Security Problems in operational navy systems, Industrial point of view

STRENGTH at sea

DCNS

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2. Risk approach
3. Methodology
4. Solutions
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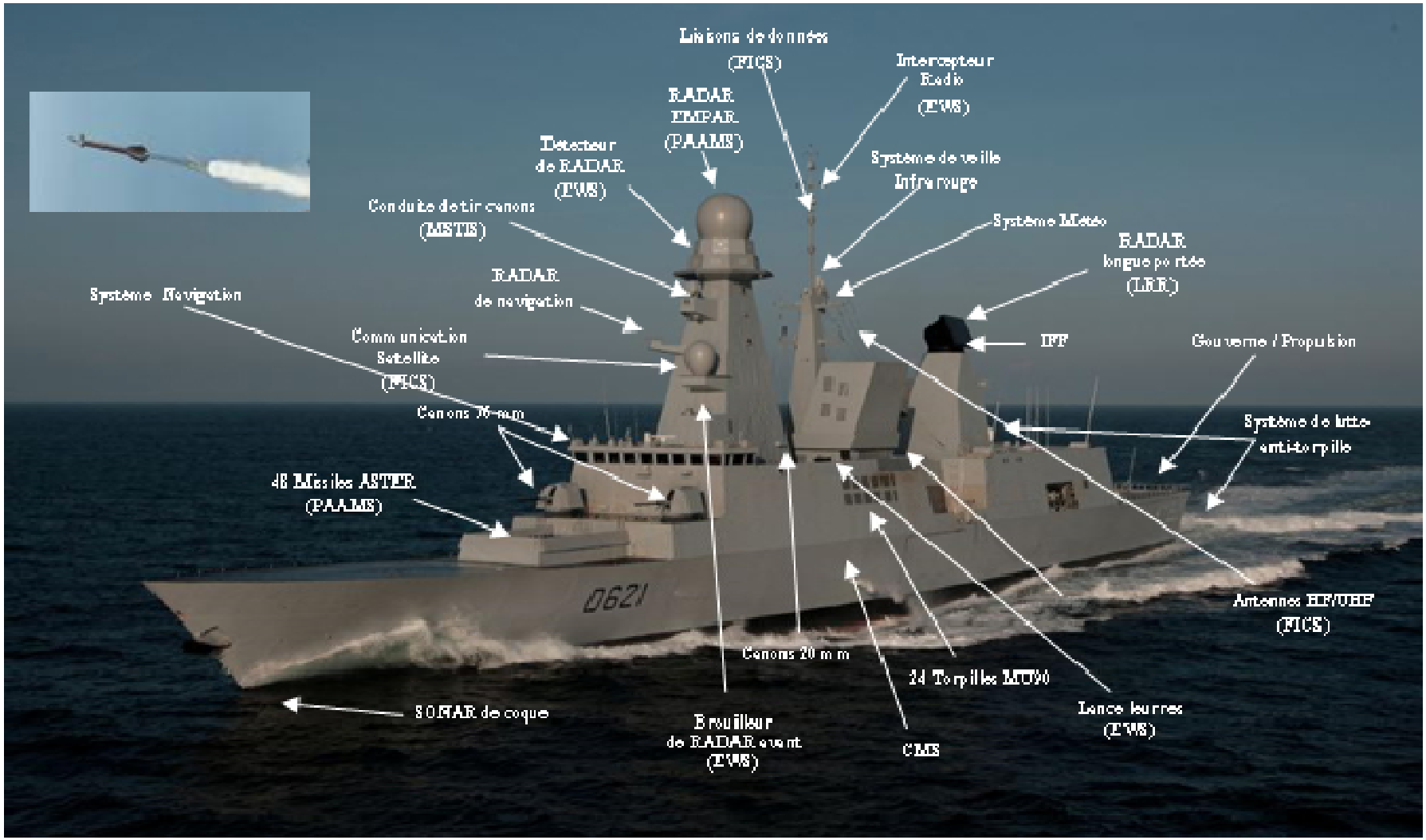
Context : Warship Information System
Combat System & Ship Management System



