892

Castleman, Patrick ~~NOT FOR PUBLIC DISCLOSURE~~

From: Castleman, Patrick
Sent: Thursday, September 01, 2011 12:51 PM
To: Reddick, Darani
Subject: RE: FYI - Organization Chart for Fukushima Lessons Learned Project Directorate

It appears that this is envisioned as a long term deal. It seems to me that this is running perilously close to a reorganization that is establishing a new office. So a charter won't cut it. Especially the charter that is in front of the Commission, which is open-ended. This is not analogous to advisory committees, which are already established and are periodically rechartered—their charters are more like two-year work plans (at least they're not five year plans, Comrade ☺).

And as for the involvement of task force members, what do you expect of an organization that is, in reality, hardwired into GBJ's office—he needs to do everything he can to ensure that this effort is, as Dale Klein would say, a self-licking ice cream cone. Independence and objectivity will certainly lead the effort in a more realistic and soundly based direction (which, incidentally, is opposite the way Dr. J wants to go).

From: Reddick, Darani
Sent: Thursday, September 01, 2011 12:38 PM
To: Castleman, Patrick
Subject: RE: FYI - Organization Chart for Fukushima Lessons Learned Project Directorate

Are you kidding me? Is this the full-time job of these people for the next few decades? Also, why does it include a member from the Task Force (Amy Cubbage)? Shouldn't the people giving technical advice to the Commission on the TF's recommendations be people other than the TF members themselves??!

From: Castleman, Patrick
Sent: Thursday, September 01, 2011 12:16 PM
To: Svinicki, Kristine
Cc: Sharkey, Jeffry; Reddick, Darani; Astwood, Heather
Subject: FW: FYI - Organization Chart for Fukushima Lessons Learned Project Directorate

Commissioner,

FYI. The reactor TAs were provided a hardcopy of this last week. What's different in this version is the addition of two senior PMs on the bottom left side...so the directorate is already causing resources to be diverted.

Pat

From: Bowman, Gregory
Sent: Thursday, September 01, 2011 11:54 AM
To: Hipschman, Thomas; Marshall, Michael; Castleman, Patrick; Gilles, Nanette; Orders, William; Franovich, Mike
Subject: FYI - Organization Chart for Fukushima Lessons Learned Project Directorate

We got a request for the organization chart for the Fukushima Lessons Learned Project Directorate. That's the group that is responsible for developing the 21- and 45-day papers required by the SRM for SECY-11-0093, and also for providing support to the team in Japan.

The chart is attached. If you have any questions, please give me a call.

Greg

~~NOT FOR PUBLIC DISCLOSURE~~

8914

Castleman, Patrick NOT FOR PUBLIC DISCLOSURE

From: Castleman, Patrick
Sent: Thursday, September 01, 2011 2:11 PM
To: Sosa, Belkys; Davis, Roger
Subject: FW: FYI - Organization Chart for Fukushima Lessons Learned Project Directorate
Attachments: PD Org Chart.pptx

From: Bowman, Gregory
Sent: Thursday, September 01, 2011 11:54 AM
To: Hipschman, Thomas; Marshall, Michael; Castleman, Patrick; Gilles, Nanette; Orders, William; Franovich, Mike
Subject: FYI - Organization Chart for Fukushima Lessons Learned Project Directorate

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Greg

~~NOT FOR PUBLIC DISCLOSURE~~

889

Castleman, Patrick

From: Castleman, Patrick
Sent: Thursday, September 01, 2011 11:01 AM
To: Svinicki, Kristine
Cc: Sharkey, Jeffry; Reddick, Darani; Astwood, Heather
Subject: FW: Slides from August 31 NTTF Meeting
Attachments: Final August 31 Public Meeting Slides Extra Recs.pptx

Commissioner,

I sent a hardcopy of this into your office yesterday. .

Pat

From: Bowman, Gregory
Sent: Thursday, September 01, 2011 10:12 AM
To: Hipschman, Thomas; Marshall, Michael; Castleman, Patrick; Gilles, Nanette; Orders, William; Franovich, Mike
Subject: Slides from August 31 NTTF Meeting

Some of you may have seen these already, but in case you're interested, I attached an electronic copy of the slides that were used at the public meeting yesterday to solicit input on the Near-Term Task Force recommendations.

Let me know if you have any questions.

Greg

PUBLIC MEETING TO OBTAIN FEEDBACK ON NEAR-TERM TASK FORCE RECOMMENDATIONS

US Nuclear Regulatory Commission

August 31, 2011

U.S.NRC

United States Nuclear Regulatory Commission

Protecting People and the Environment

AGENDA

- Welcome and Opening Comments
- Discussion of Recommendations of the Near-Term Task Force Report
  - Statements from Panelists
  - Discussion - NRC & Panelists
- Public Statements on NRC's Proposed Actions
- Closing Remarks

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Eric Leeds, Director
Office of Nuclear Reactor Regulation
Nuclear Regulatory Commission

NEAR-TERM TASK FORCE RECOMMENDATIONS BEING CONSIDERED FOR IMPLEMENTATION WITHOUT UNNECESSARY DELAY

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COMMISSION DIRECTION

- Staff Requirement Memorandum (SRM)11-0093 - August 19th
- Provide prioritization of recommendations
- Provide a draft charter for the structure, scope, and expectations for assessing the Task Force recommendations and NRC's longer-term review
- Advisory Committee on Reactor Safeguards (ACRS) should formally review all Task Force recommendations

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COMMISSION DIRECTION

- The staff should provide the Commission with a paper by September 9th that identifies and makes recommendations regarding any Task Force recommendations that can, and in the staff's judgment, should be implemented, in part or in whole, without unnecessary delay
- The review should include dialogue with external stakeholders

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RECOMMENDATIONS UNDER DISCUSSION

- The recommendations for discussion today are those under consideration for implementation without unnecessary delay
- Guiding Questions:
  - Which specific sub-recommendations do you propose the staff undertake without unnecessary delay?
  - What is the basis for your proposal?
  - What do you see as the potential implications should the staff follow your proposal?

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RECOMMENDATION 2

- The Task Force recommends that the NRC require licensees to reevaluate and upgrade as necessary the design-basis seismic and flooding protection of structures, systems, and components for each operating reactor
  - 2.1 - Order re-evaluation of seismic/flooding hazards
  - 2.2 - Rulemaking regarding seismic/flooding hazards
  - 2.3 - Order walkdowns to evaluate seismic/flooding hazards

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RECOMMENDATION 4

- The Task Force recommends that the NRC strengthen station blackout mitigation capability at all operating and new reactors for design-basis and beyond-design-basis external events
  - 4.1 - Rulemaking to revise 10CFR50.63
  - 4.2 - Order enhanced protection and capacity of equipment required by 10CFR50.54 (hh) (2)

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RECOMMENDATION 5

- The Task Force recommends requiring reliable hardened vent designs in boiling water reactor facilities with Mark I and Mark II containments
  - 5.1 - Order reliable hardened vents for BWR Mark I/II containments
  - 5.2 - Study need for hardened vents for other containment designs

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RECOMMENDATION 7

- The Task Force recommends enhancing spent fuel pool makeup capability and instrumentation for the spent fuel pool
  - 7.1 - Order safety-related instrumentation
  - 7.2 - Order safety-related AC electrical power
  - 7.3 - Order spent fuel pool technical specifications
  - 7.4 - Order spent fuel pool makeup systems
  - 7.5 - Spent fuel pool related rulemaking

RECOMMENDATION 8

- The Task Force recommends strengthening and integrating onsite emergency response capabilities such as emergency operating procedures, severe accident management guidelines, and extensive damage mitigation guidelines
  - 8.1 - Order integration of EOPs, SAMGs, and EDMGs
  - 8.2 - Modification of standard technical specifications
  - 8.3 - Orders related to tech spec modification
  - 8.4 - Rulemaking for training and exercises related to SAMGs and EDMGs

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RECOMMENDATION 9

- The Task Force recommends that the NRC require that facility emergency plans address prolonged station blackout and multiunit events
  - 9.1 - Rulemaking for EP enhancements for multi-unit events
  - 9.2 - Rulemaking for EP enhancements for prolonged SBO
  - 9.3 - Orders related to EP interim actions regarding multi-unit events and prolonged SBO
  - 9.4 - Order completion of ERDS modernization

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Public Statements on NRC's Proposed Actions

Closing Remarks

COMMENTS

Regulations.gov

Docket number NRC-2011-0196

Accepting Comments Through September 2, 2011

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CONTACT

Address questions about NRC dockets to Carol Gallagher

- Telephone: 301-492-3668
- E-mail:

Carol.Gallagher@nrc.gov

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RECOMMENDATION 1

- The Task Force recommends establishing a logical, systematic, and coherent regulatory framework for adequate protection that appropriately balances defense-in-depth and risk considerations
  - 1.1 - Commission policy statement on extended design basis requirements as part of adequate protection
  - 1.2 - Rulemaking to implement the policy statement in 1.1
  - 1.3 - Modify regulatory analysis guidelines to more effectively implement defense-in-depth philosophy
  - 1.4 - Evaluate IPE and IPEEE insights

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RECOMMENDATION 3

- The Task Force recommends, as part of the longer term review, that the NRC evaluate potential enhancements to the capability to prevent or mitigate seismically-induced fires and floods

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RECOMMENDATION 6

- The Task Force recommends, as part of the longer term review, that the NRC identify insights about hydrogen control and mitigation inside containment or in other buildings as additional information is revealed through further study of the Fukushima Dai-ichi accident

RECOMMENDATION 10

- The Task Force recommends, as part of the longer term review, that the NRC should pursue additional EP topics related to multiunit events and prolonged SBO
  - 10.1 - Analyze protective equipment requirements for emergency responders
  - 10.2 - Evaluate oversight functions for addressing a long-term SBO or multiunit event
  - 10.3 - Evaluate ERDS performance

RECOMMENDATION 11

- The Task Force recommends, as part of the longer term review, that the NRC should pursue EP topics related to decision-making, radiation monitoring, and public education
  - 11.1 - Study the need for enhanced onsite emergency response resources
  - 11.2 - Engage external stakeholders on evaluation of EP-related insights
  - 11.3 - Study the efficacy of real-time radiation monitoring
  - 11.4 - Conduct training on appropriate use of KI

RECOMMENDATION 12

- The Task Force recommends that the NRC strengthen regulatory oversight of licensee safety performance (i.e., the ROP) by focusing more attention on defense-in-depth requirements consistent with the recommended defense-in-depth framework
  - 12.1 - Expand scope of ROP assessment to include defense-in-depth considerations
  - 12.2 - Enhance the NRC staff training on severe accidents

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Protecting People and the Environment

897

Sharkey, Jeffry

From:	HEYMER, Adrian [aph@nei.org]
Sent:	Friday, September 02, 2011 4:11 PM
Subject:	Industry Comments on Proposed Near-Term NRC Actions Associated With the Fukushima Dai-Ichi Accident; Docket Number NRC-2011-0196
Attachments:	09-02-11_NRC_Industry Comments on Proposed Near-Term NRC Actions Associated with the Fukushima Dai-Ichi Accident; Docket ID NRC-2011-0196.pdf; 09-02-11_NRC_Industry Comments on Proposed Near-Term NRC Actions Associated with the Fukushima Dai-Ichi Accident; Docket ID NRC-2011-0196_Attachment.pdf

September 2, 2011

Ms. Cindy K. Bladey
Chief, Rules, Announcements and Directives Branch
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: Industry Comments on Proposed Near-Term NRC Actions Associated With the Fukushima Dai-Ichi Accident; Docket Number NRC-2011-0196

Project Number: 689

Dear Ms. Bladey,

The Nuclear Energy Institute appreciates the opportunity to provide comments and input on the set of proposed near-term U.S. Nuclear Regulatory Commission (NRC) actions associated with the NRC report, *Recommendations for Enhancing Reactor Safety in the 21st Century, The Near-Term Task Force Review of Insights from the Fukushima Dai-ichi Accident.* This letter supplements the industry comments made in the NRC August 31, 2011 public meeting and reflects input provided by several industry working groups and the chief nuclear officers of all U.S. nuclear operating companies.

Detailed comments on each of the six main recommendations are provided in the attachment to this letter.

In addressing the NRC task force recommendations, we encourage the Commission to adopt a flexible, performance-based approach, especially in the area of beyond design bases activities, to allow for the variations in siting, geographical and geological locations, and plant designs.

The industry agrees that there are important lessons to be learned and implemented from the Fukushima accident. The industry has developed a strategic plan, *The Way Forward,* to coordinate and manage its response to the Fukushima crisis. The plan emphasizes the importance of maintaining high safety performance at the 104 operating reactors and covers the development and implementation of lessons learned from Fukushima, R&D and technical support, international cooperation and support, communications, emergency planning and preparedness, training, and regulatory interactions and response.

The industry will soon complete a provisional timeline that reconstructs the progression of events and accident conditions at Fukushima. Once the provisional timeline is completed..discussions with Tokyo Electric Power Company are necessary to

resolve a number of open issues and questions before the industry completes its evaluations. Also, that information will be critical in determining the extent to which insights related to the events and conditions pertain to U.S. plants and the potential plant enhancements that should flow therefrom. There must be a reasoned determination that the correct lessons have been learned and that those lessons are appropriately linked to the causal factors of the Fukushima accidents.

The industry, the public and the NRC must have a common understanding of the events and rationale for the actions taken at Fukushima before the industry—as required by the NRC and on its own initiative—implements plant enhancements. To attain this objective, the industry is willing to discuss the timeline with NRC staff. This will provide additional confidence in the development and understanding of the bases for regulatory actions being required in response to the Fukushima accidents as well as the manner in which new requirements are to be satisfied.

The NRC task force concluded that a sequence of events like the Fukushima accident is unlikely to occur in the United States and that continued operation and continued licensing activities do not pose an imminent risk to public health and safety. A preliminary industry qualitative, risk-informed assessment of the six NRC recommendations under consideration reaches the same conclusion. As a result, we do not believe that orders are necessary at this time. To the extent the NRC seeks information from all licensees or seeks to elicit a response from all licensees on a significant issue, there are regulatory tools such as generic letters and bulletins that can achieve those objectives.

If the NRC determines that it is necessary to impose new requirements on a generic, industry-wide basis, the appropriate regulatory process is rulemaking. If necessary, such rulemakings could be expedited. In summary, we believe that the NRC and all stakeholders would benefit from the transparent and deliberative process mandated by the Administrative Procedure Act.

The near-term actions should be focused on those enhancements that generally may be attainable within 12 to 18 months and where additional clarifying information forthcoming from Fukushima will not negate earlier decisions.

To effectively implement the multi-unit staffing proposal in the NRC task force recommendation 9 concurrent with the existing EP rule change, the implementation schedule for the emergency response organization needs to be extended by one year to accommodate the staffing criteria.

The industry is committed to ensuring that the U.S. nuclear industry learns from and incorporates the lessons from the Fukushima accidents in a manner that will improve safety and plant performance so that the nuclear industry will continue to provide additional benefit to the nation's environment and economy.

Sincerely,

Brian Heymer
Senior Director, Strategic Programs

Nuclear Energy Institute
1776 I Street NW, Suite 400
Washington, DC 20006
www.nei.org

202-739-8094

F: 202-533-0147
E: aph@nei.org

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Adrian P. Heymer
SENIOR DIRECTOR
STRATEGIC PROGRAMS
NUCLEAR GENERATION DIVISION

September 2, 2011

Ms. Cindy K. Bladey
Chief, Rules, Announcements and Directives Branch
U.S. Nuclear Regulatory Commission
Washington, DC 20555-0001

Subject: *Industry Comments on Proposed Near-Term NRC Actions Associated With the Fukushima Dai-Ichi Accident; Docket Number NRC-2011-0196*

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[1] NEI is the organization responsible for establishing unified nuclear industry policy on matters affecting the nuclear energy industry, including the regulatory aspects of generic operational and technical issues. NEI's members include all utilities licensed to operate commercial nuclear power plants in the United States, nuclear plant designers, major architect/engineering firms, fuel fabrication facilities, materials licensees, and other organizations and individuals involved in the nuclear energy industry.

1776 I Street, NW | Suite 400 | Washington, DC | 20006-3708 | P: 202.739.8094 | F: 202.533.0147 | aph@nei.org | www.nei.org

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Sincerely,

A. Heymer

Adrian Heymer

Attachment

c: The Honorable Gregory B. Jaczko, Chairman, U.S. Nuclear Regulatory Commission
The Honorable Kristine L. Svinicki, Commissioner, U.S. Nuclear Regulatory Commission
The Honorable William D. Magwood, IV, Commissioner, U.S. Nuclear Regulatory Commission
The Honorable George Apostolakis, Commissioner, U.S. Nuclear Regulatory Commission
The Honorable William C. Ostendorff, Commissioner, U.S. Nuclear Regulatory Commission
Mr. R. William Borchardt, Executive Director for Operations, U.S. Nuclear Regulatory Commission

Attachment

Comments on NRC Proposed Near-Term Recommendations from the Fukushima Dai-ichi Accident

NRC Task Force Recommendation 2

The Task Force recommends that the NRC require licensees to reevaluate and upgrade as necessary the design-basis seismic and flooding protection of SSCs for each operating reactor.

The Task Force recommends that the Commission direct the following actions to ensure adequate protection from natural phenomena, consistent with the current state of knowledge and analytical methods. These should be undertaken to prevent fuel damage and to ensure containment and spent fuel pool integrity:

2.1 Order licensees to reevaluate the seismic and flooding hazards at their sites against current NRC requirements and guidance, and if necessary, update the design basis and SSCs important to safety to protect against the updated hazards.

2.2 Initiate rulemaking to require licensees to confirm seismic hazards and flooding hazards every 10 years and address any new and significant information. If necessary, update the design basis for SSCs important to safety to protect against the updated hazards.

2.3. Order licensees to perform seismic and flood protection walk-downs to identify and address plant-specific vulnerabilities and verify the adequacy of monitoring and maintenance for protection features such as watertight barriers and seals in the interim period until longer term actions are completed to update the design basis for external events.

NEI Comments and Input

The industry believes the initial focus should be on conducting walk-downs (Recommendation 2.3) to confirm that the plant is protected against the design bases flood and seismic events. The other recommendations are longer-term actions.

Walk-downs

Seismic: The industry proposes that a sample set of walk-downs should be conducted in accordance with procedures covering the walk-down criteria and validation against the design bases. In addition, a process for selecting the sample set of systems, structures and components should be developed together with criteria for determining when the sample should be expanded, if circumstances dictate. Regulatory interactions and endorsement of the walk-down criteria should occur prior to conducting the walk-downs to ensure that there is a common understanding on the approach and criteria. It should be recognized that additional

time should be allowed for completing the seismic walk-downs because some safety-related structures, systems and components may be accessible only during shutdown conditions.

External flooding: A similar approach to the seismic walk-downs would be employed except there would be no need to use a sampling methodology. As with the seismic walk-downs, regulatory interactions should occur in advance to reach a common understanding on the approach and acceptance criteria prior to commencing the activity.

Ten-Year Update of Seismic and Flooding Hazards

NEI believes that a process should be developed for identifying and assessing new and significant information as it emerges rather than wait 10 years. Such an approach would be consistent with how the NRC and the industry manage other new information. The industry recommends a three-phase process approach:

1. Identification of pertinent information that is of sufficient significance to warrant assessment.
2. Assessment to determine whether the information would impact the hazard.
3. A process for updating the hazard and determining whether changes are needed. The update would be performed against current regulatory requirements and standards based on the new assumptions and information. For example, if the original design bases standard was a 500-year flood, the update would be based on the 500-year flood, but the impact of an increased downstream levy height would be evaluated. Similarly, if the Corps of Engineers changed the height of the 500-year flood standard based on updated or new meteorology information, the impact on the plant would be evaluated against the new 500-year flood, even though a new plant may be evaluated against a 750-year flood.

Re-evaluation of Seismic and Flooding Hazard

Re-evaluations of the seismic and flooding hazard are longer-term activities and should be considered as part of the NRC long-term activities.

For seismic, we believe GI-199 and any follow-on activities and changes would address this aspect of recommendation 2.1.

For flooding, once a process for assessing new and significant pertinent information has been developed and the walk-downs have been completed, along with actions to fix any identified deficiencies, an evaluation on whether the flooding hazard has changed and its impact on the plant can be evaluated.

Industry Near-term Recommendation

External Flooding Walk-downs

- In response to a §50.54(f) letter, a licensee would develop procedures, including acceptance criteria for conducting external flood protection walk-downs and obtain NRC concurrence regarding the acceptability of the walk-down criteria.

  Conduct the walk-downs and validate the results against the existing design basis and report the results to the NRC within 120 days of NRC approval of the walk-down criteria.

Seismic Walk-downs

- In response to a §50.54(f) letter a licensee would develop procedures, including acceptance criteria for conducting a sample set of seismic walk-downs on safety-related systems, structures and components. Obtain a NRC concurrence regarding the approach, including the acceptability of the walk-down criteria and mechanism for expanding the scope of the structures, systems and components to be walked down if deficiencies are identified.

  Conduct seismic walk-downs for a sample set of critical safety-related systems, structures and components and verify against the seismic design bases. For areas that are inaccessible because of power operations, the walk-downs will be conducted at the first opportunity. Results will be reported to the NRC within 90 days of the end refueling outage of the first complete operating cycle following the issuance of the regulatory vehicle.

External Flooding and Seismic Hazard Update (Long-Term Activity)

- Initiate rulemaking to require licensees to confirm seismic hazards and flooding hazards as new and significant information is identified. If necessary, update the design basis to protect safety-related structures, systems and components against the updated hazards.

NOTE: We do not believe there is sufficient information or understanding to be able to establish acceptance and implementation criteria for an order or proceed with implementation to enable completion within a period of time normally associated with an order.

NRC Task Force Recommendation 4

4.1 Initiate rulemaking to revise 10 CFR 50.63 to require each operating and new reactor licensee to:

(1) establish a minimum coping time of 8 hours for a loss of all ac power,

(2) establish the equipment, procedures, and training necessary to implement an "extended loss of all *ac*" coping time of 72 hours for core and spent fuel pool

cooling and for reactor coolant system and primary containment integrity as needed, and

(3) preplan and pre-stage offsite resources to support uninterrupted core and spent fuel pool cooling, and reactor coolant system and containment integrity as needed, including the ability to deliver the equipment to the site in the time period allowed for extended coping, under conditions involving significant degradation of offsite transportation infrastructure associated with significant natural disasters.

4.2 Order licensees to provide reasonable protection for equipment currently provided pursuant to 10 CFR 50.54(hh)(2) from the effects of design-basis external events and to add equipment as needed to address multiunit events while other requirements are being revised and implemented.

NEI Comments and Input

Revision to 50.63

The industry agrees that rulemaking is the correct process for implementing enhancements that would enable plants to better mitigate and manage an extended and complete loss of AC power event. There would be benefit in an advanced notice of proposed rulemaking to frame the scope and objectives of the rule. In addition, key aspects of coping time and access to offsite resources should be considered. We believe that such an initial step would help to focus stakeholder comments and provide for a more efficient overall implementation of recommendation 4.1.

The nature of challenges to AC power supplies by natural phenomena are plant- and site-specific. For example, external flooding progresses very differently at a river or lake site versus a site that has a significant tsunami hazard. Therefore, the identification of appropriate short- and long-term coping strategies can vary from site to site. The approach must assure a degree of flexibility to accommodate the variations in site configuration, features and hazards.

