Fifth US-Japan Roundtable, “American Viewpoints on Japan’s Zero Nuclear Option” hosted jointly by The Howard Baker Forum and The Heritage Foundation on December 5, 2012, at the Heritage Foundation, Washington D.C. USA.

Closing Remarks

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Chairman

Japan Atomic Energy Commission

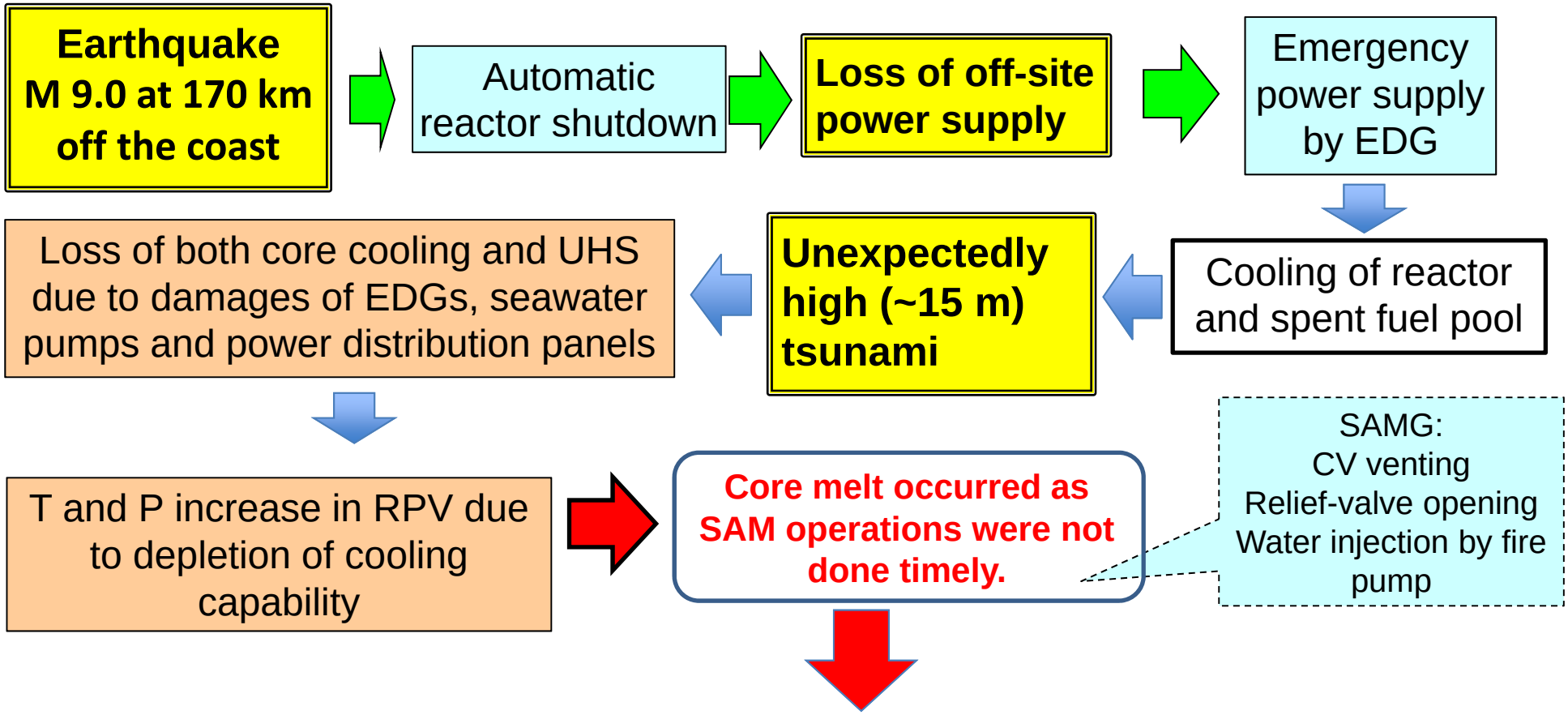
The Philosophy of the Howard Baker Forum

- *In governance, wrote James Madison in Federalist No.14, the government should never disregard as touchstones of sound policy "the suggestions of their own good sense, the knowledge of their own situation, and the lessons of their own experience."*
- *Sorting out these "suggestions" in today's modern world of advocacy and spin is a daunting challenge.*
- *The Howard Baker Forum serves as a neutral ground for examining the issues and finding creative solutions to pressing national problems.*

