

Managing and Maintaining Cable Penetration Integrity

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Shipbuilding – What is more important?

- Electrical

- Piping

- Ventilation

- Machinery

- Protective Coatings

- Outfitting

- Structure

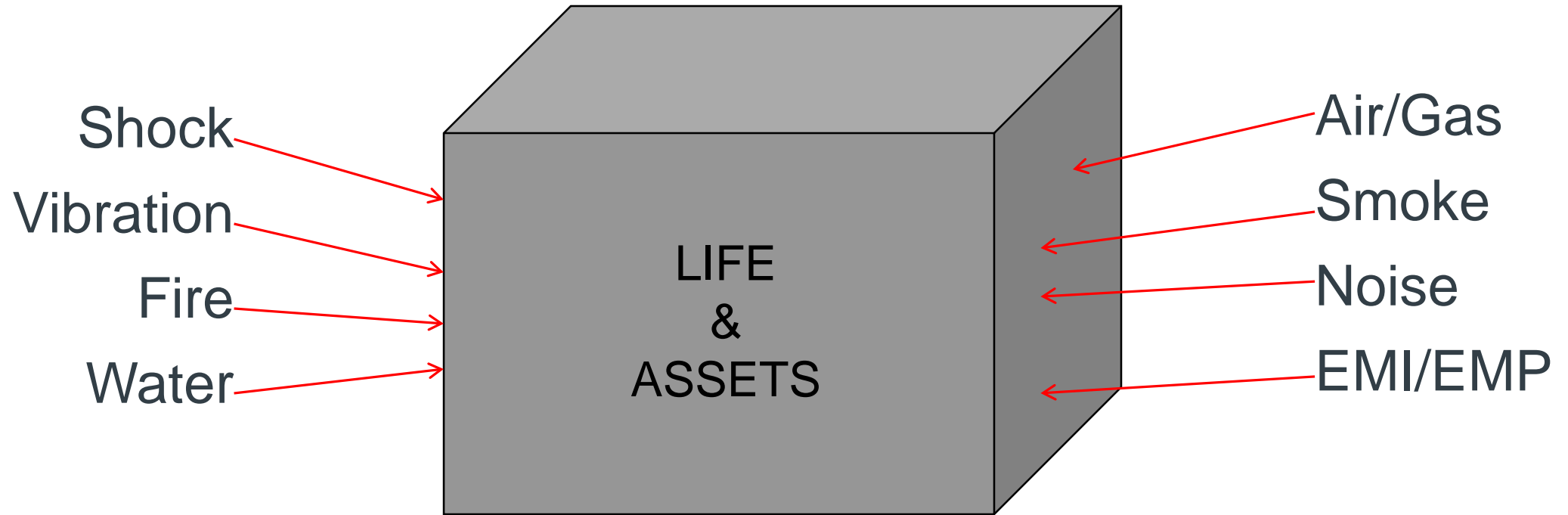
It is ALL important!

- A ship is one large and complex system, similar to the human body.
- That ship/system has a mission, which is part of an even bigger system and mission.
- Every part and system has a function and is necessary for the ship to perform its mission in the most effective and safest way possible.

The Ship's Hull

- ⦿ The Hull's function is to literally hold everything together. It is the skin and bones of the system.
- ⦿ It is designed to support the weight of everything on board, as well as protect itself and everything inside from external hazards.
- ⦿ These external hazards can be outside of the ship, or outside of a compartment.

Protection From Hazards



Hull Penetrations

- ⦿ Penetrations are necessary for various reasons:
 - Doors/Hatches/Openings
 - Through services:
 - Cableways
 - Piping
 - Ventilation
- ⦿ In order to create a penetration, it is first necessary to destroy the existing structure.
- ⦿ All penetration systems must put back in function what was removed in the destruction of the hull.

Cable Penetrations

- Thousands throughout a ship.
- Range from single cables up to hundreds of cables through one opening.
- Come in various forms, for various needs, made by multiple manufacturer's.
- Must meet specification requirements and must be accepted by NAVSEA.
- All NAVSEA approved types/manufacturers are acceptable if correctly installed.

Multi-Cable Transits (MCTs) or Multi-Cable Penetrators (MCPs)

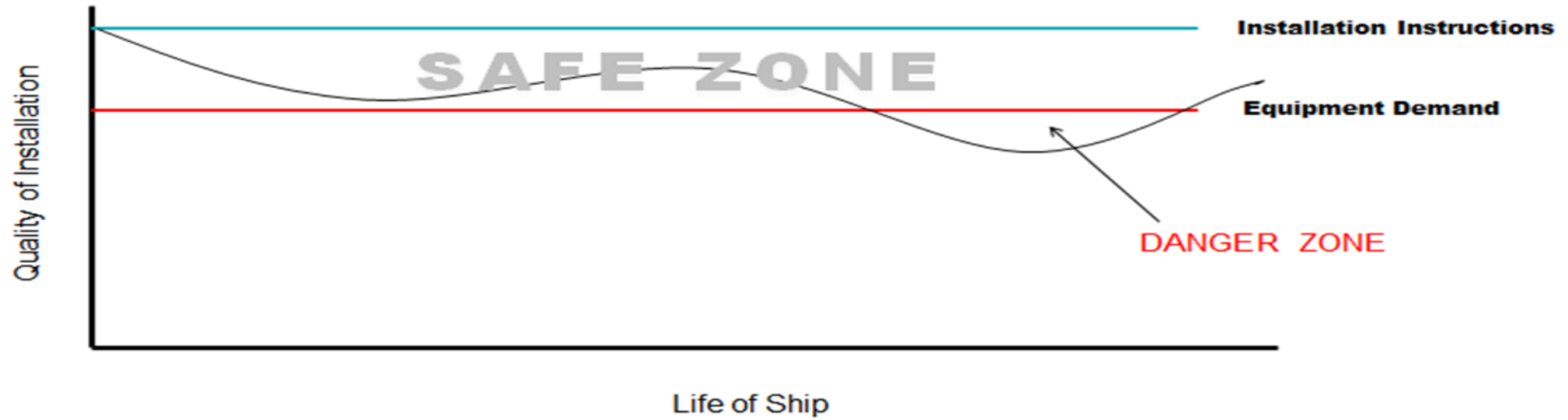
- ⦿ Have a structural compensation coaming.
- ⦿ Have an internal system that stops the spread of hazards to an adjacent space. Currently two basic types:
 - Modular based (blocks and stayplates)
 - Sealant based
- ⦿ Must allow for the addition/removal of cables throughout the life of the ship based on electrical system changes.

Ship's Service Life

- ⦿ Penetration integrity is crucial throughout the life of the ship.
- ⦿ The addition/deletion of cables through a penetration occurs throughout the life of the ship.
- ⦿ Products must be applied correctly.
- ⦿ Products must be installed correctly.

Ship's Service Life (continued)

- Incorrect/poor installations have varying degrees of potential consequences, ranging from none to catastrophic.



Configuration Management

- ⦿ There is no standard certification required to work on cable penetrations.
- ⦿ There is no standardized/required and up-to-date training regarding cable penetrations.
- ⦿ Reentry/resealing is required to be possible, therefore it can be performed with basic tools by any person with a desire to do so.
- ⦿ There is no system in place to monitor the changes and provide a current-state assessment of cable penetrations to the ship's owner.

How do we fix this?