The basis for the proposed 72-hour additional coping is unclear. The barriers to logistic offsite support during an emergency vary depending on location, local geography and transportation infrastructure, the hazard and the extent of the natural phenomena impact on the local and surrounding counties. For some plants assistance and reliable AC generation may be able to be supplied within 24 or 48 hours, at other sites, under different circumstances it may be longer. Thus, the approach must assure a degree of flexibility in the implementation to accommodate varying extended coping time durations for a complete loss of AC power.

Rulemaking is a long-term activity and should be included under the NRC long-term Fukushima activities.

Multi-Unit §50.54(hh) Requirements

We agree that pre-staging additional contingency equipment to meet §50.54(hh)(2) requirements for multi-unit sites would be appropriate. The exact composition of the extra equipment at or near the site complemented by additional offsite equipment at pre-staged areas needs to be determined. It is important to note that the wide diversity of unit configurations, geographic locations, varying risks of natural hazards of different types, etc. make this analysis complex. A series of regional public meetings in preparation of the advanced notice of proposed rulemaking could be beneficial and would assure that the rulemaking is correctly framed.

The industry is evaluating the role that regional support centers could play in these situations. Such centers would house contingency equipment, especially for slow, evolving events. Prior to requiring a definitive site-specific solution to the 50.54(hh)(2) equipment, the strategies for use of pre-staged equipment at regional support centers should be established in the implementing guidance for the final rule. Distance from the site, accessibility under external events, and site-mitigation strategies that are, in part, dependent on location and proximity of amenities. Other support infrastructure are variables that need to be addressed before reaching a final conclusion on the additional equipment to be procured and the location of such equipment. We note that other countries are evaluating this approach.

Any requirement to require protection of the contingency equipment against natural phenomena events should allow for flexibility in implementation to achieve the objective. In view of the beyond design bases scenarios that are central to the events under consideration, the specifications for the protection criteria should be based on commercial standards and not the traditional nuclear special treatment specifications. In addition, depending on the site geography, natural phenomena hazards and transportation infrastructure, protection could be afforded by locating more than the minimal set of equipment at various locations on or offsite at a location where it would still be possible to commission the equipment in the timeframe required by the §50.54(hh) requirements. Diversity of location and possibly redundancy could be just as effective as housing the equipment in Category 1 structures to ensure the availability of equipment.

In the interim, until the issues described above are resolved and the equipment is in place, the industry believes that short-term actions could be taken to ensure that adequate equipment is in place to support the contingency needs for each unit, and that the equipment has adequate protection and accessibility.

At this time, we do not believe that there is sufficient knowledge to define the implementation criteria that would be required to accompany an order for the additional §50.54(hh) equipment and protection requirements. We believe a bulletin requesting information on how sites would address the multi-unit contingency equipment issue would be more appropriate. The industry is

willing to work on implementing guidance in parallel with a rulemaking amendment to achieve the objective of recommendation 4.2 in the optimum time.

New Plants

The NRC task force recommendations recognize the advances of new plant designs. Yet the task force report states that COL applicants would have to address prestaging of any needed equipment for beyond 72 hours, and ITAAC should be established to confirm effective implementation of minimum and extended coping, as described in the recommendation. It is not necessary for prestaging to be addressed in COLs, including those for Vogtle 3/4 and Summer 2/3, for which the NRC staff has completed its technical review. There is no basis for requiring ESBWR or AP1000 COL applicants to adhere to a different coping strategy than existing plants.

Part 52 change processes and other regulatory vehicles exist and should be used for ensuring that new plant licensees comply with coping, prestaging or other new requirements. These matters may be addressed after design certifications or COLs are issued. ITAAC should not be the regulatory vehicle for adjusting the licensing basis.

Industry Near-Term Recommendations

- In response to a NRC bulletin, procure additional equipment, as determined from site specific evaluations, sufficient to meet §50.54 (hh)(2) requirements for each unit at a nuclear power plant and protect it from natural hazards using commercial standards and taking into account the use of regional or offsite support locations, as circumstances allow and justify.

Long-Term Activities

- Pursue an advanced notice of proposed rulemaking (ANPR) to revise §50.63 as a first step to define the scope and key objectives of the revision and to obtain stakeholder input on considerations necessary to address coping time, and offsite resources access before crafting a proposed rule and developing its implementing guidance.

- If necessary, amend, through rulemaking, the regulatory §50.54(hh) requirement based on the final implementation plans.

NRC Task Force Recommendation 5

The Task Force recommends requiring reliable hardened vent designs in BWR facilities with Mark I and Mark II containments.

The Task Force recommends that the Commission direct the staff to take the following actions to ensure the effectiveness of hardened vents:

5.1 Order licensees to include a reliable hardened vent in BWR Mark I and Mark II containments.

- This order should include performance objectives for the design of hardened vents to ensure reliable operation and ease of use (both opening and closing) during a prolonged SBO.

5.2 Reevaluate the need for hardened vents for other containment designs, considering the insights from the Fukushima accident. Depending on the outcome of the reevaluation, appropriate regulatory action should be taken for any containment designs requiring *hardened vents."*

NEI Comments and Input

The industry agrees that accessibility of BWR containment hardened vent valves and the ability to manually operate these valves under a loss of AC power condition need to be assessed.

BWR Mark I Plants

One of the conclusions from the industry reconstruction activities of the Fukushima events is that there are a number of open issues and questions surrounding the containment venting operation at Fukushima Dai-ichi. At this time, action and evaluation of hardened containment vent valve operation beyond a determination of accessibility and ability to operate hardened containment vent valves under loss of AC power conditions should be reserved until more information is known and confirmed about the venting operations at Fukushima.

BWR Mark II Plants

Under NRC Generic Letter 88-20, Supplement 3, BWR Mark II licensees were requested to consider the use of hardened vents in assessing heat-removal capabilities during severe accidents. As a result of these evaluations, BWR Mark II plants should not be required to re-evaluate containment heat removal capabilities until there is more confidence and knowledge of the venting operations at Fukushima Dai-ichi. At that time, the industry and NRC staff will be better positioned to reach a determination on whether additional BWR Mark II heat-removal evaluations are necessary.

Other Containment Structures

For other nuclear power plant containment structures, no additional evaluations should be performed until there is more definitive information on the Fukushima events that is applicable and relevant to these other containment structures. Once this information is available, probably towards the end of the year, a determination can be made on whether evaluations and modifications are necessary.

Industry Near-Term Recommendations

- Issue a §50.54(f) letter to require licensees to review plant procedures and guidelines for operating existing BWR Mk I hardened vent valves and evaluate the accessibility for operation of these valves in accordance with existing design commitments assuming no AC power is available and to report the results to the NRC within 90 days of completion of the next refueling outage that starts after 1 January 2012.

  If improvements to assure accessibility are determined to be necessary they would be implemented consistent with operational schedules and as a separate activity.

NRC Near-Term Task Force Recommendation 7

NRC Task Force Recommendation

The Task Force recommends enhancing spent fuel pool makeup capability and instrumentation for the spent fuel pool.

The Task Force recommends that the Commission direct the staff to do the following:

> 7.1 Order licensees to provide sufficient safety-related instrumentation, able to withstand design-basis natural phenomena, to monitor key spent fuel pool parameters (i.e., water level, temperature, and area radiation levels) from the control room.
>
> 7.2 Order licensees to provide safety-related ac electrical power for the spent fuel pool makeup system.
>
> 7.3 Order licensees to revise their technical specifications to address requirements to have one train of onsite emergency electrical power operable for spent fuel pool makeup and spent fuel pool instrumentation when there is irradiated fuel in the spent fuel pool, regardless of the operational mode of the reactor.
>
> 7.4 Order licensees to have an installed seismically qualified means to spray water into the spent fuel pools, including an easily accessible connection to supply the water (e.g., using a portable pump or pumper truck) at grade outside the building.
>
> 7.5 Initiate rulemaking or licensing activities or both to require the actions related to the spent fuel pool described in detailed recommendations 7.1–*7.4.*"

NEI Comments and Input

The events surrounding the Fukushima Dai-ichi spent fuel pools are a good example of where facts discovered later have invalidated earlier conclusions. There was early speculation that there had been a spent fuel pool accident. Now, with the benefit of visual inspections and

samples from the four affected spent fuel pools, it is evident that the spent fuel rods did not experience significant failure.

The accidents at Fukushima demonstrated that spent fuel pools are robust, with a thermal inertia that provides time to plan and execute appropriate mitigation measures, allowing the early operator focus to be on stabilizing the reactor and achieving a safe reactor condition. Even so, the industry is taking proactive actions that include assuring that operators and the site emergency response team are aware of the estimated time for the spent fuel pools to reach 200F, following a loss of spent fuel pool cooling with a starting temperature that is normally around 90F.

The industry recognizes that there is a benefit to remote monitoring of the spent fuel pool during the accident conditions to assure that operator attention and plant resources are not diverted from higher priority and more safety-significant activities. The industry agrees that there should be a process for remotely monitoring the temperature and water level in the spent fuel pools. The power supplies for the monitoring equipment do not need to be safety related based on the thermal inertia and the time taken to reach a point of extensive evaporation.

We note that the events at Fukushima would not have benefited from safety-related power supplies. Safety-related requirements would not have changed the situation. We believe that diversity would appear to be a more important attribute. The proposal for a hardened seismically-qualified fuel pool spray line capable of being supplied from portable pumps outside of the reactor or fuel pool building would add diversity to spent fuel pool cooling capability. Such a requirement would support the use of non-safety-related power supplies for fuel pool cooling and instrumentation considering the slow evolution of a spent fuel cooling event.

There are numerous spent fuel pool configurations. As a result, we believe that the commission should allow for a flexible, performance-based approach for spent fuel pool monitoring. The requirements should define what is to be achieved, leaving the industry to define in general guidance the implementation options based on plant configuration and needs.

The low probability of a fuel pool severe accident and the slow progression of an event that would lead to a severe spent fuel pool accident do not warrant the imposition of an order. There is significant time to adjust, plan and implement mitigation measures based on the events at Fukushima and recent and unusual loss of spent fuel pool cooling events in U.S. plants.

Industry Near-Term Recommendations

Issue a Generic Letter Identify and evaluate the instrumentation and equipment needed to monitor spent fuel level and temperature throughout an extended loss of AC power event that includes depletion of DC battery power.

Attain a common understanding with the NRC staff on the methodologies and guidelines for

performing the monitoring evaluation. Inform the NRC staff of:
(1) The methods and equipment that are used to monitor the condition of the spent fuel pools during an extended loss of AC power, and, if necessary,
(2) The action plan for assuring operators have the capability for monitoring the spent fuel pool during an extended loss of AC power event.
(3) Report the results of the evaluations and the action plan to the NRC within 180 days of reaching a common understanding on the methodologies and guideline for implementing the generic letter.

NRC Near-Term Task Force Recommendation 8

NRC Task Force Recommendation

The Task Force recommends strengthening and integrating onsite emergency response capabilities such as EOPs, SAMGs, and EDMGs.

The Task Force recommends that the Commission direct the staff to further enhance the current capabilities for onsite emergency actions in the following ways:

8.1 Order licensees to modify the EOP technical guidelines (required by Supplement 1, *"Requirements for Emergency Response Capability," to NUREG*-0737, issued January 1983 (GL 82-33), to (1) include EOPs, SAMGs, and EDMGs in an integrated manner, (2) specify clear command and control strategies for their implementation, and (3) stipulate appropriate qualification and training for those who make decisions during emergencies.

8.2 Modify Section 5.0, "Administrative Controls," of the Standard Technical Specifications for each operating reactor design to reference the approved EOP technical guidelines for that plant design.

8.3 Order licensees to modify each plant's technical specifications to conform to the above changes.

8.4 Initiate rulemaking to require more realistic, hands-on training and exercises on SAMGs and EDMGs for all staff expected to implement the strategies and those licensee staff expected to make decisions during emergencies, including emergency coordinators and *emergency directors."*

NEI Comments and Input

We agree that enhancements can be made to the process of migrating from EOPs to SAMGs and EDMGs to incorporate lessons learned from Fukushima. The integration of the EDMGs and SAMGs will be a complex and large endeavor. Such an activity needs to be split into manageable sections to ensure a coordinated, efficient and effective implementation. The industry has already started work on this activity and enhancements are being pursued.

Near-term actions should focus on improving the training and implementation of EDMGs, SAMGs and §50.54(hh)(2) mitigation procedures and measures. Training programs should be reviewed and, if necessary, enhanced to assure that operators and the emergency response organizations are capable of making correct decisions and implementing procedures. In the development and implementation of these enhanced training programs, it is critical for operators to be more knowledgeable of mitigation measures for more likely events (abnormal and EOP type events) than the mitigation of extremely low probability events such as an extreme beyond design basis seismic event that would result in a severe accident. We suggest that for SAMGs, EDMGs and B5b events, the training standard should be one of familiarization.

It is important that the industry and the NRC reach a common understanding on the standards and scope of training with an emphasis on emergency response organizations, while assuring that the training focus for operators remains on the more probable events and operations. As with other industry training programs, the National Academy for Nuclear Training in Atlanta would provide oversight of the training programs referenced in this section.

There needs to be further regulatory discussions on the implications of requiring Technical Specifications on the SAMG and EDMG training and what it means for operator exams.

New Plants

ITAAC should not be the regulatory vehicle for adjusting the licensing basis. The Part 52 change processes and other regulatory vehicles exist and should be used for ensuring that new plant licensees comply with of EOP/SAMG/EDMG implementation or other new requirements. These matters may be addressed after design certifications or as COLs are issued.

Industry Near-Term Recommendations

Enhance implementation of EOPs, SAMGs and B5b strategies.

Issue a Bulletin to review and, if necessary, enhance training programs to assure that plant personnel are able to transition from EOPs to SAMGs and implement SAMG strategies. Personnel should be aware of the intent and scope of SAMG and B5b strategies so that they can be implemented in accordance with the stations emergency preparedness activities. The level and depth of knowledge should be commensurate with the safety significance and probability of the events.

NRC Near-Term Task Force Recommendation 9

NRC Task Force Recommendation

The Task Force recommends that the NRC require that facility emergency plans address prolonged SBO and multiunit events.

9.1 Initiate rulemaking to require EP enhancements for multiunit events in the following areas:

- Personnel and staffing,
- Dose assessment capability,
- Training and exercises,
- Equipment and facilities

9.2 Initiate rulemaking to require EP enhancements for prolonged SBO in the following areas:

- Communications capability,
- ERDS capability,
- Training and exercises,
- Equipment and facilities

9.3 Order licensees to do the following until rulemaking is complete:

- Determine and implement the required staff to fill all necessary positions for responding to a multiunit event.
- Add guidance to the emergency plan that documents how to perform a multiunit *dose assessment (including releases from spent fuel pools) using the licensee's* site-specific dose assessment software and approach.
- Conduct periodic training and exercises for multiunit and prolonged SBO scenarios. Practice (simulate) the identification and acquisition of offsite resources, to the extent possible.
- Ensure that EP equipment and facilities are sufficient for dealing with multiunit and prolonged SBO scenarios.
- Provide a means to power communications equipment needed to communicate onsite (e.g., radios for response teams and between facilities) and offsite (e.g., cellular telephones, satellite telephones) during a prolonged SBO.
- Maintain ERDS capability throughout the accident.

9.4 Order licensees to complete the ERDS modernization initiative by June 2012 to ensure *multiunit site monitoring capability"*

NEI Comments and Input

From discussions with some Japanese utilities, it is clear that U.S. industry emergency preparedness and the government (state, local and federal) emergency response infrastructure is more mature and is better positioned to manage an emergency on the scale of the Fukushima natural disasters and a nuclear emergency. U.S. company and government

organizational structures, training, drills and the strong working relationships between the plants and state and local response centers are significant differences.

Nevertheless, the industry acknowledges that there are lessons to be learned and enhancements that can be made to the industry's emergency preparedness activities. Pre-Fukushima enhancements to EP programs have already been identified and are about to be implemented via the imminent NRC EP rulemaking and the completion of the revision to Radiological Emergency Preparedness Manual, soon to be issued by FEMA.

As the rule changes are being implemented, and as we learn more about the ongoing events at Fukushima, the NRC and industry can identify the prioritization and performance criteria for further enhancements, as recommended in the NRC task force report.

The revised rule that is about to become effective requires a comprehensive analysis of on-shift staffing to validate that the emergency plan can be implemented for five categories of scenarios. For multi-unit event Emergency Response Organization (ERO) staffing, new criteria need to be defined. This includes defining the events' characteristics, simultaneous occurrences, response time requirements and coping strategies. The new criteria would be appended to the staffing methodology prescribed in NEI 10-05. Analysis would follow the implementation of the initial staffing analysis requirement.

In order for the industry to implement the multi-unit staffing analysis concurrent with existing EP rule change, the implementation period for this rule change should be extended by one year in order to accommodate the development of new staffing criteria.

In the interim, as recommended in the NRC task force report, licensees could take voluntary action to develop a viable notification and transportation strategy to ensure staff needed to augment the site response would be available.

Revised guidance can be developed and implemented within the existing rule structure to encompass three of the recommendations:

- Multiple release point and spent fuel pool dose assessment
- Onsite protective equipment
- Backup ERO communication

The balance of the NRC task force recommendations warrant rulemaking. Based on industry-NRC staff interactions, consideration should be given to a parallel implementation-rulemaking approach. Such an approach would cover:

- Requiring licensed operators in the ERO outside the control room
- Drills and exercise changes
- Emergency facilities for multi-unit events (changing design basis and accident analysis requirements)

Rulemaking in these areas would provide the necessary regulatory predictability and the basis for consistent implementation and inspection.

New Plants

Part 52 change processes and other regulatory vehicles exist and should be used for ensuring that new plant licensees comply with of spent fuel cooling or other new requirements. These matters may be addressed after design certifications or COLs are issued, and ITAAC should not be the regulatory vehicle for adjusting the licensing basis.

Industry Near-Term Recommendations

(1) Implement the revised EP rule that is about to become effective.
(2) Engage NRC staff and other stakeholders in developing guidance for EP recommendations that do not require rulemaking.
(3) For those recommendations that do require an additional rulemaking, guidance can be developed in parallel with the rulemaking and implementation could commence once the content of the final rule is known. (This is a long-term activity)

An action plan will be developed for implementation of the Fukushima-related recommendations beginning in 2012.

Castleman, Patrick

From: Reddick, Darani
Sent: Friday, September 09, 2011 9:45 AM
To: Svinicki, Kristine; Sharkey, Jeffry; Castleman, Patrick
Subject: FW: NRC To Discuss Early Implementation Recommendations of Near-Term Japan Task Force Sept. 14 in Rockville, MD
Attachments: 11-170.doc.docx

"NRC To Discuss Early Implementation Recommendations of Near-Term Japan Task Force Sept. 14 in Rockville, MD"

What, exactly, does "early" implementation mean? Earlier than what?

From: OPA Resource
Sent: Friday, September 09, 2011 9:42 AM
To: Abbott, Coleman; Apostolakis, George; Ash, Darren; Baggett, Steven; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Blake, Kathleen; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Gilles, Nanette; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hawkens, Roy; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quayle, Lisa; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Sosa, Belkys; Steger (Tucci), Christine; Stuckle, Elizabeth; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy
Subject: NRC To Discuss Early Implementation Recommendations of Near-Term Japan Task Force Sept. 14 in Rockville, MD

Attached to be released in approximately one hour.

NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION
Office of Public Affairs Telephone: 301/415-8200
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Blog: http://public-blog.nrc-gateway.gov

No. 11-170 September 9, 2011

NRC TO DISCUSS EARLY IMPLEMENTATION RECOMMENDATIONS OF NEAR-TERM JAPAN TASK FORCE SEPT. 14 IN ROCKVILLE, MD

The Nuclear Regulatory Commission will hold a meeting to discuss the staff's proposal to implement those recommendations from the NRC's Near-Term Japan Task Force that can and should be implemented without unnecessary delay. The Task Force examined issues raised by the Fukushima reactor accident in March.

The commission meeting will be held from 9 a.m. to 12 p.m. in the Commissioner's Conference Room at NRC Headquarters, 11555 Rockville Pike, Rockville, Md. Discussion will include external stakeholders' input on the recommendations and a presentation by NRC staff. The meeting will be open to public observation and will be webcast.

A detailed agenda and meeting slides will be available in advance on the webcast page. The NRC staff paper that will form the basis of the meeting will be available in advance on the Commission's Recently Released Documents page.

Media Notes: At this time, this event will be open for television; the agency reserves the right to seek a mandatory pool if demand exceeds available space. Seats on one side of the commission hearing room will be reserved for accredited members of the news media. Photographers will have limited space at the meeting in which to take photos. Movement must be kept to a minimum so as not to be distracting and entry into the inner well closest to the Commission briefing table is prohibited.

Plan to arrive in advance of the meeting at the NRC's One White Flint North entrance, at the corner of Rockville Pike and Marinelli Road, with proper media credentials. The NRC is located across the street from the White Flint Metro station. Parking is available at the White Flint metro parking garage on Marinelli Road. Members of the media are asked to call the NRC Office of Public Affairs (301-415-8200) in advance to provide the names of those attending the meeting to assure sufficient seating.

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NOTE: Anyone wishing to take photos or use a camera to record any portion of a NRC meeting should contact the Office of Public Affairs beforehand.

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Sharkey, Jeffry

From: Breskovic, Clarence
Sent: Wednesday, September 14, 2011 12:48 PM
To: Breskovic, Clarence
Subject: Japan METI Updates September 14, 2011: Two documents attached
Attachments: Additional Report Japan to IAEA September 2011.pdf; Japan Progress Status of the Assistance Roadmapt Update Sept 2011.pdf

Please see attached files

1. Summary of the Additional Report of the Japanese Government to the IAEA
2. Progress Status of the "Roadmap for Immediate Actions for the Assistance of Residents Affected by the Nuclear Incident"

Clarence Breskovic
International Policy Analyst
U.S. Nuclear Regulatory Commission
Office of International Programs
1555 Rockville Pike
Rockville, MD 20852, USA
Tel: 1-301-415-2364
Fax: 1-301-415-2395
Alternate Email: (b)(6)

Progress Status of the "Roadmap for Immediate Actions for the Assistance of Residents Affected by the Nuclear Incident"

August 17, 2011
Nuclear Emergency Response Headquarters

The progress status of the "Roadmap for Immediate Actions for the Assistance of Residents Affected by the Nuclear Incident" decided on May 17 is as follows:

1. Actions concerning the evacuation areas

(1) Reassessing evacuation areas

- On August 9, the Nuclear Emergency Response Headquarters finalized "The Basic Approach to Reassessing Evacuation Areas". Regarding Evacuation-Prepared Areas in Case of Emergency, since nuclear reactor facility assessment and monitoring have shown that these areas are basically safe, the instruction of all Evacuation-Prepared Areas in Case of Emergency will be lifted at same time once individual municipalities have drafted a Recovery Plan. The national government will provide the necessary support for homecoming, taking into account the individual municipality's evacuation situation, the existence of infrastructural recovery response, the state of public service resumption, the progress of decontamination and the residents' wishes
- A reassessment of Restricted Areas and Deliberate Evacuation Areas will be explored following the completion of Step 2. However, decontamination and efforts aimed at recovery of everyday life environment for the residents will be pursued ahead of time.

