

# RESPONDER PROTECTION

## Hazards :

- explosion :
- fire :
- toxic, noxious :
- corrosive :
- radioactive :
- biologic :
- cryogenic :
- NRBC :

## Effects :

- splinter – pressure – thermal effects
- radiation – temperature
- solid (dust...), liquid, toxic gas
- idem corrosive
- idem, irradiating or contaminant
- idem avec infection, toxicity
- freeze burn
- solid (dust), liquid, gas

# Maritime specificities

- Fall at sea : location, flottability, cold, stability
- Transportation : hélipontage, rope ladder, air sickness and naupathia
- Moving on board : narrow environment, vertical ladder, list, darkness
- Risk exposure duration (protection autonomy )
- Stress (noise, capsizing risk, claustrophobia, uncertain return, fall, difficult rescue,...)
- Undispensable respiratory protection
- Heat or cold
- Heavy supply
- Constraining management of donning, decontamination and doffing

# RESPONDER PROTECTION

**Gas tight suit, splash suits with breathing apparatus :**

- advantages :
  - Large range of protection against chemical, toxic, corrosive and biological materials
  
- limits :
  - Don't protect against explosion, fire, from certain chemical products (to know), irradiating radioactive products
  - Limited ease, keep body heat without adapted cooling system, heavyness, limited performance to cold thermal shocks, responder stress, sensitivity to mechanical strengths



# RESPONDER PROTECTION

## Encapsulated suits with Self-Contained Breathing Apparatus (SCBA):

- advantages :
  - Large range of protection against chemical, toxic, corrosive and biological materials
- limits :
  - Protection spectrum against chemicals less large
  - Idem ahead



# RESPONDER PROTECTION

## Fire fighting suits :

- don't protect against gas, and toxic or corrosive vapors



# RESPONDER PROTECTION

## NRBC suits:

- Limited protection against gas and vapors
- Air purifying respirator



# RESPONDER PROTECTION

- **Approach suits with SCBA :**
  - advantages :  
Large range of protection against chemical, toxic, corrosive and biological materials
  - limits :  
limited spectrum and limited protection against vapors



# RESPONDER PROTECTION

## Manstrim encapsulated suit:

A concept of specific protection developed by french Navy and Matisec :

Gas and splash encapsulated suit with long term SCBA :

- liquid air SCBA,
- gas and splash protection





# RESPONDER PROTECTION

## Manstrim

### encapsulated suit :

- Limited to responders with physical and mental very high capacities
- Needs a very heavy logistic support
- Advanced training required



# OUR LIMITS

## **THEY ARE LINKED TO**

- Hazard identification (ex :pollutant behaviour at sea ),
- Physical capacity of the responder,
- Respiratory protection duration
- Ship accessibility ,
- Risk/rescue ratio,
- Actions means really available,
- Transportation vectors (out and home),
- Protection capacity (fire-explosion, all type of toxic materials, radioactive incidents,...),
- Rescue team skills (polyvalence, protect each other,...),
- Logistic (before and during opération),
- Financial support ...