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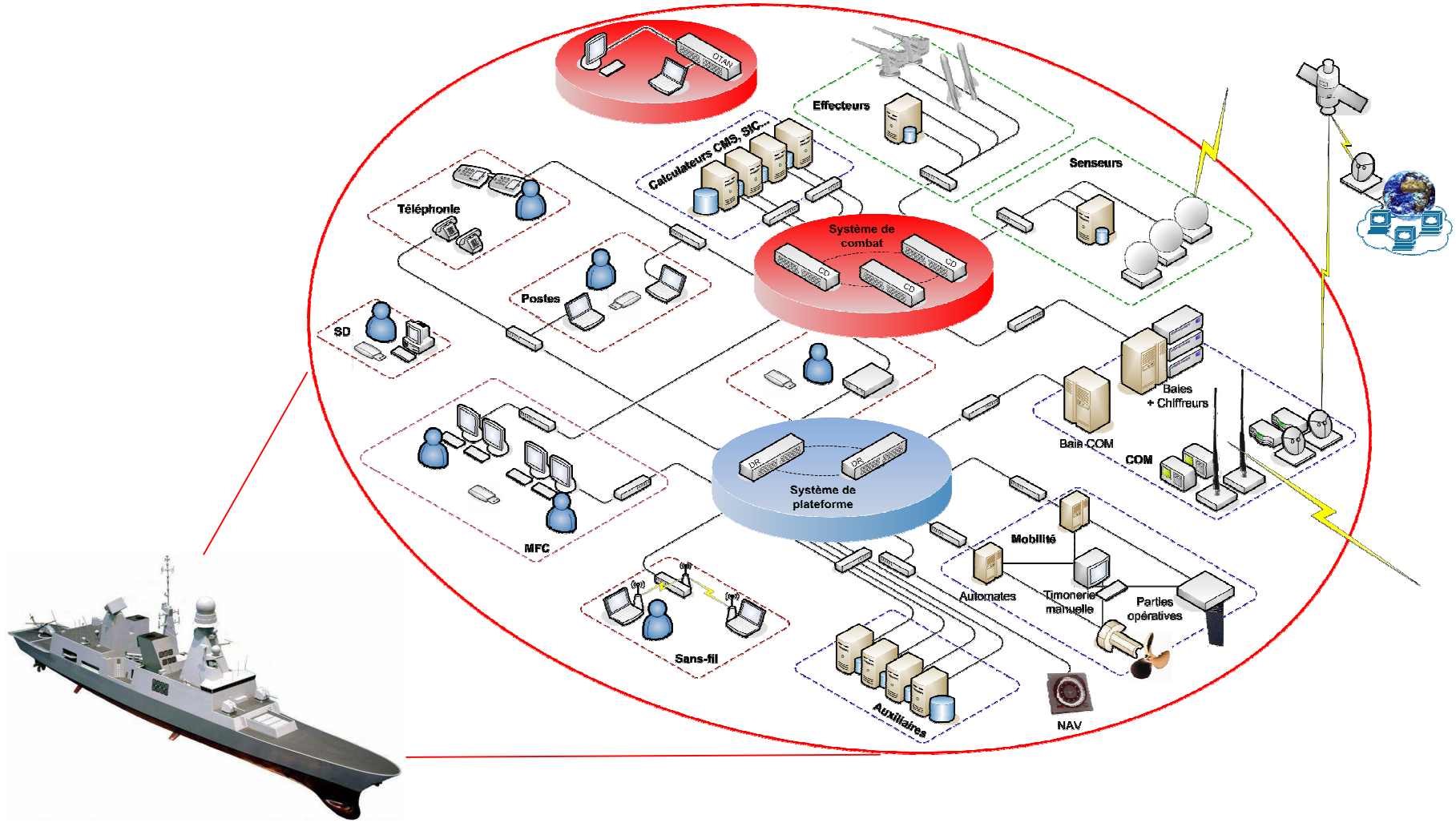
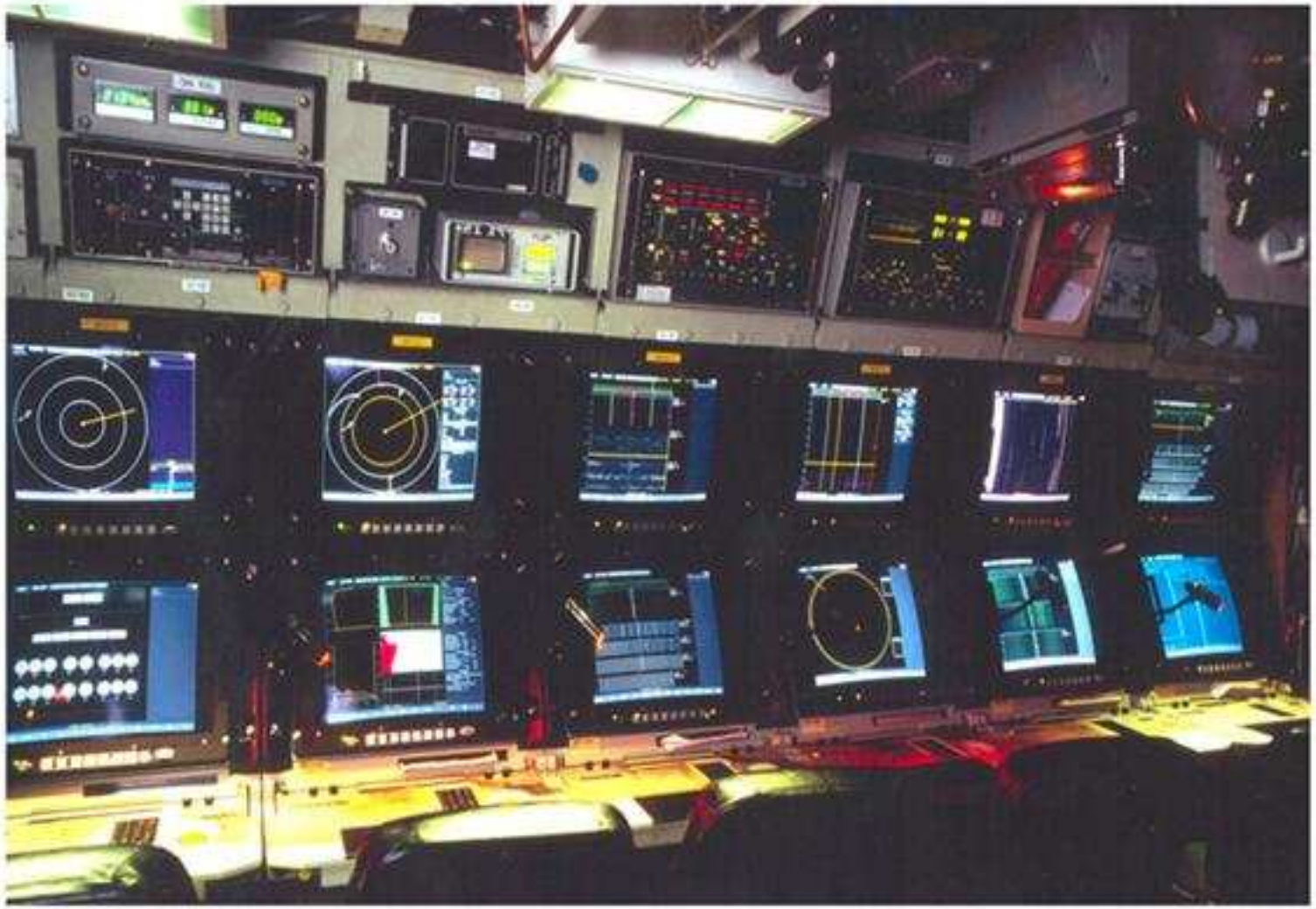


