Hellenic Navy General Staff

DAMAGE CONTROL AND CBRN DEFENCE CHALLENGES AND PRIORITIES IN THE HELLENIC NAVY

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Carrer Highlights

▸ Chief Engineer (8 years)

▸ Operations Evaluation Directorate (6 years) (HOD to DC/ Fleet HQ)

▸ FOST (S) (2014-2015) UK (SDCO 10)

▸ JCBRN Defence COE (2019-2022) CZE (NATO Doctrines Specialist)

Structure

▶ Training

▶ 'Digital Fire-fighting Team'

▶ Firefighting Techniques

▶ Flooding

▶ Mitigating the factors influencing fire risk

▶ CBRN Defence

Training

The Challenges:

➤ Realistic firefighting and DC training
  ○ Full firefighting equipment and BAs
  ○ Pressurized hoses
  ○ Firefighting techniques as in a real fire incident
  ○ Damage control techniques as in a real flooding incident
  ○ Safety of trainees
  ○ Not inside a Ship

Priority:

➤ Training Simulators

Training

Hellenic Navy's Damage Control School / Simulators

THEORETICAL TRAINING

FIRE FIGHTING TRAINING UNIT (FFTU)

EVACUATION TRAINING UNIT (ETU)

Flooding Training Unit (FTU)

Training

Simulators Participants

➤ Chinese Navy
➤ German Navy
➤ Egyptian Navy
➤ Albanian Navy
➤ Jordan Navy
➤ Israeli Navy
➤ Qatar Navy
➤ Montenegro Navy
➤ United Arab Emirates Navy

➤ Maritime domain

Training

Capacity of Training Simulators

'Digital Fire-fighting Team'

The Challenges:
- ➤ Training Simulators
  - ○ Transportation costs
  - ○ Maintenance costs of BAs
  - ○ Instructors' cost
  - ○ Cost of fuel
- ➤ Health monitoring of Firefighters
- ➤ Age burden of instructors
- ➤ Stress / lack of experience by the PIC
- ➤ Manpower to Naval Bases

Priority:

