

# Interrogations to learn from the Fukushima disaster through Human and Organizational Factors

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*Faire avancer la sûreté nucléaire*



Conference Human and  
Organizational aspects  
assuring Nuclear Safety

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# BUILD NEW SOLUTIONS TO COPE WITH CHAOS



Source: National Geographic, March 25, 2011



Source : TEPCO

## How to cope with chaos:

- How people manage to create new solutions ?
- What would they need ?

## → We will question:

- Role of the Organizational structure
- Centralization/decentralization advantages

# Methodology

Focus on :

- the management at the site of the accident
- the actors that participate in its management
- in the heart of the crisis

**1) How do operators succeed in making sense?**

NPPS

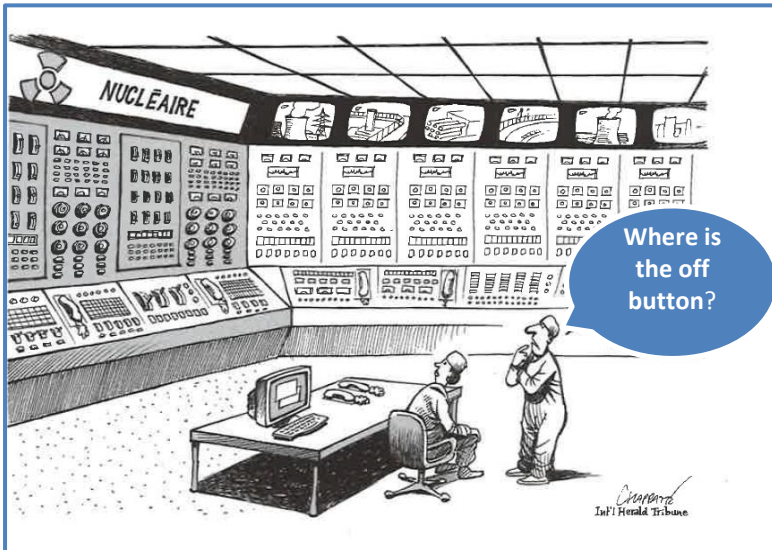
**Main Control Room  
MCR**

**2) What are the conditions to build innovative solution into the plant?**

**Emergency Response  
Center  
ERC**

# 1) How do operators succeed in making sense?

They were attempting to connect the chaos they were experiencing



## □ Creating new indicators

*“A delicate tradeoff between dangerous action which produces understanding and safe inaction which produces confusion” (Weick, 1988)*

## □ Interpretation of weak signal and culture

*“The methods of positivistic science [...] were the means by which uncertainty was converted to certainty” (Vaughan, 1996)*