(2) Promptly obtaining emergency temporary housing and other related housing

- As of August 8, construction on about 90% or 13,949 units, has started (of these, construction on about 90%, or 12,810 units, is complete).
- There has been ongoing coordination of the relocation of affected residents into government employees' housing, employment promotion housing and local governmental public housing, etc. As of August 5, 1,931 households in Fukushima Prefecture had moved into their new houses or have been assigned housing (nationwide, 14,753 households had moved into their new houses or have been assigned housing).

N.B.: Emergency temporary housing and other related housing include those for residents affected by the earthquake and tsunami.

(3) Providing temporary access

- First round of access in all 9 cities, towns and villages was successfully concluded on August 12. (As of August 12, 31,914 people from 18,900

households had obtained temporary access. Temporary access is being planned for late August to early September for those who were unable to make the earlier round due to scheduling issues.)

- Temporary access to retrieve personal vehicles has been organized on a rolling basis since June 1. All vehicles belonging to those who registered for the access are scheduled to be retrieved by early September. (A total of 2,431 personal vehicles in 9 cities, towns and villages have been retrieved as of August 12)
- A second round of access, for retrieval of personal vehicles or general purposes, will be organized following the completion of the first round in early September, for those who were unable to make the earlier round due to scheduling issues.
- Given the safety assessment on the nuclear reactor facility at TEPCO's Fukushima Dai-ichi NPS, access to the 3km Zone will be permitted as long as all due safeguards taken for the safety of people entering the area. The target start date is sometime during August.
- The Ministry of the Environment and the Fukushima Prefectural Government are working together to retrieve and protect pets, in conjunction with temporary access. As of August 11, arrangements to protect 300 dogs and 188 cats had been made.

(4) Conducting Deliberate Evacuation

① Status of implementation of Deliberate Evacuation

- Resident evacuation is almost complete in all 5 municipalities that were wholly or partially designated as Deliberate Evacuation Areas.
- In Iitate Village, as of August 4, only a few out of the subject population of 6,177 have chosen to remain. The village office began operation on June 1 at the Iino branch office in Fukushima City, and completed full transition of all village operations on the June 22nd. Regarding Kawamata Town, as of July 31, only a few out of the subject population of 1,252 have chosen to remain.
- Many residents had evacuated ahead of the deliberate evacuation in Katsurao Village, Namie Town and Minamisoma City. As of August 9, only a few people remain out of the subject populations of 1,300 in Katsurao and 1,300 in Namie, and as of late May, approximately ten Minamisoma residents, who are all of the residents subject to evacuation, have relocated.
- As an exception to continuing business operations in Deliberate Evacuation Areas, municipalities were informed on May 17 that in those cases where the municipality permits a business to continue operating on the basis of an exceptional reason, there should be no impediment provided that ample safety precautions are taken. (8 businesses in Iitate Village and 2 in Kawamata Town are continuing to operate on this basis).

② Livestock relocation and other related issues

- In addition to providing necessary assistance such as identifying a relocation destination outside the area, there were notifications provided to Fukushima Prefecture on procedures and other related issues for livestock screening and decontamination.
- As of August 8, 127 cattle remain in the Deliberate Evacuation Area out of the evacuation subject cattle of approximately 9,300 heads.

(5) Establishing "Specific Spots Recommended for Evacuation"

There are multiple spots where the accumulated dose over a one-year period after the accident is estimated to exceed 20mSv, in areas that are outside the Deliberate Evacuation Areas or restricted area and do not show as much regional spread as the Deliberate Evacuation Areas. While the situation in these locations does not call for the government to take action such as ordering a general evacuation, the possibility that the dose will exceed 20mSV depending on a person's lifestyle can not be ruled out. Therefore, these spots are designated as "Specific Spots Recommended for Evacuation", to raise the residents' awareness and to assist and promote evacuation. (On July 21 and August 3, 104 spots [113 households] were designated in Date City, 122 spots [131 households] in Minamisoma City and 1 spot [1 household] in Kawauchi Village.)

(6) Maintaining order in the evacuation areas

- On June 2, a "Special Security Team" (of approximately 300 individuals) was organized to maintain public safety in the 30km-radius zone of Fukushima Dai-ichi Nuclear Power Station (NPS) as well as the Deliberate Evacuation Areas, and are conducting patrols, questioning suspects, implementing movable checkpoints, etc.
- Additionally, to secure more peace of mind and safety for the residents through better crime prevention in the Deliberate Evacuation Areas, "Iitate Village Minders," consisting of residents of Iitate Village, was formed and began patrolling the village on June 6. The town of Kawamata's "Kawamata Regional Safety Patrol" began operating on June 20, the village of Katsurao's "Katsurao Special Watch Team" on June 21, and the town of Hirono's "Hirono Watch Patrol" on July 10.

2. Ensuring security and safety of affected residents

(1) Managing the long-term health of local residents (assessing radiation levels)

- More than 210,000 people have been screened as of August 1, with experts sent from related organizations, universities and local governments working under the supervision of Fukushima Prefecture. No case of adverse health effects has been found to date.

- In light of request from Fukushima Prefecture, appropriations were made in the secondary supplementary budget for the "Health Fund for Children and Adults Affected by the Nuclear Accident" created by Fukushima Prefecture in order to ensure health of residents, including children through mid- to long-term projects (78.2 billion yen out of 96.2 billion total). Fukushima Prefecture has launched a preliminary survey of Namie Town, Iitate Village, and the Yamakiya ward of Kawamata Town, where environmental monitoring results indicated a possibility of higher external and internal exposure relative to other communities. A basic survey to estimate the exposure dose for all prefectural residents will take the results of this preliminary survey into account, with questionnaires planned for mailing starting in mid-August.
- The National Institute of Radiological Sciences (NIRS) has been evaluating methods for measuring internal contamination level using whole body counters and internal exposure level using urine bioassays and other means, with cooperation from 122 residents of those areas subject to the preliminary survey since June 27th. In addition, Japan Atomic Energy Agency (JAEA) began an internal exposure survey of 2,800 evacuees (Namie, Iitate, Kawamata) on July 11.
- A detailed health check for evacuees and cancer check-ups for children are also planned in the mid- and long-term, as well as examinations with whole-body counters, loans of personal-use cumulative dosimeters for children and pregnant women, and emotional and physical health care projects for children.

(2) Disposal of rubble, sludge and other waste

On June 23, the Ministry of Environment finalized the disaster waste disposal policy for Evacuation Areas, Deliberate Evacuation Areas and Nakadori and Hamadori areas beyond those ten towns and villages where disposal has already resumed.

- Radioactive substances have been detected from sewage sludge and other by-products outside Fukushima Prefecture, mostly in eastern Japan. Based on this fact, a provisional policy regarding the handling of sludge and other byproducts of water and sewage treatment found to contain radioactive material was determined on June 16.

(3) Dose surveying for schoolyards and managing the soil

- Approximately 1,800 cumulative dosimeters were distributed to every elementary and junior high school in Fukushima Prefecture. Cumulative dosimeter allocation was also approved for schools outside Fukushima Prefecture that request them, provided those institutions have a schoolyard air dose rate of higher than 1mSv/hour (6/20).
- Allocation of financial support was decided for the schools with a schoolyard

air dose rate of higher than 1mSv/hour that seek soil dose reduction measures (5/27), with the tentative goal of limiting each students' annual exposure at schools to 1mSv. The support was extended to communities outside of Fukushima Prefecture (6/20), and the secondary supplementary budget included appropriations for dose reduction work on schoolyards and other locations, including those regions outside Fukushima Prefecture (approximately 5 billion yen).

- Taking into account a request from Fukushima Prefecture, the second supplementary budget included an item (JPY18 billion out of JPY96.2 billion) for the aforementioned "Health Fund for Children and Adults Affected by the Nuclear Accident" created by Fukushima Prefecture. The fund will be used for dose reduction projects for public facilities such as schools, parks and school zones and support installation of air conditioning and other protection in school facilities.

(4) Conducting ongoing environmental monitoring (atmospheric, soil, seawater and seabed) and evaluation thereof

Based on the Enforced Plan on Environmental Monitoring (created April 22, 2011 by the Nuclear Emergency Response Headquarters), "Dose Rate Map" and "Accumulated Dose Estimation Map" are being updated approximately twice a month. (Released 4/26, 5/16, 6/3, 6/21, 7/20).

- Air dose rate measurements and soil surveys began on June 6, with the goal of creating a distribution map of radiation dose and other related indicators in the whole area and the areas adjacent to Fukushima Prefecture (the air dose rate map was released on August 2; radiation concentration map is scheduled for release by the end of August). A survey also began on May 30 with the goal of producing a radiation concentration distribution map for agricultural soil (the map is scheduled for release by the end of August).
- Regarding the Evacuation-Prepared Areas in Case of Emergency, a child-centered perspective and the wishes of the community were emphasized, in monitoring schools, hospitals, libraries and their environs. (A midway report of the results was made on 8/9, and additional monitoring will be conducted as needed.)
- Aircraft radiation monitoring was implemented on a zone approximately 100km in radius around Fukushima Dai-ichi NPS in Miyagi and Tochigi Prefectures, and the results published (7/22, 7/27). Aircraft monitoring is currently being conducted in Ibaraki Prefecture. Aircraft monitoring is scheduled to be implemented for the whole of East Japan, targeted for completion by the end of 2011.
- The target area for marine radiation monitoring has been expanded off the coast of the prefectures of Fukushima, Ibaraki and Miyagi, and seawater and seabed soil measurements will continue to take place.
- Regarding radioactive materials in food and tap water, the relevant local

governments are conducting ongoing examination, and the results are being disclosed daily by the Government.

N.B.: Of the 11,203 cases of examination for food inspections, 540 cases exceeded provisional regulation limit (as of 8/7), and of the 34,818 cases for tap water, 69 exceeded indicator values (as of 8/5). There have been no instances of tap water levels exceeding the limit since March 30.

- Assistance will be provided to local governments in deploying radiation dose inspection equipment, through the Funds to Improve Regional Consumer Policy and existing subsidies for the operating cost of the National Consumer Affairs Center of Japan.
- In order to implement radiation monitoring related to TEPCO's Fukushima NPS accident in a certain and deliberate manner, a Coordination Meeting for Monitoring was held to unify and coordinate the radiation monitoring work being conducted by the related ministries and agencies, local authorities and operators (1st round on 7/4, 2nd round on 8/2). The meeting resulted in the creation of a "Total Monitoring Plan" on August 2, which lays out the content and the labor divisions for the monitoring to be conducted in partnership among the Japanese and local governments and other entities by the end of 2011.
- Radiation monitoring was implemented for public water basins, groundwater and offshore area within Fukushima Prefecture. The measured results for concentration of radioactive substance for public water basins (rivers) were released on June 3 and August 1, and for groundwater on June 21 for 5 sites, 41 sites on July 7, 55 sites on July 14, and 10 sites on August 4. The measured results for concentration of radioactive substance for offshore seawater and seabed were released on July 8.
- The second supplementary budget includes appropriations for enhancements to environmental monitoring in Fukushima Prefecture such as the building of real-time radiation monitoring system and set-up of transportable monitoring posts, and for enhancements to environmental monitoring nationwide such as set-up of additional monitoring posts in other prefectures and maintenance of environmental sample analysis equipment (approximately JPY23.5 / N.B. includes some projects that use "Health Fund for Children and Adults Affected by the Nuclear Accident")

3. Ensuring employment as well as agricultural and industrial support

(1) Ensuring employment

- The Ministry of Economy, Trade and Industry (METI), the Ministry of Health, Labour and Welfare (MHLW) and Fukushima Prefecture have joined forces to expand job opportunities for, and offer management assistance to, residents

and businesses affected by the nuclear incident, and are aiming to create 20,000 jobs in the prefecture through the measures below.

- Joint job fairs will be held in the prefecture with a target of 5 events by the end of the year. (The 1st job fair was held on June 23 in Koriyama, with a 2nd scheduled for 9/24 in the same city).
- A request was made jointly by METI, MHLW and Fukushima Prefecture to 26 economic organizations in manufacturing, retail and other sectors to maintain or create job opportunities in light of the Fukushima NPS accident (May 26).
- There are plans to hire 11,000 people in Fukushima Prefecture through the Job Creation Fund Programs, and of these, 4,428 people have already secured jobs (according to data processed by MHLW as of 7/29).
- Companies with especially strong interest in hiring new graduates from the affected area were identified from among the participants of the New Graduate Employment Support Project (Internship Project), and publicized (187 firms as of 6/17). Also, more flexible responses such as higher priority for assignment and relaxation of requirements are being implemented for interns and participating firms affected by the accident, particularly for internships conducted in Fukushima Prefecture.

(2) Agricultural, livestock and fishery industries, etc.

- Bridge loans are being offered by Japan Agricultural Co-operatives (JA) and Japan Fisheries Cooperatives (JF) groups to support the business operators in agricultural, forestry and fishery industries subjected to shipment suspension, and approximately 450 loans have been made as of August 8 (approx. 1.3 billion yen).
- In order to ensure swift and appropriate processing of compensation for damages to the business operators in agricultural, forestry and fishery industries, liaison conferences (a total of 5 since 4/18) were held for the Ministry of Agriculture, Forestry and Fisheries, the prefectures and cities involved and other relevant parties (177 organizations, as of 8/9) to offer information and exchange views regarding developments in nuclear damage compensation.
- In response to the identification of cesium exceeding provisional limits in beef and rice straw, emergency support measures were issued on July 26, namely 1) measures to restore trust in domestic beef, 2) assistance to beef cattle ranchers, and 3) assistance to enable emergency supply of rice straw. On August 5, given that there are now 4 prefectures subject to shipping restrictions, new measures were announced, including support for the de facto purchase of shipping-delayed cattle by prefectural livestock industry associations.

(3) Measures for small and medium enterprises

- The new long-term, low-interest (some no-interest for all intents and purposes) loan system "The Great East Japan Earthquake Special Recovery Loans" for small- and mid-sized companies that saw significant direct or indirect damage from the disaster, including via the nuclear incident or harmful rumors, and the new guarantor system "The Great East Japan Earthquake Emergency Guarantee for Recovery", which establishes a new framework completely separate from the existing guarantor system, began operating on May 23. Between May 23 and July 29, "The Great East Japan Earthquake Special Recovery Loans" served 52,264 cases totaling JPY1.181 trillion, and "The Great East Japan Earthquake Emergency Guarantee for Recovery" served 35,189 cases totaling JPY 939.4 billion.
- For small and medium enterprise owners with their places of business in the restricted area who were therefore forced to relocate to new premises, METI and Fukushima Prefecture agreed on a system of special support to provide them with long-term no-collateral, no-interest loans independent of regular funding support. The program began accepting applications on June 1 at Fukushima Prefectural Industrial Revitalization Center as well as chamber of commerce offices throughout the prefecture. There have been 225 applications, for a total of approximately JPY5.5 billion (as of 8/4).
- Regarding the restoration projects for temporary storefronts and plants (1st supplementary budget) by the Organization for Small & Medium Enterprises and Regional Innovation, the group received restoration requests from 30 locations in 13 Fukushima cities, towns and villages as of August 5. Work was begun in 12 locations where a basic agreement was finalized: Iwaki City (61 location), Shinchi Town (2 locations), Bandai Town (1 location), Minamisoma City (3 locations), Soma City (2 locations), Koori Town(1 location) and Iitate Village(2 locations). Of these, work has been completed in Iwaki and Minamisoma (1 location).
- Discounts and free access were made available for a portion of the roster of international business support offered by JETRO, such as overseas trade shows and seminars, to those small- and mid-sized companies that saw direct or indirect damage from the disaster (49 instances as of July).

(4) Export assistance and measures to deal with damaging rumors.

Export assistance and organization of inspection system

- In terms of fee subsidization for radiation dose inspection of export items conducted by government-specified inspection organizations, these entities were specified on June 7. The system began operating on the June 22nd at the 13 organization specified. In addition, in order to expand the scope of the assistance to inspection of export containers applied for by shipping companies, an open call is being conducted for additional inspection organizations.
- For domestic export-related business operators, a spectrum of responses is

being implemented such as disseminating information regarding regulations on Japanese food products on a country-by-country basis, readying a contact office to advise affected companies individually and organizing a system for issuing certificates for countries that demand proof of geographic origin for products.

- In order to respond to other nations' demands for radiological inspection on foods of Japanese origin, support is being provided for deployment of inspection equipment. At the same time, information is being actively disseminated in order to regain trust in Japanese foods.
- For alcoholic beverages, the Regional Taxation Bureau handles the issuing of export certificates, and has been issuing the certificates for production date and place of origin for alcoholic beverages exported to the EU, Republic of Korea and Malaysia since April. Preparations were then made for a radiological analysis system, and from June on, radiological analysis as well as certificate issuance for alcoholic beverages for export to the EU has also been implemented. Plans are in place for monitoring the safety of alcoholic beverages, with emphasis being place on the affected area.
- Guidelines for export containers and ships were published on April 22. Currently, radiation measurements based on the guidelines are being conducted in ports including Ports of Yokohama and Tokyo.

Information release

- The relevant ministries and agencies, overseas diplomatic missions and Japan External Trade Organization's (JETRO) overseas offices are working together to hold information sessions for foreign industries in major cities (15 cities in 12 nations and regions), on the nuclear accident as well as Japan's efforts since the accident. Information sessions have also been held domestically (3 in Tokyo, 3 in Osaka), for foreign-affiliated firms, and consulates and international organizations based in Kansai.
- JETRO has requested the cooperation of trade promotion entities in 21 countries and regions to prevent damage caused by harmful rumors to the Japanese products. In the future, publicity booths will be set up at about 50 international exhibitions and there are plans for exhibits including display panels, videos, etc. calling for prevention of damage caused by harmful rumors.
- The Japanese and American governments, Keidanren and the American Chamber of Commerce launched a bilateral public-private partnership, holding events such as visits to Japan by the singer Lady Gaga and renowned New York chefs, to ease fears about the safety of Japanese food and other products
- Weekly briefings were held for embassies, international organizations and foreign press organizations based in Tokyo.
- The results of air and seawater monitoring for ports and harbors nationwide

are currently available on the MLIT (Ministry of Land, Infrastructure and Transport) Web site. These measurements are also being disseminated to relevant companies through port, harbor and shipping organizations, and through diplomatic channels to relevant bodies worldwide such as port authorities and CIQ.

- "Q&A about Food Products and Radioactivity", a clear and accessible guide to radioactivity and safety of food and other related products, was created and is being distributed to local authorities, consumer groups and other parties.
- In conjunction with the "Recovery Action" campaign and as a way to assist in promoting consumption of agricultural and fisheries product from the affected area (catchphrase: "Show Your Support—Eat!"), PR is being conducted in the form of newspaper advertisements and television commercials, as well as information release about private-sector events that support this effort through the Ministry of Agriculture, Forestry and Fisheries Web site.
- As a risk communication, opinion exchange sessions have been scheduled on the topic of radiation and food safety, with participation from both experts and consumers at large. (8/28 in Yokohama and 8/29 in Saitama)

Other

- Due to various efforts including a request from Prime Minister Kan to Prime Minister Harper at the May Japan-Canada Leadership Meeting, the Canadian government reversed additional import restrictions on Japanese food. JETRO co-sponsored the Canadian government's "Japan Engagement Seminar", aimed at promoting investment in Japan.
- The outcome documents from various international conferences included a declaration that no measures inconsistent with WTO agreements were to be taken against Japan, or that the measures taken regarding Japanese products and travels to Japan should be based on scientific evidence. As a result of disseminating accurate, up-to-date information through diplomatic missions in 15 priority-market nations and regions for the Visit Japan Campaign, and urging reassessment of excessive travel restrictions, if any, some travel restrictions were relaxed.
- Relaxation of restrictions on Japanese exported products and other measures were urged at leadership and ministerial meetings conducted during these international conferences.
- In order to prevent problems caused by harmful rumors, such as cancelled and avoided trade deals, drastic reduction of orders, trade details with unreasonable conditions attached, etc., documents for request were issued to the concerned industrial associations for appropriately handling any problems based on scientific, objective evidence (6/1).
- JETRO invited overseas media to Japan in order to promote dissemination of accurate information. Bernama, the Malaysian national news agency, was

invited in May, and at the request of Iwate, Miyagi and Fukushima Prefectures, major Chinese journalists were invited in July. Preparations are being made to invite journalists from Hong Kong and Russia in the future.

- Country-by-country information such as export restrictions and radiological inspections are being provided to businesses on the official METI and JETRO web sites. JETRO's urgent help desk, 36 trade information centers nationwide and 73 overseas offices worldwide are also advising businesses.

(5) Other actions

In addition to maintaining and strengthening financial functions in the affected areas overall, an amendment bill for the Financial Function Reinforcement Law was submitted to the Diet on May 27 addressing the content of relaxing the requirements for capital participation by the Government, in order to establish in advance a framework to provide reassurances to depositors. The law was passed on June 22, and went into effect on July 27.

4. Support for affected local governments

(1) Support for affected local governments and municipalities accepting evacuees

- Due to the disastrous effects of the nuclear power station accident as a result of the Great East Japan Earthquake, a large number of residents were forced to evacuate, or even relocate, to areas outside of their municipalities. In order to respond to this situation, The bill for "Law on Measures Involving Residents with a Change of Address and Special Exemption from Administrative Processing of Evacuees, as a Means of Coping with the Nuclear Power Plant Accident Resulting from the Great East Japan Earthquake" was submitted to the Diet on July 22, passed on August 5 and came into effect on August 22. The new law established an exemption where administrative processes for evacuated residents could be performed by the government of the receiving municipality, and determined measures relating to those undergoing a change of address.
- With regard to an existing fund endowed by the power plant siting subsidy, the initial objective was modified to enable utilization in projects geared towards disaster recovery and rebuilding, leading to use for 12 projects totaling approximately JPY3.1 billion
- It was also decided that should an application be submitted from a local authority of an affected area that is also eligible for the plant siting subsidy, a payout could take place in April rather than June, the usual month. An estimated JPY 700 million has been paid out as a result. The subsidy application deadline has also been extended from the usual end of May to end of July.

5. Compensation for affected residents, businesses and others

(1) Regarding the guidelines established by the Nuclear Damage Compensation Dispute Judgment Committee

- The Dispute Reconciliation Committee for Nuclear Damage Compensation prioritizes rapid aid to those who suffered damage, and set the guidelines starting with those cases deemed the most urgent and likely to fit the definition of a nuclear damage, such as government-ordered evacuations and shipping restrictions. To date, it has issued "The First Guideline Regarding the Judgment of the Scope of Nuclear Damage Due to TEPCO's Fukushima Dai-ichi and Dai-ni NPS Accident" (4/28), the Second Guideline (5/31) and the Supplement to the Second Guideline (6/20). In addition, it has established a Midterm Guideline (8/5) that adds items for consideration to the content already established and released as above, to present the big picture of the extent of the nuclear damage. In enabling rapid compensation payout by TEPCO, the government will likely see multiple disputes as well as payout of indemnity according to the nuclear damage compensation insurance contract. The second supplemental budget proposal includes expenses for organizing a framework for rapid resolution to these.
- Some necessary rules were established, such as the addition of a special committee member to the Dispute Reconciliation Committee for Nuclear Damage Compensation specifically for the purpose of participating as a reconciliation facilitator during the nuclear damage compensation dispute process.

