

Technical Meeting on Integration of Safety Culture into Regulatory Practices  
and The Regulatory Decision Making Process

# **Regulatory Implications of TEPCO Fukushima Daiichi NPP Accident on Safety Culture**

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## Regulatory response to deterioration of safety culture

2007: Publish of **guidelines for safety culture**, RCA etc.  
2007: Amendment of the nuclear regulation law  
- **System for fostering safety culture is required during the plant operation.**

2011

**TEPCO Fukushima Daiichi NPP accident**

After TEPCO Fukushima Daiichi NPP accident

✓ **Lessons learned from TEPCO Fukushima Daiichi NPP accident regarding safety culture**  
Identify the key issue related to safety culture

✓ **Regulatory response to TEPCO Fukushima Daiichi NPP accident**  
Oversight of operator's safety culture, internal safety culture

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## **1. Lessons learned from TEPCO Fukushima Daiichi NPP accident regarding safety culture**

Identify the key issues related to safety culture

- (1) Typical findings from the accident investigation reports
- (2) Analysis by JNES

## **2. Regulatory response to deterioration of safety culture after TEPCO Fukushima Daiichi NPP accident**

- 2.1 Oversight of operator's safety culture
- 2.2 Internal safety culture

## **3. Conclusion**

# 1. Lessons learned from TEPCO Fukushima Daiichi NPP accident regarding safety culture

## ➤ **Identify the key issues related to safety culture**

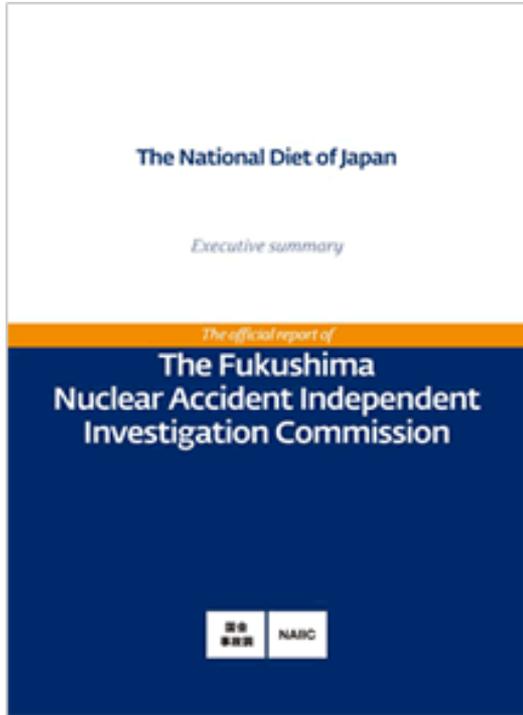
### **(1) Typical findings from the accident investigation reports**

Comparison of typical findings related to the safety culture among three accident investigation reports

### **(2) Analysis by JNES**

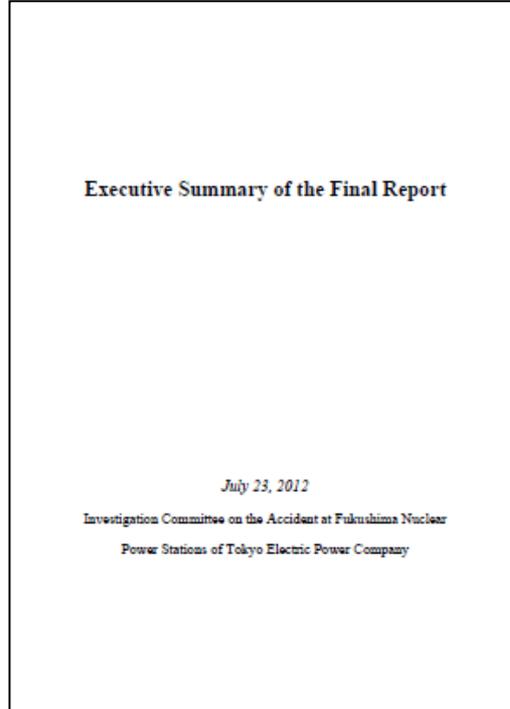
Analysis of the findings related to defective or fragile safety culture in both regulatory body and operator (2012)

