NRA
Nuclear Regulation Authority

Lessons from Fukushima

－Response and Changes to Regulatory Framework and System－

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April 9，2013

Ottawa

Main Findings (Kurokawa Report)

A complex disaster - Manmade:

***Flawed Safety culture ("nuclear safety myth", etc.)**

***Organizational/Systemic failures and weaknesses**

- **Lack of regulatory independence**
- **Collusion between regulators and operators "regulatory capture"**
- **Weak SA preparedness/response**
- **Inward-looking attitude**
- **Governance problems within TEPCO**
- **Disaster handling (on-site, off-site)**
- **Risk communications**

Was the accident preventable?

If:

- **"Safety first" policy had been strictly enforced; risks had been squarely faced;**
- **Severe accident measures (defense in depth) were in place (esp. natural hazards);**
- **International good practices and safety standards had been followed;**
- **Delays in reinforcements had been avoided…..**

Specific Recommendations
(Kurokawa Report)

1 Set up a permanent parliamentary body specific to nuclear issues, including for oversight of new regulatory bodies;
2 Review the nation's crisis management system to clarify the role and responsibility of government, local authorities, operators;
3 Urgent government measures needed for the health of the affected population, radiation monitoring, rehabilitation of communities, decontamination, etc.;
4 Governance reform at TEPCO; transparency in relations between regulators and utilities; mutual oversight system among power companies;
5 Requirements for new regulatory bodies;
6 Drastic reform of nuclear-related legislation;
7 Set up independent investigation commissions comprising outside experts to continue work on unresolved or unaddressed issues.

Recommendations (Conti'd)

Requirements for new regulatory bodies

- Protecting the health and safety of people should be the top-most priority;
- Independence from politics, from operators, and from promoting organizations;
- Transparency: public disclosure of information and of processes, regular reporting to the Diet;
- Professional expertise: global standards, exchange of personnel, stuff training, advisory bodies;
- Proactive and continuous reform

Recommendations (Conti'd)

Crisis management system

Reform of nuclear-related legislation

- Reflect the state-of-the art knowledge and technology in new legislations, with the health and safety of the people as the top priority;
- Define the line of responsibility for emergency response:
  - Operators (on site: stop, cool, contain);
  - Government (off site, evacuations, etc.)
- Introduce "back-fitting" as a rule.

Nuclear Regulation Authority (NRA)
(Established September 2012)

