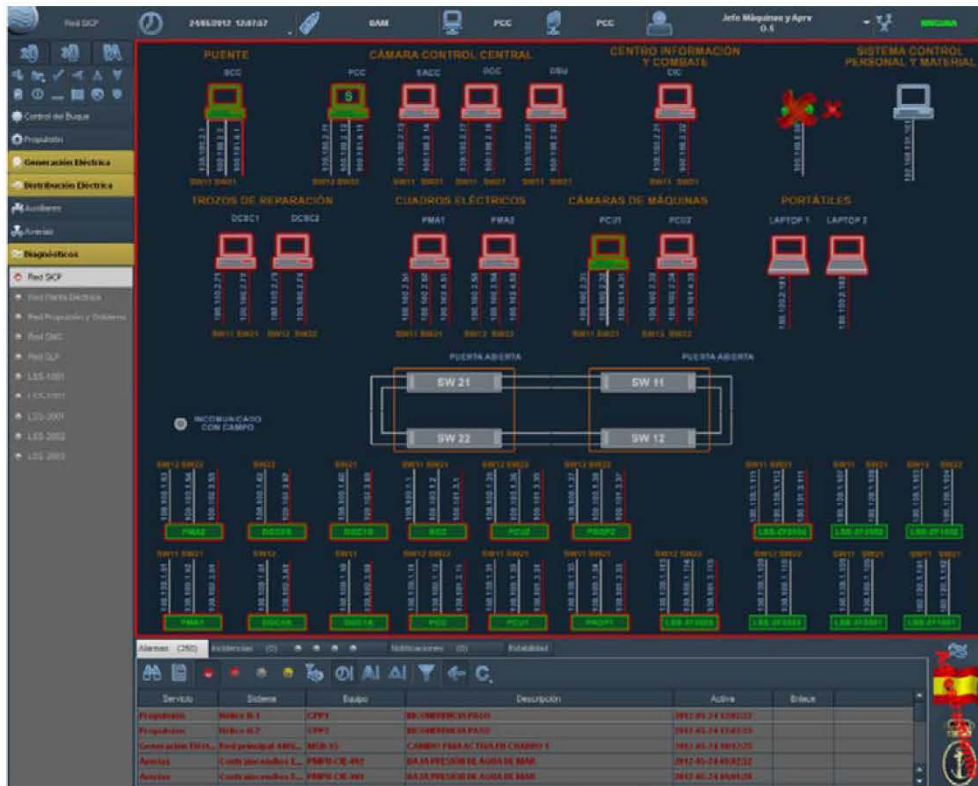
# TRAINING



## IPMS COMMUNITY

- Flood, fire or multiple incidents are setting virtually in the OBTS, IPMS training module.
- Sharing general knowledge among the IPMS users.
- Authentic training exercises are taking place on board, weekly.

### VIRTUAL ENVIRONMENT



### REAL SITUATION





# INCIDENT REACTION



## INNOVATIVE EMERGENCY PROCEDURES

New OPV In-port  
Emergency Plan



DC DOCTRINE

- Sizing **Emergency Team** (4-6 Pax). Features, roles, missions and background.
- DC material ready to deploy.
- Communications links On.
- DC Systems, CCTV, IPMS & critical assets On.

PREPARATION

- Basic Roles: Petty Officer, senior sailor, junior sailor & IPMS operator. Ad-hoc group.
- On board rounds periodically (2 per duty time).
- Internal & external Communications links On.
- DC Systems, CCTV, IPMS & Critical Assets On

DETECTION



Killcard  
activation



Quick deployment  
Emergency Team

- High degree of tightness integrity.
- Mechanical Isolation.
- Electrical isolation.
- Fire-fighting material.
- Counter-flooding measures.
- Guidance semi-automatic Process.