# (1) Typical findings from the accident investigation reports



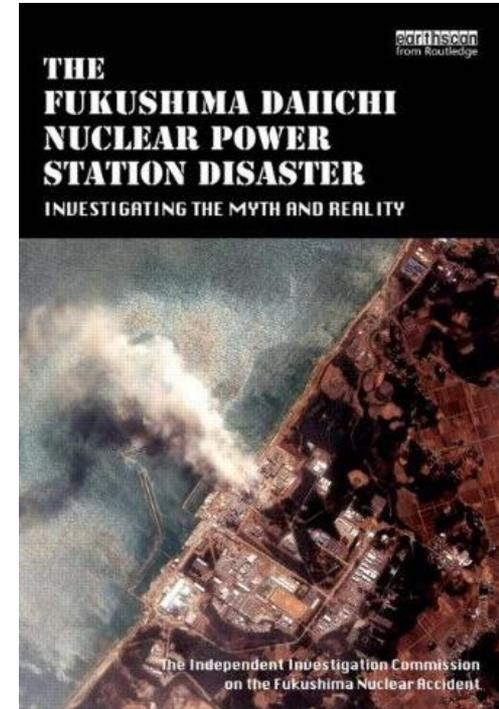
## Diet Report

The Report of the National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC\*1)



## The Government Report

The Interim Report and Final Report of Investigation Committee on the Accident at Fukushima Nuclear Power Stations (CANPS\*2)



## The non-Government Report

Rebuild Japan Initiative Foundation (RJIF\*3)

(1): Typical findings from the accident investigation reports

## Issues related to safety culture of TEPCO

### Fukushima Daiichi NPP accident

1. Diet Report (NAIIC \*1)

- The approach taken in reviewing regulations and guidelines did not follow a sound process of establishing regulations necessary to ensure safety, and **the regulators and the operators together looked for points of compromise in the regulations in order to maintain appearances as regulation and satisfy the conditions for one of their major premises: that “existing reactors should not be stopped.”** [Chapter5,p.14]
- It became clear that the necessary independence and transparency in the relationship between the operators and the regulatory authorities of the nuclear industry of Japan were lost, **a situation best described as “regulatory capture”—a situation that is inconsistent with a safety culture.**[Chapter5, p.15]
- The operators and the regulatory authorities shared the common understanding of ensuring that the operations of existing reactors would not be impacted negatively by lawsuits and mandatory back-fitting. **Deliberations took place in a way that is incompatible with a safety culture.** From this deliberation process can be gleaned the attitude of the operators and the regulatory authorities, both of whom failed to give foremost priority to the enhancement of nuclear safety but instead prioritized lawsuit avoidance and operating ratios.[Chapter5, p.26]

\*1.The Report of the National Diet of Japan Fukushima Nuclear Accident Independent Investigation Commission (NAIIC)

(1): Typical findings from the accident investigation reports  
**Issues** related to safety culture of TEPCO Fukushima Daiichi NPP accident (Cont'd)

<p>1.Diet Report (NAIIC*1)</p>	<p>■ Creating any risk of shutdowns at existing reactors by adopting new regulations was considered taboo, not only by the operators but also by the regulatory authorities. <b>Any standards that would raise doubts about the safety of existing reactors or would be difficult to meet because of the existing reactors' design limits were passed over for adoption even if they were necessary to secure safety.</b>[Chapter5,p.29]</p>
<p>2.Government Report (CANPS*<sup>2</sup>)</p>	<p>■ <b>It is difficult to assess both the nuclear operator and the regulatory authority as having sufficiently established a safety culture.</b>[p.504]</p>
<p>3.Non-Government Report (RJIF*3)</p>	<p>-</p>

\*2.The Interim Report and Final Report of investigation Committee on the Accident at Fukushima Nuclear Power Stations (CANPS)  
 \*3. Rebuild Japan Initiative foundation (RJIF)

- This was nothing less than bureaucratic inertia – which is incompatible with a safety culture. They were structurally incompetent, and lacked a mindset capable of absorbing new knowledge and making improvements.  
[Chapter5, pp.47-48]
- The operators and the regulatory authorities shared the common understanding of ensuring that the operations of existing reactors would not be impacted negatively by lawsuits and mandatory back-fitting. Deliberations took place in a way that is incompatible with a safety culture. From this deliberation process can be gleaned the attitude of the operators and the regulatory authorities, both of whom failed to give foremost priority to the enhancement of nuclear safety but instead prioritized lawsuit avoidance and operating ratios.[Chapter5,p.26]
- For Japan’s regulators, “Promotion” considerations took priority over introducing new regulatory measures. They feared that new regulations might call into question the validity of the safety measures that were in place, raise the risk of defeat in lawsuits by anti-nuclear advocates, or draw the unwelcome attention of the local community and people at large to nuclear safety issues. They stuck to their belief of infallibility so much that they were reluctant to improve safety regulations, and thus their mindset was structurally ill-matched for running a safety culture.  
[Chapter5, p.47]