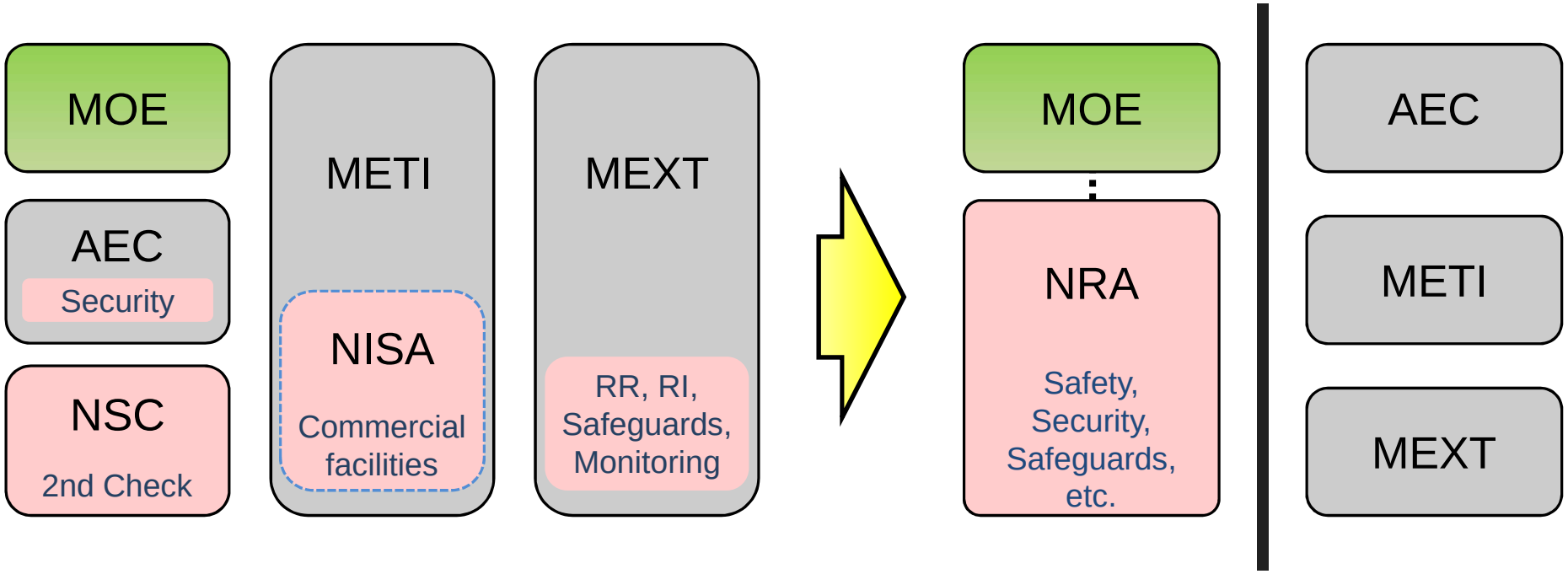
Independence

- Clear separation of Regulation from Promotion
- An independent Commission (under the Ministry of the Environment)

Integration

- All nuclear regulatory functions integrated in NRA: “3 S” (safety, security, safeguards); radiation monitoring; RI

Integrated and Independent



AEC : Atomic Energy Commission
METI : Ministry of Economy, Trade and Industry
MEXT : Ministry of Education, Culture, Sports, Science and Technology
MOE : Ministry of the Environment
NISA : Nuclear and Industrial Safety Agency (abolished)
NSC : Nuclear Safety Commission (abolished)

NRA's Core Values and Principles
(Mission statement)

- Learn and absorb lessons from Fukushima and never allow such accidents again;
- Restore public trust is of utmost importance;
- Foster a genuine safety culture; Highest priority on public safety;
- Independent decision-making based on scientific and technological information, free from any outside pressure or bias;
- Achieve genuinely effective regulations rather than formalities;
- Open and transparent organization: avoid self-isolation, self-righteousness;
- High ethical standards, sense of mission, rightful pride;
- Swift and effective response readiness to all emergencies.

NRA: Current and future activities

1 TEPCO Fukushima Daiichi NPP

- Designation as "disaster-experienced" plant; ensuring cooling of the molten debris, including spent fuel pools; managing radiation-contaminated water; readying for decommissioning processes;
- Investigation of some accident details in the offing;

2 Drafting new safety standards in three areas, to be ready by July 2013:

- Design basis safety standards,
- Severe accident measures,
- Safety standards relative to earthquakes/tsunamis,

