



People, Families, Teams, Organizations and Institutions **Together** Address Climate Change

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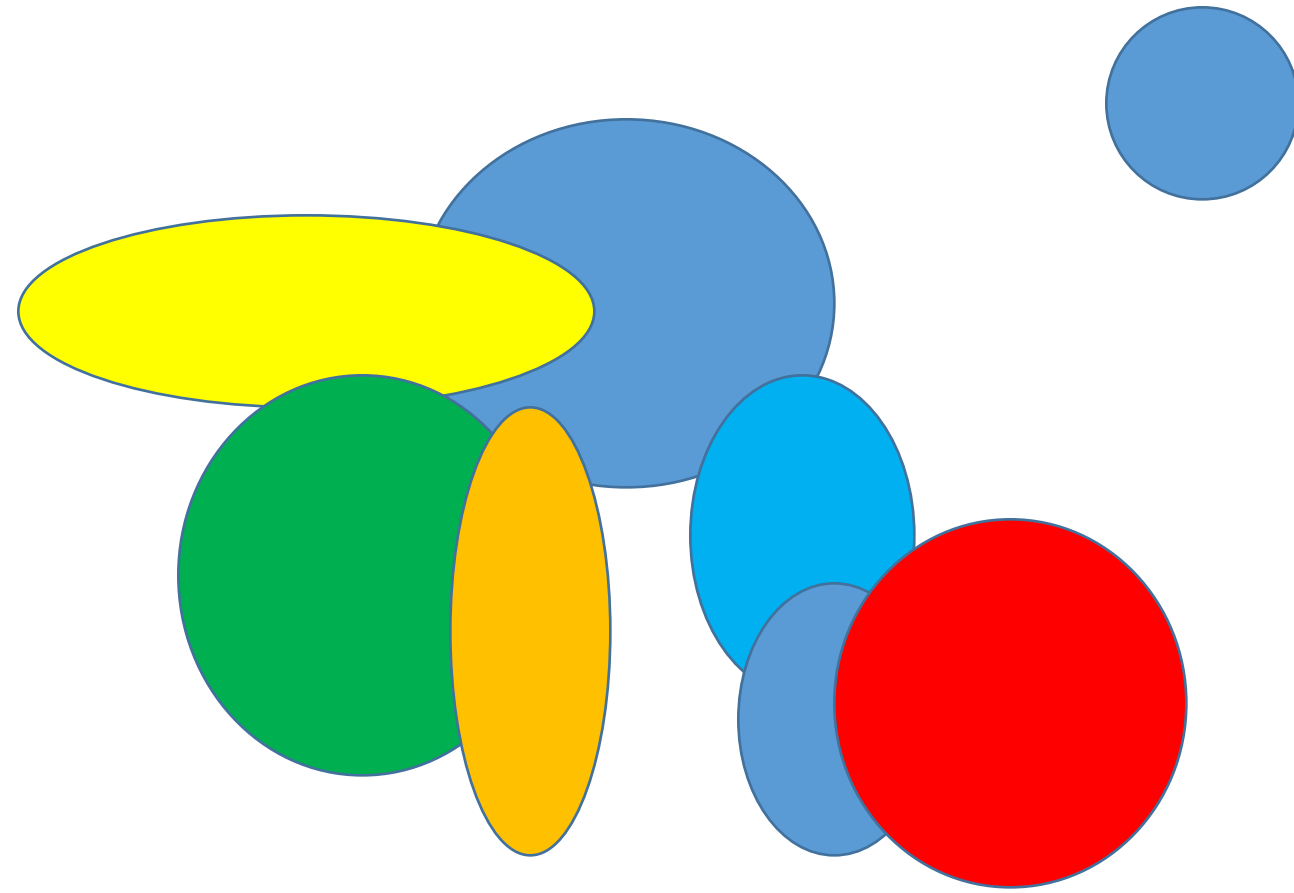
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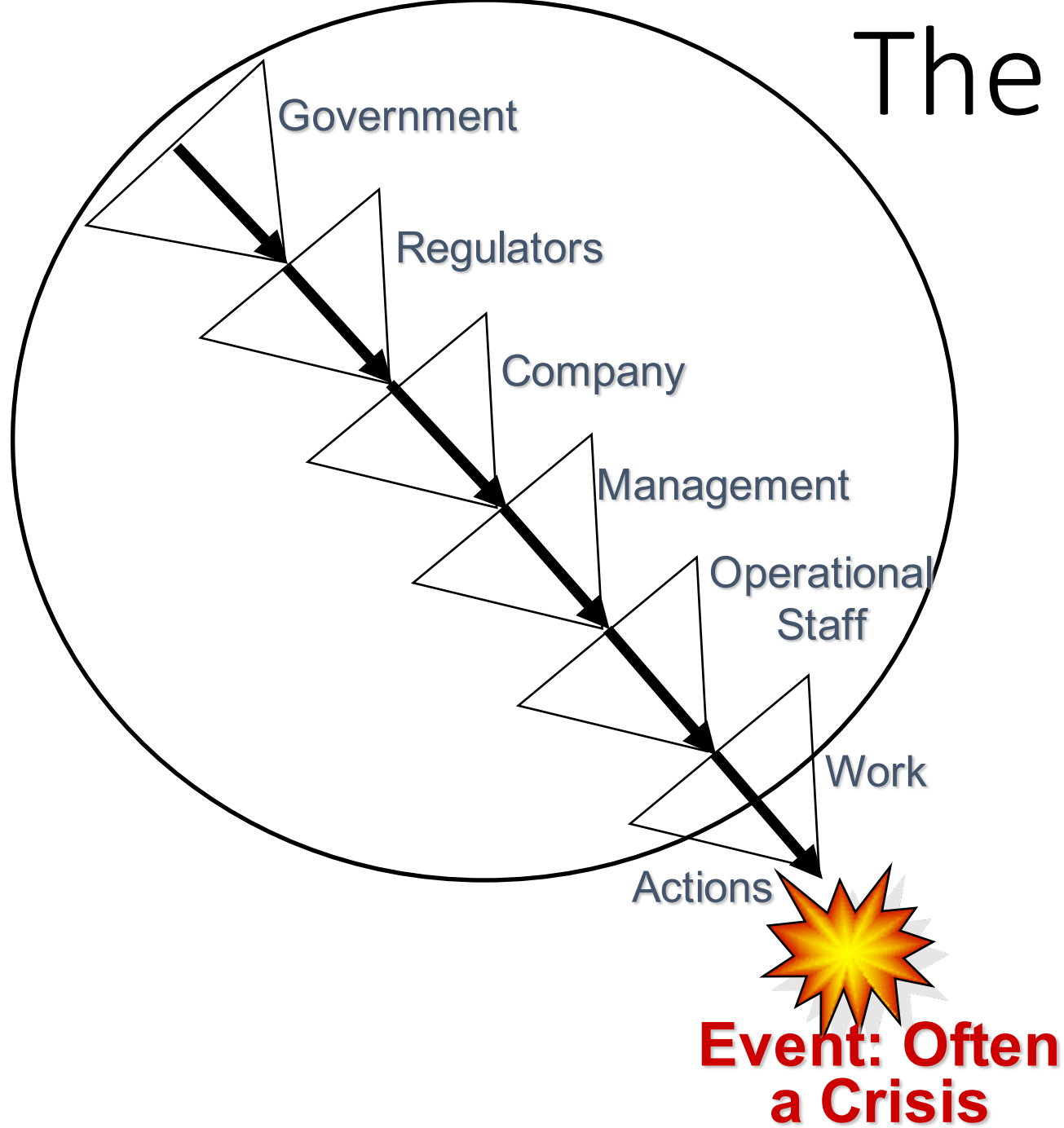