Aftermath of 2011 Great East Japan Earthquake and Tsunami

- Causalities
  - 18, 131 deaths, 6194 injured and 2829 missing
  - 1618 deaths related with the disaster: 764 in Fukushima; 636 in Miyagi and 179 in Iwate
- Damages
  - 129,391 house were completely destroyed and 265,096 houses were half destroyed.
- Evacuees
  - 326,873 people in total; 41,969 of Iwate, 114,787 of Miyagi and 99,229 of Fukushima
- Causes
  - The magnitude of this natural event was that of once in 1,000 years.
  - Only 40% of the coastline was lined with anti-tsunami seawall.
  - Most of them were washed over their top by the tsunami as the return period of their design base tsunami was less than 1,000 years.

Accident Sequences



- **Hydrogen explosion in reactor building (RB)** caused by the leakage of H_2 generated by water-Zr reaction in the core to PCV and then to RB
- **Large releases of radioactive materials (RM) to environment** from PCV owing to degradation of leak-tightness due to its excessive temperature rise

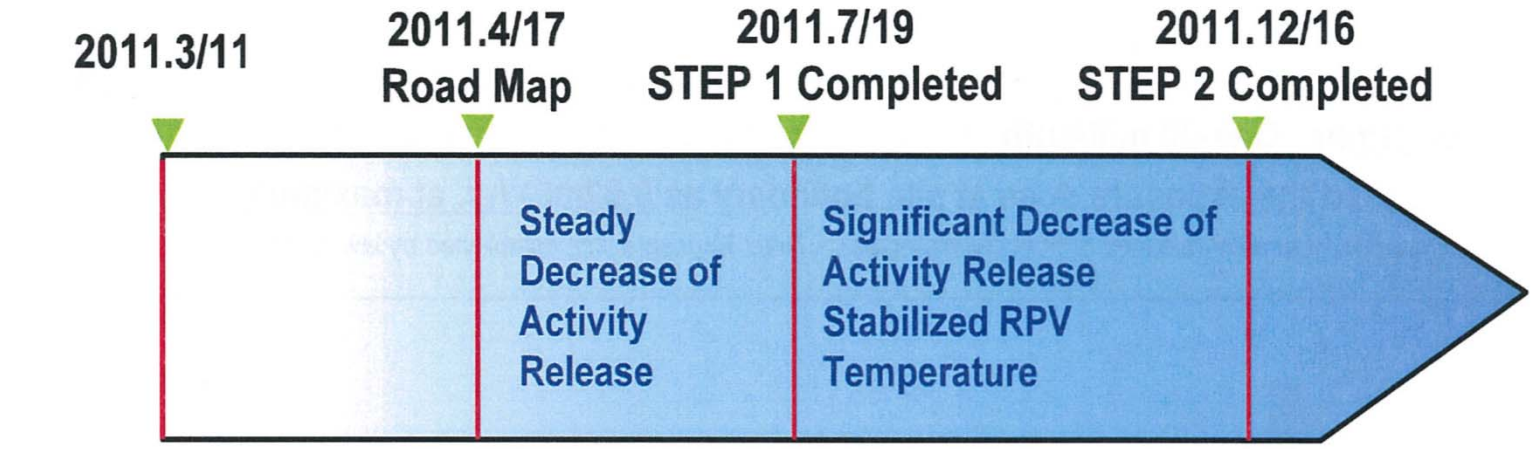
AEC's Request for Governance* Plans

- On-site cleanup
- Off-site remediation
- Nuclear power recovery
- Coping with the policy of no new NPP