Killcard  
Context Menu

# INCIDENT REACTION

POWERFUL TOOL



KC-CAER (CENTRAL AUXILIARY ENGINE ROOM)

Source **Tightness** Mechanical Isolation Electrical Isolation Fire Fighting Means Configuration Change

Element	Inhib./Curr. St.	Cmd./Desired St.	Control	Description
<b>Ventilation Emergency Stop</b>				
FEC-FEC_CAER				Fire Emergency Condition in CAER
Fans				
Fire Dampers				
Firedoors				
Motorized Valves				
MV-NBC4002	Closed	Closed	Local	MOTORIZED VALVE - NBC SYSTEM - FIRE ZONE 4
MV-NBC4003	Closed	Closed	Local	MOTORIZED VALVE - VENTILATION SYSTEM - FIRE ZONE 4
MV-NBC4004	Closed	Closed	Local	MOTORIZED VALVE - VENTILATION SYSTEM - FIRE ZONE 4
FEC-FEC_FZ				Fire Emergency Condition FZ N°4
Fan/Coll				
Fans				
Fire Dam				
Heating				
Motorize				
NBC Filtr				
Pumps a				
Valves v				
<b>Firewall Doors</b>				
<b>Doors, Hatches an</b>				
<b>Tight limits</b>				
Deck 6: FR1				

**MV-NBC4002**

- Show Detail Window
- Open
- Close
- Inhibit
- Go to 2D Mimic
- Go to 3D Scene
- Go to Data
- Go to Panel (VMS-VCS0004)
- Go to Panel (VMS-VCS0004)
- Add to Events Auditory
- Add to Actions Auditory
- Show Equipment Signals
- Show Controllers
- Set as route origin
- Set as route destination

X | Y | Z | W



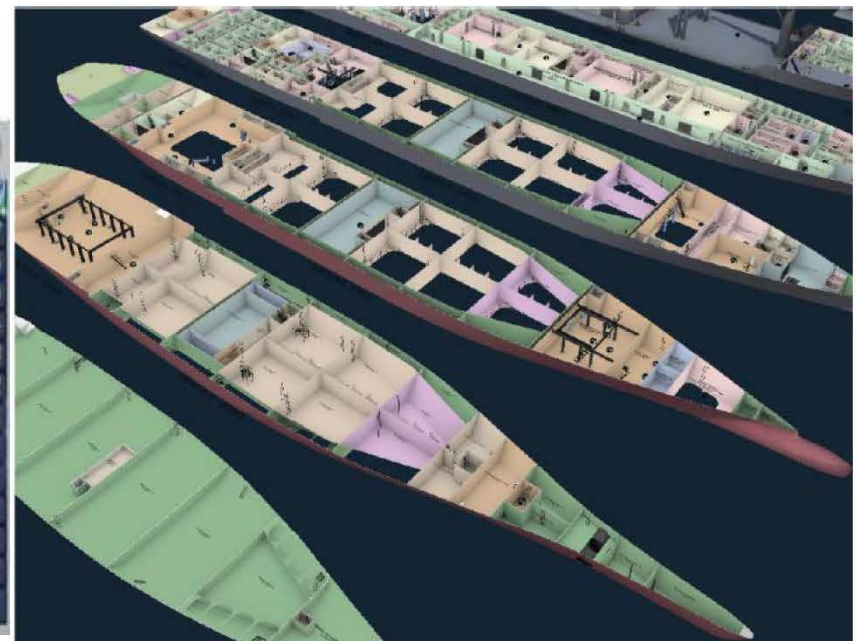
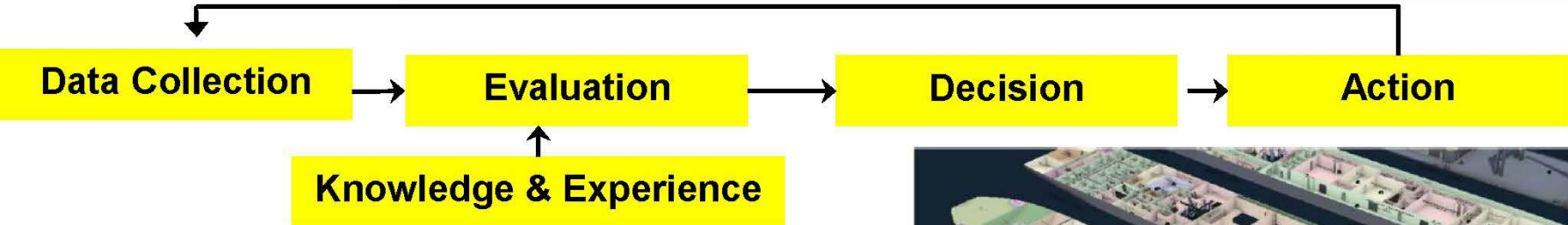
# INCIDENT REACTION



## EMERGENCY TEAM

### ACTION

- Killcards executed.
- Emergency Team deployed and constant coordination with IPMS operator.
- Ground support with duty personnel from the Arsenal.
- Civil Emergency services.