Context : Warship Information System
Central Operation Room



Warship Information System Security : Why Based on Civil Technology

- **Duality Civil / Military**
  - Hardware : PC based equipment
  - Operating Systems : Linux, Windows
  - Application level : web technology, Java
  - Network protocols : TCP/IP, HTTP
  - Network equipments : switch, router
- **Advantages :**
  - Cost reduction
  - Maturity of the Technology
  - Performances

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- **Advantages :**
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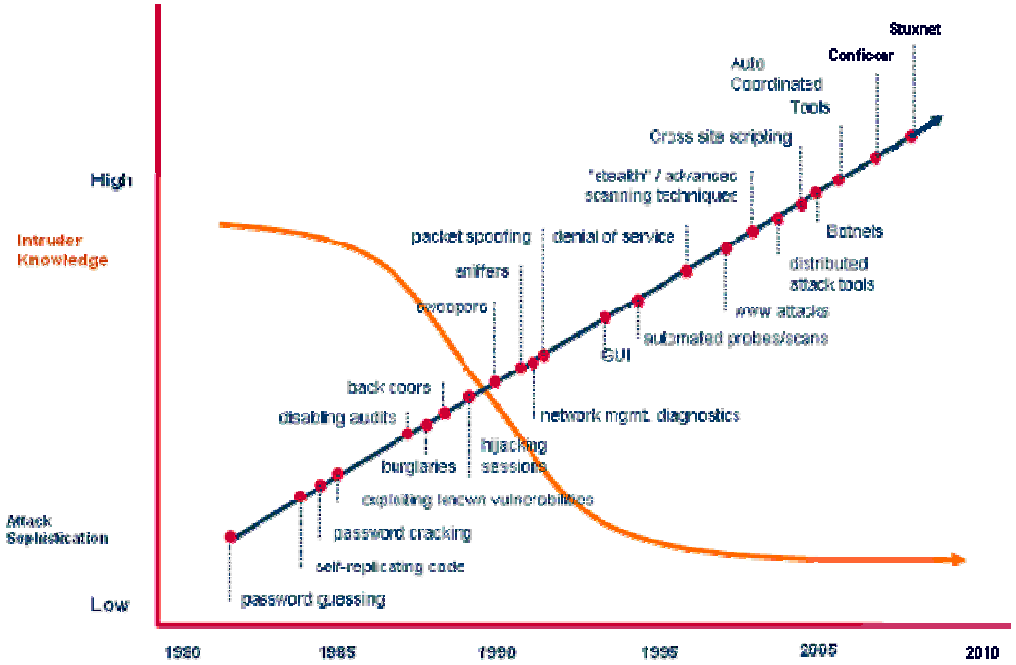
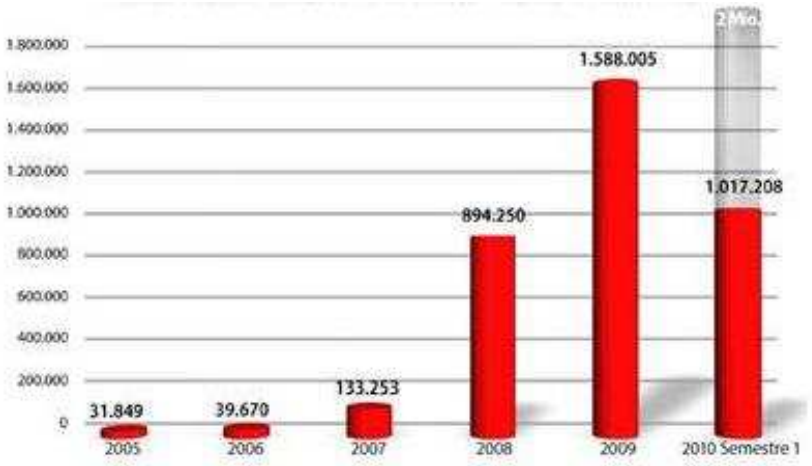
- **But :**
  - **Well known Vulnerabilities**

Warship Information System Security : Why Increase of security attack



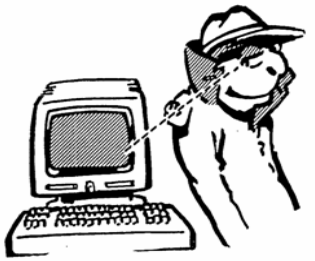
New malware between 2005 and 2010



Warship Information System Security : Why Critcal Impacts

- **Combat system :**
  - **Confidentiality : Communication,**
    - e.g : disclosure of mission data
  - **Integrity : Tactical situation, information database**
    - e.g : corruption of missile target data
  - **Availability : main warfare systems**
    - e.g : shutdown of Air Defence System

Confidentiality



Integrity

Availability

Warship Information System Security : Why Critical Impacts

- **Ship Management System :**
  - **Confidentiality : navigation subsystem**
    - e.g : disclosure of SSBN position
  - **Integrity : auxiliary automate**
    - e.g : corruption of the course
  - **Availability : ship management**
    - e.g : uncontrollability of the ship