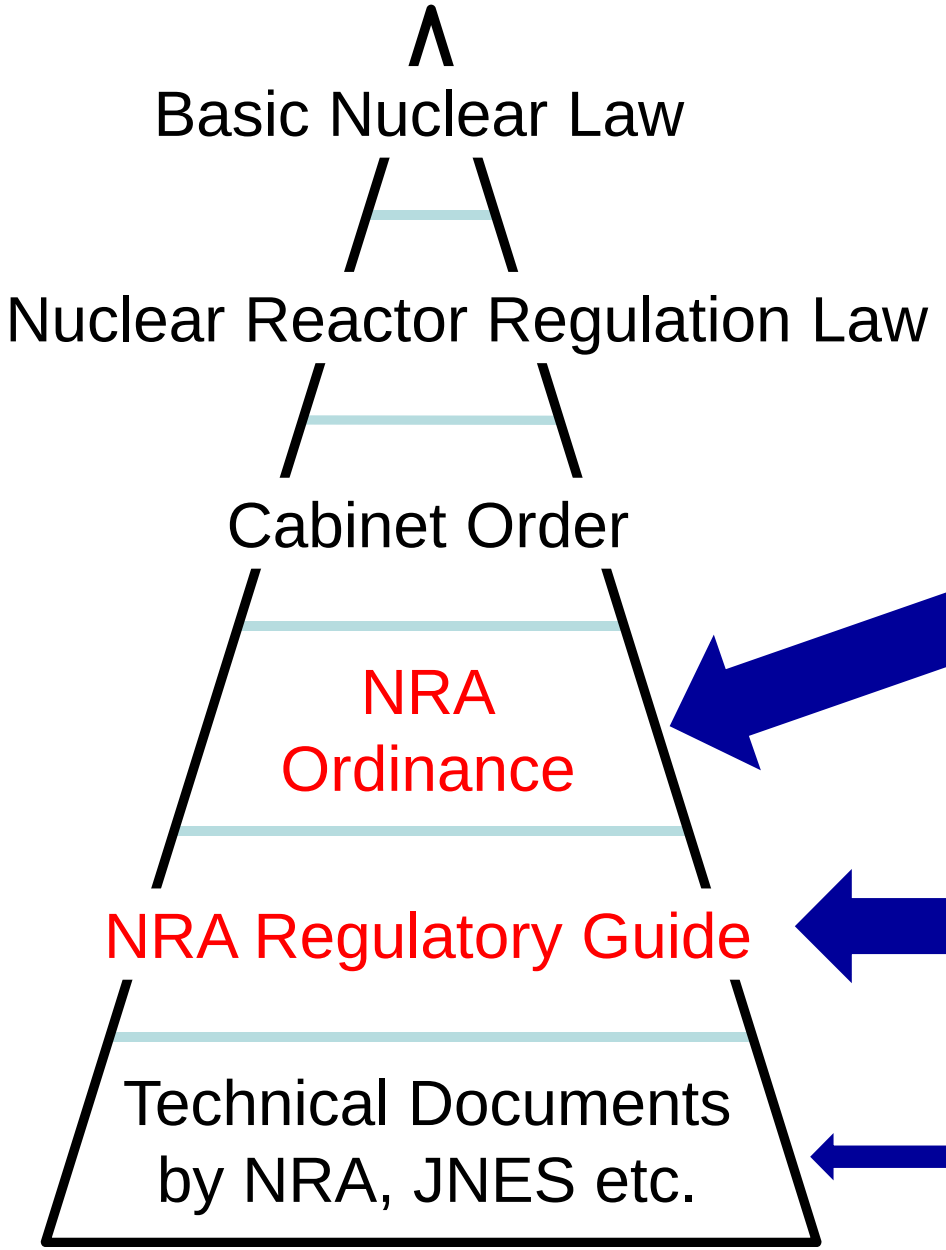
3 Fracture zones surveys

4 Preparedness and evacuation guidelines for local communities

5 Work on safety assessment regarding shutdown reactors (50)

- Once new safety standards and regulations are promulgated (after July)