# NEW DEVELOPMENTS



## DC EXPECTATIONS

- Incident typology.
- Flooding, Fire & Engine Room.
- Sensor data.

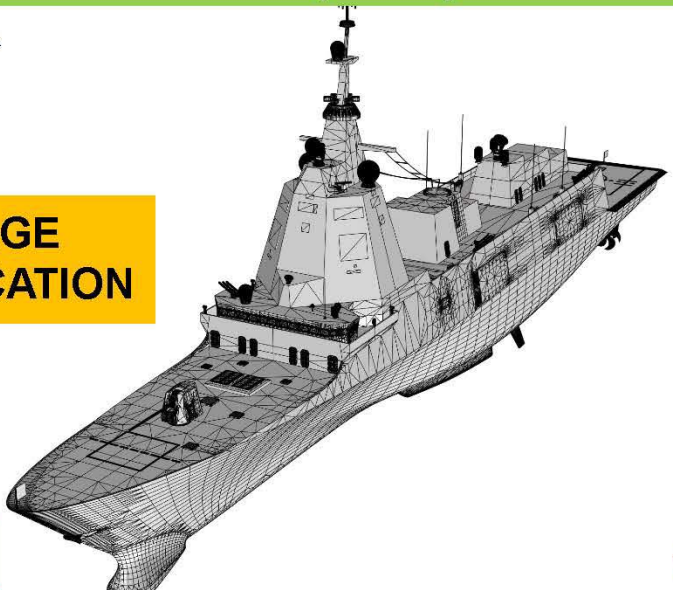
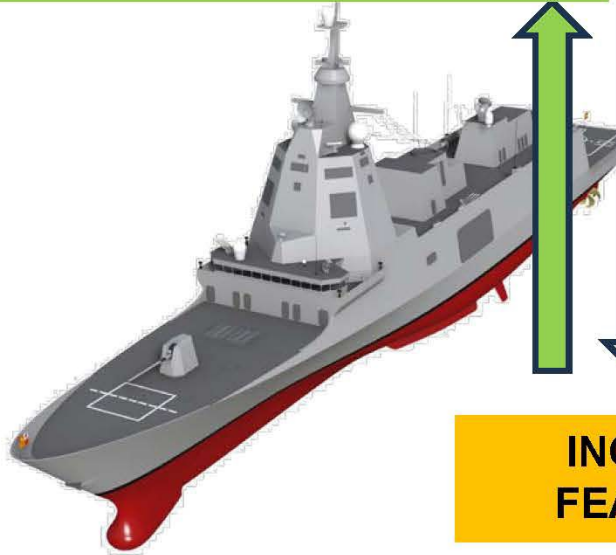
- Tightness condition.
- Operational priority.
- Sensor data.

- Lessons learned
- DC Experience.
- Smart Rules.

### Key factors

- Vision 3D flooding area.
- Vision 3D smoking area.
- Vision 3D O<sub>2</sub> distribution.

- Vision 3D damage area.
- Readiness extinguishing tools/material.
- Damage propagation forecast.
- Recommendations & priority.