Pool, R. *Beyond Engineering: How Society Shapes Technology*, 1997, p.276

- In a generation or two, the world will likely need thousands of high-reliability organizations running not just nuclear power plants, space flight, and air traffic control, but also chemical plants, electrical grids, computer and telecommunication networks, financial networks, genetic engineering, nuclear-waste storage, and many other complex, hazardous technologies. Our ability to manage a technology, rather than our ability to conceive and build it, may be the limiting factor in many cases (1997, p. 276).

The Arrow



1. Process Auditing:

- An established system for ongoing checks designed to spot expected as well as unexpected safety problems.
- Safety drills are in this category, as is equipment testing.
- Follow-ups on problems revealed in prior audits are critical.

2. Reward System:

- The reward system is the payoff an individual or organization receives for behaving one way or another.
- Organizational theory points out that organizational reward systems have powerful influences on the behavior of individuals in them.
- Similarly, inter-organizational reward systems also influence behavior in organizations.

3. Quality Degradation:

- Avoiding degradation of quality and/or developing inferior quality: This refers to the essential quality of the system as compared to a referent generally regarded as the standard for quality in the industry.

4. Perception of Risk:

- There are at least two elements of risk perception;
 - (1) Whether or not there is knowledge that risk exists, and
 - (2) If there is knowledge that risk exists, the extent to which it is acknowledged and appropriately mitigated and/or minimized
- Part two is a logical outgrowth of part one.

5. Command and Control Elements:

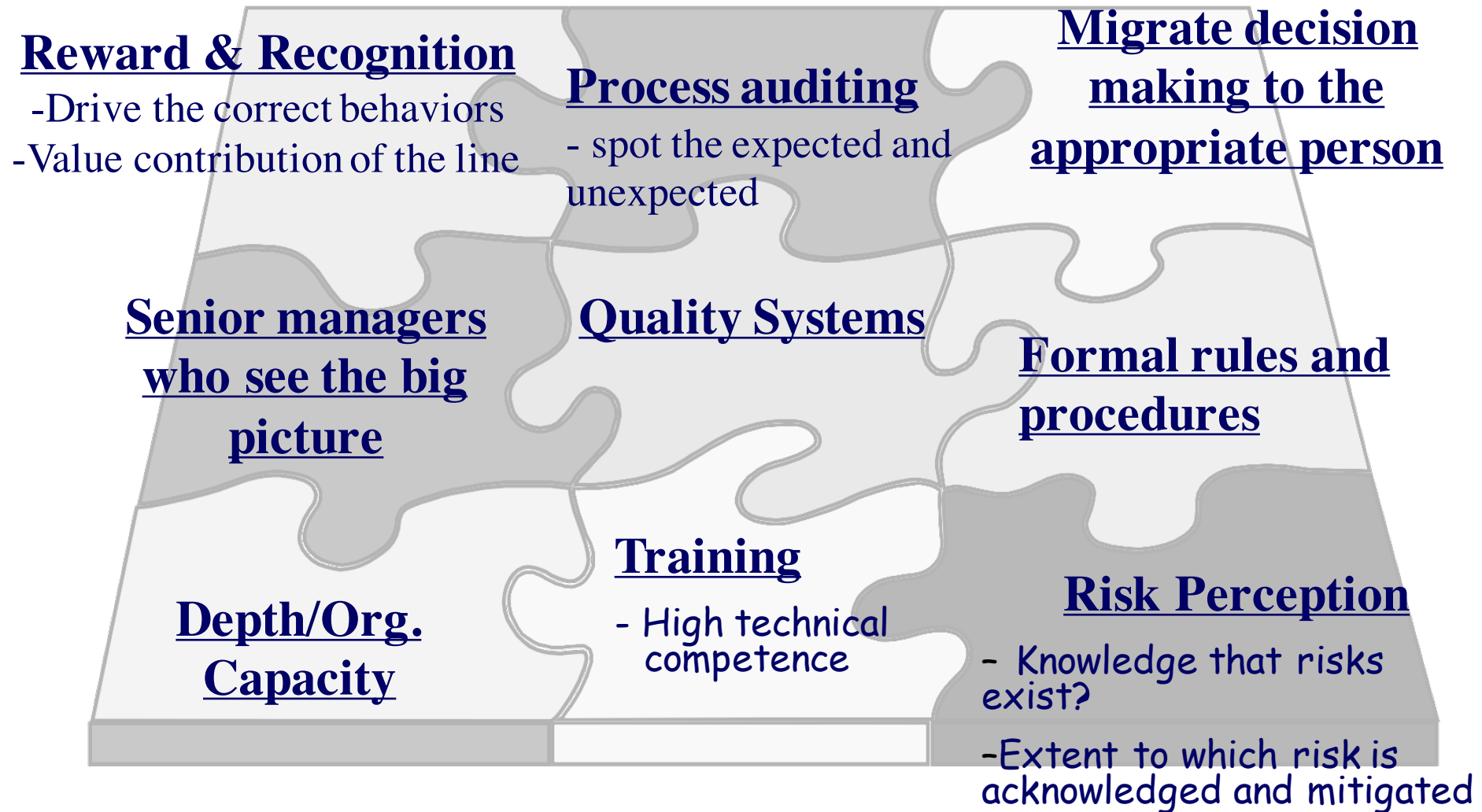
- Migrating decision making: (the person with the most expertise makes the decision).
- Redundancy: (people and/or hardware), i.e., backup systems exist.
- Senior managers who see the “big picture”: i.e., they don't micromanage.
- Formal rules and procedures: A definite existence of hierarchy but not necessarily bureaucracy in the negative sense.
- Training.