(1): Typical findings from the accident investigation reports

## Cause related to issues of TEPCO Fukushima Daiichi NPP accident (Cont'd)

### 2. Government Report (CANPS\*2)

- The third reason for the lack of sufficient tsunami preparedness was the **adverse effect of the division of professional expertise** into sectoral specialist fields. The high degree of specialization does not encourage consideration of issues that extend across various fields of expertise productively. Successful tsunami preparedness requires the knowledge and technical expertise of different fields, and it is important that groups of specialists and engineers, each with their own academic culture, work together to find solutions. [Interim Report of Gov't Accident Investigation Committee, pp.594-595]

### 3. Non-Government Report (RJIF\*3)

- The bureaucratic organization have consideration for “**Zenrei-tousyu**”<sup>\*4</sup> and tend to handle things by fitting the format is strong. In particular, **affinity is low for those properties required to continue to be improved by incorporating a new knowledge always as nuclear safety.**  
[ In Japanese, p.288]

\*4. “Zenrei” means “Former precedent example”. “Tousyu” means “Follow in a person’s foot steps.”

(1): Typical findings from the accident investigation reports  
**Countermeasures** related to cause of TEPCO Fukushima Daiichi NPP accident

<p>1. Diet Report (NAIIC*1)</p>	<ul style="list-style-type: none"> <li>■ <i>Autonomy</i>: Those organizations will be required to keep up with the latest knowledge and technology and undergo continuous organizational reform and voluntary changes, for the purpose of protecting public health and safety. The Diet shall monitor this process.[Introduction , p.19]</li> <li>■ It is necessary to adopt drastic changes to achieve a properly functioning “open system.” The incestuous relationship described as “regulatory capture” that exists between regulators and operators must not be allowed to flourish. To ensure that Japan’s safety and regulatory systems keep pace with evolving international standards, it is necessary to do away with the old attitudes that were complicit in the accident. [Introduction,p.40]</li> </ul>
<p>2. Government Report (CANPS* 2)</p>	<ul style="list-style-type: none"> <li>■ In view of the reality that safety culture was not necessarily established in our country, the Investigation Committee would strongly require rebuilding safety culture of practically every stakeholder in nuclear power generation such as nuclear operators, regulators, relevant institutions, and government advisory bodies.[p.504]</li> </ul>
<p>3. Non-Government Report</p>	<p>-</p>

