

# A Governance Model and Safety Management System Framework for Industrial Fire Safety During Naval Ship Maintenance Availabilities

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<https://allhands.navy.mil/Media/Gallery/igphoto/2002452915/>

# Research Goals and BLUF

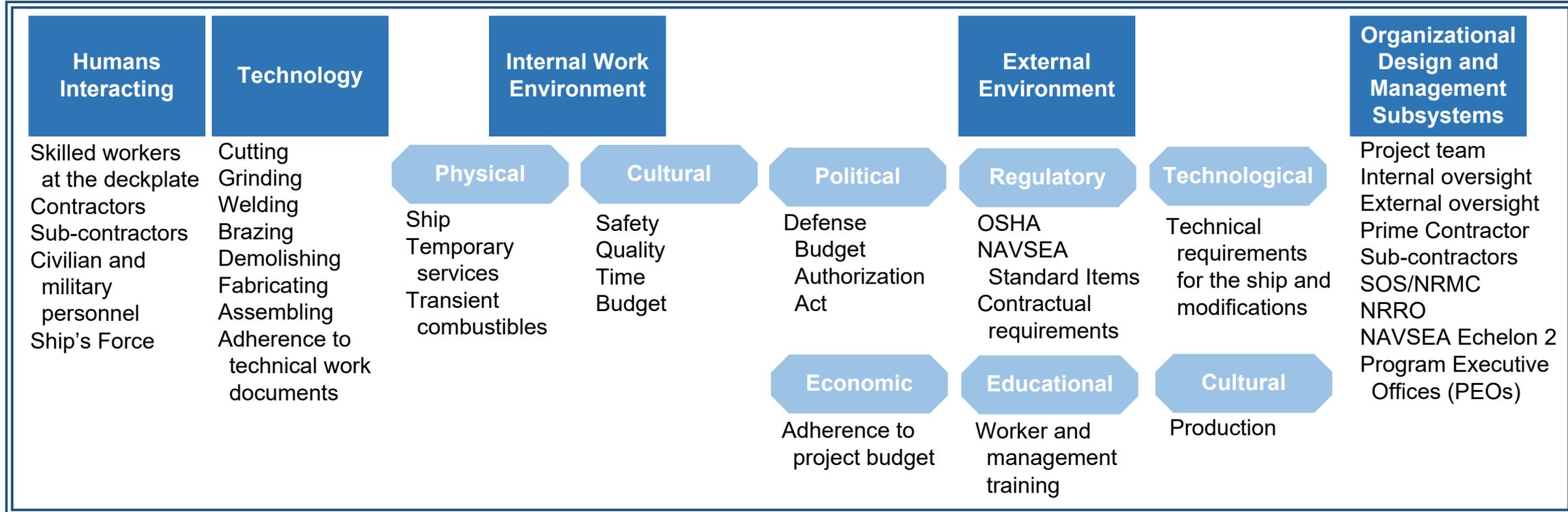
## Goals:

1. Dissect the shipboard industrial fire safety problem, including acquisition system influences
2. Develop a Safety Management System (SMS) framework for Shipboard Industrial Fire Safety based on the Complex System Governance (CSG) reference model

## BLUF:

**Rather than the current state of rote compliance (or noncompliance) to general requirements, contractual requirements for shipboard industrial fire safety should be data driven and vary based on risk. There should be clear technical authority over setting these requirements and technical cognizance in ensuring they are met.**

# Dissecting the Problem - Sociotechnical Safety Perspective on Risk



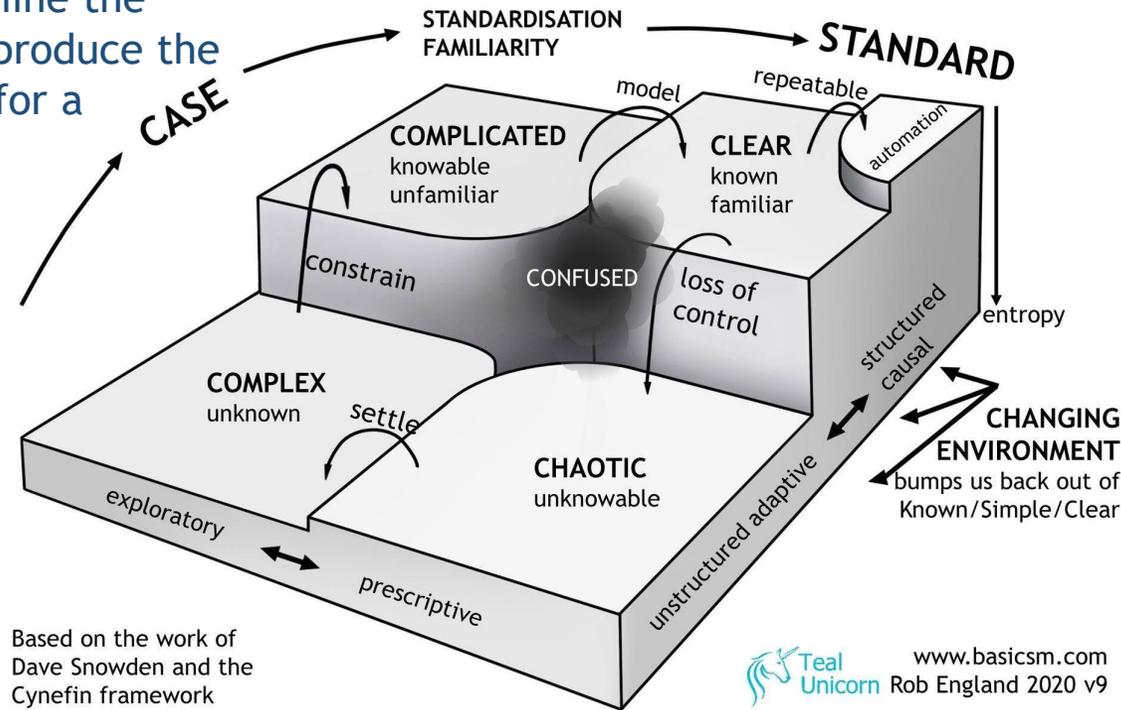
**Risk:** the occurrences of some specified consequences of the activity and associated uncertainties

