

# **Promotion of Safe Development of Nuclear Power by Learning Lessons from Fukushima Accident**

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# Content

1. Comprehensive safety Examination
2. Regulatory and emergency body
3. Nuclear Safety Plan

## Decision by State Council Executive Meeting on 16 March 2011

- (1) Immediately organize a comprehensive safety examination to nuclear power plants to identify weaknesses and take corresponding measures.
- (2) Operator should improve management and ensure safe operation. Regulatory body should strengthen inspection.

- Use the most advanced standards to review and exam all NPPs under construction. And take all kinds of measures to ensure safety and quality.
- Draw up *Nuclear Safety Plan*. Adjust and improve medium-long term nuclear power development plan. Not approving new projects until nuclear safety plan is approved.

# **1. Comprehensive Safety Examination**

# 1. Comprehensive Safety Examination

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- **Time:** from March to December 2011
- **Objects:** NPPs in operation and under construction, other Nuclear Facilities.
- **Methods:** Self-examination, technical assessment, site Inspection, interaction with Industry, expert consultation.
- **Technical scope:** 11 elements, focus on external events, severe accident and emergency preparedness.

# 1. Comprehensive Safety Examination

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## Conclusion for NPP

- Design satisfied Chinese technical regulations. Improvements have been made continuously.
- China adopted IAEA standards.
- Construction quality and operation safety is under control in whole process of construction, installation , engineering management, equipment manufacture and operation.

# 1. Comprehensive Safety Examination

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- Good safety operation record, and there is no event in grade 2 or above in INES.
- The external events like earth quake and flooding have been assessed when siting. The extreme external event like Fukushima is unlikely to happen in China
- Chinese regulatory control is effective by MEP (NNSA).

# 1. Comprehensive Safety Examination

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## In general

- Chinese NPPs' design, construction and operation satisfy requirements of Chinese safety regulations, and reach the safety level in IAEA new requirements. The NPPs have full ability to prevent DBA, and have basic ability to prevent and mitigate severe accidents and risk is under control.

# 1. Comprehensive Safety Examination

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Future improve on

- (1) Assessment and prevention of extreme external events
- (2) Ability of prevention and mitigation of severe accident
- (3) Emergency management, including multi-unit company and national emergency resources
- (4) Strengthen regulatory body
- (5) Nuclear safety culture
- (6) Information and public communication

# 1. Comprehensive Safety Examination

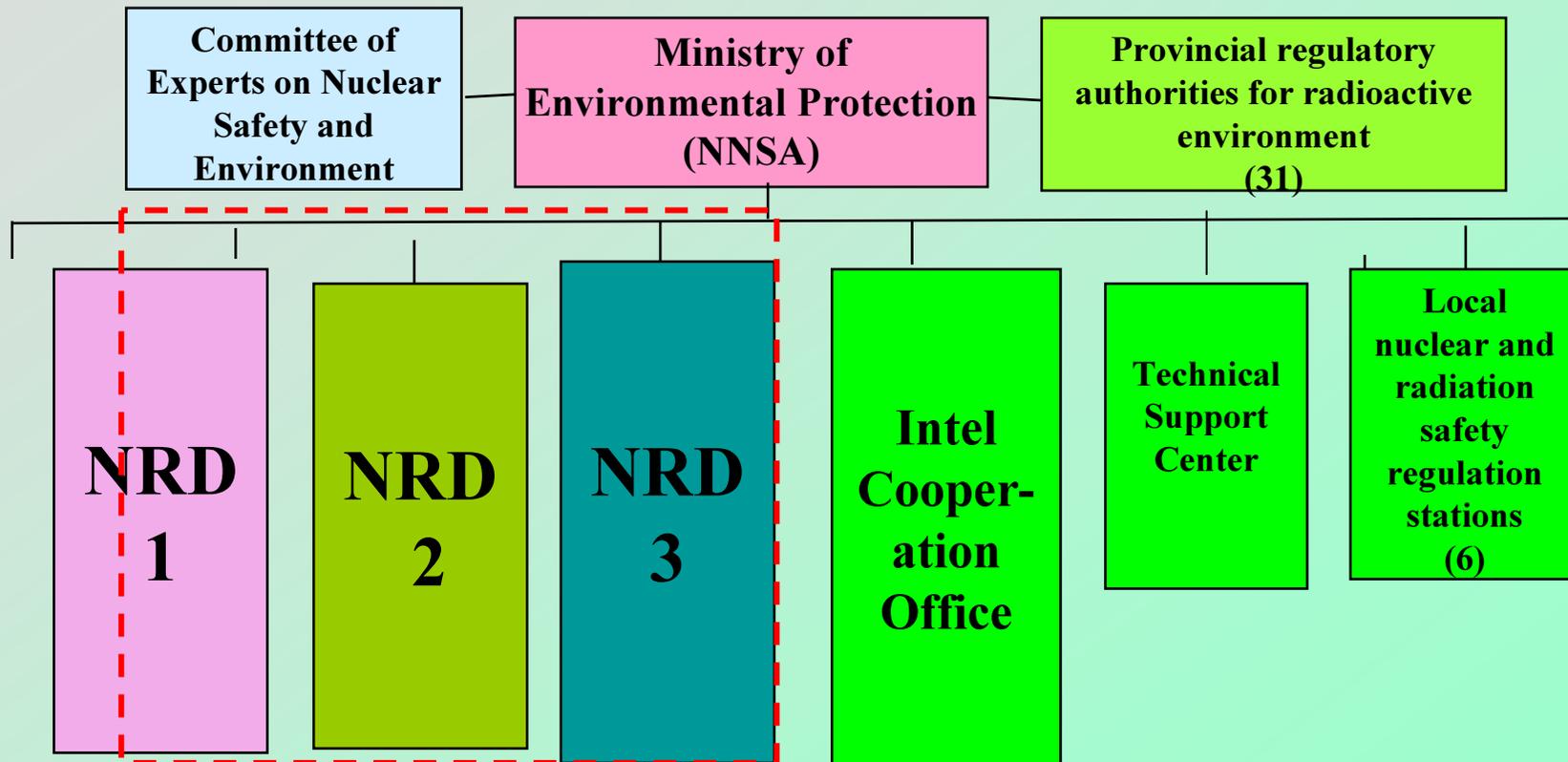
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## Near term