(2) Provisional compensation payment to residents, business operators and others

- Provisional payments to residents forced to evacuate according to instructions based on the Act on Special Measures Concerning Nuclear Emergency Preparedness began in April on a household basis, and approximately JPY 51.4 billion have been paid out to 55,000 households (as of 8/5). On July 5, TEPCO announced additional provisional compensation payout. (The payout was on individual basis, ranging from JPY 100,000 to 300,000 per person depending on the circumstances of their evacuation.) Payments began on July 25, and to date, approximately JPY 3.9 billion have been paid out to approximately 14,000 people (as of 8/5).
- With regard to agricultural, forestry and fishery business operators, TEPCO and the trade associations involved met to work towards a prompt payout in the light of the May 12 establishment of "Emergency Support Measures for Residents Affected by the Nuclear Accident". Actual payout began on May 31, and to date, approximately JPY8.1 billion (as of 8/5) have been paid out to agricultural associations in 6 prefectures (Fukushima, Ibaraki, Gunma, Tochigi, Chiba) as well as fishery associations in 2 prefectures (Fukushima

and Ibaraki).

- With regard to small and medium enterprises, on May 31, TEPCO announced the concrete framework for provisional compensation payment including the scope and method of the payment, and began actual payout on June 10. Approximately 5,500 companies have received payment totaling approximately JPY6.7 billion (as of 8/4)

(3) "Act on the Nuclear Damage Compensation Facilitation Corporation" and "Act on Emergency Measures Related to the Damage Due to the 2011 Nuclear Accident"

- In order to ensure 1) an implementation of prompt and appropriate compensation for damages, 2) an avoidance of adverse effects on business operators involved in NPS stabilization and incident management, 3) a stable supply of electricity essential for everyday life of the nation, as 3 defining components of the Government's support framework for compensation for nuclear damages caused by the accident at TEPCO's Fukushima NPS, the Cabinet decided on the draft bill for the Act on the Nuclear Damage Compensation Facilitation Corporation on June 14, and submitted it to the Diet. The law was enacted on August 3.
- On July 29, "Act on Emergency Measures Related to the Damage Due to the 2011 Nuclear Accident" was enacted. This legislation establishes the particulars needed for provisional payments by the government, as an emergency measure to aid the victims of this nuclear accident at the earliest opportunity.

6. Working towards homecoming

(1) Monitoring, decontamination and improvement of soil, etc.

- "The Basic Approach to Reassessing Evacuation Areas" (created by the Nuclear Emergency Response Headquarters, 8/9) laid out the basic policy for emergency implementation of decontamination, with the month of August as the target period, and established that thorough and ongoing decontamination would be carried out in partnership with relevant parties.
- On July 15, the Nuclear Emergency Response Headquarters put together "The Basic Approach to Cleanup Work (Decontamination) in Residential Areas (Except Restricted Area and Deliberate Evacuation Area) in Fukushima Prefecture", and notified Fukushima Prefecture and the Ministry of Environment of cautions to be taken when residents perform cleanup work, and the approach to waste collected during cleanup.
- Air dose rate measurements and soil surveys began on June 6, with the goal of creating a distribution map of radiation dose and other related indicators for all of Fukushima Prefecture as well as neighboring regions (air dose map released on 8/2; concentration map for the soil scheduled for release before

the end of August). A survey was also begun on May 30 with the goal of producing a distribution map of radioactive substance concentration in agricultural soil (map scheduled for release before the end of August). (As previously described)

- In collaboration with Fukushima Prefecture and other related organizations, verification testing began on May 28 for the development of decontamination technology for agricultural soil (seeding of sunflowers and other plants on 5/28 and test removal of topsoil from contaminated agricultural land on 6/13 in Iitate Village, and seeding of amaranth on 6/29 in Kawamata Town).

(2) Reviewing revitalization and reconstruction of local communities

- On June 25th, "Proposal for Reconstruction" was put together by the Reconstruction Design Council in Response to the Great East Japan Earthquake
- With enactment of the Basic Act on Great East Japan Earthquake Reconstruction (provisional translation) (June 24), the Headquarters for the Reconstruction from the Great East Japan Earthquake and the Local Headquarters in Iwate, Miyagi and Fukushima Prefectures were established
- Based on the above Act, a "Basic Policy on Reconstruction" was put together on July 29.

Additional Report of the Japanese Government to the IAEA

- The Accident at TEPCO's Fukushima Nuclear Power Stations -

(Second Report)

(Summary)

September 2011

Nuclear Emergency Response Headquarters

Government of Japan

Contents of Summary

1.Introduction

The Nuclear Emergency Response Headquarters of the Government of Japan prepared for the International Atomic Energy Agency (IAEA) Ministerial Conference on Nuclear Safety convened in June 2011 a report (hereinafter referred to as the "June Report") addressing the situation of the accident at the Tokyo Electric Power Company' (TEPCO) Fukushima Nuclear Power Stations which occurred on March 11 of this year. This report covered the occurrence and development of the accident, responses to the nuclear emergency, lessons learned from the accident until that time, and other such matters. The Headquarters submitted the report to the IAEA and made presentations of the report at the Conference.

The Ministerial Declaration and the Chair's Summary of the Conference's plenary session state expectations towards Japan for the continued provision of information. The government recognizes that it is incumbent upon Japan to continue to provide accurate information regarding the accident to the international community, including lessons learned through the accident. In accordance with this approach the Government of Japan decided to compile information on the state of affairs subsequent to the June report in the form of an additional report and submit it to the IAEA on the occasions of the Board of Governors meeting and the General Conference.

Restoration from the accident has been steadily proceeding with Step 2 after completing Step 1, including among other matters the achievement of stable cooling of the nuclear reactors and the spent fuel pools in Fukushima NPS. That said, the situation is such that several more months are expected to be required to bring about more stable cooling. Against such a backdrop, the following three points have been noted in preparation of this additional report.

(1) This report compiles additional information on the accident obtained as well as efforts being made to bring about restoration from the accident after the June Report.
(2) The report compiles the current state of efforts to make full use of lessons learned.
(3) The report indicates of the state of affairs regarding the response to those who have suffered as a result of the nuclear accident (an off-site response) and the state of examination of a mid- to long-term plan for the site after restoration from the accident is completed (an on-site plan).

Particularly with regard to (3) above, the Government of Japan not only naturally advances its own initiatives but also considers it to be of paramount importance in the context of steadily advancing the initiatives to undertake matters through obtaining information, such as the related experiences and research results of other nations around the world and international organizations, as well as through receiving technical cooperation with them. Japan hopes this report will serve to engender such partnerships.

This additional report records in considerable detail what has been ascertained up until the present time regarding the situation of the responses at not only the Fukushima NPS but also other NPSs affected by the Tohoku District - Off the Pacific Coast Earthquake and the subsequent tsunamis. Moreover, the report gives an account of developments in terms of the response to those suffering as a result of the nuclear accident, including decontamination efforts. On the other hand, efforts regarding nuclear damage compensation are not covered, as was also the case with the June Report.

Preparation of this additional report has been carried out in the Government Nuclear Emergency Response Headquarters, taking into consideration efforts for restoration from the accident conducted by the Government-TEPCO Integrated Response Office, while also listening to opinions from outside eminent persons. The work in preparing

this report has been managed as a whole by Mr. Goshi Hosono, Minister for the Restoration from and Prevention of Nuclear Accidents, and compiled with Mr. Yasuhiro Sonoda, Parliamentary Secretary of the Cabinet Office, playing a central role.

Japan's basic policy is to maintain a high degree of transparency as it releases information about the accident. Consequently in this report as well, it has paid attention to providing accurate descriptions of the facts of the situation while also evaluating as stringently and objectively as possible its countermeasures to address the accident. Hearings were also conducted with related parties as necessary in order to confirm various situations. The descriptions of factual situations are based on what had been ascertained as of August 31.

Japan will continue to make full use of appropriate opportunities to disseminate additional reports to the world about the accident, using a similar format. In addition, with the activities of the "Investigation Committee on the Accidents at the Fukushima Nuclear Power Station of Tokyo Electric Power Company" established by the government now fully underway, the results of the Committee's investigation will also be publicly disclosed to the world in the course of time.

Japan intends to engage in efforts for restoration from this accident in partnership with the world. It will at the same time firmly uphold the principle of transparency as it continues to provide information about the state of affairs regarding the accident to the world through the IAEA.

2. Further Developments regarding the Nuclear Accident

(1) The Tohoku District-Off the Pacific Ocean Earthquake and the resulting tsunamis

A seismic source rupture process (a seismic source model) and a tsunami source rupture process (a tsunami source model) were obtained through an analysis that used observed ground motion data and observed tsunami waveform data, respectively. The results of this analysis indicated that slips, which are one of the major factors in mechanisms that give rise to seismic and tsunami sources, were between 55 m and not quite 70 m in the shallow area along the Japan Trench.

There is a high probability that the recent earthquake was an earthquake of M9 in terms of long-period ground motions, yet had at the same time characteristics of an earthquake of M8 in terms of short-period ground motions.

It is likely that those factors that had a great impact on the tsunami water level include the large slip noted above and the overlap effects of the tsunami water level due to a delay in rupture start time associated with consecutive rupturing of multiple seismic source areas.

(2) Status of the accident at the Fukushima NPSs, etc.

TEPCO has reported that, in an effort to ascertain the inundation height and inundation area of the premises of the Fukushima Dai-ichi NPS on the basis of tsunami source models estimated through figure simulation, it was successful in reproducing the actual behavior for the most part. TEPCO also reported investigation results which included that the direct main bus panels of Units 1, 2 and 4 were inundated due to the tsunamis while those of Units 3, 5 and 6 were spared, and that the inundation pathway leading to the main buildings was mainly the opening on the ground on the sea side of the turbine building and the opening connecting to the trench duct under the ground.

TEPCO has also reported the results of an evaluation analyzing the impacts of earthquakes on buildings and structures as well as equipment and piping critical to safety, stating that it can be estimated that the major facilities and equipment that had key functions with regard to safety were, at the time of the earthquake and immediately afterwards, at a status at which safety functions could be maintained. Insofar as many aspects regarding the detailed status of impacts caused by the earthquake remain unclear, the Nuclear and Industrial Safety Agency intends to conduct further investigations and examination, such as through a substantial on-site investigation, and also carry out evaluations.

The Nuclear and Industrial Safety Agency has received reports from TEPCO regarding the accident and has been moving forward with investigations making use of hearings with the employees of TEPCO and others. Based on these, the major additional information regarding the status of the initial response at the power stations after the accident occurred with regard to such matters as cooling, alternative water injection, the

PCV venting, and so on, as well as the current state of affairs including the state of the spent fuel pools, the state of the RPV, and the like were determined to be as follows.

1) The status of the Fukushima Dai-ichi NPS in overall terms

In the Fukushima Dai-ichi NPS after the earthquake struck, while the staff designated for emergency responses was able to be secured, these persons were required to carry out various responses to the situation of concurrent disasters at multiple Units. As a result of the lost of all AC power supply due to the tsunami striking, the means of communication within the power station were extremely limited, including the loss of function of the site-specific PHS system. The Safety Parameter Display System (SPDS), which is the system to figure out the status of each plant, lost its ability to function, negatively impacting the formulation of response measures within the power station's emergency response headquarters.

On the basis of the state of damage of its power supply facilities, TEPCO had power supply vehicles from all of its branches head to the Fukushima Dai-ichi NPS beginning on the evening on March 11, but due to road damage and traffic jams, they were not able to proceed as intended. The transportation by air of power supply vehicles by the Self-Defense Forces was also considered but this could not be realized due to the great weight of the vehicles. It was against such a backdrop that, utilizing power supply vehicles secured before dawn on March 12, the staff of the stations undertook work to lay electricity cables with a view to restoring power supply amidst extremely poor working surroundings, such as darkness, strong aftershocks occurring intermittently, an ongoing major tsunami alert, pools of water left by the tsunamis, obstacles strewn about, the high air dose, etc.

2) Unit 1 of Fukushima Dai-ichi NPS

- *Initial cooling*

Although cooling by isolation condenser (IC) (two lines) was begun after the automatic shutdown of the nuclear rector, it was manually stopped by following the operation procedure documents because of a rapid decrease in the temperature of the RPV. After that, using only one system of IC, start-up and shutdown was repeated manually. The loss of power supplies due to the following tsunami made it impossible to confirm the operating status of the IC.

- *Alternate water injection*

Since it was unclear whether the IC functions at the plant were able to be maintained and since it was impossible to confirm the water level of the reactors, at 17:12 on March 11, with the aim of implementing cooling by means of alternative water injection, TEPCO started to consider adopting alternative water injection actions (the fire protection system, the make-up water condensate system) set up as accident management (AM) measures and fire engines using fire cisterns, which had been set up in response to the lessons learned from the Niigata-ken Chuetsu-oki Earthquake. Regarding the utilization of the fire protection system, staff manually opened valves of the core spray system and so on in the dark, making it possible for water injection to occur after the depressurization of the RPV.

Also, although the deployment of an available fire engine near Unit 1 became necessary, tsunami-induced driftage interrupted the flow of road traffic on site. A fire engine was deployed near Unit 1 only after securing an access route by breaking the lock of a gate that was closed. It was through such difficult work that at 05:46, March 12, fresh water injection was started using the fire engine, by means of the fire protection system line.

- *PCV venting*

Because the means to transfer heat to the ultimate heat sink was lost as a result of the tsunami, TEPCO started to review from the very earliest stages of the accident the possibility of conducting PCV venting. When station employees connected a small generator at around 23:50 on March 11 to the instrument to confirm PCV drywell pressure, it was 0.600 MPa abs (maximum operating pressure is 0.427 MPa gage (= 0.528 MPa abs)). Therefore the NPS started work in concrete terms to perform venting. The evacuation of residents in the vicinity was being confirmed prior to performing the venting, and at 9:03 on March 12 the evacuation of Okuma Town (Kuma district) was confirmed as having been completed. At around 9:15 station employees performed the operation to open a PCV venting valve (open 25% of the stipulated procedure) using the light of a flashlight in the darkness. Subsequently station employees went to operate the small valve of the suppression chamber (S/C); but, it was impossible to do so due to a high dose in the environment of that spot. Due to this, the opening operation of the S/C small valve in the Main Control Room was performed with expectations of residual pressure of air in the S/C small valve, and the operation to open the S/C large valve through the use of a temporary compressor was performed at around 14:00 that day. The result was that at 14:30 the PCV drywell pressure was confirmed to have decreased, and

consequently it was judged that venting had been performed.

- Situation of the spent fuel pool

Due to the loss of all AC power and the consequent loss of seawater pump function due to the earthquake and tsunamis on March 11, the functions of cooling and of make-up water were lost. The reactor buildings were damaged by hydrogen explosions on March 12 and portions of the ceilings fell down on the upper side of the pool. There is a high probability that exposed fuel was avoided by maintaining the water level at the spent fuel pool through the spraying of water by concrete pump truck and injections of water taken from the piping of the fuel pool cooling and cleanup systems and freshwater sources. An alternative cooling system has been organized and operated since August 10 and at present the water temperature has been stabilized at approximately 30°C.

- Current status of the RPV

As of August 31, water injection was being undertaken at a flow rate of approximately 3.6m^3/h, which exceeds the flow rate equivalent to decay heat. The temperature of the bottom of the RPV is below 100°C and has been trending in a stable manner without showing any continuous increasing trend for the past month, a fact indicating that sufficient cooling has been secured through the circulating water injection cooling system. The injection of nitrogen into the PCV has been underway since starting the injection on April 7.

3) Unit 2 of Fukushima Dai-ichi NPS

- Initial cooling

Although the loss of power supplies due to the tsunamis made the operating status of the reactor core isolation cooling system (RCIC) unidentifiable, at 02:55, March 12, it was confirmed that the RCIC was in operation, and thereafter, the monitoring of the reactor continued for a little while as an alternative water injection system was prepared.

- Alternative water injection

Since it was impossible to determine whether or not the RCIC function was being maintained immediately after the tsunamis struck, just as with Unit 1, TEPCO began to consider adopting alternative water injection actions (the fire protection system, the make-up water condensate system) which had been set up as AM measures, as well as fire engines using the fire cistern. Thereafter, upon confirming the operation of the RCIC, monitoring of the reactor condition continued for some time, and in parallel, a

water injection line which took its water from the Unit 3 backwash valve pit was developed in case the RCIC stopped, and hoses were connected the fire engines deployed. At 11:01, March 14, an explosion occurred in the rector building of Unit 3, resulting in the water injection line which had been ready for operation becoming unusable due to damages to the fire engines and hoses. At 13:25 on the same day, since it was judged that the operation of RCIC was not available, it was decided that due to the fact that debris lay scattered on the site direct seawater injection from the landing area would be implemented. After that, while the work was forced to stop due to aftershock, the subsequent arrangements including, among others, reconnecting hoses, depressurizing the RPV using main steam safety relief valves (SRV), and refueling fire engines which had stopped operations after running out of fuel, were completed, although some interruption by aftershocks were unavoidable. At 19:54 on the same day, TEPCO began seawater injections via fire engines.

- PCV venting

In order to create a situation in which PCV venting can be performed, operations to open a PCV vent valve (MO valve (motor operated valve)) (open 25% of the stipulated procedure) was performed at 8:10 on the 13th, and the operation of opening the large valve of the S/C vent (AO valve (air operated valve)) was performed at 11:00 of the same day to complete the vent line configuration and await the blowout of a rupture disk. However, after that, the S/C large valve was closed and unable to be re-opened, affected by the explosion of the reactor building of Unit 3 at 11:01 on the 14th; nevertheless, efforts were continued to form a line. At around 21:00 on that day the small valve of the S/C vent (AO valve) was opened slightly, making the vent line configuration successful again. However, a policy of drywell venting was adopted because the pressure on the S/C side was lower than the working pressure of the rupture disk and the pressure on the drywell side was increasing, and an operation to open the small valve of the drywell vent valve (AO valve) was performed once at 0:02 on the 15th; however, it was confirmed several minutes later that the small valve was closed. After that, drywell pressure maintained a high level of values; large sounds of impact occurred between around 6:00 and 6:10 of the 15th, while S/C pressure indicated 0 MPa abs. Lower drywell pressure was also confirmed at around 11:25 on that day.

- Situation of the spent fuel pool

Due to the loss of all AC power and the consequent loss of the seawater pump function due to the earthquake and tsunamis on March 11, the functions of cooling and

of make-up water was lost. A blow-out panel of the reactor building at Unit 2 was thrown open by a hydrogen explosion at the reactor building of Unit 1 on March 12. Water injections using seawater as the source water and which made use of the piping of the fuel pool cooling and cleanup system had started since March 20. (This was switched to a freshwater source as of March 29.) There is high probability that exposed fuel has been avoided by maintaining the water level of the spent fuel pool through this method of water injection. An alternative cooling system was begun on May 31 and the water temperature has been stabilized at approximately 30°C at present.

- Current status of the RPV

As of August 31, water injection was being undertaken at a flow rate of approximately 3.8m^3/h, which exceeds the flow rate equivalent to decay heat. The temperature at the bottom of the RPV is below 130°C and trending in a stable manner without showing any continuous increasing trends for the past month, which indicates that sufficient cooling has been secured via the circulating water injection cooling system. The injection of nitrogen into the PCV has been underway since starting the injection on June 28.

4) Unit 3 of Fukushima Dai-ichi NPS

- Initial cooling

Regarding Unit 3, even after the loss of all AC power on March 11, the RCIC was functioning for some time and cooling of the rector was maintained. However, at 11:36, March 12, the RCIC was tripped. HPCI, whose operation was begun immediately following that, which means at 12:35 on the same day, stopped at 02:42, March 13. In light of this situation, TEPCO attempted to restart the injection of water using existing cooling facilities (HPCI, RCIC, diesel-powered fire pumps), but the HPCI failed to operate due to battery depletion. An injection of water into the RPV was also attempted upon confirming the site conditions, but the RCIC failed to begin operating.

- Alternative water injection

After the restoration of roads within the site located to the side of units 5/ 6, including the removal of debris and other efforts, the recovery of the fire engines which were parked to the side of units 5/6, and the transfer to Fukushima Dai-ichi NPS of a fire engine which had been positioned as a backup for emergencies at Fukushima Dai-ni NPS, in the early morning of March 13, a line for an injection of water was developed by which freshwater was taken from the fire cistern. In order to depressurize the RPV, it

became necessary to operate the main steam safety relief valves (SRV), but due to a lack of working batteries, batteries were removed from cars employees used for commuting and collected. Rapid depressurization of the RPV was implemented using these batteries as a power supply. Following this, at 09:25 on the same day, alternative water injection with fire engines was launched. When freshwater from the fire cistern, the water source, was depleted, at 13:12 on the same day, a seawater injection was begun by developing the line which injects seawater of the backwash valve pit. The explosion of the reactor building on March 14 caused the backwash valve pit to become unusable. Having attempted other sea water injections, around 16:30, March 14, seawater injections were developed that directly took in seawater, and seawater injection via fire engines resumed.

- *PCV venting*

At around 4:50 on March 13 the operation to open the vent valve was started for the PCV vent, and the S/C large valve (AO valve) was not able to be opened despite the forcible energization of the electromagnetic valve for activating the large valve using a small generator, so it was made to open by changing cylinders. Also, the operation to open another vent valve was performed manually (open 15% of the stipulated procedure), the vent lineup was complete at around 8:41 on March 13, and TEPCO awaited the blowout of a rupture disk. At 9:24 on March 13 it was confirmed that drywell pressure had decreased from 0.637 MPa abs (at 9:10 on the 13th) to 0.540 MPa abs (at 9:24 on the 13th), so that TEPCO judged that venting had been conducted. However, after that, there was the repeated closure of a vent valve due to decreased air pressure, so that the operation to open the valve was performed each time by changing cylinders, etc.

- *Situation of the spent fuel pool*

Due to the loss of all AC power and the consequent loss of the seawater pump function due to the earthquake and tsunamis on March 11, the functions of cooling and of make-up water were lost. The entire upper side exterior-wall of the operating floor at the reactor building was damaged by an explosion assumed to have been a hydrogen gas explosion on March 14, and a large amount of rubble fell down onto the spent fuel pool. A large amount of steam emissions from the exposed operating floor was confirmed because of the damage to the building. On March 17, the spraying of seawater to the upper side of the reactor building by helicopter of the Self-Defence Force began. Spraying toward the spent fuel pool through the use of a water spraying truck also

started on the same day. Water injection by a concrete pump truck began on March 27, and water injection from the piping of the existing fuel pool cooling and cleanup system was started on April 26. Through this effort, it is highly likely that exposed fuel has been avoided by maintaining the water level at the spent fuel pool. An alternative cooling system has been in place since June 30 and the water temperature is presently stabilized at approximately 30°C.

- *Current status of the RPV*

As of August 31, water injection was being undertaken at a flow rate of approximately 7.0m^3/h, which exceeds the flow rate equivalent to decay heat. The temperature of the bottom of the RPV is below 120°C and trending in a stable manner without showing any continuous increasing trend for the past month, which indicates that sufficient cooling has been secured by means of the circulating water injection cooling system. The injection of nitrogen into the PCV has been underway since starting the injection on July 14.

5) Unit 4 of Fukushima Dai-ichi NPS

- *Situation of the spent fuel pool*

Due to the loss of all AC power and the consequent loss of the seawater pump function due to the earthquake and tsunamis on March 11, the functions of cooling and of make-up water were lost. The upper wall side and other portions of the operating floor were damaged by an explosion assumed to have been a hydrogen gas explosion on March 15. The spraying of freshwater by Self-Defence Forces water spraying trucks began on March 20 and has been conducted periodically ever since. Injections using a temporary fuel pool injection facility were also launched on June 16. After analyzing the results, etc. of nuclide analysis of the pool water sample, most of the fuel inside of the pool appears to be in sound condition and it is presumed that systematic mass-damage has not occurred. In this respect, due to damage at the reactor building at Unit 4, the possibility that part of the fuel was damaged by rubble falling into pool cannot be ruled out. An alternative cooling system has been in place since July 31 and the water temperature is presently stabilized at approximately 40°C.