# Cynefin Framework

**Clear:** Skilled work (tasks) performed by a welder.

**Complicated:** The work done by the welding engineer to determine the welding requirements and produce the technical work documents for a particular work evolution.

## CYNEFIN & STANDARD+CASE



**Chaotic:** Introducing a transient and unequally trained workforce with a few workers that may randomly decide to follow no rules into ship repair work evolutions. While emergence between sub-systems in the shipboard fire safety problem should be discernable, this is only possible when all agents are playing by an identifiable and uniform set of rules.

**Complex:** Interaction between welding (hot work) and the surrounding environment. Factors such as type of welding, proximity to combustibles, fire resistant and non fire-resistant separations, and adequacy of the fire watch all contribute to the safe execution of this work evolution.

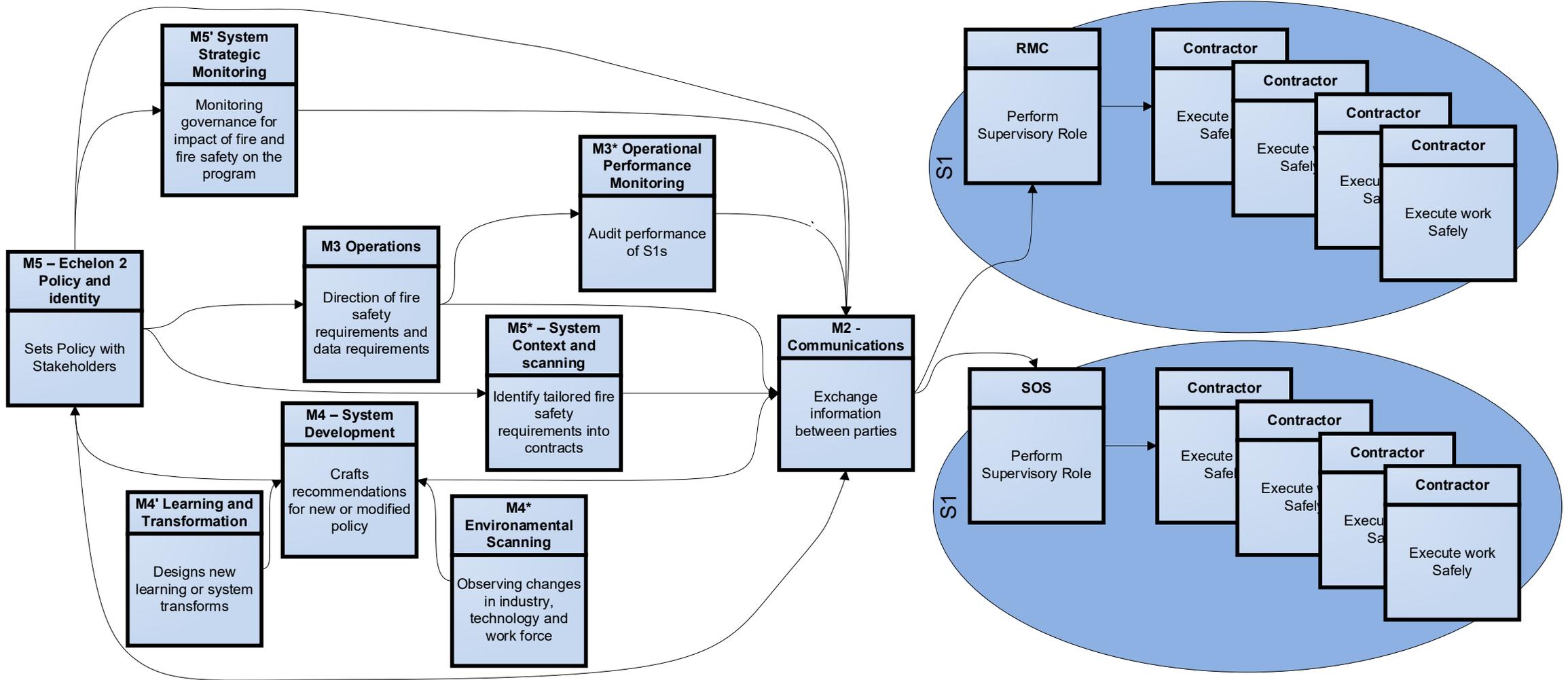
**Confused:** From a programmatic standpoint, this is the current domain of shipboard industrial fire safety.

# Navy Safety Management System (SMS) Framework



## Four Pillars of a Navy SMS and Fundamental Elements

# Complex System Governance Model



# Gaps and Conclusion

## Gaps:

1. Technical Authority
2. Technical Cognizance
3. Weaknesses in Defense-in-Depth
4. Lags in Incorporating Lessons Learned into Contracts
5. Contract Requirements are not Driven by Data

## Conclusion:

There is not currently a uniform level of industrial fire safety during ship maintenance availabilities, primarily because there is not currently a cohesive governance model or framework that is driving specificity of requirements to manage risk.