Elements of High Reliability Organizing of People, Families, Teams, Organizations and Institutions

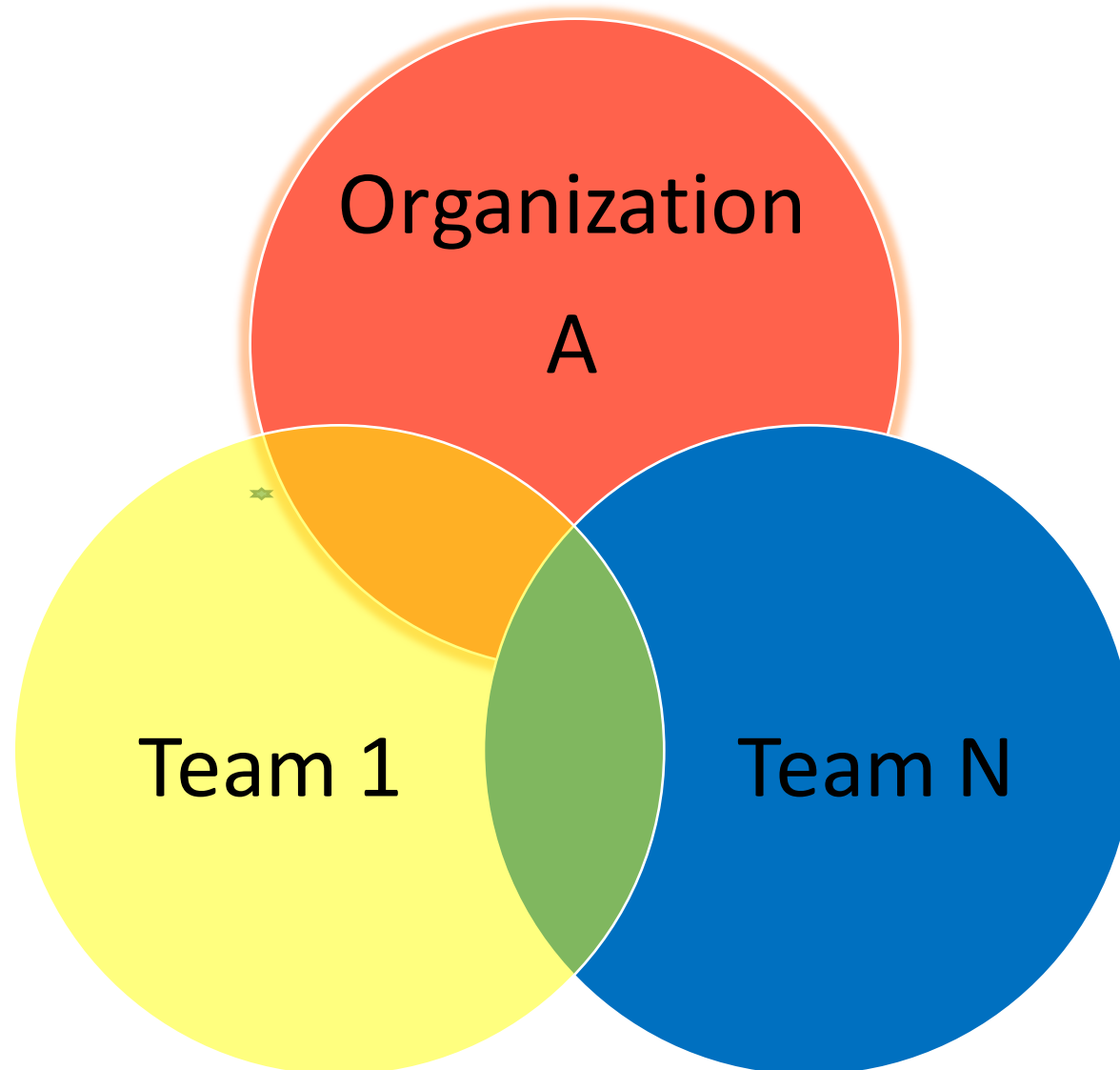
1. Process auditing (audits, drills.....)
2. Reward Systems (rewards and punishments)
3. Quality degradation
4. Risk perception (is there any, what's done about it)
5. Command and Control

EXAMPLES OF THE GOOD, THE BAD, AND THE UGLY

High Reliability Organizations



How Do I Organize to do This?