In addition, the installation of a supportive structure at the bottom of spent fuel pool was completed on July 30 and seismic safety has been enhanced.

6) Fukushima Dai-ni NPS

In Fukushima Dai-ni NPS (BWR of Units 1~4), before the earthquake on March 11, all four units were in operation. One external power supply line was secured for the entire Fukushima Dai-ni NPS, and therefore the securing of an AC power supply was successfully achieved. Regarding Units 1 and 2, the turbine-driven injection system was ensured, and, in the case of the motor-driven injection system, despite the entirety of the emergency core cooling system (ECCS) becoming unusable, all other injection systems except the ECCS were ensured. Thus, core cooling was successfully achieved. Regarding Units 3 and 4, the turbine-driven injection system was ensured, and insofar as motor-driven injection system, part of ECCS and other injection systems were ensured, so that core cooling was successfully achieved. Regarding the removal of decay heat from the PCV, as for Unit 3, since the residual heat removal system (RHR) was ensured, continuous cooling was implemented which led to a cold shutdown. Regarding Units 1, 2 and 4, though the heat removal function was lost due to tsunamis, one RHR system was restored by replacing motors, installing temporary cables, receiving power from temporary cables, and receiving power from high voltage power supply vehicles, and in this way, a cold shutdown was achieved.

7) Other NPSs affected by the earth quake and tsunami

- *Onagawa NPS*

In Tohoku Electric Power Company Onagawa NPS (BWR of Units 1~3), Units 1 and 3 were operating, and Unit 2 was in the process of starting reactor operation. Even after the earthquake and tsunami, one external power supply line was secured for the entire NPS. Due to a fire at the normal distribution panel, Unit 1 could not supply power to the emergency distribution panel, thus it could not use an external power supply. However, by activating the emergency diesel generator, it could secure an AC power supply. As for core cooling, the turbine-driven water injection system and motor-driven water supply system were secured in Units 1 and 3, and core cooling was successful. Regarding Unit 2, the operation of pulling out the control rods for starting up the reactor was carried out, and the water temperature in the reactor was 100°C or less and immediately resulted in cold shutdown. Regarding removal of decay heat from the PCV, all Residual Heat Removal Systems (RHR) could be secured in Units 1 and 3, and were kept cool and resulted in a cold shutdown. As for Unit 2, the water temperature was 100 °C or less, and it shifted directly to cold shutdown. One RHR system became dysfunctional due to the following tsunami, but one other system was available, and this was successful in securing the removal of decay heat.

- *Tokai Dai-ni NPS*

The Japan Atomic Power Company Tokai Dai-ni NPS (BWR of 1 Unit) was in operation before the earthquake on March 11.Due to the earthquake, three external power supply lines were stopped and thus external power supply was lost. All emergency diesel generators started operating. After that, although one system became unusable due to the tsunamis, through the use of another emergency diesel generator and a high-pressure core spray system (HPCS), AC power supply from diesel generators was successfully achieved. Regarding core cooling, one motor-driven water supply system could be secured, and core cooling was successful. As for the removal of decay heat from the PCVs, since one system of power supply was secured by an emergency diesel generator, and one system of power supply was secured by Residual Heat Removal System (RHR) as well, it required some time, but cooling was maintained and it resulted in a cold shutdown.

(3) Response regarding Evacuation Areas, etc

The Japanese government has established Evacuation Areas, etc. as necessary in order to avoid the accident impacting the residents in the surrounding areas. As was described in the June Report, the Director-general of the Nuclear Emergency Response Headquarters instructed the mayors concerned of the cities, towns and villages to establish the area within 20 km radius of the Fukushima Dai-ichi NPS as a restricted area from April 22 and residents have in principle been prohibited from access to the area. At the same time, it permits both residents to temporarily access their own residences (residents' temporary access) and public organizations and enterprises, etc., whose public interest are badly damaged without temporally access to the area, to temporarily access the area (public temporary access). The first round of residents' temporary access for all the cities, towns and villages in the area was almost complete by August 31, with 19,683 households (33,181) people having been granted temporary access by August 31.

On April 22, the government established as the Deliberate Evacuation Area the area in which the cumulative dose might reach 20 mSv within a year from the occurrence of the accident. The residents in this area have almost completed evacuation to date. Regarding the Evacuation-Prepared Area in Case of Emergency which was established on the day as the Deliberate Evacuation Area, in which a response of "stay in-house"

and/or evacuation was required in case of emergency, efforts are currently being made to lift the designation (cf. 4.(2) below).

In addition, since June particular spots have been found, which have no areal spread but of which cumulative dose might reach 20 mSv within a year from the accident occurrence depending on a life style, the government has identified their residences as Specific Spots Recommended for Evacuation, and it was decided for the residents living at the spots first to draw attention to these spots and then support and promote evacuation. To date, 227 spots have been established as Specific Spots Recommended for Evacuation, covering 245 households.

(4) Situation regarding the release of radioactive materials

The Japan Atomic Energy Agency (JAEA) reported on May 12 to the Nuclear Safety Commission (NSC) about its trial calculation of the amount of release to the atmosphere of iodine-131 and cesium after the accident occurred, and, as the result of emergency monitoring from March 12 to 15 was thus newly confirmed, the JAEA reevaluated and reported the result to the NSC on August 22.

For the current release amount of radioactive materials at the site, TEPCO, using a graph of the concentration distribution which had been made in advance by means of observed data of concentration measurements of radioactive materials in the atmosphere near the site and a diffusion model (a diffusion model based on the "Regulatory Guide for Meteorological Observation for Safety Analysis of Nuclear Power Reactor Facilities" of the NSC), estimated the current release amount of radioactive materials to the atmosphere. As a result, at a time in early August, the release amount including the total of both cesium-137 and cesium-134 per unit time was estimated to be approximately 2.0×10^{6} Becquerel/hour (Bq/h).

The government, to assess the impact of radioactive materials released from the Fukushima Dai-ichi NPS, has actively continued environmental monitoring. In July, the government established the "Monitoring Coordination Meeting" to promote precise implementation and evaluation of monitoring based on the overall results of wide-range environmental monitoring performed by related ministries and agencies, municipalities and the operators. The Coordination Meeting determined the "Comprehensive Monitoring Plan" on August 2 to perform careful monitoring without omissions

regarding 1) general environmental monitoring, 2) harbors, airports, etc., 3) the water environment, etc., 4) agricultural soil, forests and fields, etc., 5) food, 6) the water supply, in cooperation with related organizations.

For the outflow of radioactive materials to the sea from the Fukushima Dai-ichi NPS, TEPCO implemented measures to prevent outflow and mitigate diffusion, including the closure of the seawater piping trench located in the upper part of outflow routes as well as blocking pits having outflow risk. The concentration of radioactive materials in seawater near the NPS' water intake and water discharge locations has now decreased to a level near the regulatory concentration value defined by law. However, in the future, there is the possibility that accumulated water might leak under ground and increase contamination of the sea. In light of this situation, the installation of a water shielding wall (at the seaside) made of steel pipe sheet pile with an adequate water shielding function in front of the existing seawall of Units 1 to 4 is planned. Beyond this, the installation of a water shielding wall (at the land side) surrounding the reactor buildings of Units 1 to 4 is also being investigated and examined.

The Ministry of Education, Culture, Sports, Science and Technology (MEXT), on the basis of "Sea Area Monitoring in Wider Areas" published on May 6, has been continuously implementing monitoring of radioactivity concentrations in refuse on the sea surface, in the seawater and in the marine soil in the sea beds off the coast of Miyagi, Fukushima and Ibaraki Prefectures, etc. in cooperation with related organizations.

(5) Situation regarding radiation exposure

Regarding the total value of the external and internal exposure of the workers, while the average value of 3,715 people was as high as 22.4 mSv in March, there is a declining tendency, with 3.9 mSv as the average value of 3,463 people in April and 3.1 mSv as the average value of 2,721 people in May.

Particularly in March, it was confirmed that six people exceeded 250 mSv, which is the dose limit for an emergency worker. All of these were TEPCO employees who were operators and engineers in electricity and instrumentation engaged in monitoring of instruments in the main control rooms immediately after the occurrence of the accident. TEPCO has made it a rule not to allow workers who have exceeded 200 mSv to work at the Fukushima Dai-ichi NPS.

For residents, Fukushima Prefecture intends to implement the "Health Management Survey for the Residents in Fukushima Prefecture" directed at all its residents, who number about two million. In concrete terms, a basic survey based on behavioral records, etc., is scheduled and a detailed survey will be implemented for the residents living in Evacuation Areas, etc. Moreover, supersonic thyroid examinations will be implemented for all residents who are 18 years old or younger. As part of the previous survey of the basic survey, a survey of internal exposure by using a whole body counter, etc. was implemented for 122 residents in areas where the possibility of internal exposure might be relatively high. The internal exposure to the total of cesium-134 and cesium-137 by these subjects was assessed as less than 1 mSv.

(6) Situation regarding measures to address agricultural products, etc.

From viewpoints of securing health, security, and safety of the citizens as well as international community, the government is promoting enhanced efforts on inspection of agricultural products and distribution restriction as necessary, etc., based on provisional regulation values of radiation dose comparable to those of major countries. Regarding agricultural products, etc., on June 27, the Government Nuclear Emergency Response Headquarters (GNER HQ) re-summarized the policy for restricting distribution and intake and also for lifting such orders, on the basis that radioactive cesium exceeding the provisional regulation values has been detected in some food even as the level of radioactive iodine detected in food has been decreasing. Based on this, relevant municipalities are carrying out distribution restrictions and also lifting these restrictions in accordance with the monitoring results of radioactive materials.

As for the specific handling by the government regarding tea in tea fields where the concentration of radioactive cesium of dried tea leaves exceeds provisional regulation values (500 Bq/kg or less) or has a risk of it, Ministry of Agriculture, Forestry and Fisheries (MAFF) provides guidance towards planning to decrease the amount of radioactive cesium by carrying out "deep-skiffing," which is to prune 10 to 20 cm from the top to the degree that no leaf layers remain. Also, radioactive cesium exceeding the provisional regulation values was detected in beef, and, since it is believed that cattle consumed rice straw collected after the accident and containing radioactive cesium, in conjunction with calling for attention to the handling of rice straw, distribution restrictions of cattle were established. Regarding rice, in cities, towns and villages

where radioactive cesium concentration in soil is high, preliminary investigations were carried out in advance in order to figure out the tendency towards concentrations of radioactive materials at a stage before harvesting, and measurement at the post-harvest stage as the main investigation will be carried out, measuring radioactive materials to decide whether or not a restriction on distribution is necessary. On the basis of this concept of the government, the inspection of rice for radioactive materials has been conducted by relevant municipalities, and radioactive materials exceeding provisional regulation values have not been detected to date (August 31). Also, regarding fertilizer, soil amendments, nursery soil, and feed, provisional acceptable values regarding the concentration of radioactive cesium were defined and inspection methods, etc. were established.

3. Efforts to Settle the Accident

On July 19, the Nuclear Emergency Response Headquarters confirmed that the roadmap to settle the situation regarding the accident will transition from Step 1 to Step 2. This was the result of a comprehensive assessment of the situations including that the radiation doses indicated by monitoring posts, etc. were steadily on the decrease, efforts to cool the reactors and spent fuel pools have progressed, the treatment of stagnant water has progressed, etc.

Under Step 2, from October of 2011 to January of 2012, efforts will be made to achieve a situation in which the release of radioactive materials is under control, and the radiation exposure dose is being significantly held down through the realization of the cold shutdown of the rectors etc. The Nuclear Emergency Response Headquarters positioned Step 2 as an effort to be undertaken by the Government-TEPCO Integrated Response Office, and that the government will be sufficiently engaged to settle the accident, including efforts to improve the life and work environment for workers, the enhancement of radiation control and the medical system, and the training of staff. The government will make its utmost efforts to surely achieve the goals of Step 2 and settle the accident as soon as possible.

As the specific situation so far, regarding stable cooling of reactors, in Step 1, in consideration of the achievement of treating stagnant water and stable water injection using it (circulation water cooling), the securing of reliable water injection (actions to

address an abnormal event, more than one measure for water injection, etc.), and the avoidance of the risk of a hydrogen explosion accompanying the nitrogen injection into the PCV, the targeted "stable cooling" in Step 1 was realized.

Currently, the actual amount of injected water exceeds the amount of water equivalent to the decay heat, and the temperature of RPV has been stable. Hereafter, regarding Units 2 and 3, where the temperature at the bottom of the PRV exceeds 100°C, the amount of water injection will be modified on a trial base in order to change the temperature inside the reactor and the amount of water necessary to be injected to achieve a cold shutdown condition will be evaluated.

Regarding the cooling of the spent fuel pools, by August 10, "more stable cooling" (a target in Step 2) was achieved before others, as circulating cooling with heat exchangers has been implemented in all Units (1, 2, 3 and 4).

In order to implement the treatment of stagnant water and more stable and efficient injection of treated water into the reactor, as second-line treatment facilities, on August 7, treatment began with evaporative concentration equipment, which reinforces the desalination process. The current accumulated amount of the treated stagnant water is approximately 66,980 tons (as of August 31) and the cesium decontamination factor achieved by the treatment facilities is 10^6. (Note: The "decontamination factor" is the ratio of the concentration of cesium in the sample before treatment to the concentration of cesium in the sample after treatment.)

In order to improve the life and work environment for workers, TEPCO installed provisional dormitories as well as rest facilities in the NPS in sequence. Also, in order to improve health control for workers, a medical room has also been installed in the NPS, and the medical systems have been improving by deploying multiple doctors in a seismic isolation building to provide a 24-hour care system etc.

4. Responses to people suffering as a result of the nuclear accident (Off-site)

(1) Off-site measures

The Nuclear Emergency Response Headquarters established the "Roadmap for Immediate Actions for the Assistance of Residents Affected by the Nuclear Incidents"

on May 17. Currently it is promoting efforts targeting the Evacuation Areas, the reinforcement and continued implementation of monitoring, and efforts such as decontamination and countermeasures against radioactive waste, etc. with full force in line with the Roadmap. The government will promptly promote such efforts in cooperation with related parties such as local municipalities.

(2) Efforts to lift the designation of Evacuation-Prepared Area in Case of Emergency

The NSC has indicated conditions, etc. for the lifting of each of the designations of Evacuation-Prepared Area in Case of Emergency, Evacuation Area, and Deliberate Evacuation Area, taking into account radiation protection and reactor stability under the "Basic Policy of the Nuclear Safety Commission of Japan on Radiation Protection for Termination of Evacuation and Reconstruction" (July 19) and "Standpoint of the Nuclear Safety Commission for the Termination of Urgent Protective Actions implemented for the Accident at Fukushima Dai-ichi Nuclear Power Plant" (August 4).

Based on the above initiatives, the Nuclear Emergency Response Headquarters indicated the "Concept of Review of Evacuation Area, etc." on August 9. The Japanese government intends to lift the designation of Evacuation-Prepared Area in Case of Emergency in block at the stage when all local municipalities have completed the development of a restoration plan based on their residents' intentions.

Therefore, related organizations are currently promoting environmental monitoring actively with a view to the lifting of the Evacuation-Prepared Area in Case of Emergency. Whole area environmental monitoring of the sites of schools and other public facilities, school zones and parks, etc. and environmental monitoring in response to individual requests of cities, towns and villages, etc. have been performed.

(3) Preparation of maps indicating radiation doses, etc.

The MEXT collected soil at about 2,200 places within a roughly 100 km radius from the TEPCO's Fukushima Dai-ichi NPS while also measuring the air dose rate and the amount of radioactive materials deposited into soil at these locations. It has made it a rule to prepare distribution maps of radiation dose, etc. on the basis of these

measurements; so far, it published an air dose rate map on August 2 and a concentration map of radioactive cesium in soil on August 30.

(4) Enactment of the Act on measures for radioactive wastes and the basic policy of decontamination

The Diet enacted the "Act on Special Measures concerning Handling of Radioactive Pollution" on August 26. In light of the fact that contamination of the environment has been occurring on account of radioactive materials discharged by the recent accident, the Act intends to reduce impacts on human health and/or living environment promptly by establishing measures to be taken by the national and local governments and relevant licensees, etc. Specifically, it stipulates that the national government is to establish the basic principles regarding the handling of contamination of the environment by radioactive materials, and, giving due consideration to the degree of significance of the contamination, designate areas where it is necessary to take measures including decontamination by the national government and so on.

As decontamination is an urgent issue to be tackled immediately, the GNER HQ established the "Basic Policy for Emergency Decontamination Work" on August 26 without waiting until the related part of the above-mentioned Act fully comes into force in next January. It summarized specific targets and working principles in carrying out decontamination, including that estimated annual exposure dose of general public in residence areas is to be reduced approximately 50% in the next two years, and so on. In this policy, 1) with a central focus on areas where the estimated annual exposure dose exceeds 20 mSv, the national government directly promotes decontamination with the goal of reducing the estimated annual exposure dose to below 20 mSv, 2) effective decontamination is carried out through the cooperation of municipalities and residents also in areas where the estimated annual exposure dose is below 20 mSv, with a goal of bringing the estimated annual exposure dose to close to 1 mSv, and 3) particularly, by putting high priority on thorough decontamination work in children's living areas (schools, parks, etc.), the goal is to reduce the estimated annual exposure dose of children close to 1 mSv as soon as possible, and then still lower, and so on. The contents of the basic policy are consistent with the above-mentioned Act and will be replaced when this Act fully comes into force. In order to promote these efforts by coordinating with the local areas the government launched "Fukushima Decontamination Promotion Team" and enhanced its on-site system on August 24. Also,

on August 25, the Office of Response to Radioactive Materials Contamination was established within the Cabinet Secretariat and a system for comprehensively promoting decontamination, the disposal of radioactive wastes, and the health investigation of residents is to be prepared. In addition, a coordination meeting to facilitate close coordination among relevant ministries and agencies will be launched, as well as a radioactive materials contamination response advisory meeting, to be comprised of persons of knowledge and experience on the establishment of standards regarding radiation. Hereafter, the government intends to appropriate about 2 billion yen for these decontamination activities from reserve fund provided under a secondary supplementary budget for this fiscal year.

(5) Individual efforts concerning decontamination, etc.

- Decontamination efforts made by municipalities

In Date City, Fukushima Prefecture, prior to decontamination works of the whole city, a demonstration experiment targeting swimming pools and private residences was carried out, whereby the radiation dose was successfully lowered to a level that does not cause problems. Other local governments also have started decontamination and remediation activities.

- Decontamination of residents' living spaces

The GNER HQ, since radioactive materials were detected from soil and sand in the gutters as well as fallen leaves, carried out a demonstration experiment on the decontamination of gutters, etc., and compiled and presented instructions for cleaning these.

- Decontamination efforts in schools, nursery schools, etc.

In cases in which the air dose rate of the school yard, kindergarten yard, etc. exceeds 1 μSv/h, MEXT and the Ministry of Health, Labour and Welfare (MHLW), through financial support from the national government, will carry out measures to reduce the dose rate of school soils, etc., with the goal that the exposure dose for pupils and school children not be more than 1 mSv per year in principle after summer vacation.

- *Dose reduction of public facilities and school zone, etc.*

The national government funded for measures in Fukushima Prefecture for urgently preventing the effects of radiation on children, etc. in schools, parks, school zones, and public facilities, etc. currently used by children, residents, and others.

- *Monitoring and decontamination of agricultural soils, etc.*

With regard to agricultural land, the Ministry of Agriculture, Forestry and Fisheries (MAFF) collected samples of soil from about 360 points in Fukushima Prefecture and about 220 points in the surrounding 5 prefectures (Miyagi, Tochigi, Gunma, Ibaraki and Chiba Prefectures), promoted investigations into the status of contamination, and compiled a distribution map of radioactive materials concentrations (August 30).

MAFF, in cooperation with the Government Council for Science and Technology Policy, MEXT and the Ministry of Economy, Trade and Industry, has promoted the verification of the effectiveness of physical, chemical and biological decontaminating methods, has been working to develop technologies for decontaminating radioactive materials, and has been reviewing necessary measures for each decontamination status. Also, regarding all forested areas in Fukushima Prefecture, a distribution map of concentrations of radioactive materials is to be prepared similarly, and the future response will be examined accordingly.

- *Disposal of disaster wastes, etc.*

Ministry of the Environment compiled the "Policy on Disposal of Disaster Wastes in Fukushima Prefecture" on June 23. It stipulated the disposal method, etc. of incinerated ash that burnable waste is to be incinerated at incineration facilities fitted with bag-filter equipment and having exhaust fume absorption functions, and also that bottom ash contaminated with 8,000 Bq/kg or less is to be disposed by landfill. Subsequently, on August 31, the "Policy on Disposal Method of Incinerated Ash, etc. with Contamination that exceeds 8,000 Bq/kg and is less than 100,000 Bq/kg" was compiled.

5. Plans for the NPS site after restoration from the accident (On-site plans)

At the Fukushima Dai-ichi NPS where the recent nuclear accident occurred, there are plans to aim to remove the spent fuel and debris and, ultimately, to take measures for decommissioning. To achieve these objectives, the Mid- and Long-term Response Team of the Government-TEPCO Integrated Response Office is discussing for efforts to

address these mid- and long-term challenges at "Advisory Committee on Mid- and Long-term Measures at the Fukushima Dai-ichi NPS of Tokyo Electric Power Co. Inc.," (hereinafter referred to as "Advisory Committee on Mid- and Long-term Measures") of the Atomic Energy Commission along with addressing issues by dividing them into mid-term challenges and long-term challenges.

Mid-term challenges include management of the groundwater on the site, integrity management of buildings and equipment, construction of reactor building containers, and the removal of spent fuel from the spent fuel pools. The Mid- and Long-term Response Team is currently discussing and designing the construction of groundwater boundaries on the ocean-side of the NPS site in order to prevent groundwater contamination from expanding, and is evaluating and discussing the safety of the reactor buildings in the event of a possible earthquake in the future in order to ensure safety. For the present, the removing spent fuels from the spent fuel pools, etc. will be tackled for the next three years, with preparations now underway, including the installation of equipment necessary to clear rubble scattered atop the reactor buildings and remove spent fuel, and modifications to the common pool to which spent fuels in the spent fuel pools are to be transferred.

Long-term challenges include the reconstruction of primary containment boundaries, extraction and storage of debris, management and disposal of radioactive waste, and decommissioning.

"Advisory Committee on Mid- and Long-term Measures of" the Atomic Energy Commission is currently discussing and putting together basic policies for efforts to address these mid- and long-term challenges and a set of research and development issues that are expected to be useful and helpful in pursuing those efforts. This Advisory Committee is identifying and sorting out technical challenges to be solved so that debris can be removed from the reactor pressure vessels (RPV) and then put under control, using examples from the activities at Unit 2 of the Three Mile Island nuclear power plant (hereinafter referred to as "TMI-2") in the United States.