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## **3. Conclusion**

## **(2)Analysis by JNES:**

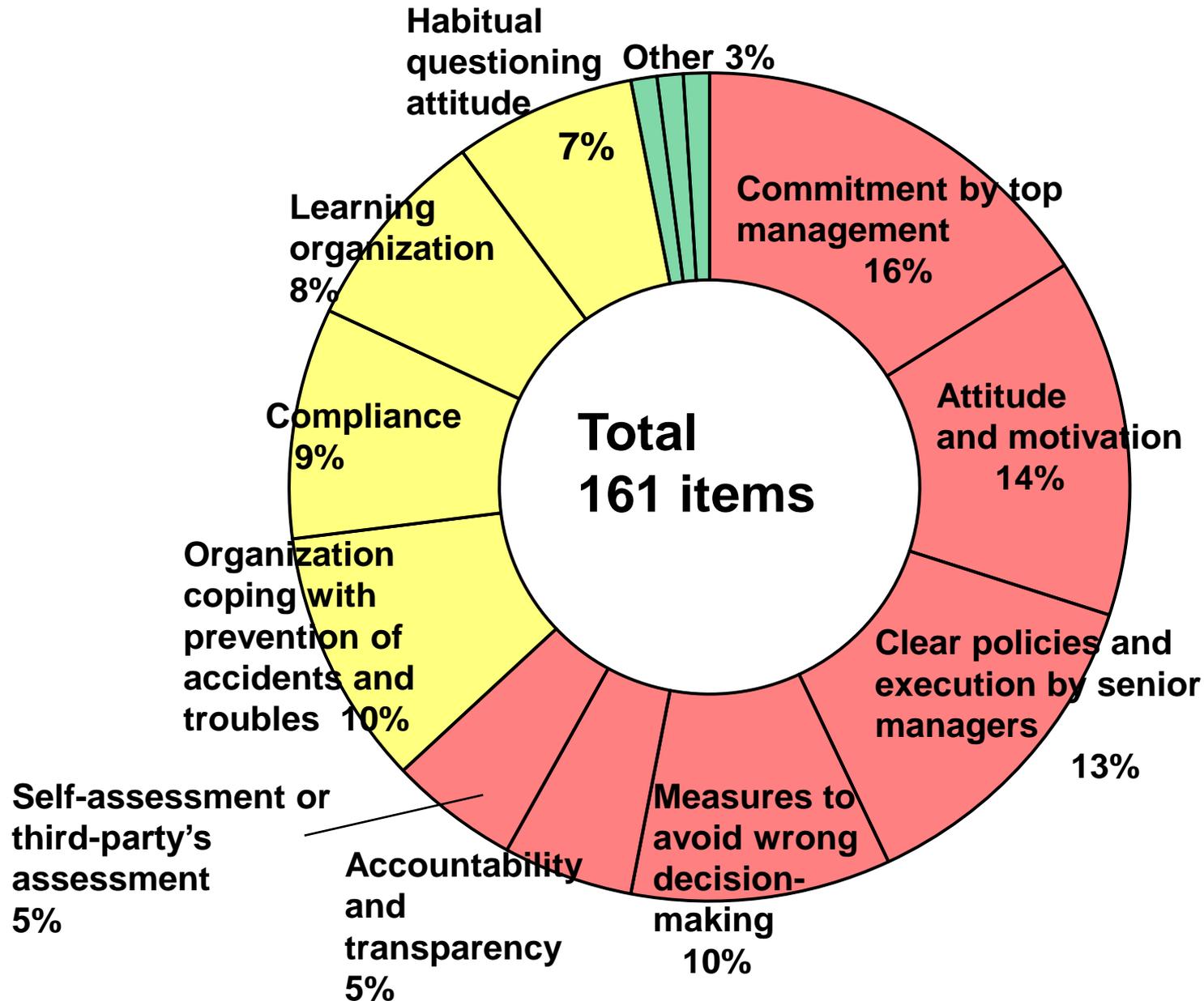
- Extract descriptions from three investigation reports
- Classify the extracted descriptions using safety culture traits

# Safety Culture Traits

Safety Culture Traits	
1. Commitment by top management	2. Clear policies and execution by senior manager
3. Measures to avoid wrong decision making	4. Habitual questioning attitude
5. Reporting culture	6. Good communication
7. Accountability and transparency	8. Compliance
9. Learning organization	10. Organization coping with prevention of accidents and troubles
11. Self-assessment or third-party assessment	12. Work management
13. Change management	14. Attitude and motivation

“Guideline for the regulatory body to evaluate the operator’s efforts to prevent degradation safety culture and climate of organization”, NISA-166c-07-11,2007

# Results of analysis on safety culture in operator



# Comparison of defective safety culture in operator during the emergency and non-emergency states

Safety culture traits

The number of findings for  
**emergency state**  
(%)(Fukushima)

The number of findings for  
**non-emergency state** (%) (2009<sup>\*5</sup>)

## Oversight of operator's safety culture

It is effective for regulatory body to oversight on operator's safety culture including the following findings.

- Commitment by top management
- Attitude and motivation
- Clear policies and execution by senior managers
- Measures to avoid wrong decision-making etc.

Reporting culture

1

5

# Results of analysis on safety culture in regulatory body



## Internal safety culture (Regulatory body itself)

It is effective for regulatory body to improve safety culture in regulatory body including the following findings.

- Measures to avoid wrong decision-making
- Habitual questioning attitude
- Accountability and transparency
- Learning organization                      etc.



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## 2.1 Oversight of operator's safety culture

### ➤ Chart of oversight of operator's safety culture

#### The Site

**April** : Operators make a plan of safety culture activities. ←

↓  
Inspectors identify findings related to lack of safety culture.

↓  
**March** : Operators make self-assessment report of safety culture activities.