Structure of NPP Regulation Legislation

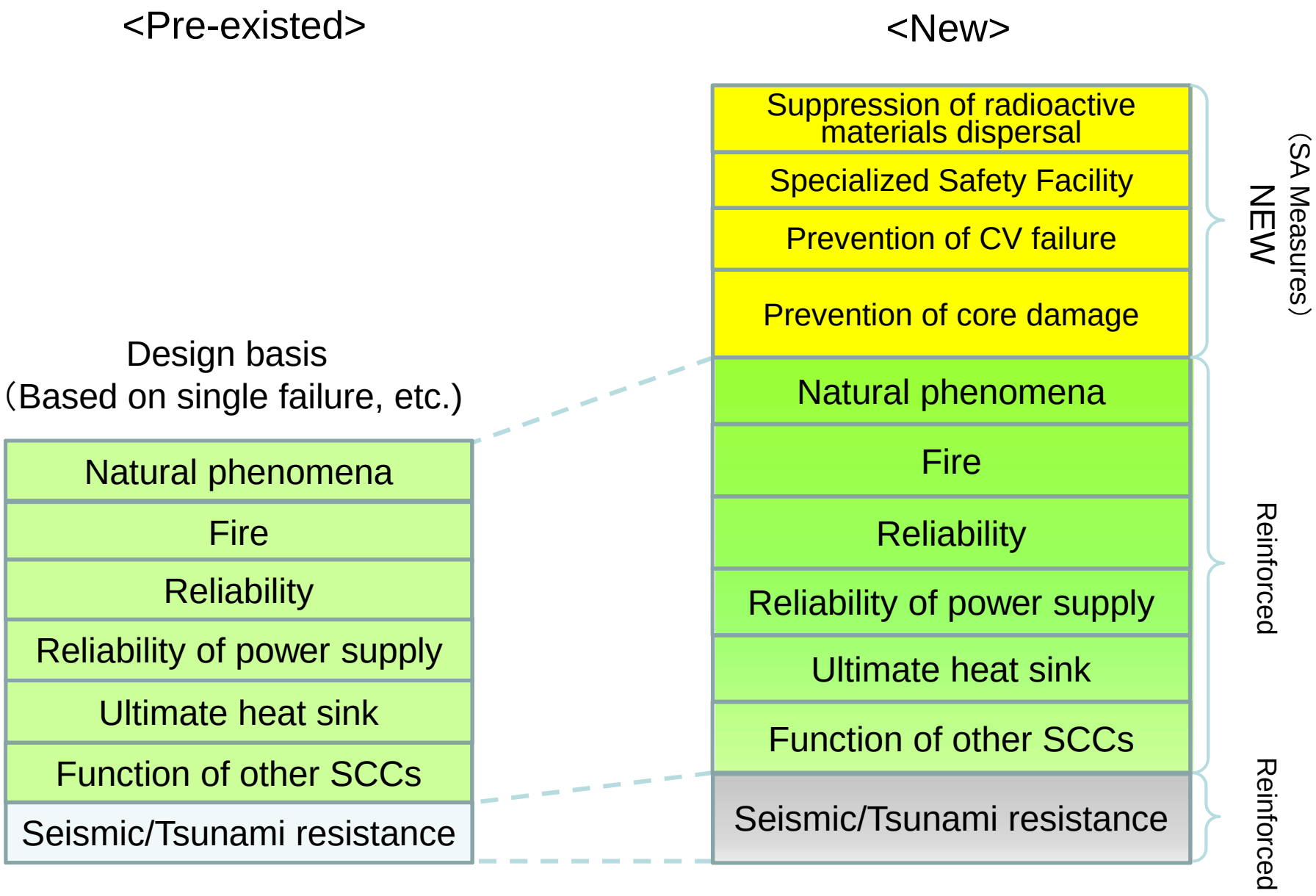


Requirements
Define the level of capacity of equipment and/or procedures for each function, e.g. depressurization of primary coolant system.

Requirement details
Show examples to achieve the level of capacity.

e.g., Evaluation method of habitability of control rooms

Structure of proposed requirements



Policy on New Safety Regulations

1. **Amendments to the Nuclear Regulation Act (promulgated in June 2012)**

   - **Mandatory severe accidents measures;**
   - **Mandatory back-fitting;**
   - **40-year operational limit for NPPs (with possibility of up to 20-year extension)**
   - **Special regulation applicable to disaster-affected Fukushima Daiichi**

Policy on New Safety Regulations (conti'd)

2. Strengthening of Design Basis

- Thorough application of Defense-in-Depth
  e.g. Multiple effective protective measures, etc.
- Elimination of common cause failure
  e.g. Enhanced fire protection, tsunami inundation
- Enhanced protective measures against extreme natural hazards
  e.g. More stringent assessment of earthquake and tsunami; diversity/independence/redundancy

3. Severe accident measures

- Measures for preventing Core Damage/Containment Failure
  e.g. Filtered venting system (BWR)
  Water injection system for cooling of molten core (mobile pumps, hoses, etc.)
- Measures against terrorism (intentional aircraft crash, etc.)
- Preventing hydrogen explosion

Policy on New Safety Regulations (conti'd)

4. Enhanced measures for earthquake/tsunami

- **More stringent standards on tsunami**

  e.g. Define "design basis tsunami" that exceeds the largest in the historical records and require to take protective measures (sea wall, tsunami gate installations, etc.)

- **Expanded scope of the application of higher seismic resistance**

- **More stringent criteria for active faults**

  e.g. Active faults with activity records later than 120,000-130,000 years ago should be considered for seismic design; Class S buildings should not be constructed on the exposure of active faults

International Dimension

- **Inviting IAEA's IRRS, IPPAS as soon as ready**
- **Bilateral cooperation:**
  US, France, UK, Russia, Ukraine, Belarus, and others
- **Trilateral TRM (Japan, Korea, China)**

- **International organizations**

Thank you for your attention !