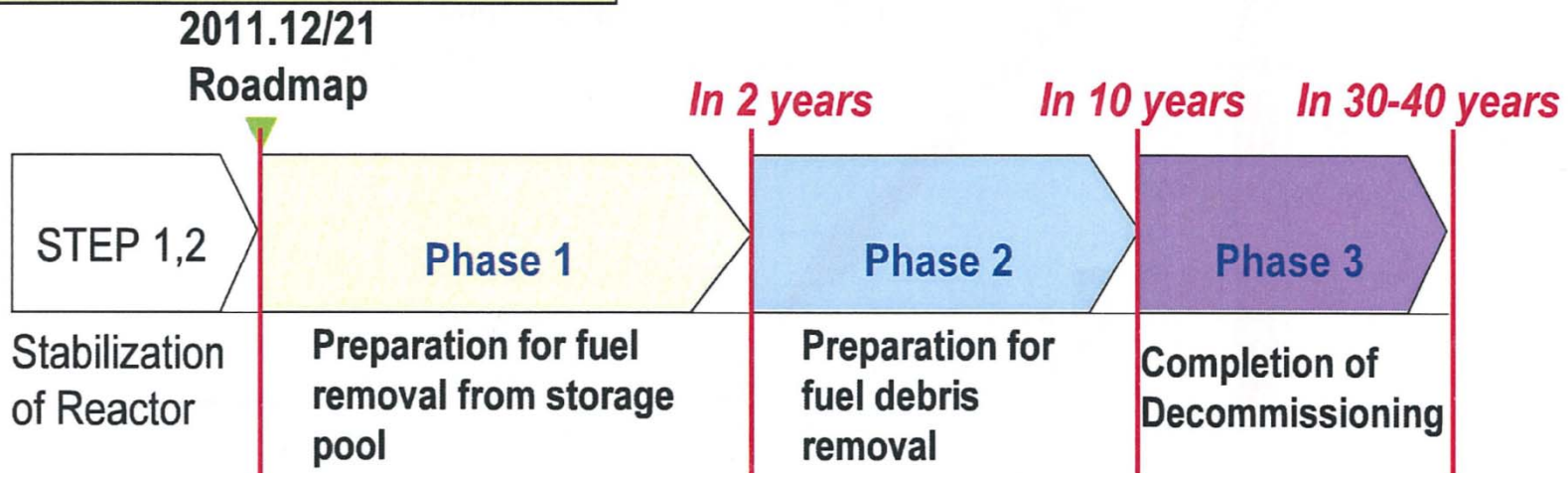
* Here governance means a democratic engagement of public decision-making body through the institutional arrangements where various stakeholders including citizens and government officials give input into the process to reach an effective and legitimate action plan.