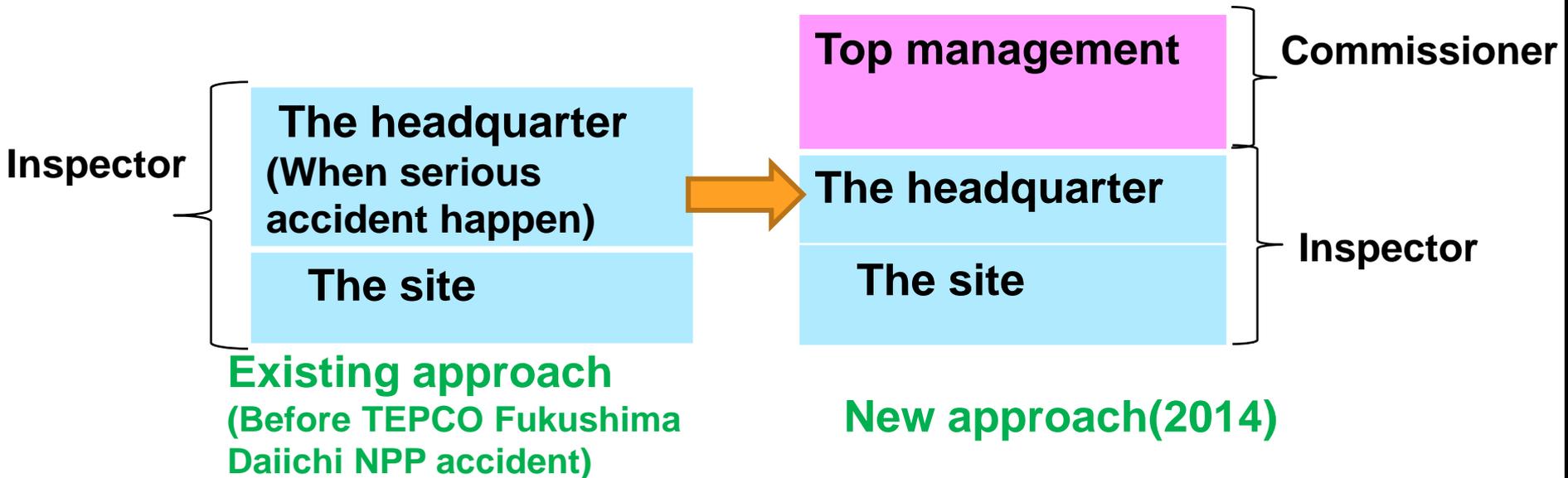
Reflect to  
Next year

↓  
**April**: Inspectors evaluate operator's safety culture activities.

↓  
The partial results of evaluation of operator's safety culture activities are opened to the public at HP of local office.

# ➤ New approach to oversight of operator's safety culture

NRA extend the area of assessment of operator's safety culture in 2014.



- NRA commissioner will hold the meeting with top management of each operator every month
  - ✓ Demonstration of commitment of top management
  - ✓ Exchange opinions and communication
- NRA inspectors have already made two pre-trial hearings in order to evaluate the efforts of safety culture activities conducted and contributed by the senior managers. (The headquarter)

## ➤ Example questions to the senior manager of nuclear facility for oversight of operator's safety culture

### Commitment by top management

- ✓ Do you understand the policy of fostering safety culture?
- ✓ Explain the action plan of safety culture based on the policy.

### Attitude and motivation

- ✓ What have the senior manager conducted to maintain the motivation of employees in light of the current status of long-term shutdown?
- ✓ What have the senior manager conducted related to attitude of safety culture?

### Measures to avoid wrong decision-making

- ✓ Do you keep open door policy?

## 2.2 : Internal safety culture

✓ NRA has enhanced internal safety culture.

### - **Independence**

A new Nuclear Regulation Authority (NRA) was established with a high degree of independence in 2012.