- ➤ 'Digital Fire-fighting Team'
  - ○ VR Training
  - ○ Human Life

- ➤ Artificial Intelligence (AI) support

- ➤ Naval Bases
  - ○ Drones
  - ○ Digitalization
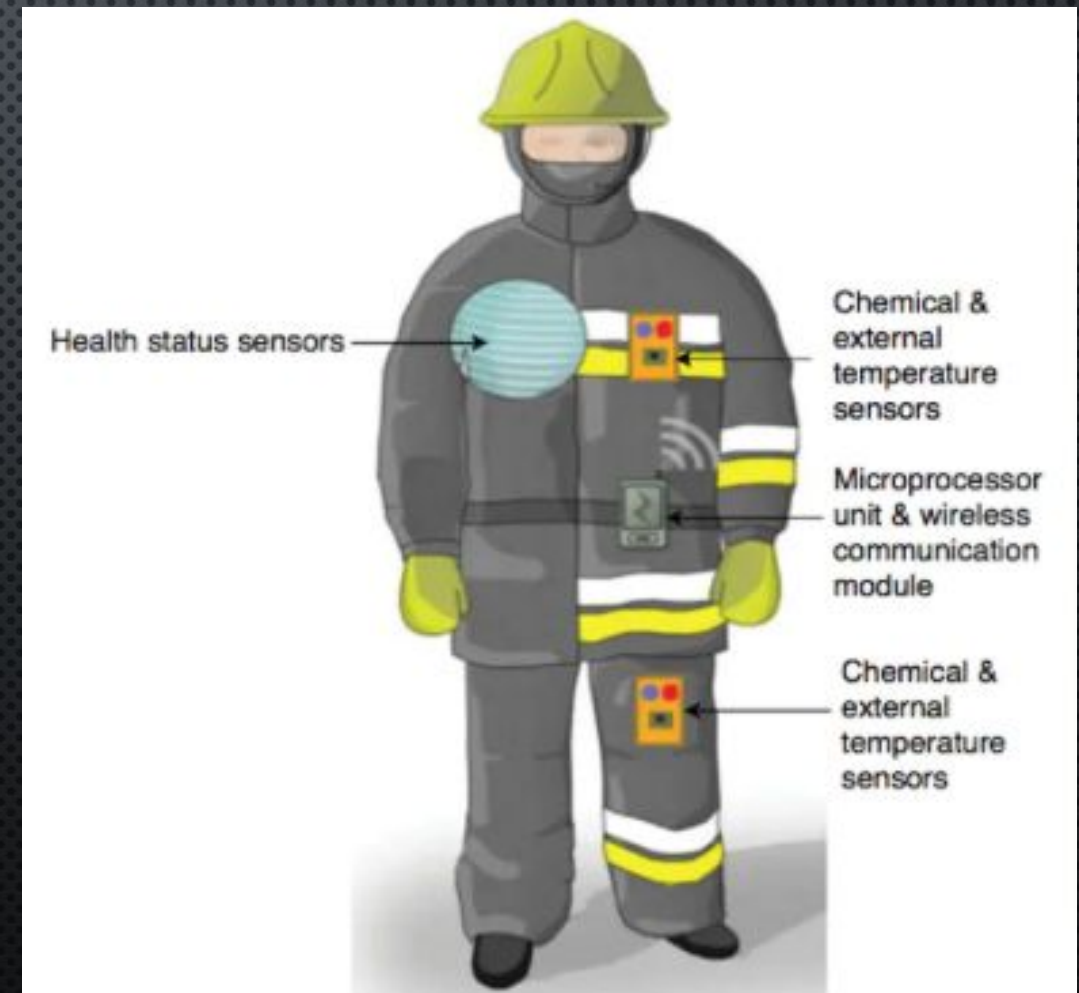
'Digital Fire-fighting Team'

VR Training

- safe
- 360 degree view
  - ceiling
  - behind
- water

'Digital Fire-fighting Team'

Human Life

▶ Biometric monitoring addressing:

- ○ carcinogenic exposure levels
- ○ cardiovascular and heat stress
- ○ physiological status

▶ comfort…

'Digital Fire-fighting Team'

Human Life

▶ Personnel Location Equipment

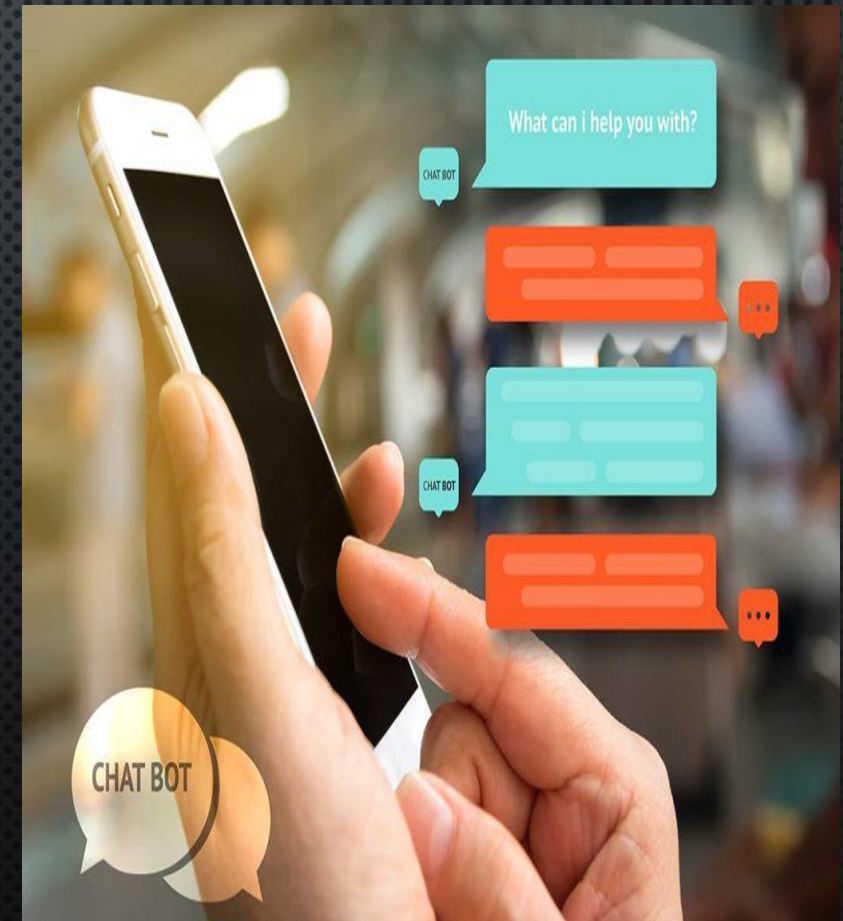 ○ The benefits:

   ◦ structural colapse
   ◦ injured or trapped
   ◦ radios and GPS ??

'Digital Fire-fighting Team'

Artificial Intelligence (AI) support

▶ 'Fire Fighting Chatbot'
  ○ Why it is important
  ○ Device (OOD ashore, MEO at sea- not battle)

    ◦ Continuous Training by a Machine Learning
      (ML) function

    ◦ Pre-installed scenarios/ fire incidents for each
      compartment

    ◦ More than a check-off list
      ▪ reminders
      ▪ answers
      ▪ COA

'Digital Fire-fighting Team'

Naval Bases
Drones

▶ Aerial imagery

▶ Thermal / IR vision
○ Eyes above scene
○ 'see through smoke'
◦ hot spots

◦ direct firefighters

'Digital Fire-fighting Team'

Naval Bases Digitalization

▸ Maps
▸ Dangerous materials
  ○ MSDS

▸ Software run scenarios
  ○ climate conditions
  ○ manpower
  ○ FRS response time

▼

personnel management

'Digital Fire-fighting Team'

➤ Tested technologies:

  ○ VR Training (basic and advanced firefighting techniques)
  ○ Biometric monitoring and Personnel Location Equipment for FF
  ○ Chatbot for firefighting purposes
  ○ Naval Bases:
    ◦ Mil-spec Drones
    ◦ Modelling and Simulation software
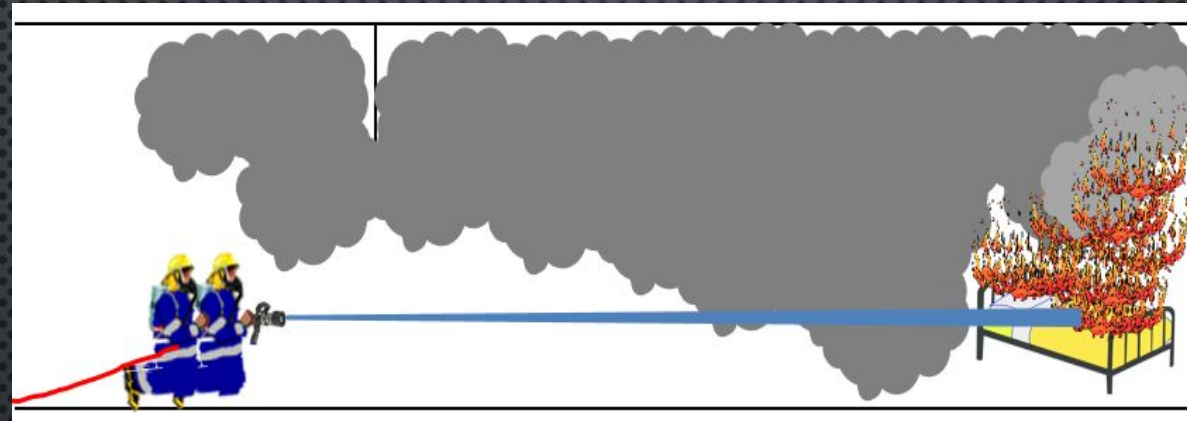
Fire-fighting Techniques