The Fukushima Dai-ichi NPS is in a difficult situation, including the facts that the placement of debris is not known, that debris may have accumulated at the bottom of the primary containment vessels (PCVs) due to damage to the RPV bottoms, unlike in the case of the TMI-2 accident, and the fact that it has been determined that the water

injected to cool the RPVs has been flowing out of there into the PCVs, leaking from the PCVs into the bottom part of the reactor buildings, and then further into the turbine buildings from there. With this recognition, it has been decided that attention should be focused on identifying points of leakage of the cooling water and on figuring out the position and nature of the fuel while enabling the circulation pathway for cooling the RPVs to be shortened and debris to be handled, for which an accommodating environment should be put in place. To achieve this, work is now underway to identify technical challenges to be solved and corresponding research and development areas.

For example, the development of engineering and construction methods to locate the leakage points of the PCVs and then repairing them to stop water, thereby enabling the PCVs to be filled with water after the construction of boundaries, has been identified as one of these technical challenges. To achieve this, the development of robots for remote inspection around the PCVs and for repairs, as well as the development of engineering and construction methods for repairing assumed leakage points to prevent water from escaping, etc. have been identified as among the research and development areas.

6. Situation regarding efforts to address lessons learned (28 items)

Japan is making its greatest possible efforts to address the 28 "lessons learned" indicated in the June report. The state of progress among these items is not uniform, with some items already having been fully implemented, others now in the process of being implemented, and still others that are to be newly planned in the future. Japan will prevent the recurrence of such an accident as this by addressing each item steadily and thoroughly based on the idea of "defense in depth," which is the most important basic principle in securing nuclear safety. In addition, while the NISA has given directions of immediate emergency measures to operators since March 30 based on the findings about this accident as of the time point, it is contemplating that the contents which are supposed to respond to each of the lessons need to be further reviewed based on extensive knowledge in Japan and overseas from now on and be improved and reinforced.

Particularly, Japan aims to establish a new safety regulatory organization and system by establishing the Nuclear Safety and Security Agency (tentative name) by around next April. As efforts to establish reinforced safety regulation under the new system and the

concrete responses to these "lessons learned" are closely related, they are to be promoted through appropriate coordination.

Lessons in Category 1

Prevention of severe accidents

(1) Strengthen measures against earthquakes and tsunamis

The tsunami damage that caused the recent nuclear accident was brought about because of inadequate preparedness against large tsunamis, including the failure to adequately envisage the frequency of occurrence and the height of tsunamis. This has led preventive measures against tsunamis at nuclear power stations becoming one of the top priorities.

In terms of measures against earthquakes and tsunamis, as noted in this report, those mechanisms, etc. that caused the Tohoku District-Off the Pacific Ocean Earthquake and resulting tsunamis, triggering the Fukushima nuclear accident, are being studied in detail by such research institutes as the Japan Nuclear Energy Safety Organization (JNES). Such recent findings are expected to serve as a basis for future preventive measures against earthquakes and tsunamis at nuclear facilities.

In particular, measures against tsunamis are at the top of the agenda for Japan and on June 26, 2011 the Central Disaster Management Council set out a basic policy for future preventive measures against tsunamis, including those that assume the largest possible tsunami and the most frequent tsunami. The NSC has undertaken and is pursuing discussions on review of the NSC Regulatory Guides regarding earthquake and tsunami considering the Council's suggestions and the progress of discussions by Japan Society of Civil Engineers etc.

In this context, the Nuclear and Industrial Safety Agency (NISA) has undertaken discussions in terms of "defense in-depth," of a design basis that assumes adequate frequency of occurrence, with an adequate recurrence period taken into consideration, and height of tsunami; and of criteria for safety design of structures that allows for the impact force of tsunami waves, etc.

(2) Ensure power supplies

One of the significant factors of the accident was failure to ensure necessary power supplies. Therefore NISA has requested nuclear plant operators to ensure concrete power supplies, and the operators have already implemented the deployment of power-supply vehicles which supply the requisite power for emergency reactor cooling, the securing of emergency diesel generator capacity for a state of cold shutdown (sharing emergency power supplies with other units), countermeasures against flooding for important equipment within a reactor building (sealing of areas of penetration and doors, etc), and assessments of the degree of reliability of power grid.

Currently, nuclear plant operators are also taking measures such as the installation of large-sized air-cooled emergency diesel generators and air-cooled emergency gas turbine generators, measures to improve the reliability of power supply based on the outcome of the assessment of the reliability of the electrical systems (transmission line enforcement, etc.), tsunami protection measures for the switchyard, etc., countermeasures against collapses of transmission line towers and seismic reinforcement of switchyard equipment. In addition, the enhancement of battery capacity and seismic reinforcement of fuel tanks for emergency diesel have been planned as future efforts.

(3) Ensure reliable cooling function of reactors and PCVs

Since the loss of the cooling functions of the reactors and the PCV led to aggravation of the accident, as specific countermeasures, the plant operators, under instructions from NISA, deployed alternative/external water injection devices (pump tucks, fire engines, hoses, coupling parts, etc), ensured the capacity of freshwater tanks, and arranged feedwater lines that take water from the sea.

Currently, in order to bring the reactors to a state of cold shutdown as early as possible, the operators are procuring seawater cooling pumps, spare parts for motors, and temporary pumps which facilitate early restoration, as well as installing large-sized air-cooled emergency generators to drive seawater cooling systems. Also, as future efforts, they plan to make seismic reinforcements of large-sized freshwater tanks and other related efforts.

(4) Ensure reliable cooling functions of spent fuel pools

In the accident, the loss of power supplies led to failure of the cooling for the spent fuel pool. The operators, under instructions from NISA, in order to maintain cooling of the spent fuel pool even when power supplies had been lost, deployed

alternative/external cooling water injection devices for the spent fuel pools (pump tucks, fire engines, hoses, coupling parts, etc.), ensured the capacity of freshwater tanks, and arranged feedwater lines that take water from the sea.
Beyond this, they plan to undertake seismic reinforcement of the cooling piping system for the spent fuel pool, etc. as future efforts.

(5) Thorough accident management (AM) measures

Since AM measures were found to be insufficient during the current accident, hereafter efforts shall be implemented to ensure thorough enhancement of AM measures.
The NSC has resumed discussions on upgrading the AM measures which had been discontinued due to the accident of this time. Also, NISA developed an operational safety program and expanded/clarified the interpretation of technical standards regarding emergency response procedures and so on which will enable the stable cooling of the reactor even should all AC power supply and all seawater cooling functions be lost. Hereafter, it plans to implement the work to seek to legislate AM measures based on the result of the examination undertaken by the NSC.

In addition, it plans to adopt a probabilistic safety assessment approach as it develops more effective AM measures.

(6) Responses to multi-unit site issues

The accident revealed issues in the area of responses to accidents at sites having multiple units, since the accidents occurred simultaneously in multiple reactors, and development of the accident at one reactor affected the emergency responses to the accident in neighboring reactors. Thus the plant operators, under instructions from NISA, developed for each reactor independent responsibility systems, systems for accident responses, and procedures.

Hereafter, the measure to ensure the engineering independence of each reactor at sites having more than one reactor are planned to be considered.

(7) Consideration of NPS arrangement in basic design

During the accident, response to the accident became difficult since the spent fuel storage pools were located at a higher part of the reactor building. In addition, situations arose in which contaminated water from the reactor buildings reached the turbine buildings, meaning that the spread of contaminated water to other buildings was not prevented. Accordingly, sufficient consideration of an adequate layout for the facilities

and buildings of NPSs is required at the stage of basic design for new construction, and the embodiment of those considerations is being planned.

(8) Ensuring the water tightness of essential equipment and facilities

During the accident, a substantial amount of essential equipment and facilities were flooded due to the tsunamis, impeding the ability to ensure power supply and cooling water. Thus, ensuring the water tightness of essential equipment and facilities even in the case of a massive tsunami is important. The operators, under instructions from NISA, took countermeasures against flood damage to important equipment within the reactor buildings (sealing of penetrations, doors, etc). Currently, the operators are reinforcing the water tightness of the reactor buildings and installing watertight doors and so on.

Lesssons in Category 2

Countermeasures against severe accidents

(9) Enhancement of measures to prevent hydrogen explosions

During this accident, the accident was aggravated by hydrogen explosions. Therefore, enhancement of countermeasures against hydrogen explosions, including measures pertaining to reactor buildings, became an important issue.

For boiling water reactors (BWRs), the operators, under instructions from NISA, as countermeasures against hydrogen leakage into reactor buildings will install exhaust ports by making a hole in the roof of each reactor building, and conducts arrangements for implementing this work. Also, as mid- to long-term efforts, the installation of hydrogen vents atop reactor building and of hydrogen detectors in reactor buildings are planned.

For pressurized water reactors (PWRs), the operators, under instructions from NISA, confirmed that hydrogen leaked from a PCV into the annulus is reliably vented to the outside of the annulus by the already installed annulus exhaust system. Also, as mid- to long-term efforts into the future, the installation of equipment to decrease concentration of hydrogen in PCVs, including passive catalytic hydrogen recombiners requiring no power supply, is planned. For reactors with ice condenser type PCVs, it has been confirmed that hydrogen leaked into the PCV is reliably treated by the already installed igniters (hydrogen burning equipment). This includes confirmation of the operability of the igniter using a power supply from power-supply vehicles, should all AC power supplies be lost.

(10) Enhancement of the containment venting systems

In this accident, problems arose in the operability of the containment venting system for severe accident as well as its functioning in the removal of radioactive materials.

Under instructions from NISA, as initial measures, the plant operators installed standby accumulators for air valves, which enable operation of valves in vent lines even should AC power supplies be lost, as well as transportable compressors and other such equipment.

Also, in addition to these initial measures, further efforts in future will be made towards enhancing the PCV vent system by extensively considering technical expertise in Japan and overseas, including enhancement for the radioactive material removal function.

(11) Improvements to the accident response environment

At the time of this accident, as the radiation dose in the main control room increased, the situations that the operating staffs were unable to enter the main room temporarily, etc. posed problems for accident response activities in various situations.

Under instructions from NISA, the plant operators have taken steps to ensure on-site communication tools (a power supply for on-site PHS communication facilities, transceivers) a portable lighting system, and means of securing a work environment in the main control room (a power supply by power-supply vehicles to the ventilation and air conditioning systems), etc.

Also, along with implementing measures such as the transfer of on-site PHS facilities, etc. to higher ground, there are now plans to enhance functions at emergency stations, seismically reinforce office buildings, and so on.

(12) Enhancement of the radiation exposure management system at the time of the accident

In this accident, adequate radiation management became difficult as the radiation dose increased within the NPS due to the release of radioactive materials. Given this background, under instructions from NISA, the operators deployed the protective clothing against high radiation doses necessary for the early stages of an accident at NPSs, arranged mutual cooperation among operators for protective clothing against high radiation doses, personal dosimeters, full-face masks, and other such equipment, developed a system by which radiation control staff could focus on important operations to ensure radiation control in emergencies, improved employee training for radiation control in emergencies, and other such improvements.

(13) Enhancement of training for responding to severe accidents

Effective training for responding to severe accidents has not sufficiently implemented in the past. Moreover, in this accident, had training been implemented before the accident, more adequate actions could have been conducted.

Therefore, under instructions from NISA, in April the plant operators conducted emergency response training at NPSs witnessed by government staff to prepare workers for a loss of all AC power supplies, a loss of seawater cooling functions, tsunami strikes and other such emergent situations.

The government will also request the operators to implement nuclear emergency drills to prepare for the occurrence of severe accidents and their prolongation and escalation caused by primary coolant pipe breaks or other such accidents. Additionally, the government is also examining hands-on nuclear disaster prevention drills which simulate severe accidents that coincide with complex disasters as happened in this accident, and plans to engage in support and cooperation such as necessary advice for the drills performed by local authorities.

(14) Enhancement of instrumentation for reactors and PCVs

In this accident, under the severe accident conditions, the instrumentation of the reactors and PCVs failed to function sufficiently, and it was difficult to adequately obtain information on the water levels in the reactors and other information that was necessary for responding to the accident.

Consequently plans are being made for the development and preparation of instrumentation of reactors, PCVs, spent fuel pools, etc. to enable adequate functioning even under severe accident conditions.

(15) Central control of emergency supplies and setting up of rescue teams

Shortly after the accident, under the damage conditions caused by the earthquake and tsunamis, the securing of emergency response equipment and the mobilization of rescue teams to support accident control activities were not performed sufficiently.

Therefore, under instructions from NISA, the plant operators have been engaged in the establishment and management of emergency response equipment (power-supply vehicles, pump trucks) and the creation of implementation forces to operate such equipment. They are also arranging and then preparing for common use among plant operators of masks, protective clothing, and the like to provide protection during work

with heavy machinery to dispose of rubble or work having high radiation doses, and otherwise developing systems for mutual cooperation.

Plans are also being made for the preparation of emergency response equipment, including robots, unmanned helicopter drones, heavy machinery, decontamination equipment and accident progression prediction systems, as well as for the enhancement of capacity building through training of Self-Defense Forces, police, firefighters, the Japan Coast Guard, and other key personnel.

Additionally, under the new safety regulatory organization, the system for responding to crisis management will be enhanced through the establishment of staff specializing in responding to emergency conditions.

Lessons in Category 3

Responses to nuclear emergencies

(16) Response to a combined situation of massive natural disaster and nuclear emergency

This time a massive natural disaster was followed by a nuclear accident to produce a complex disaster. Also, the prolonged nuclear accident caused difficulties in securing means of communication and of procurement as well as in the mobilization of the full range of support personnel for the accident and disaster response.

Therefore, off-site centers have been reinforced by deploying satellite phones, emergency power supplies and reserves of goods. Deploying alternative materials and equipment is also planned so that alternative facilities may be utilized immediately even if the situation necessitates relocating the function of an off-site center. Moreover, regarding the response to a complex disaster, a review of the full readiness and chain-of-command structure will be made across ministries and agencies.

(17) Reinforcement of environmental monitoring

During the initial stages of this accident, appropriate environmental monitoring became impossible due to damage to local authorities' monitoring equipment and facilities caused by the earthquake and tsunami.

The "Monitoring Coordination Meeting" has therefore been established within the government for the coordination of, and smooth implementation of, environmental monitoring conducted by ministries and agencies, local authorities and TEPCO. The "Comprehensive Monitoring Plan" was developed as an initiative for the immediate future. Based on this Plan, related organizations are engaged in partnership in

monitoring by aircraft, monitoring of sea areas and radiation monitoring with a view to facilitating the lifting of restrictions on Emergency Evacuation-Prepared Areas, among other endeavors, and preparation of cumulative dose estimation maps and maps indicating the distribution of radiation doses, etc. Also, in an emergency, the government will take responsibility for establishing the system of performing environmental monitoring surely and deliberately, and it will have the new safety regulation organization play a commanding role in environmental monitoring.

(18) Clarification of the allotment of roles between central and local organizations

In the initial stages of the accident, communication and cooperation between the central and local governments as well as between various relevant organizations were not achieved to a sufficient degree, due to the difficulty in securing means of communication and also due to the fact that the roles and responsibilities of each side were not always clearly defined.

Therefore in responding to the current accident, local bases to respond to the accident were established by utilizing J Village and the Onahama Coal Center. Central organizations to coordinate response activities were also established, including the Government-TEPCO Integrated Response Office, the sufferers' livelihood support team and the Office of Response to Radioactive Materials Contamination.

Hereafter, roles and responsibilities of relevant organizations including the GNER HQ will be reviewed to enable prompt and appropriate responses, and measures will be taken to amend Acts and revise manuals when necessary. Also, communication systems, including communication tools and channels, will be reviewed in order to enable the delivery of information quickly and with certainty. Furthermore, as for the video conference system used at the time of nuclear disaster, it is planned to interconnect relevant governmental organizations, all electric power companies and NPSs to ensure quick and adequate instruction and information collection in emergency situations.

(19) Enhancement of communication regarding the accident

Especially immediately after this accident, actions were not sufficiently taken to provide local residents with information or easily-understood explanations about radiation, radioactive materials, or information on future outlooks on risk factors.

Therefore, a "one-stop counseling service"was established to provide consultation services to local residents, especially residents of Fukushima Prefecture, on the situation regarding the accident, radiation's impact on health and other matters. Also, as for the disclosure of information to the citizens, jointly-held regular press conferences and

other opportunities have been conducted by relevant organizations such as NISA and the NSC.

Based on the disclosure of information regarding the Fukushima NPS accident and on the experience of communicating in the contexts of various domestic and foreign disasters as well, it is planned to examine ways of disclosing and providing information during significant NPS accidents, to develop a basic manual, and to provide education and training on that basis to relevant organizations regarding information disclosure and provision.

(20) Enhancement of responses to assistance from other countries and communication to the international community

After the accident, the government could not promptly respond to offers of assistance from other countries around the world (e.g., offers to supply equipment). Initially information was not always fully shared in advance especially with neighboring countries.

In light of this, in order to immediately notify neighboring countries in the case of an accident, contact points for each neighboring country have been specified. The list of contact points will be updated, as appropriate, to ensure the quick and accurate provision of information to the international community.

The system for international responses to an accident will be improved as part of implementing the IAEA Action Plan on Nuclear Safety, including the development of lists of equipment effective for accident responses and methods for international information sharing, including through international notifications. Japan will actively contribute to such international efforts.

(21) Accurate understanding and prediction of the effect of released radioactive materials

In this accident, the use of the System for Prediction of Environmental Emergency Dose Information (SPEEDI) and disclosure of its calculation results, etc. were not properly conducted.

Against this background, since April the government has been disclosing the calculation results of SPEEDI. Since June, the government has also been using SPEEDI for environmental impact assessment after opening the reactor buildings of the Fukushima Dai-ichi NPS as well as for estimating external radiation exposure to residents to supplement the monitoring data that were not sufficiently collected during

the early stages of the accident. The results of such evaluations have been disclosed without delay.

In future, the new safety regulation organization will serve as a control center for environmental monitoring, including the operation of SPEEDI, and more effective ways of utilizing SPEEDI will be considered in that context.

(22) Clear definition of the criteria for wide-area evacuations and radiological protection standards in nuclear emergencies

Criteria for specific nuclear emergency response actions, etc. were not well prepared before the accident, especially for wide-area evacuation and radiological protection associated with a prolonged accident.

Moreover, relevant organizations will promote examination the standard of radiological protection, etc. on the basis of this accident. Moreover, the NSC started reviewing "The Regulatory Guide for Emergency Preparedness of Nuclear Facilities", including the definition of the Emergency Planning Zone (EPZ).

Japan will make efforts to reflect the Fukushima experience of accident responses within the review of the standards of International Commission on Radiological Protection (ICRP) and the IAEA standards for nuclear emergency preparedness and radiological protection.

Lessons in Category 4

Enhancement of safety infrastructure

(23) Enhancement of safety regulatory and administrative systems

Due to the unification of administrative organizations over the utilization and regulation of nuclear power and the non-centralized administrative organizations for ensuring nuclear safety, it was unclear until recently which organization has primary responsibility for disaster prevention and the protection of public safety. Reviews of such bodies and the enhancement of nuclear regulatory bodies need to be done promptly.

Therefore, the Japanese Government decided on the "Basic Concept of Structural Reform of Nuclear Safety Regulations" at the Cabinet Meeting of August 15 this year and decided on the launch of a new safety regulatory body. Specifically, considering international discussions in the past, and on the basis of the principle of "separating regulation from utilization," the nuclear safety regulatory divisions of NISA will be separated from the Ministry of Economy, Trade and Industry, with a "Nuclear Safety

and Security Agency (tentative name)" aimed to be established by April 2012 as an external agency of the Ministry of Environment by integrating into it the functions of the NSC. For this purpose, the capabilities of this regulatory body will be enhanced by centralizing nuclear safety regulatory activities, a dedicated risk management division will be established to enable this Nuclear Safety and Security Agency to take quick initial responses, and efforts will be made to recruit highly qualified personnel from both the public and private sectors to adequately execute the regulatory activities. In addition, a "Task Force for the Reform of Nuclear Safety Regulatory Bodies, etc."was established on August 26 for the preparation of the bill necessary to establish the new organization.

(24) Establishment and reinforcement of legal frameworks, standards and guidelines

The accident raised a wide range of issues regarding the establishment of legal frameworks and related standards and guidelines regarding nuclear safety and nuclear emergency preparedness. There will also be many issues that should be reflected within the IAEA's standards and guidelines in light of the experiences of the accident.

Reflecting this, a revision of the legal framework, standards, and so on with regard to nuclear safety and nuclear emergency preparedness is scheduled, based on knowledge learned from the accident, including the introduction of a new safety regulatory framework (e.g., backfitting), the enhancement of safety standards and the streamlining of complicated nuclear safety regulatory and legislative systems. Furthermore, a detailed evaluation of the basic designs of nuclear reactors, etc. and review of the relationship between reactor types and the causes of the accident will be carried out, and the safety and reliability of existing reactors will be evaluated on the basis of technological progress in nuclear reactor design and comparisons with the latest technologies.

Furthermore, the Japanese Government will actively provide its experience and knowledge from the accident to contribute to a review of the IAEA's standards and guidelines.

(25)Human resources for nuclear safety and nuclear emergency preparedness and responses

The accident re-emphasized the vital importance of developing human resources in the fields of nuclear safety and nuclear emergency preparedness in order to respond to an accident similar to the Fukushima accident.

Therefore, the new safety regulatory body will have among its basic policies securing personnel who are highly qualified with regard to regulatory matters through reinforced training. This body will also deliberate the establishment of an International Nuclear Safety Training Institute (tentative name), as a research institute that will seek to improve the quality of its human resources and engage in international cooperation. Also, through further promoting activities of "Japan Nuclear Human Resource Development Network" established in cooperation among industry-academic-government related organizations, , etc., this body will work to advance the reinforcement of human resources development in such fields such as nuclear safety, nuclear emergency preparedness, risk management and radiation medicine.

(26) Ensuring the independence and diversity of safety systems

With regards to ensuring the reliability of safety systems, insufficient consideration was given to approaches that would avoid multiple malfunctions all having a common cause in having been triggered by the earthquake and tsunamis, etc. Furthermore, independence and diversity were not achieved to a sufficient degree.

In response to this situation, there are plans to respond appropriately to multiple malfunctions having a common cause, to attain further enhancement of the reliability of safety functions such as in ensuring the independence and diversity of types, storing locations, and other aspects of emergency power generators and seawater cooling systems and to strengthen ensuring the independence and diversity of safety systems.

(27) Effective use of probabilistic safety assessment (PSA) in risk management

PSA has not always been effectively utilized in the overall reviewing risk reduction efforts at nuclear power facilities.

Therefore, NISA and the Japan Nuclear Energy Safety Organization (JNES) are now engaged in deliberations of revisions to legislation and standards, etc., on the premise of the utilization of PSA. Also, regarding the Tsunami PSA, the Japan Atomic Energy Society is preparing to make a guideline.

In addition, there are now plans to formulate improvements to safety measures, including effective accident management measures, based on PSA.

Lessons in Category 5
Thoroughly instill a safety culture

(28) Thoroughly instill a safety culture

Thoroughness in safety culture, which is the foundation of nuclear safety, has been strongly recognized anew through this accident.
Because of this, various responses to this accident will be reviewed carefully and Japan is working to rebuild the attitude in which both nuclear plant operators and individuals involved in safety regulation sincerely pursue new knowledge, both as organizations and individuals.

For those engaged in nuclear safety, it is a starting point, an obligation, and a responsibility for each organization and individual to firmly acquire a culture of nuclear safety. The fact that continuous improvement in nuclear safety is impossible when a safety culture is lacking, is being positioned as the starting point for Japan's ensuring safety in the future. This will be confirmed anew in various forms and will be brought into being.