- to implement water seal for flooding
- to add mobile electrical supply, mobile water pump
- to improve training
- to improve engineering, commissioning and non-conformance management

## **2. Regulatory and Emergency Body**

## 2. Regulatory and Emergency Body



- NRD1: Department of Safety on Nuclear Installations
- NRD2: Department of Safety on Nuclear Power
- NRD3: Department of Safety on Radiation Sources

## 2. Regulatory and Emergency Body

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### Staffing:

- 600 before 2010
- ~900 now
  - -- NNSA headquarter: 85
  - -- Six regional offices: now about 250 (total 331)
  - -- NSC: now about 400 (total 600)
  - Radiological Monitoring Center: 100

## 2. Regulatory and Emergency Body

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Department of Nuclear Emergency and Safety Regulation,  
CAEA: 20

Division of General Affairs

Division of Nuclear Emergency Coordination Management

Division of Nuclear Emergency Rescue and Assistance  
Management

Division of Nuclear Safety Licensing Management

Division of Nuclear Safety Regulation

## 2. Regulatory and Emergency Body

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- State Nuclear Security Technology Center, CAEA: 29(50)
- National Nuclear Emergency Technical Assistance Center, CAEA: 20

# 3. Nuclear Safety Plan

## 3. Nuclear Safety Plan

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- **Plan on Nuclear Safety and Radiological Pollution Prevention and Control ( 2012 - 2020) .**
- **Approved:** State Council after public comment

# **3. Nuclear Safety Plan**

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## **Main Content**

- 1. Current situation and challenge**
- 2. Principal and goals .**
- 3. Tasks and works in priority ( 9 areas)**
- 4. Projects in Priority ( 5 projects)**
- 5. Measures to ensure implementation (8 measures)**
- 6. Implementation and assessment of the Plan.**

# 3. Nuclear Safety Plan

## Principals and Goals

- Principals
  - prevention as priority, and defense in depth
  - same importance for new and old facilities, combining prevention and treatment of pollution
  - to upgrade safety continuously with development of technology
  - strict inspection based on laws and regulations
  - transparent, and sustainable development

# 3. Nuclear Safety Plan

## Principals and Goals (con)

- goals in 2015
  - to improve safety of nuclear installations and facilities of nuclear technology application
  - to lower the environmental risk
  - to establish basic capacity for accidental prevention, contamination treatment, R&D on safety, emergency response, regulatory control
  - to ensure nuclear safety and maintain good environmental radiological quality

# 3. Nuclear Safety Plan

## Principals and Goals (con)

- goals in 2020
  - to maintain high safety of nuclear installations and to eliminate practically from design possibility of large radioactive release for new build NPP since 2016
  - to conduct radioactive pollution treatment and progress on nuclear decommissioning,
  - to eliminate risk of legacy radwaste and build underground lab of high level radwaste
  - to establish national R&D capacity and monitoring system
  - to establish emergency response system
  - in 2020, NPP safety maintain world advance, overall enhancement of nuclear safety and radioactive pollution control, and maintain good environmental radiological quality

# 3. Nuclear Safety Plan

- **Emergency preparedness and response**
- Reevaluating and modifying existing on site emergency plan for each NPP in 2012.
- Enhancing radiological monitoring, prediction and evaluation, and decision-making.
- Building fast engineering team for mitigation of severe accidents by upgrading NPP emergency support system of CNNC and Guangdong Nuclear Power Company.
- Strengthening coordination between off-site and on-site emergency organizations.

# 3. Nuclear Safety Plan

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- The 12th Five-year Plan for China National Nuclear Emergency Coordination Committee

- Further enhance the research efforts with regard to accident mechanisms and needed preventive measures;
- Enhance the study of safety culture and promote the further development of safety culture.
- Enhance the study of the public communication method and conduct the accurate description and deep study of radiation biological effects, so as to minimize the social effect from severe accident consequence.

# Thank you