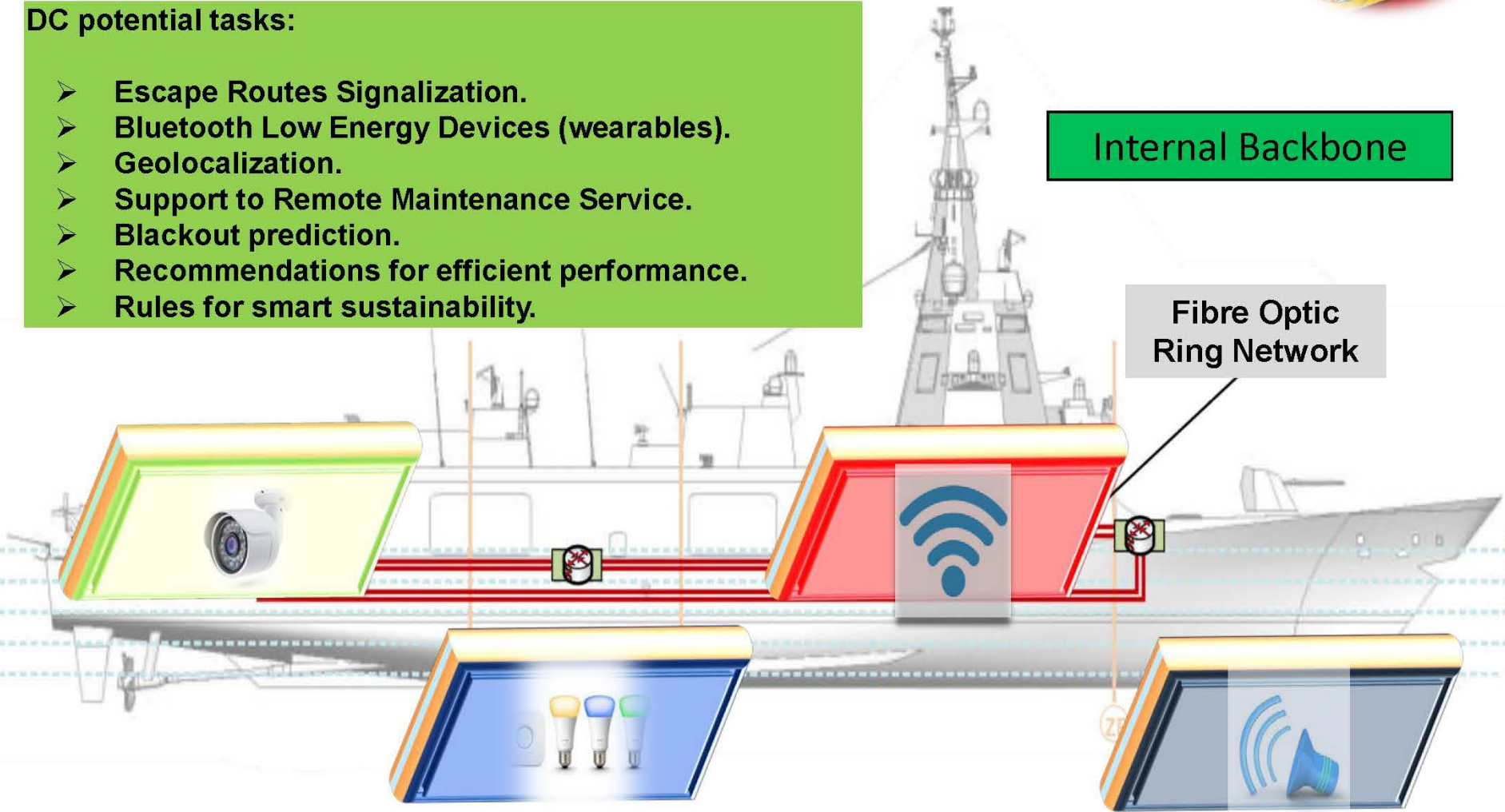
INCIDENT FEATURES

DAMAGE IDENTIFICATION

## DIGITALIZATION DC PROCEDURES / Digital Twin

## DC potential tasks:

- **Escape Routes Signalization.**
- **Bluetooth Low Energy Devices (wearables).**
- **Geolocalization.**
- **Support to Remote Maintenance Service.**
- **Blackout prediction.**
- **Recommendations for efficient performance.**
- **Rules for smart sustainability.**





## CONCLUSIONS



- Using Technology for the DC issue is an affordable, feasible and fruitful way. In-Port surveillance is a good example.
- The use of In-Port surveillance capabilities generates multiple benefits for Ship's crew, increasing its DC awareness.
- The Spanish Navy will keep on using in-port surveillance capabilities due to their positive outcomes.