7. Situation on deliberation to enhance standards etc

The NSC has been presenting various advice and basic policies based on the views indicated by the IAEA and the ICRP. Specifically, "Near-term policy to ensure the safety for treating and disposing contaminated waste around the site of Fukushima Dai-ichi Nuclear Power Station of Tokyo Electric Power Company", "Basic Policy of the Nuclear Safety Commission of Japan on Radiation Protection for Termination of Evacuation and Reconstruction", "Basic Policy on Radiation Monitoring from Now on", and "Standpoint of the Nuclear Safety Commission for the Termination of Urgent Protective Actions implemented for the Accident at Fukushima Dai-ichi Nuclear Power Plant" , etc. have been presented as basic policies and directions related to radiation protection measures to restore from the accident and to facilitate subsequent reconstruction.

In light of the recent accident at the Fukushima Dai-ichi NPS, the NSC has also started reviewing the NSC Regulatory Guides, such as the "Regulatory Guide for Reviewing Safety Design of Light Water Nuclear Power Reactor Facilities" and

"Regulatory Guide for Emergency Preparedness of Nuclear Facilities", and has furthermore resumed to enhance severe accident countermeasures.

The Nuclear and Industrial Safety Agency (NISA) has started deliberating a review of safety standards and other matters. Also, NISA and the Japan Nuclear Energy Safety Organization (JNES) have started analyzing the 28 lessons learned through the June report, have proposed a review of the Guide for Seismic Design of Nuclear Facilities (NS-G-1.6) and Siting Guidelines (DS433) by the IAEA, etc., and also have worked to organize a Safety Report and Technical Document having concrete cases to which those guidelines were applied, etc. with the cooperation of the International Seismic Safety Center of the IAEA.

8. Further Safety Assessment Efforts for NPSs

On July 11, 2011, aiming to further improve safety at NPSs and ensure security and confidence of the public and local residents in terms of nuclear safety, the Japanese government decided to implement safety assessments based on new procedures and rules, basically by making use of international knowledge and experiences of stress tests, particularly those implemented in European countries.

More specifically, those NPSs that have undergone regular inspection and are prepared to start up will sequentially undergo safety assessments in terms of the degree to which safety margins are secured against beyond-design-basis events for facilities and equipment important to safety (preliminary assessments). In addition, all existing nuclear power stations including those in operation and those examined through this preliminary assessment will also undergo comprehensive assessments (secondary assessments), in consideration of the implementation of stress tests in Europe and the progress of the discussions by the Investigation Committee on the Accident at the Fukushima Nuclear Power Stations.

9. Conclusion

Approximately half a year has passed since the accident occurred at the Tokyo Electric Power Co. (TEPCO) Fukushima Nuclear Power Station. This nuclear accident

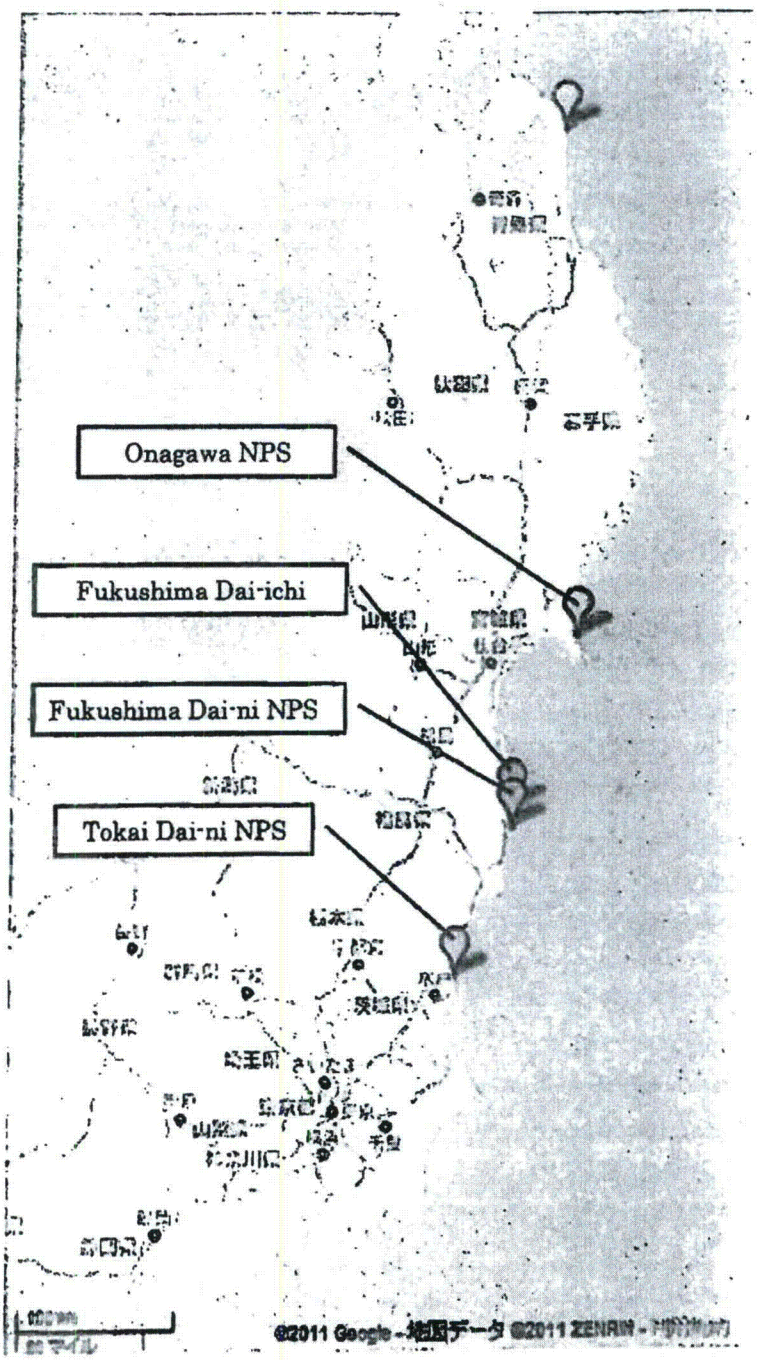
caused by an earthquake and tsunamis is a massive accident unprecedented in Japan or abroad insofar as severe accidents occurred simultaneously at multiple units, that the accident has affected an extensive range in its surrounding area, and that it has been taking a long time to achieve restoration from the accident.

In Japan, related organizations such as TEPCO, the central government and local authorities, including the workers on the site, have been tackling this accident together. While progress has steadily been made with regard to restoration from the accident, such as stable cooling of the reactors and the spent fuel pools, it is far from easy to complete the restoration from the accident, dispose of the radioactive materials and the spent fuel thereafter and proceed with decommissioning of the nuclear reactors. Also, it is necessary to advance the efforts while listening carefully to the voices of the local people when responding to those who suffered as a result of the nuclear accident, including such responses as environmental monitoring and decontamination.

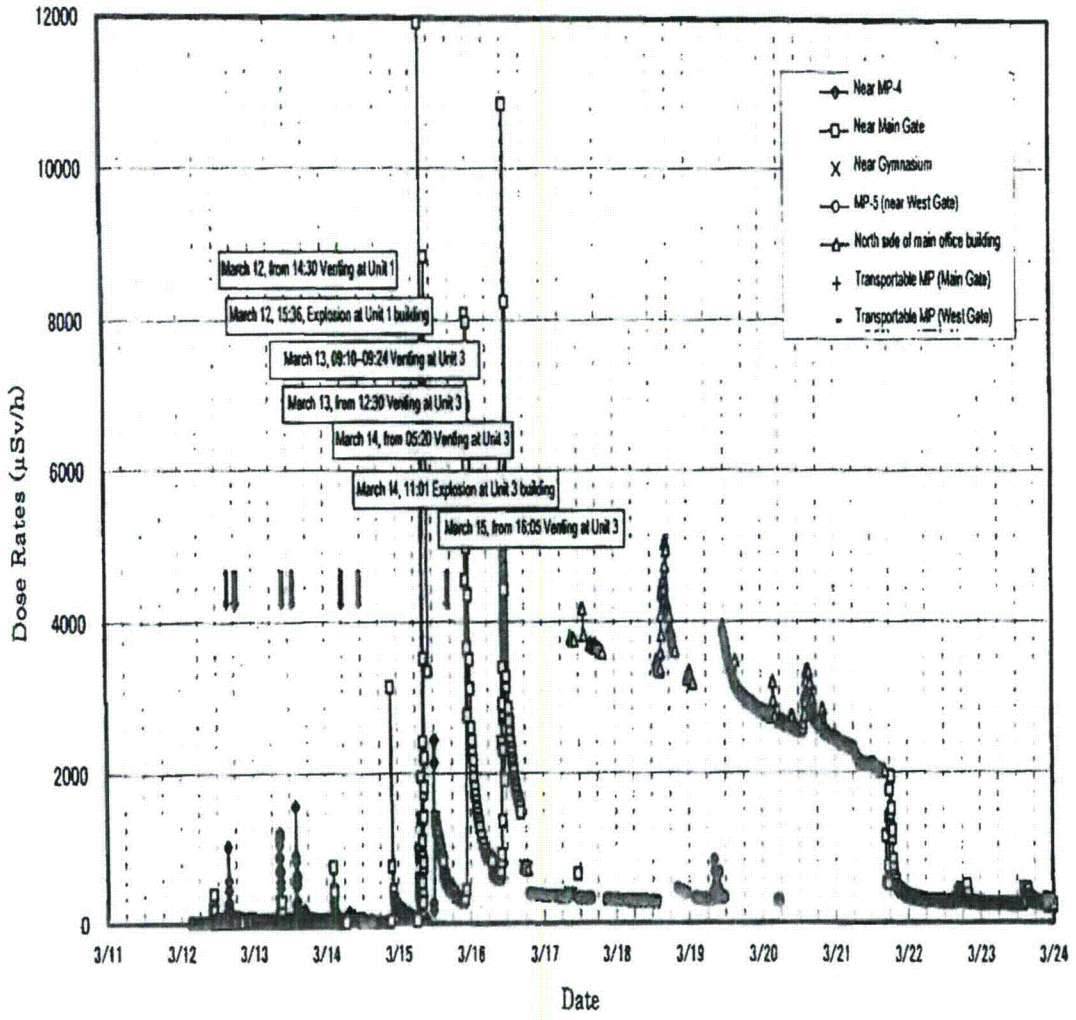
In this second report, the responses taken immediately after the occurrence of the accident at the Fukushima NPS and elsewhere have also been described in greater details. Moreover, it has described a situation in which the station employees and workers at the site, as well as personnel in related organizations, have been working hard in a severe environment that includes damage by an earthquake and by tsunamis, the impact of rubble, and the impact of debris scattered as a result of the hydrogen explosions. The Government of Japan is determined to continue its utmost efforts to support the health management and other aspects of the people engaged in this work.

Japan has received a wide array of support from countries around the world, related international organizations, and others to date. Japan would like to express its deepest gratitude once more while also requesting continued support.

Japan is confident that it will overcome this accident without fail by mobilizing wisdom and efforts from around the world.

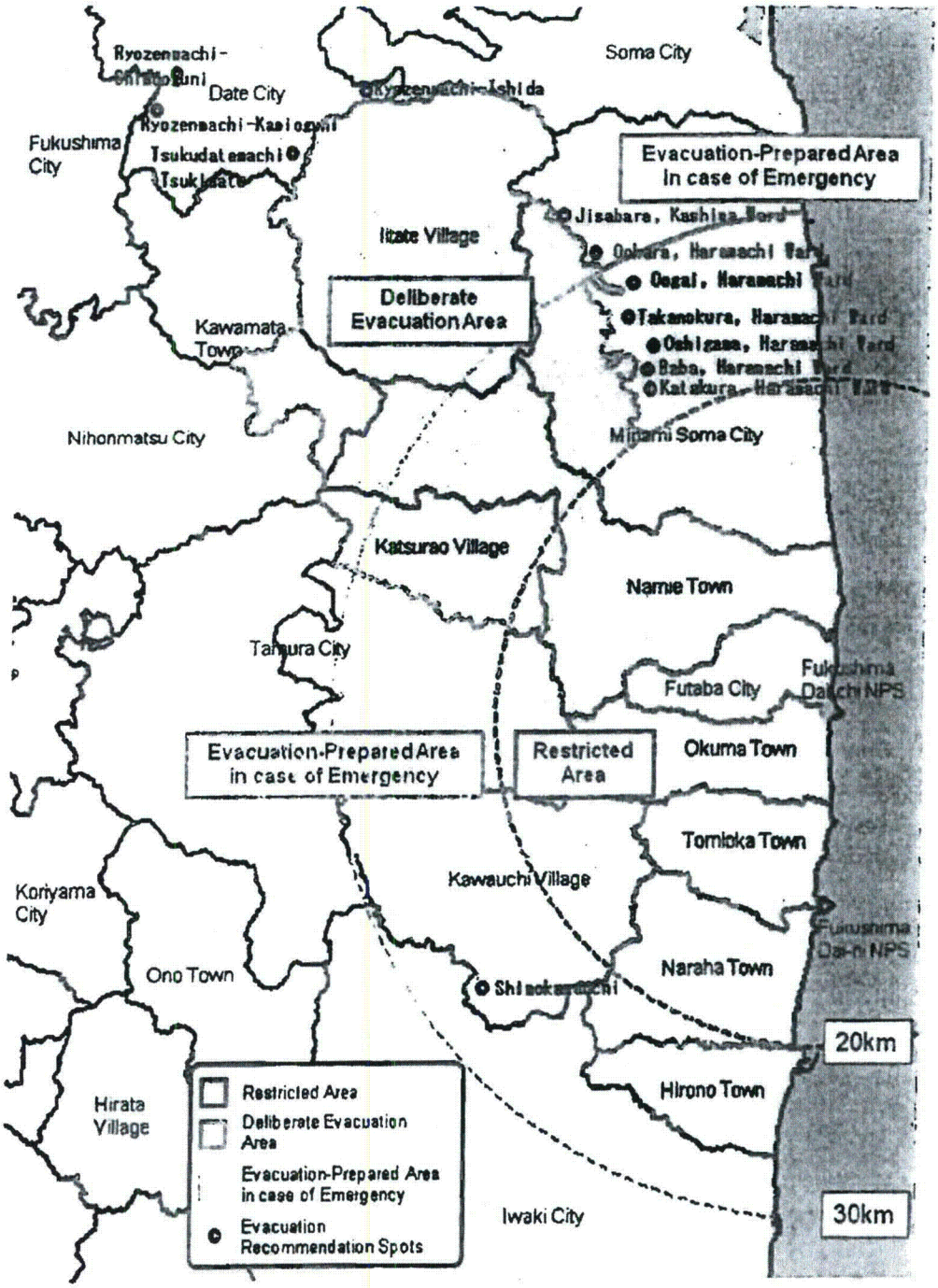


Location of NPSs affected by the Tohoku District - off the Pacific Ocean Earthquake

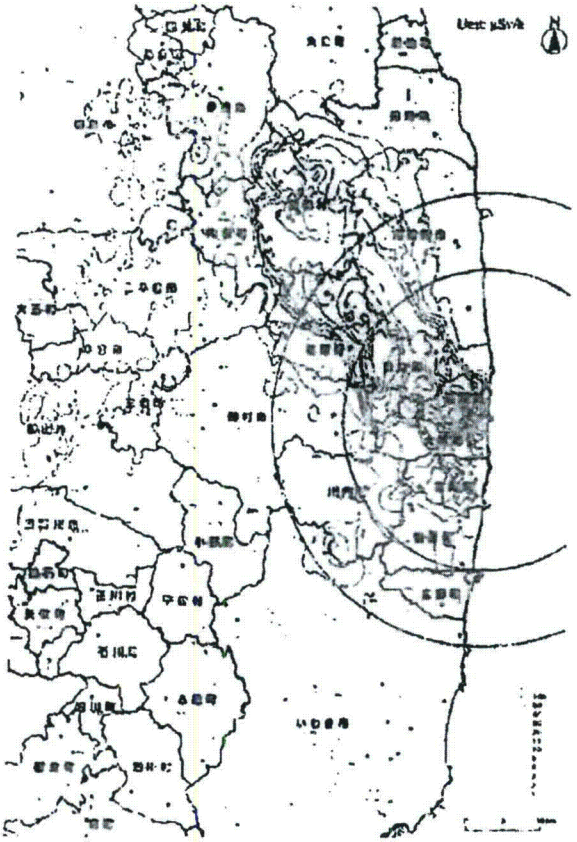


Measurement Results of Dose Rates by Monitoring Car at Fukushima Dai-ichi NPS

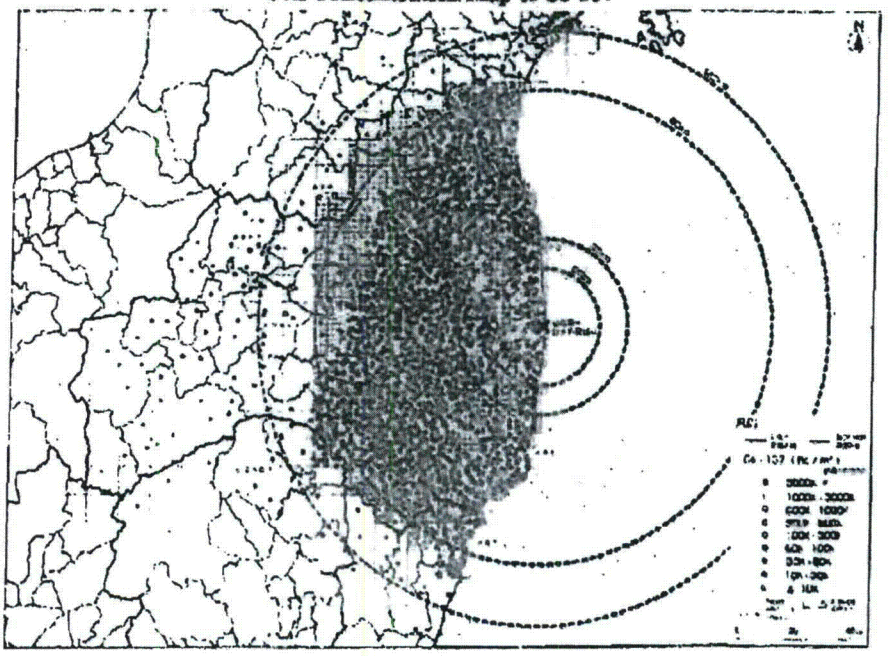
Resricted Area, Deliberate Evacuation Area, Evacuation-Prepared Area in case of Emergency And Evacuation Recommendation Spots (As of August 3, 2011)



Air Dose Rate Map
(As of August 11, 2011)



Soil Concentration Map of Cs-137



Status of Units 1, 2 and 3 of Fukushima Dai-ichi NPS
(As of August 27)

Unit	Unit 1	Unit 2	Unit 3
Status of water injection to the reactor	Fresh water feeding by feed water system Flow rate: 3.7m³/h	Fresh water feeding by feed water system Flow rate: 3.6m³/h	Fresh water feeding by feed water system Flow rate: 7.0m³/h
Reactor Water Level	Fuel range A: Downscale Fuel range B: -1,700mm	Fuel range A: -1,850mm* Fuel range B: -2,200mm*	Fuel range A: -1,550mm* Fuel range B: -2,000mm*
Reactor Pressure	0.017 MPa g(A) - MPa g(B)	0.013 MPa g(A) - MPa g(B)	0.080 MPa g(A) 0.001 MPa g(B)
Temperature around the reactor vessel	Temperature in feed-water nozzle: 92.2 ℃ Temperature at reactor vessel bottom: 87.7 ℃	Temperature in feed-water nozzle: 106.9 ℃ Temperature at reactor vessel bottom: 115.0 ℃	Temperature in feed-water nozzle: 113.9 ℃ Temperature at reactor vessel bottom: 108.8 ℃
Pressure in D/W, S/C	D/W 0.1275 MPa abs S/C: 0.105 MPa abs	D/W: 0.114 MPa abs S/C: Downscale	D/W: 0.1015 MPa abs S/C: 0.1817 MPa abs
Status	Each plant receives electricity from external power supplies. The process is carried on ensuring reliability of cooling function by installing temporary emergency diesel generators and the seawater pump etc.		

*These data may be modified when TEPCO makes evaluates them.

916

NOT FOR PUBLIC DISCLOSURE

Castleman, Patrick

From: Castleman, Patrick
Sent: Wednesday, September 14, 2011 4:04 PM
To: Monninger, John; Marshall, Michael; Orders, William; Franovich, Mike; Gilles, Nanette; Hart, Ken; Ulses, Anthony; Tonacci, Mark
Subject: Japan Evacuation

All, I took another look at the 14-page progress report, and, on a closer read, the situation is indeed as John described. The "thumb" is evacuated (deliberate evacuation area) except for a few people in each town who decided to remain. Then there are the "Specific Spots Recommended for Evacuation" outside the mandatory and deliberate evacuation zones—these are the ones where there are specific houses that need to be vacated.

Sharkey, Jeffry

From: National Journal [rsvp@nationaljournal.com]
Sent: Wednesday, September 21, 2011 1:37 PM
To: Sharkey, Jeffry
Subject: Chairman Jaczko to Keynote: Lessons From Japan, Global Implications of Nuclear Disaster

NATIONAL JOURNAL LIVE POLICY SUMMIT

LESSONS FROM JAPAN

Global Implications of Nuclear Disaster

As we approach the seven month anniversary of the Great East Japan earthquake and tsunami and the ensuing nuclear crisis, Americans still question what happened, why, and what an event of this magnitude means for U.S. nuclear policy and our relative state of preparedness.

National Journal will convene experts to discuss the latest on the current nuclear situation, the U.S. government's efforts to assist Japan, and the public health and economic lessons learned as a result of the disaster.

RSVP: njsummit100511.eventbrite.com

KEYNOTE:
Gregory B. Jaczko, Chairman, U.S. Nuclear Regulatory Commission

MODERATED BY:
James Kitfield, Senior Correspondent, National Journal

Wednesday, October 5, 2011
8:00 AM Registration
8:30 – 11:00 AM Program

National Press Club
First Amendment Room
529 14th Street NW
Washington DC

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WITH SPECIAL THANKS TO OUR UNDERWRITER: FLIR

Note to Government Employees: In deference to the letter and spirit of applicable ethics regulations, this educational event is not intended for state and local government employees. A description of this event - written for government ethics office review - may be requested by writing jhostetter@nationaljournal.com.