Roadmap for Recovery and Decommissioning

Roadmap for immediate recovery



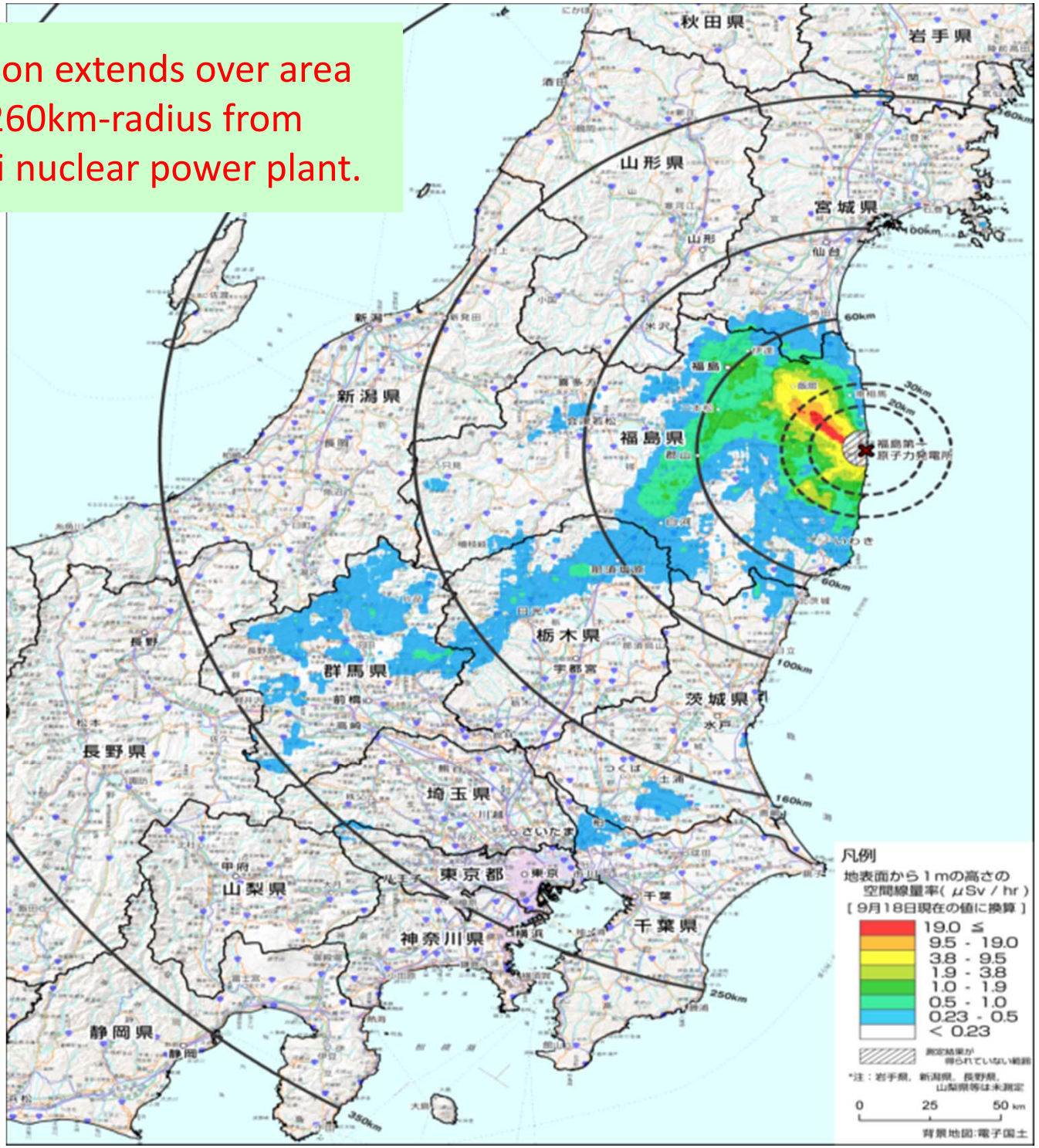
Roadmap for Decommissioning

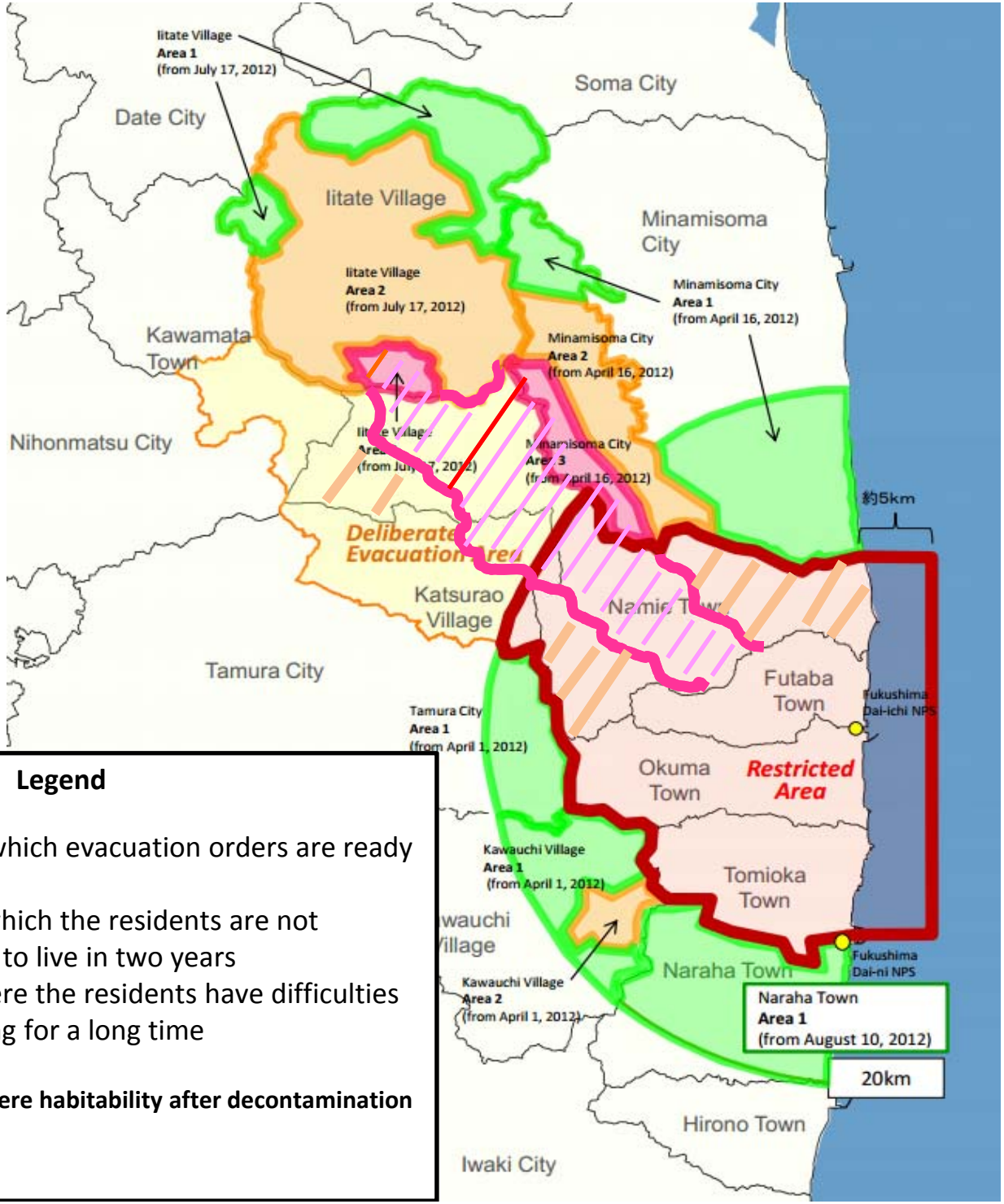


Major Onsite Works Promoted at Present

- Assurance of the reliable operation of circulating-water injection cooling
- Treatment of accumulated water and control of ground water inflow to reactor buildings
- Reduction of environmental radiation