Availability

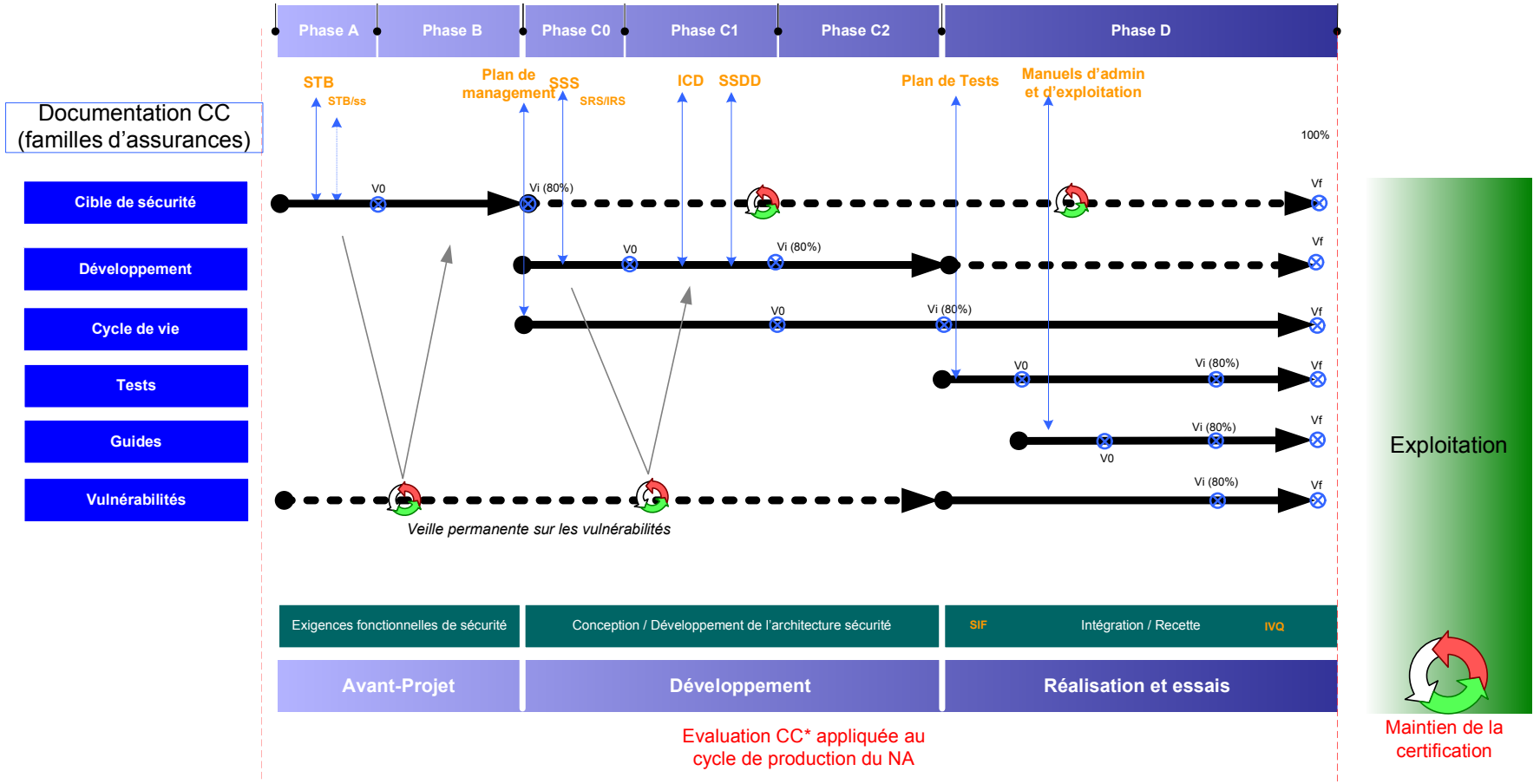
Integrity

Confidentiality

Warship Information System Security : How Security Methodology

- **Methodology depends on National or NATO Security Accreditation Authority**
  - **Accreditation process**
    - Risk analysis (MOD)
    - Security requirements (IND)
    - Security mechanisms development and test (IND)
    - Audit (MOD)
    - Authority acceptation (MOD)
  - **Common Criteria methodology**
    - Global security analysis to give an assurance on the whole information system
      - › e.g : EAL1 at whole warship level
    - A deeper analysis for critical part of the system
      - › e.g : EAL3-5 at subsystem, component or equipment

Warship Information System Security : How Security in Industrial development



Warship Information System Security : How Security Functions

- **Risk analysis lead to security requirements**
  - **Based on Common Criteria Security Functions**

  - **Identification and authentication**
  - **Access Control Policy**
  - **Flux Control Policy**
  - **User Data Protection**
  - **Communication and cryptography**
  - **Security Audit**
  - **Security Management**

Warship Information System Security : What Security mechanisms

- **Architecture**
  - Sensitive level separation
  - Red / Black Architecture
- **GOTS/COTS integration**
  - Cipher
  - Antivirus
  - Firewall
  - IDS/IPS
  - Diode
- **Specific development**
  - Operating System Configuration
  - Software Components

Antivirus

IP Cipher

Firewall

IDS/IPS

Warship Information System Security : What Security mechanisms

- **Physical security**
  - Electronic access control
  - Alarms
  - Video surveillance
  - Intruder detection systems

Protected areas

CCTV

Locks

- **Administration and Organisation of Security**
  - Regulation
  - Security operating procedures
  - Technical policies (ex: password policy)

Safes

InfraRed & hyper-frequency sensors

Motion detectors

- **Personnel security**
  - Security clearance
  - Training

Holograms

Digicode

security seals

Warship Information System Security
Conclusion

- **Warship Information System can be targeted by malware**
  - **System based on civilian technology**
  - **Number of malware increasing**
  - **Human life impact**

Security … Not an option … A MUST

STRENGTH at sea