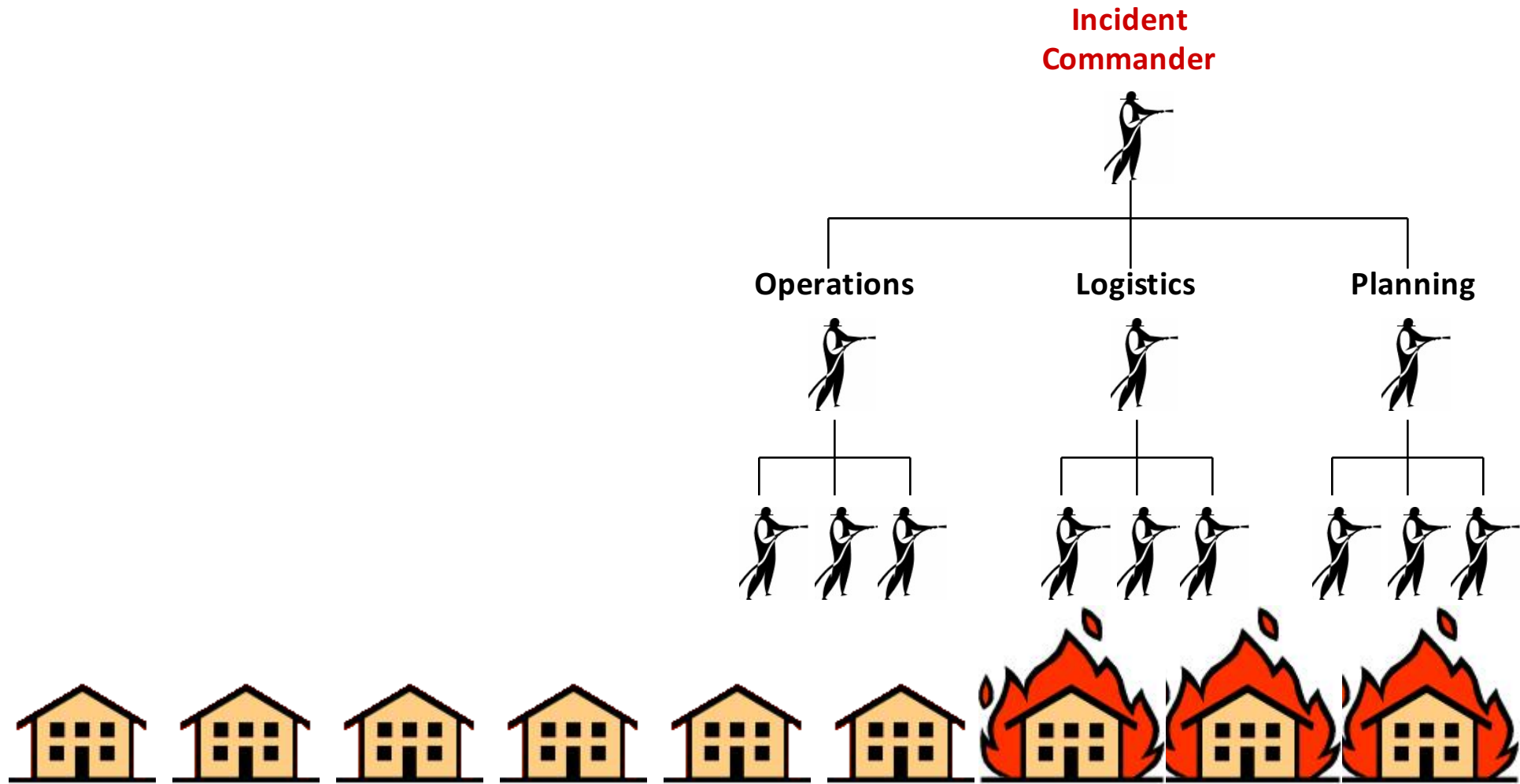
Incident Command System

First Responders



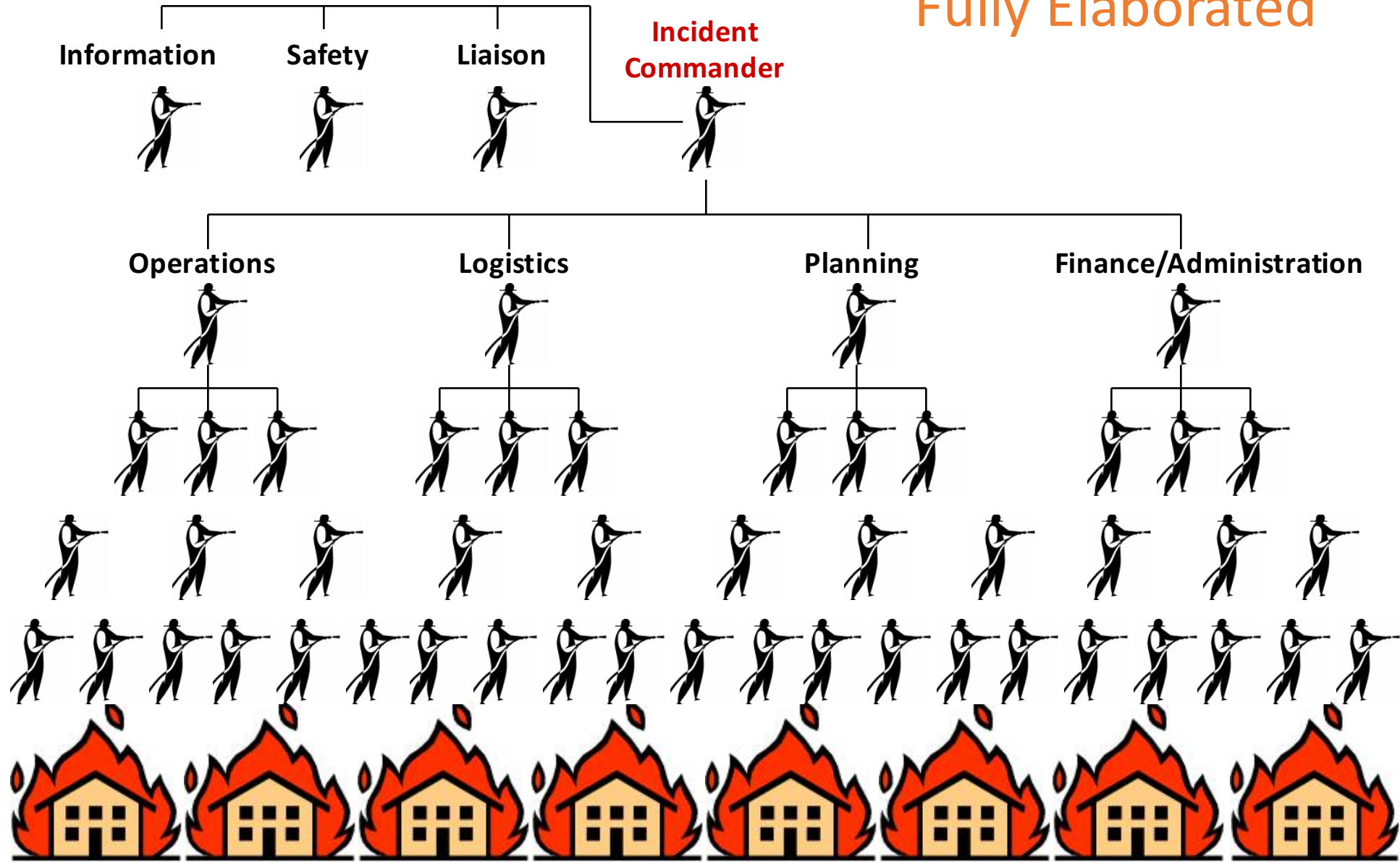
Incident Command System

Structure Elaboration



Incident Command System

Fully Elaborated



What Institutions And Organizations Provide Examples of How We Might Build HROs to Address Climate Change?

- Some health care organizations
- Parts of the U.S. Navy
- Federal Aviation Administration' Air Traffic Control System
- U.S. Commercial Nuclear Power Production
- Commercial jet aircraft aviation

WHAT DO NON HROS DO AND
ARE YOU A PART OF THAT?

Non-HRO's

Weick, Sutcliffe, Obstfeld (1998)

- **attend meetings and solve nothing,**
- **catch airplanes and miss 'connections',**
- **conduct briefings and persuade no one,**
- **evaluate proposals and miss the winners, and**
- **meet deadlines for projects on which the plug has been (or should be) pulled**
- **people shuffle papers and lose a few**

Non-HRO's

- **Focus on success**
- **Underdeveloped cognitive infrastructure**
- **Focus on efficiency**
- **Inefficient learning (episodic)**
- **Lack of diversity (focused conformity)**
- **Information & communications filtering**
- **Reject early warning signs of quality degradations**

Nuclear Energy Institute Data

1985-2008