# 1) How do operators succeed in making sense?

## The partition of role to support sensemaking



- ☐ Creating new rules to move on the field
- ☐ Maintaining the local leadership

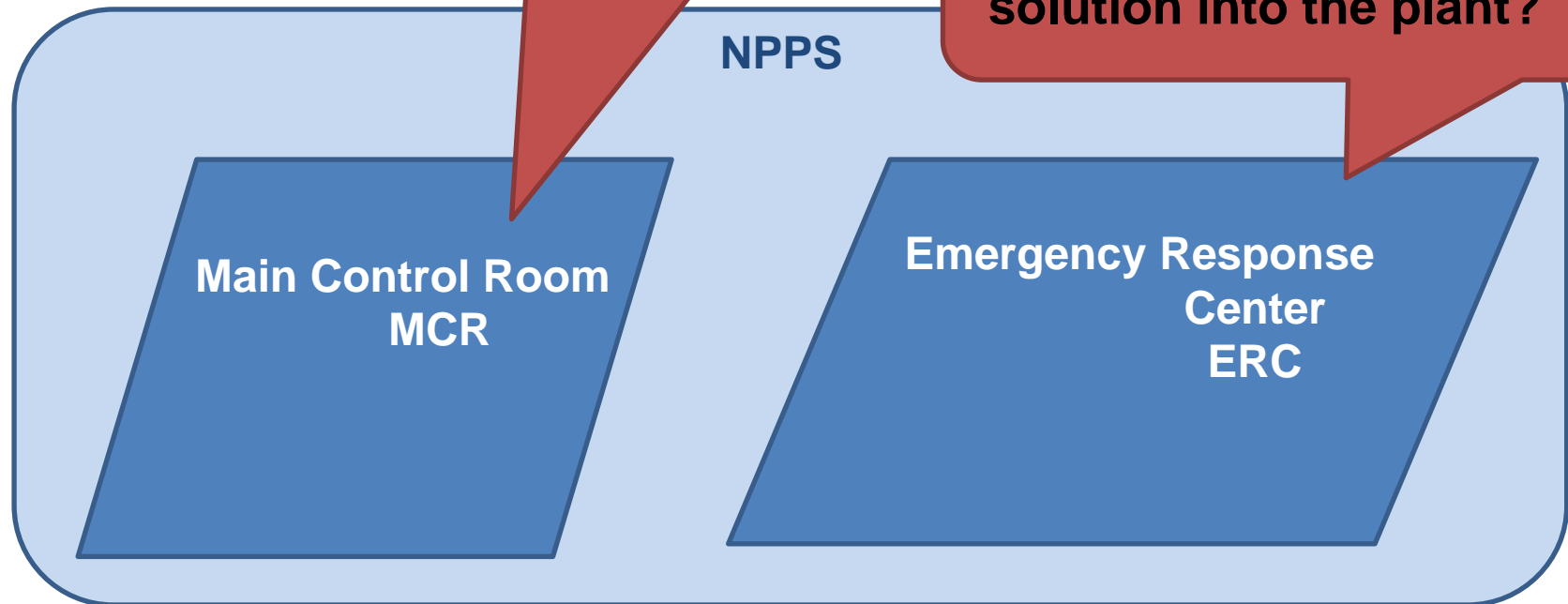


# BUILD NEW SOLUTIONS TO COPE WITH CHAOS

## 1) Operators succeed in making sense

- Field approach to enact sense making
- Social structure to support
- Limited by technical culture

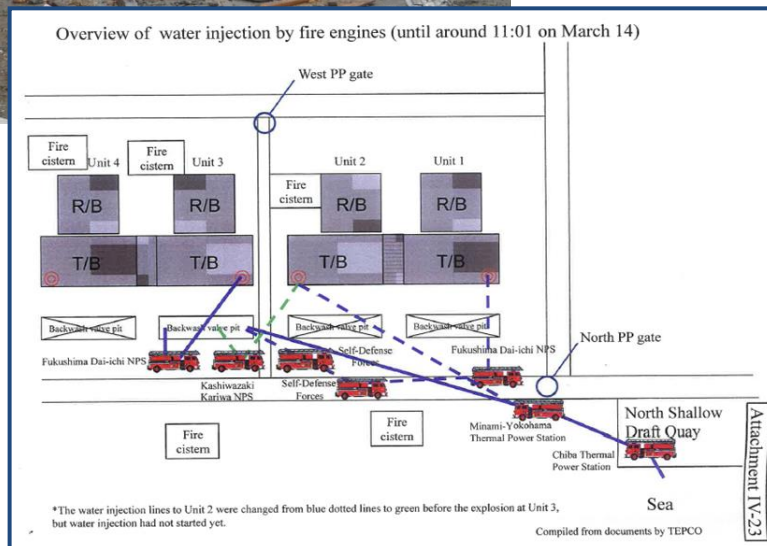
## 2) What are the conditions to build innovative solution into the plant?



## 2) What are the conditions to build innovative solution into the plant?



Source: TEPCO



Source : Interim Report, Attachments , IV-23, p, 144

- ☐ 3 cooling solutions but only 1 was efficient
- ☐ The solution to restore emergency system is one that satisfies all levels
- ☐ The solution of fire engine to inject water called for hierarchical level

## 2) What are the conditions to build innovative solution into the plant?



- ❑ Implementation of innovative solutions through centralized coordination
- ❑ Use the assistance of the restoration team

Source : AIR PHOTO SERVICE/KYODO for Japan Time



# BUILD NEW SOLUTIONS TO COPE WITH CHAOS

## 1) Operators succeed in making sense:

- Field approach to enact sense making
- Social structure to support
- Limited by technical culture

## 2) The conditions to build innovative solution into the plant

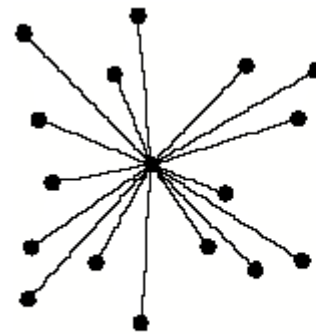
- Shape sensemaking
- Help to define a new partition of role

NPPS

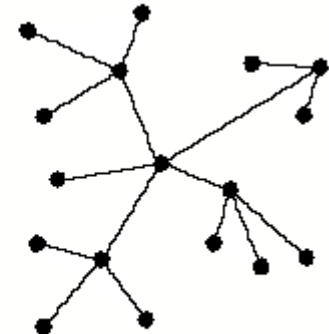
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## Centralization vs Decentralization an ongoing debate



**CENTRALIZED**



**DECENTRALIZED**



The construction of new solution is supported by both centralization and decentralization

The organizationnal culture transcends the logic of centralized or decentralized

Thank you for your attention