- Improvement of work environment in controlled areas
- Long-term health management of workers experienced high-level exposures
- Removal of spent fuel from spent fuel pool
- Preparations for fuel debris removal
- Management of radioactive wastes

Land contamination extends over area within about 260km-radius from Fukushima Daiichi nuclear power plant.





Legend

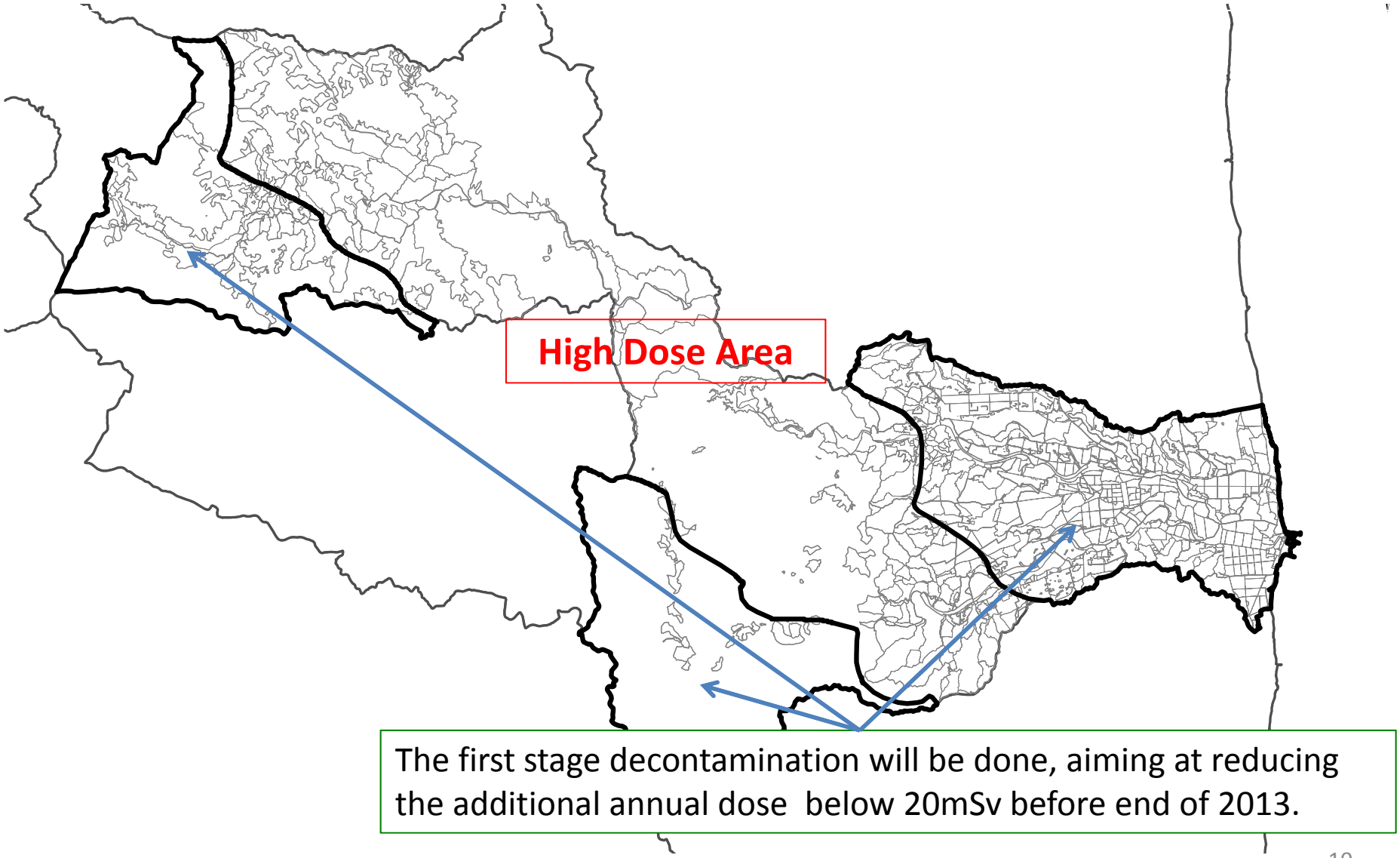
Area1 : Areas to which evacuation orders are ready lifted