The Challenge:
- ➤ Different equipment for the same purpose
  - ○ Fire-fighting nozzles
    - ◦ Different techniques (confusion)
      - ▪ waterwall, firefighter
      - ▪ vari-nozzle
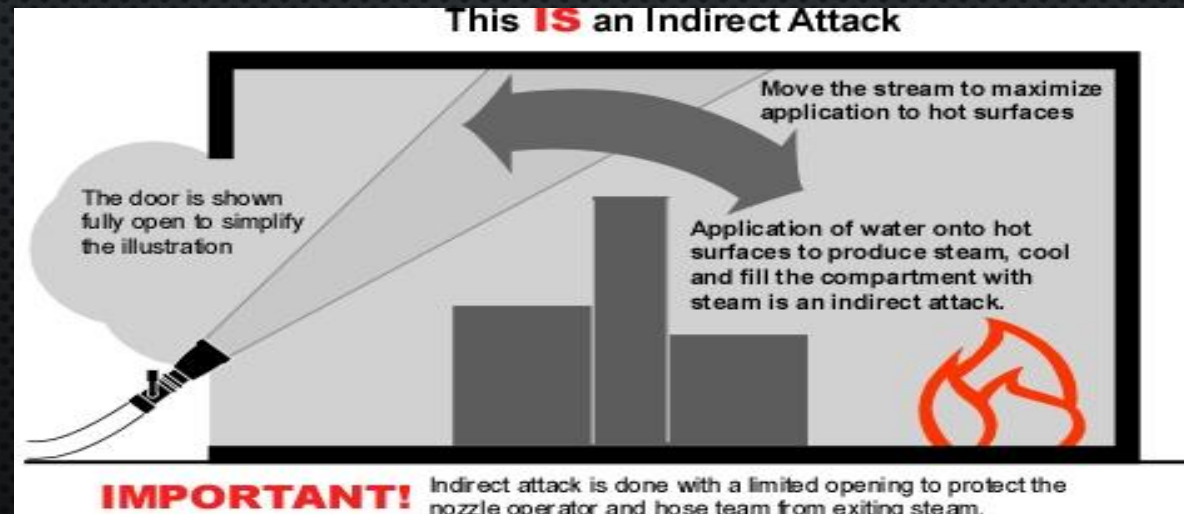   - ▪ foam nozzle
      - ▪ other nozzles

Priority:

- ➤ One nozzle for all techniques

Fire-fighting Techniques

▶ Direct attack

▶ In-direct attack

This **IS** an Indirect Attack

Move the stream to maximize application to hot surfaces

The door is shown fully open to simplify the illustration

Application of water onto hot surfaces to produce steam, cool and fill the compartment with steam is an indirect attack.

IMPORTANT! Indirect attack is done with a limited opening to protect the nozzle operator and hose team from exiting steam.

Fire-fighting Techniques

▸ Gas cooling (3D Firefighting)

  ○ using 'Burst and Pause' cycles, to cool gases in the overhead
  ○ water droplet size: 0.2 - 0.4 mm
  ○ less water than other techniques (Free Surface)