### - **NRA's Core Values**

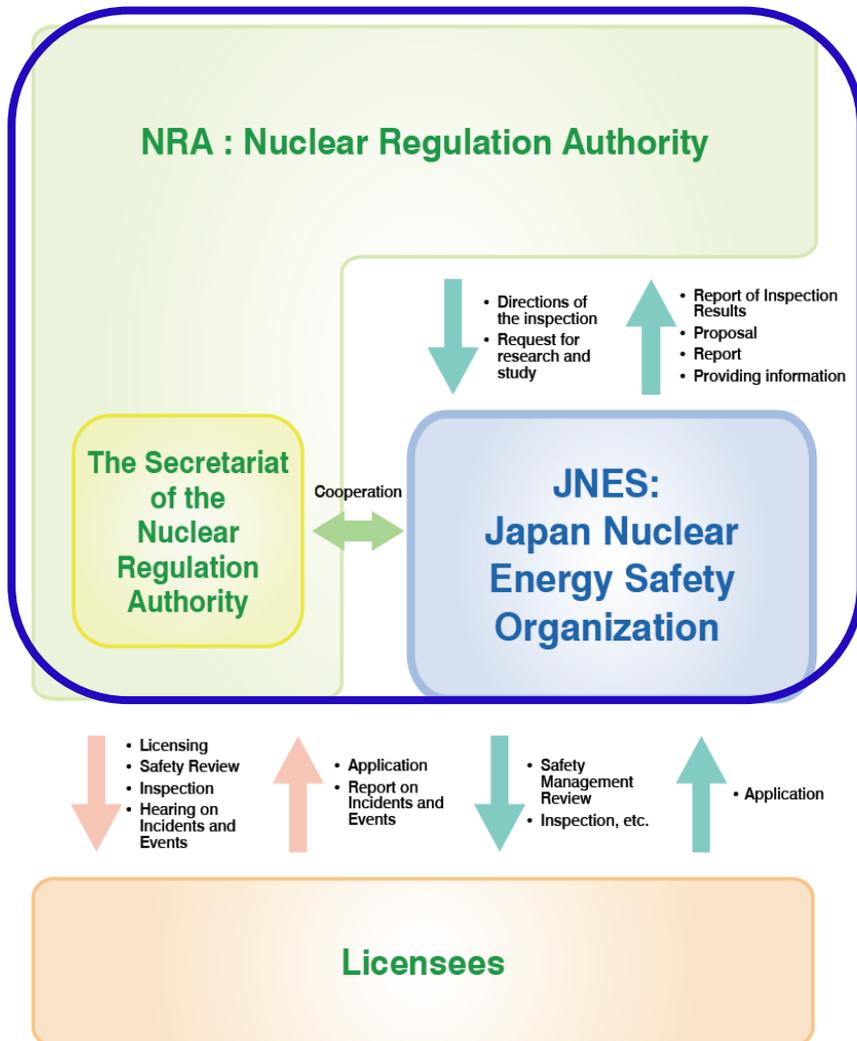
The nuclear safety system and management must be rebuilt on a solid basis, placing the highest priority on public safety and a genuine safety culture.

### - **Development of management system for regulatory body**

It is described as managing organization, fostering safety culture, responsibility of the authority, leadership, and documentation and record management that can be used as the basis in implementation of the management system.