Area2: Areas in which the residents are not permitted to live in two years

Area3: Areas where the residents have difficulties in returning for a long time

Restricted Area, where habitability after decontamination is under discussion.

Naraha-City is Divided into Habitable Area and Inhabitable Area (at least for five years) in Two Years.



Offsite Recovery

The challenges government are tackling at present are to

- Promote public communication for securing sites for interim storage facility for radioactive waste from decontamination works;
- Seek for more efficient and effective decontamination technology and approach and those for forests which cover more than 70 % of their area, in particular;
- Monitor health condition and promote health management based on the common concept of early diagnosis and treatment for any diseases identified for a two million population during almost whole lifespan due to uncertainty in the effect of low-dose radiation exposure;
- Promote risk communication about the low-dose exposure;

The life of sufferers, the proceeding of these works and inevitable occurrences of friction in the proceeding are on the news almost day after day and will be so year after year.

Recovery of Nuclear Power Generation

- Should cover governance in three dimensions
  - ✓Technological
  - ✓Institutional
  - ✓Public trust

Recognition of Global Nuclear Community

- Though the accident was triggered by a massive force of nature, it was existing weaknesses regarding defense against natural hazards, regulatory oversight, accident management and emergency response that allowed it to unfold as it did, and apparently they can be fixed.
- Nuclear energy offers and will offer many benefits, helping to improve energy security, reduce the impact of volatile fossil fuel prices, mitigate the effects of climate change and make economies more competitive.

Root Causes of the Accident

- Nuclear regulator and operators were shy with probabilistic approach and failed to let the experts in tsunami know the necessity of having information about a tsunami event of which frequency of exceedance was less than 1 in 10,000 years.
- They also failed to satisfy the need for defense-in-depth features that should prevent a disproportionate increase in radiological consequences from an appropriate range of events more severe than the design basis event (cliff-edge).
- Utilities and vendors made a decision to deviate from the accident management strategies developed by the global nuclear community, claiming that AC Power supply in Japan is highly reliable based on the data obtained in 10 years or so: measures introduced were based on the assumption that a loss of all AC power would not last for more than 30 minutes.
- Emergency trainings were superficial such that they could not build up the preparedness for venting PCV in diverse situations.

Measures Directed by the NISA

- Ensure that design base external events (seismic, seismic-tsunami and other events, their combined effects) are properly evaluated.
- Ensure extended losses of power and ultimate heat sink are covered under severe accident conditions and protection is provided by a diverse and flexible capability to provide power and cooling:
- Ensure that severe accident management procedures, including reliable hardened vent for specific reactor containments, that take into consideration the fact that external events might affect the entire site, and that training thereof are in place:
- Ensure emergency preparedness capabilities are in place and available even under combined effects of natural events.