Fire-fighting Techniques

➤ A nozzle that does it ALL
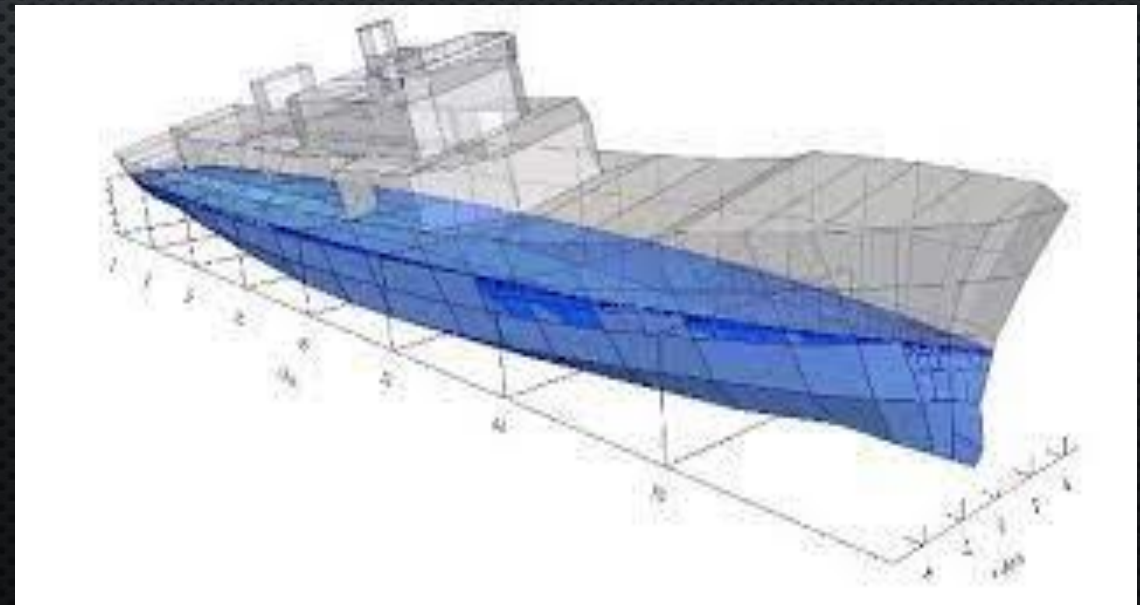 ○ FF
  ○ WW
  ○ Foam

Flooding

The Challenge:
- ➤ Quickly assess the Damage Stability of a Ship
  - ○ Hydrostatic Curves ?
  - ○ Lack of combination (i.e. aft and forward compartments)
  - ○ Measuring the water depth due to a flood in real time
    (i.e. rising, falling, 'winning or loosing')

Priority:

- ➤ Elaborate a software which calculates
  the damage control situation for every
  possible case
- ➤ A system that depicts in real time
  the water depth to each comp

Flooding

➤ A DC stability software for each Ship class

➤ Monitoring in real time of the water depth

Mitigating the factors influencing fire risk

The Challenges:

1. Maintenance of electrical and mechanical systems

2. Maintenance of fire prevention equipment

The Challenges:

3. Safety culture

Priorities (for Safety Culture):
➤ Engage all
➤ Upper Management
➤ Safety incident reporting system
➤ Reward
➤ Hazard assessment / re-assess
➤ Satisfaction

Mitigating the factors influencing fire risk

Priorities (for Safety Culture):

➤ Work with human factors consultant specialists
  ○ How the organization treats its personnel?

Mitigating the factors influencing fire risk

➢ Safer regulations

➢ Embrace a safe culture

CBRN Defence

The Challenges:

➤ New geopolitical threats
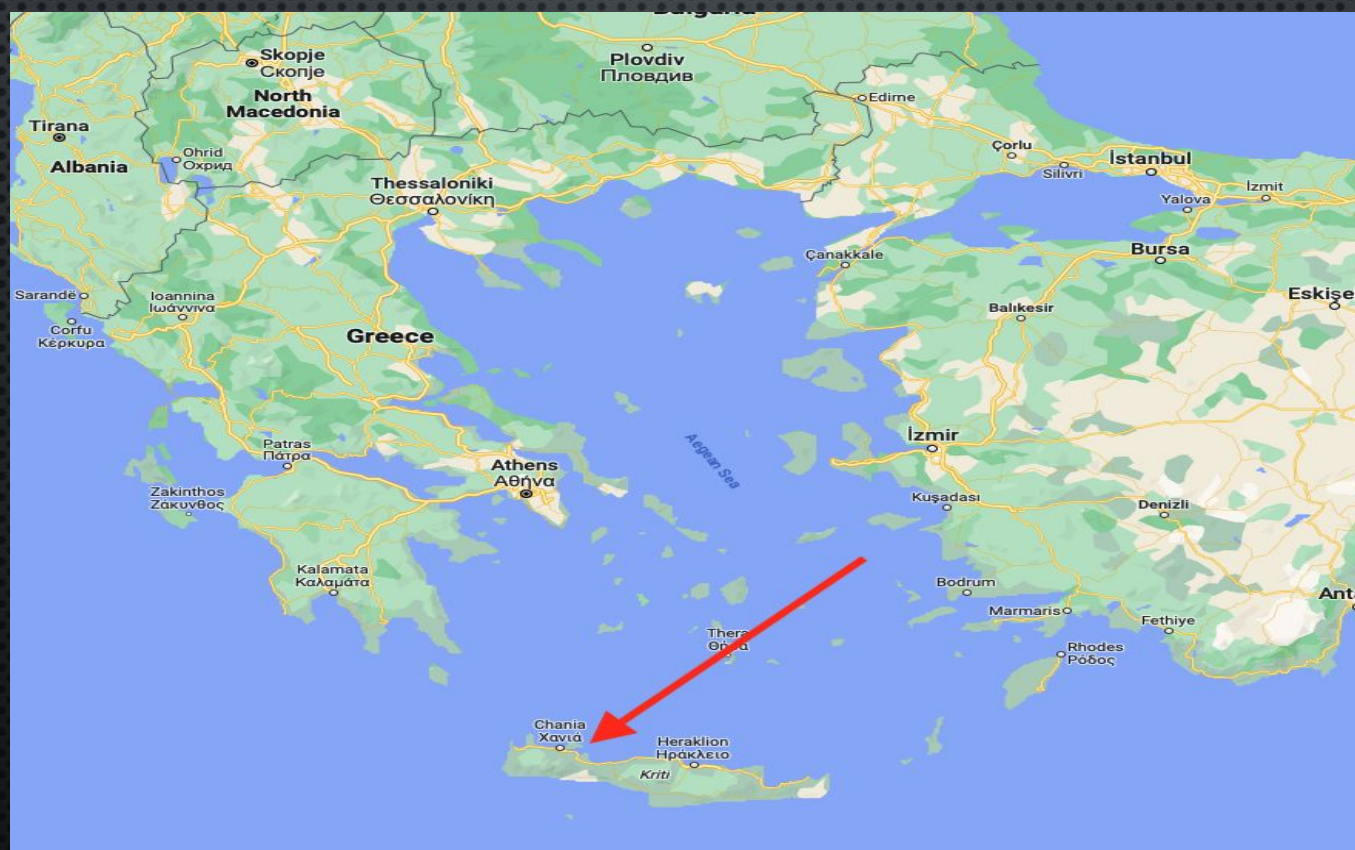➤ Implement the new NATO CBRN Policy (July 22)

NATO's Principles and Commitments for CBRN Defence

CBRN Defence

Priorities:

➤ Naval CBRN exercise in littoral waters: 'Toxic Bay' / in Souda bay / NATO Maritime Interdiction Operational Training Centre (NMIOTC) https://nmiotc.nato.int in 2024

CBRN Defence

Priorities:

➤ 1 Week (Sun-Fri) TBD
➤ several CBRN-related scenarios will be exercised including civ-mil cooperation
➤ Command team (up to CBRN Officer's level)
➤ Target group:
   ○ CBRN officers
   ○ CBRN teams (survey, RECCE)
   ○ MIO teams
   ○ firefighters, harbour authorities,
      environmental authorities.
   ○ private sector

Hellenic Navy General Staff

Your Attention is Appreciated !

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