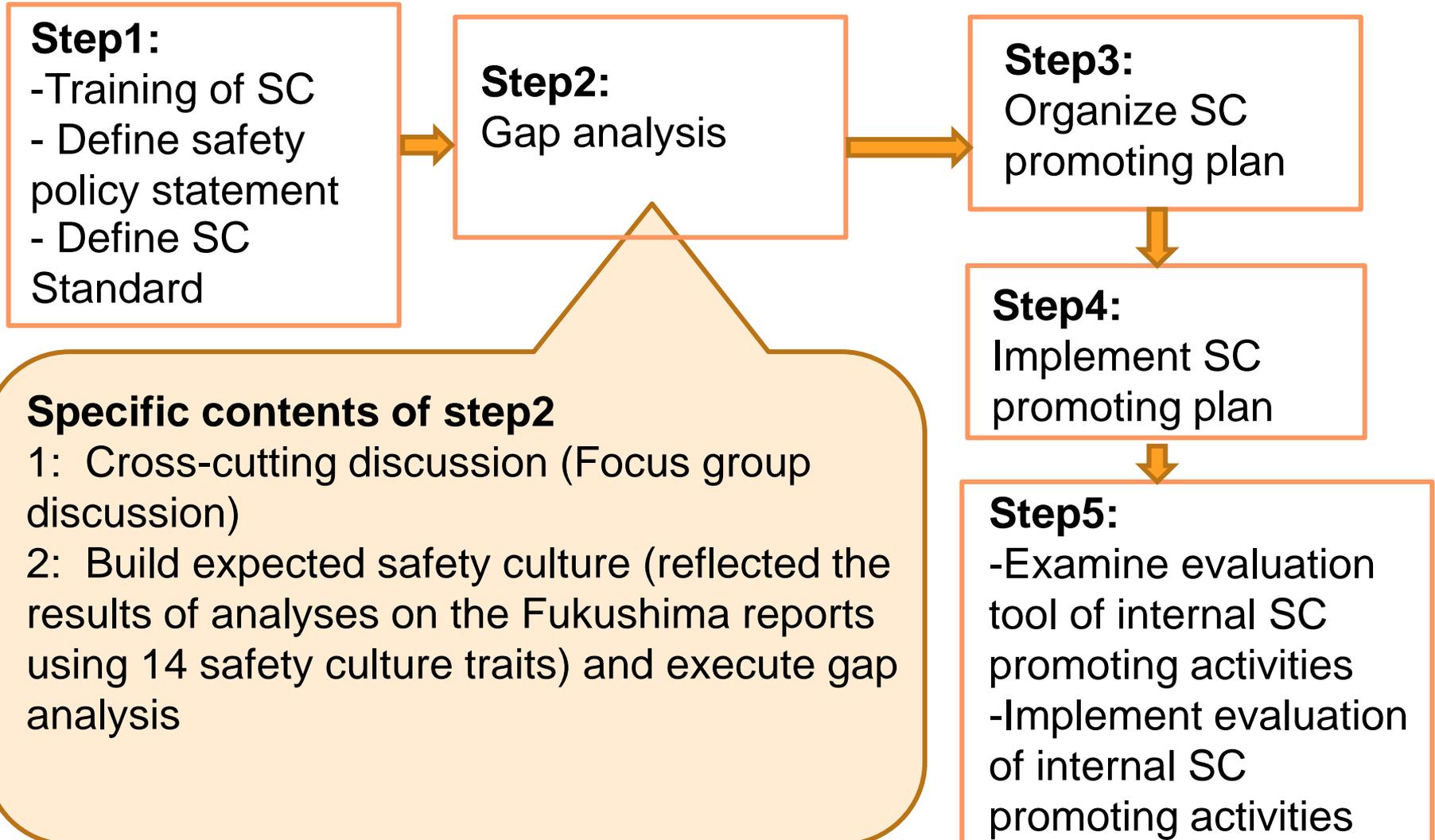
NRA will implement safety culture promoting activities based on management system in the work plan.

✓ JNES carried out internal safety culture promoting activities from November 2012 to February 2014.



- **JNES carried out safety culture promoting activities (November 2012~ February 2014)**
- ✓ JNES was Technical Support Organization of NRA.
- ✓ In the end of 2012, implementing internal safety culture promoting activities was officially decided at the board of directors.
- ✓ On the way, JNES merged into NRA in March 2014.

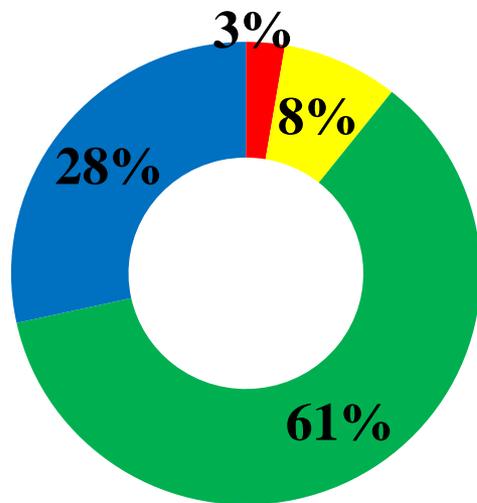
## ➤ Contents of safety culture promoting activities in JNES



# ➤ The results of safety culture promoting activities in JNES

## Results of questionnaire survey

Do you change your mind on safety culture through safety culture promoting activity?



■ Missing   
 ■ Deficient   
 ■ Good   
 ■ Excellent

- ✓ The secretariats performed a questionnaire survey on safety culture activity to all staffs in January 2014 and were received 91% responses to the questions.
- ✓ Questionnaire answer related to safety culture traits constituted of Excellent, Good, Deficient, and Missing.
- ✓ The ratio of staffs that recognized importance of safety culture was 89%

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- The three reports of TEPCO Fukushima Daiichi NPP accident pointed out vulnerability of safety culture of regulatory body and operator.
- Japanese regulatory body has improved internal safety culture.
- NRA expand the inspection area of safety culture.
- NRA commissioner will hold the meeting with top management of each operator every month.

**Thank you for your attention**