Recommendations of the Governmental Accident Investigation Committee

- A strong safety culture should be established in every nuclear enterprise.
- There should be strong leadership in all the institutions involved in nuclear power that ensures attention to safety, as well as continuing efforts to understand the technology and to improve it.
- Every operator should recognize its fundamental responsibility for safety, continuously driving himself for safety excellence and making regular investments to address insights arising from operating experience and evolving knowledge of external events.
- The regulator must be competent, independent, and dedicated to the task of ensuring that safety obligations are fulfilled.

Nuclear Regulation Authority (NRA)

The Commission


Commissioner Nakamura


Commissioner Shimazaki


Chairman Tanaka


Commissioner Fuketa


Commissioner Oshima

- Reactor Safety Examination Committee
- Nuclear Fuel Safety Examination Committee
- Radiation Council
- Committee for Evaluation of Independent Administrative Agency

Secretariat of NRA (S/NRA)

Secretary-General

Deputy Secretary-General

- Director-General for Emergency Response
  - General Affairs Division
  - Policy Evaluation and Public Relations Division
- Director-General for Nuclear Regulation Policy
  - International Affairs Division
  - Regulatory Standard and Research Division
- Director-General for Regional Safety Management
  - Nuclear Emergency Preparedness Division
  - Director for Nuclear Regulation (5 members)

- Nuclear Regulatory Local Office (22 sites)
- Liaison to the local administration (5 members)

Recent Actions Taken by the NRA

- Started reviewing the characteristics of active-faults in and around several NPP sites that had been open to dispute.
- Recommended the municipalities within 30km from NPPs to establish an emergency plan (about 10 km in the past).
- Started the deliberation of a new safety requirement that should request the implementation of countermeasures against severe accident.
  - ✓ The latest technical requirement (seismic resistance, regulations on severe accident, etc.) shall be applied to the existing plants retrospectively.
  - ✓ NPPs must not be operated beyond 40 years, in principle, though one-time-only extension up to 20 years will be allowed on a case-by-case basis.

The Governance of Public Trust

- In the public trust dimension local governments and citizens are essential participants in addition to central government and operators of NPPs.
- As the NRA asked municipalities within 30km from NPPs to establish an emergency plan, the number of participating municipalities rose significantly.
- Government should establish an innovative institutional arrangement within which problems are identified and solutions are enacted through interaction among participants in restarting the idling plants.

How to Cope With No New Construction Policy

- The plan should cover;
  - Human resources
  - Competitiveness of nuclear industries
  - Nuclear fuel cycle activity
  - Relation with local governments
  - International relations

Recent Activities in the Area of the Nuclear Fuel Cycle

- Japan Nuclear Fuel Limited (JNFL)
  - Started the operation of new centrifuge cascade for uranium enrichment of the updated section of Uranium Enrichment Plant.
  - Resumed the construction of a MOX Fuel Fabrication Plant.
  - Started the final test of Melter B of Reprocessing Plant. The test of Melter A will followed and the active test will be completed in the fall of 2013.
- Government is to
  - Start the R&Ds for used nuclear fuel direct disposal and for advanced burner reactors that can reduce the amount of radioactive wastes, compiling the outcome of 30 years or so of fast-breeder reactor R&D activity including the operation of Monju.
  - Intensify the activity to determine the site for a high level radioactive waste repository.

How to Cope With No New Construction Policy

- At present, priority should be given to recovery of public trust:
  - ✓ Improve the safety of their plant so that they can resume the operation of idling plant, satisfying the requirement of the NRA and obtaining the consent of the local government ;
  - ✓ Resume their efforts to obtain the consent of the local government to use MOX fuel in their plants.
- The plan should have a mid and long term perspective:
  - ✓ Complexity – need for comprehensive approach
  - ✓ Industry already has prepared themselves for low domestic order.
- Short term actions necessary
  - ➢ Assurance of human resources
  - ➢ Pursuance of a joint action for making best use of industrial capability in terms that are going to make sense to the people

We should fix nuclear energy,

not extirpate it.

David Lilienthal, the first Chairman of the US AEC,

shortly after the TMI Accident in 1979.

Thank you