600 New Hampshire Avenue NW, Washington, DC 20037

922

Sharkey, Jeffry ~~NOT FOR PUBLIC DISCLOSURE~~

From: Marshall, Michael
Sent: Monday, October 03, 2011 12:26 PM
To: Laufer, Richard; Baggett, Steven; Bavol, Rochelle; Castleman, Patrick; Franovich, Mike; Gilles, Nanette; Hart, Ken; Hipschman, Thomas; Batkin, Joshua; Lisann, Elizabeth; Orders, William; Sharkey, Jeffry; Shea, Pamela; Vietti-Cook, Annette; Bradford, Anna; Kock, Andrea; Tadesse, Rebecca; Ammon, Bernice; Bupp, Margaret; Burns, Stephen; Clark, Lisa; Coggins, Angela; Davis, Roger; Nieh, Ho; Reddick, Darani; Sexton, Kimberly
Cc: Armstrong, Janine; Batkin, Joshua; Blake, Kathleen; Bozin, Sunny; Bubar, Patrice; Chairman Temp; Crawford, Carrie; Dhir, Neha; Doane, Margaret; Droggitis, Spiros; EDO_ETAs; Fopma, Melody; Gibbs, Catina; Greathead, Nancy; Hayden, Elizabeth; Henderson, Karen; Herr, Linda; Hudson, Sharon; Jimenez, Patricia; Joosten, Sandy; KLS Temp; Lepre, Janet; Loyd, Susan; Mitchell-Funderburk, Natalie; Monninger, John; Montes, David; Moore, Scott; Olive, Karen; Pace, Patti; Poole, Brooke; Riddick, Nicole; Rothschild, Trip; Savoy, Carmel; Sosa, Belkys; Speiser, Herald; Svinicki, Kristine; Temp, GEA; Temp, WCO; Temp, WDM; Warren, Roberta; Wright, Darlene
Subject: RE: Early Public release of SECY paper on Prioritization of Japan Task Force recommendations.

Chairman Jaczko supports early release of the SECY.

rom: Laufer, Richard
ent: Monday, October 03, 2011 11:04 AM
o: Baggett, Steven; Bavol, Rochelle; Castleman, Patrick; Franovich, Mike; Gilles, Nanette; Hart, Ken; Hipschman, Thomas; atkin, Joshua; Laufer, Richard; Lisann, Elizabeth; Marshall, Michael; Orders, William; Sharkey, Jeffry; Shea, Pamela; Vietti-Cook, nnette; Bradford, Anna; Kock, Andrea; Tadesse, Rebecca; Ammon, Bernice; Bupp, Margaret; Burns, Stephen; Clark, Lisa; oggins, Angela; Davis, Roger; Nieh, Ho; Reddick, Darani; Sexton, Kimberly
c: Armstrong, Janine; Batkin, Joshua; Blake, Kathleen; Bozin, Sunny; Bubar, Patrice; Chairman Temp; Crawford, Carrie; Dhir, eha; Doane, Margaret; Droggitis, Spiros; EDO_ETAs; Fopma, Melody; Gibbs, Catina; Greathead, Nancy; Hayden, Elizabeth; enderson, Karen; Herr, Linda; Hudson, Sharon; Jimenez, Patricia; Joosten, Sandy; KLS Temp; Lepre, Janet; Loyd, Susan; itchell-Funderburk, Natalie; Monninger, John; Montes, David; Moore, Scott; Olive, Karen; Pace, Patti; Poole, Brooke; Riddick, icole; Rothschild, Trip; Savoy, Carmel; Sosa, Belkys; Speiser, Herald; Svinicki, Kristine; Temp, GEA; Temp, WCO; Temp, WDM; arren, Roberta; Wright, Darlene
ubject: Early Public release of SECY paper on Prioritization of Japan Task Force recommendations.
mportance: High

he SECY paper with the staff's recommendations for the prioritization of the Japan Task Force recommendations is ith the EDO for signature. Once SECY receives the signed copy it will send an advance copy to the Commission ffices.

ECY is requesting early public release of this SECY paper to allow time for stakeholder's to review it prior to the ommission meeting on Tuesday, October 11.

ease let SECY know if your office supports the early release of this paper.

anks,
ch

925

Castleman, Patrick

From: Sharkey, Jeffry
Sent: Tuesday, October 04, 2011 5:05 PM
To: Castleman, Patrick
Subject: FW: *RESEND* Meeting - Recommendations of Near-Term Japan Task Force
Attachments: 11-190.docx

From: OPA Resource
Sent: Tuesday, October 04, 2011 5:05:15 PM
To: Abbott, Coleman; Apostolakis, George; Ash, Darren; Baggett, Steven; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Blake, Kathleen; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Gilles, Nanette; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hawkens, Roy; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quayle, Lisa; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Sosa, Belkys; Steger (Tucci), Christine; Stuckle, Elizabeth; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy
Subject: *RESEND* Meeting - Recommendations of Near-Term Japan Task Force
Auto forwarded by a Rule

For immediate issuance.

Change – Paragraph 3, last sentence

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US Nuclear Regulatory Commission
301-415-8200
pa.resource@nrc.gov

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Sharkey, Jeffry

From: OPA Resource
Sent: Tuesday, October 04, 2011 4:34 PM
To: Abbott, Coleman; Apostolakis, George; Ash, Darren; Baggett, Steven; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Blake, Kathleen; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Gilles, Nanette; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hawkens, Roy; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quayle, Lisa; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Sosa, Belkys; Steger (Tucci), Christine; Stuckle, Elizabeth; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy
Subject: Meeting - Recommendations of Near-Term Japan Task Force
Attachments: 11-190.docx

For issuance in 15 minutes.

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NRC NEWS

U.S. NUCLEAR REGULATORY COMMISSION

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Blog: http://public-blog.nrc-gateway.gov

No. 11-190 October 4, 2011

NRC TO DISCUSS PRIORITIZING RECOMMENDATIONS OF NEAR-TERM JAPAN TASK FORCE OCT. 11 IN ROCKVILLE, MD

The Nuclear Regulatory Commission will meet Tuesday, Oct. 11, to discuss the staff's prioritization proposal for the recommendations of the NRC's Japan Near-Term Task Force. The Task Force examined issues raised by the Fukushima nuclear accident in March.

The commission meeting will be held from 9 a.m. to 3:30 p.m. in the Commissioners' Conference Room at NRC Headquarters, 11555 Rockville Pike, Rockville, Md. Discussion will include external stakeholders' input on prioritization and a presentation by NRC staff. The meeting will be open to public observation and will be webcast.

A detailed agenda and meeting slides will be available in advance on the webcast page. The NRC staff paper that will form the basis of the meeting will be available in advance on the Commission's Recently Released Documents page.

Media Notes: At this time, this event will be open for television; the agency reserves the right to seek a mandatory pool if demand exceeds available space. Seats on one side of the commission hearing room will be reserved for accredited members of the news media. Photographers will have limited space at the meeting in which to take photos. Movement must be kept to a minimum so as not to be disruptive, and entry into the inner well closest to the Commission briefing table is prohibited.

Plan to arrive in advance of the meeting at the NRC's One White Flint North entrance, at the corner of Rockville Pike and Marinelli Road, with proper media credentials. The NRC is located across the street from the White Flint Metro station. Parking is available at the White Flint metro parking garage on Marinelli Road. Members of the media are asked to call the NRC Office of Public Affairs (301-415-8200) in advance to provide the names of those attending the meeting to assure sufficient seating.

###

NOTE: Anyone wishing to take photos or use a camera to record any portion of a NRC meeting should contact the Office of Public Affairs beforehand.

News releases are available through a free *listserv* subscription or by clicking on the EMAIL UPDATES link on the NRC homepage (www.nrc.gov). E-mail notifications are sent to subscribers when news releases are posted to NRC's website. For the latest news, follow the NRC on www.twitter.com/NRCgov.

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Sharkey, Jeffry ~~NOT FOR PUBLIC DISCLOSURE~~

From: Doane, Margaret
Sent: Wednesday, October 05, 2011 4:27 PM
To: Batkin, Joshua; Warren, Roberta; Coggins, Angela; Sharkey, Jeffry; Nieh, Ho; Bubar, Patrice; Sosa, Belkys
Cc: Moore, Scott
Subject: Commission Meeting Tomorrow on Fukushima

Hello EAs,
Can you please let your principals know that OIP has been informed that there will international counterparts at the meeting tomorrow and web streaming the meeting. Thanks.
Margie

Sent from an NRC Blackberry
Margaret Doane

Sharkey, Jeffry

Subject:	BRIEFING ON THE JAPAN NEAR TERM TASK FORCE REPORT - PRIORITIZATION OF RECOMMENDATIONS (Public Meeting)
Location:	OWFN 1st Fl Conf Rm
Start:	Tue 10/11/2011 9:00 AM
End:	Tue 10/11/2011 3:30 PM
Show Time As:	Tentative
Recurrence:	(none)
Meeting Status:	Not yet responded
Organizer:	CommissionCalendar Resource
Required Attendees:	Apostolakis, George; Ash, Darren; Blake, Kathleen; Borchardt, Bill; Bozin, Sunny; Brock, Kathryn; Bubar, Patrice; Burns, Stephen; Cianci, Sandra; Commission_Hearing_Room; Crawford, Carrie; Doane, Margaret; Franovich, Mike; GBJGroupCalendar Resource; GEA_Daily_Cal Resource; GEA_Staff_Daily Resource; Hayden, Elizabeth; Herr, Linda; Jaczko, Gregory; Joosten, Sandy; Kock, Andrea; Lepre, Janet; Malone, Tina; Mamish, Nader; Moore, Scott; Nieh, Ho; Poole, Brooke; Pulley, Deborah; Riddick, Nicole; Sargent, Kimberly; Sharkey, Jeffry; Svinicki, Kristine; Taylor, Renee; Temp, WCO; Temp, WDM; Vietti-Cook, Annette; Virgilio, Martin; Weber, Michael; Wittick, Susan

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Sharkey, Jeffry

From: OPA Resource
Sent: Tuesday, October 11, 2011 12:45 PM
To: Abbott, Coleman; Apostolakis, George; Ash, Darren; Baggett, Steven; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Blake, Kathleen; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Gilles, Nanette; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hawkens, Roy; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Holian, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quayle, Lisa; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Sosa, Belkys; Steger (Tucci), Christine; Stuckle, Elizabeth; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy
ubject: Chairman Gregory B. Jaczko's Opening Remarks 45 Day Review of the Japan Task Force Safety Recommendations
ttachments: 11-194.docx

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No. 11-194 October 11, 2011

OPENING REMARKS OF NRC CHAIRMAN GREGORY B. JACZKO AT THE 45 DAY REVIEW OF THE JAPAN TASK FORCE SAFETY RECOMMENDATIONS

Good morning. The Commission meets today to discuss the staff's 45-day review of the Japan Task Force's safety recommendations. The Steering Committee, which we established to conduct this review, has clearly confirmed that the Task Force did an outstanding job. The Steering Committee has endorsed moving forward with virtually all of the Task Force's recommendations. In addition, they also have recommended several new measures beyond the steps outlined by the Task Force, which touch on important issues such as spent fuel storage and emergency planning.

I want to thank the Steering Committee for their excellent work, as well as the many other NRC staff who assisted their efforts. I also want to thank the stakeholders who participated in this process. The Steering Committee benefited from the diverse perspectives they brought to the table, and the Commission will hear from many of them today. Because of the staff's hard work and the tremendous participation of our stakeholders, the Commission is now in the position to provide clear and definitive guidance on the Task Force's recommendations. It is important that we move forward expeditiously because we still have a great deal of work ahead of us. We not only need to implement the recommendations that we decide to adopt, but we also have to conduct the longer-term review, which could lead to additional recommendations based on new information and insights.

During today's meeting, we will hear from the staff and a broad cross-section of stakeholders, including: other federal agencies, state representatives, industry leaders, and public interest groups committed to nuclear safety and environmental protection. Our first panel will consist of stakeholders who will share their perspectives on the recommendations related to preventing and mitigating an accident. The second panel will also consist of stakeholders, who will address the recommendations related to emergency planning. In the third and final panel, the staff will provide an overview of the additional information that the Commission requested concerning the recommendations.

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936

CABINET OFFICE
3-1-1 Kasumigaseki
Chiyoda-ku, Tokyo 100-8970 JAPAN
Tel:+81-3-3581-6690 Fax:+81-3-3581-9828

October 7, 2011

Dr. Gregory B. Jaczko
Chairman
U.S. Nuclear Regulatory Commission

Dear Dr. Jaczko,

I would like to express my sincere appreciation for taking time from your busy schedule to have a meeting on September 19th. I would also like to take this opportunity to reiterate our deepest gratitude to you and the Nuclear Regulatory Commission for your indispensable assistance and advice in response to the accident at Fukushima Daiichi Nuclear Power Plant of the TEPCO.

At the meeting, I believe that we had useful discussions about a variety of topics, particularly about the upgrading of the Japanese nuclear safety regulations.

I sincerely hope that Japan and the United States will continue to work together in our efforts to restore stability at the site, and to contribute to the further enhancement of effective nuclear safety regulations.

I look forward to maintaining and further strengthening close ties between us and hope to see again in the future.

Sincerely yours,

細野豪志

Goshi HOSONO
Minister of State for Special Missions
Cabinet Office
Government of Japan

935

Reddick, Darani

~~NOT FOR PUBLIC DISCLOSURE~~

From: Lewis, Antoinette
Sent: Thursday, October 13, 2011 10:59 AM
To: Commission E-Reader Distribution
Subject: COMMISSION E-READER....THURSDAY, OCTOBER 13, 2011
Attachments: dailymemos.doc; Tab A 10-07-11 Hosono-Gov of Japan 11-0562.pdf; Tab B 09-28-11 Mills-SBA 11-0561.pdf; Tab C 10-12-11 FRN.pdf

~~INTERNAL USE ONLY~~
Some of the information contained in the Reader is not publicly available.
If there are any questions, please contact SECY.

READING FILE

INDEX

October 13, 2011

INCOMING CORRESPONDENCE

Tab "A" 10/07/11 – Letter from Goshi Hosono, Government of Japan, expresses appreciation to the Chairman for scheduling meeting on September 19,2011.

Outside of Scope

~~NOT FOR PUBLIC DISCLOSURE~~

938

Frazier, Alan

From: Frazier, Alan
Sent: Friday, October 14, 2011 12:34 PM
To: Castleman, Patrick
Subject: FW: REPLY: Chairman's Question Regarding Plutonium and SOARCA

Looks like this should have gone to you. I will talk to Craig about make sure you get these directly. He's new.

From: Erlanger, Craig
Sent: Friday, October 14, 2011 12:20 PM
To: Frazier, Alan; Baggett, Steven; Bradford, Anna; Kock, Andrea; Tadesse, Rebecca
Cc: Brock, Kathryn
Subject: FW: REPLY: Chairman's Question Regarding Plutonium and SOARCA

FYI.

Craig

From: Rini, Brett
Sent: Thursday, October 13, 2011 10:06 AM
To: Taylor, Robert; Marksberry, Don; Erlanger, Craig; Brown, Eva; RST01_F Resource; Skeen, David
Cc: Santiago, Patricia; Armstrong, Kenneth; Gibson, Kathy; Scott, Michael
Subject: REPLY: Chairman's Question Regarding Plutonium and SOARCA

Bob,

NES/DSA has drafted a response to the Chairman's question below that you sent a week ago. The response has been approved by Brian Sheron.

Craig, please share with OEDO and the other Commissioners' offices if needed.

Question: Could SOARCA have predicted the plutonium found 45 km to the northwest of the site (45Bq/m2).

Answer: No, the radioactivity attributed to the plutonium radioisotope cannot be extracted from the SOARCA analyses. The SOARCA analyses consider 69 isotopes in the treatment of consequences grouped by radionuclides that behave similar both chemically and physically. Plutonium is in the cerium radionuclide group. The contribution to dose and contamination from radionuclide groups is calculated by factoring in additional input parameters (e.g., wind speed/direction, dose conversion factors, and population distributions). Nonetheless, we can provide the data for the group of nuclides that are bundled with plutonium to give an idea of the distance plutonium is dispersed for the Peach Bottom analyses.

The actual contribution to the dose and contamination at any location in the environment from a particular radionuclide such as plutonium is not straightforward, and other analyses would have to be run. The MELCOR and MAACS2 codes used for SOARCA could be used to isolate the effects of plutonium for Fukushima. The MELCOR code would predict the release of plutonium and the MAACS2 code calculates its distribution in the environment. However, the differences between Peach Bottom and Fukushima such as weather, fuel burnup, reactor operating power, and other parameters would have to be obtained. As part of a DOE initiative, Sandia National Laboratory is developing MELCOR models of the Fukushima reactors making this type of analysis possible in the near future.

Thanks

Brett

Brett A. Rini
Technical Assistant
Office of Nuclear Regulatory Research
U.S. Nuclear Regulatory Commission
(301)251-7615
Brett.Rini@nrc.gov

From: Taylor, Robert
Sent: Thursday, October 06, 2011 6:19 AM
To: RST01_F Resource
Cc: Brown, Eva; Skeen, David; Marksberry, Don
Subject: Pu and SOARCA

Eva,

During yesterday's briefing of the Chairman, he asked if SOARCA could have predicted the Plutonium found 45 km to the northwest of the site (45Bq/m2). Would you please work with RES to get an answer. He indicated that there was no hurry. I would like to be able to respond to his question at next week's regular Thursday briefing so we probably need an answer by Wednesday. I only need a 2-3 sentence response.

Rob

940

Svinicki, Kristine

From: shizuyo.kusumi@cao.go.jp
Sent: Tuesday, October 18, 2011 8:50 PM
To: Svinicki, Kristine
Cc: Ostendorff, William; Magwood, William
Subject: NRC RIC2012

Dear Kristine,
c.c. Commissioner Ostendorff, Commissioner Magwood

First of all, I would like to express our sincere appreciation for your great supports for the Fukushima Daiich accident.

I am writing to you today concerning the NRC Regulation Information Conference (RIC) to be held in March 2012.

As you know, the main role of our Nuclear Safety Commission of Japan (NSC) is to give the technical advices to the head of Government Nuclear Emergency Response Headquarter, i.e. the Prime Minister of Japan, in case of a nuclear accident. The NSC has been, therefore, playing this role, including issuing more than two-hundred advice, since the beginning of the accident in March 2011.

In particular, in terms of radiation protection, we have applied the concept of "reference level" (existing exposure situation etc.), described in the Recommendation of International Commission on Radiation Protection (ICRP), 2007, as the very first case in the world.

I am writing to you today to propose to introduce, on behalf of the NSC, such a series of experiences throughout the Fukushima accident at the NRC RIC in March 2012. We believe that it would be of interest for the participants of the RIC. If you would kindly accept this, I will send you the abstract of my presentation and we can discuss more.

Thank you for your kind consideration and I look forward to hearing from you. Should you need further information or clarification, please feel free to contact me.

Yours sincerely,
Shizuyo

Shizuyo KUSUMI, M.D.
Commissioner, Nuclear Safety Commission, Cabinet Office
3-1-1 Kasumigaseki, Chiyoda-ku, Tokyo 100-8970 JAPAN Tel:+81-3-3581-3470, Fax:+81-3-3581-3475
E-mail: shizuyo.kusumi@cao.go.jp
URL: http://www.nsc.go.jp

Castleman, Patrick

From: Castleman, Patrick
Sent: Thursday, October 20, 2011 11:40 AM
To: Brock, Kathryn; Marshall, Michael; Hipschman, Thomas; Orders, William; Franovich, Mike; Gilles, Nanette
Cc: RST01_F Resource; Taylor, Robert
Subject: RE: State Travel Alert Website

Thanks, Kathy.

From: Brock, Kathryn
Sent: Thursday, October 20, 2011 11:26 AM
To: Castleman, Patrick; Marshall, Michael; Hipschman, Thomas; Orders, William; Franovich, Mike; Gilles, Nanette
Cc: RST01_F Resource; Taylor, Robert
Subject: State Travel Alert Website

http://travel.state.gov/travel/cis_pa_tw/pa/pa_5574.html

Hi everyone. See the link above for the latest travel alert.

~~NOT FOR PUBLIC DISCLOSURE~~

945

Castleman, Patrick

From: Castleman, Patrick
Sent: Thursday, October 20, 2011 10:05 AM
To: Reddick, Darani; Sharkey, Jeffry
Subject: RE: NRC Takes Action on Japan Near-Term Task Force Recommendations

He certainly loves his SOUR GRAPES! ☺

From: Reddick, Darani
Sent: Thursday, October 20, 2011 10:00 AM
To: Castleman, Patrick; Sharkey, Jeffry
Subject: FW: NRC Takes Action on Japan Near-Term Task Force Recommendations

Wow. Way to be the spokesman.

"The station blackout rulemaking is an achievable goal," said Chairman Jaczko. "It will, however, be complicated by the Commission's direction to initiate the rulemaking through an advance notice of rulemaking, rather than as a proposed rule. This will add an extra step to the process. Nevertheless, addressing station blackout is a high priority, and I will do my best to lead the staff in accomplishing this effort."

From: OPA Resource
Sent: Thursday, October 20, 2011 9:56 AM
To: Abbott, Coleman; Apostolakis, George; Ash, Darren; Baggett, Steven; Barkley, Richard; Batkin, Joshua; Bell, Hubert; Belmore, Nancy; Bergman, Thomas; Blake, Kathleen; Bonaccorso, Amy; Borchardt, Bill; Bozin, Sunny; Brenner, Eliot; Brock, Terry; Brown, Boris; Bubar, Patrice; Burnell, Scott; Burns, Stephen; Carpenter, Cynthia; Chandrathil, Prema; Clark, Theresa; Collins, Elmo; Couret, Ivonne; Crawford, Carrie; Dacus, Eugene; Dapas, Marc; Davis, Roger; Dean, Bill; Decker, David; Dricks, Victor; Droggitis, Spiros; Flory, Shirley; Franovich, Mike; Gibbs, Catina; Gilles, Nanette; Haney, Catherine; Hannah, Roger; Harbuck, Craig; Harrington, Holly; Hasan, Nasreen; Hawkens, Roy; Hayden, Elizabeth; Holahan, Gary; Holahan, Patricia; Hollan, Brian; Jacobssen, Patricia; Jaczko, Gregory; Jasinski, Robert; Jenkins, Verlyn; Johnson, Michael; Jones, Andrea; Kock, Andrea; Kotzalas, Margie; Ledford, Joey; Lee, Samson; Leeds, Eric; Lepre, Janet; Lew, David; Lewis, Antoinette; Loyd, Susan; Magwood, William; McCrary, Cheryl; McGrady-Finneran, Patricia; McIntyre, David; Mensah, Tanya; Mitlyng, Viktoria; Monninger, John; Montes, David; Nieh, Ho; Ordaz, Vonna; Ostendorff, William; Owen, Lucy; Powell, Amy; Quayle, Lisa; Quesenberry, Jeannette; Reddick, Darani; Regan, Christopher; Reyes, Luis; Riddick, Nicole; RidsSecyMailCenter Resource; Riley (OCA), Timothy; Rohrer, Shirley; Samuel, Olive; Satorius, Mark; Schaaf, Robert; Schmidt, Rebecca; Scott, Catherine; Screnci, Diane; Shaffer, Vered; Shane, Raeann; Sharkey, Jeffry; Sheehan, Neil; Sheron, Brian; Siurano-Perez, Osiris; Sosa, Belkys; Steger (Tucci), Christine; Stuckle, Elizabeth; Svinicki, Kristine; Tabatabai, Omid; Tannenbaum, Anita; Taylor, Renee; Temp, WDM; Uhle, Jennifer; Uselding, Lara; Vietti-Cook, Annette; Virgilio, Martin; Virgilio, Rosetta; Walker-Smith, Antoinette; Weaver, Doug; Weber, Michael; Weil, Jenny; Werner, Greg; Wiggins, Jim; Williams, Evelyn; Zimmerman, Roy
Subject: NRC Takes Action on Japan Near-Term Task Force Recommendations

[illegible]

Office of Public Affairs
US Nuclear Regulatory Commission
301-415-8200
opa.resource@nrc.gov

AREVA

The Fukushima Daiichi Incident

1. Plant Design
2. Accident Progression
3. Radiological releases
4. Spent fuel pools
5. Sources of Information

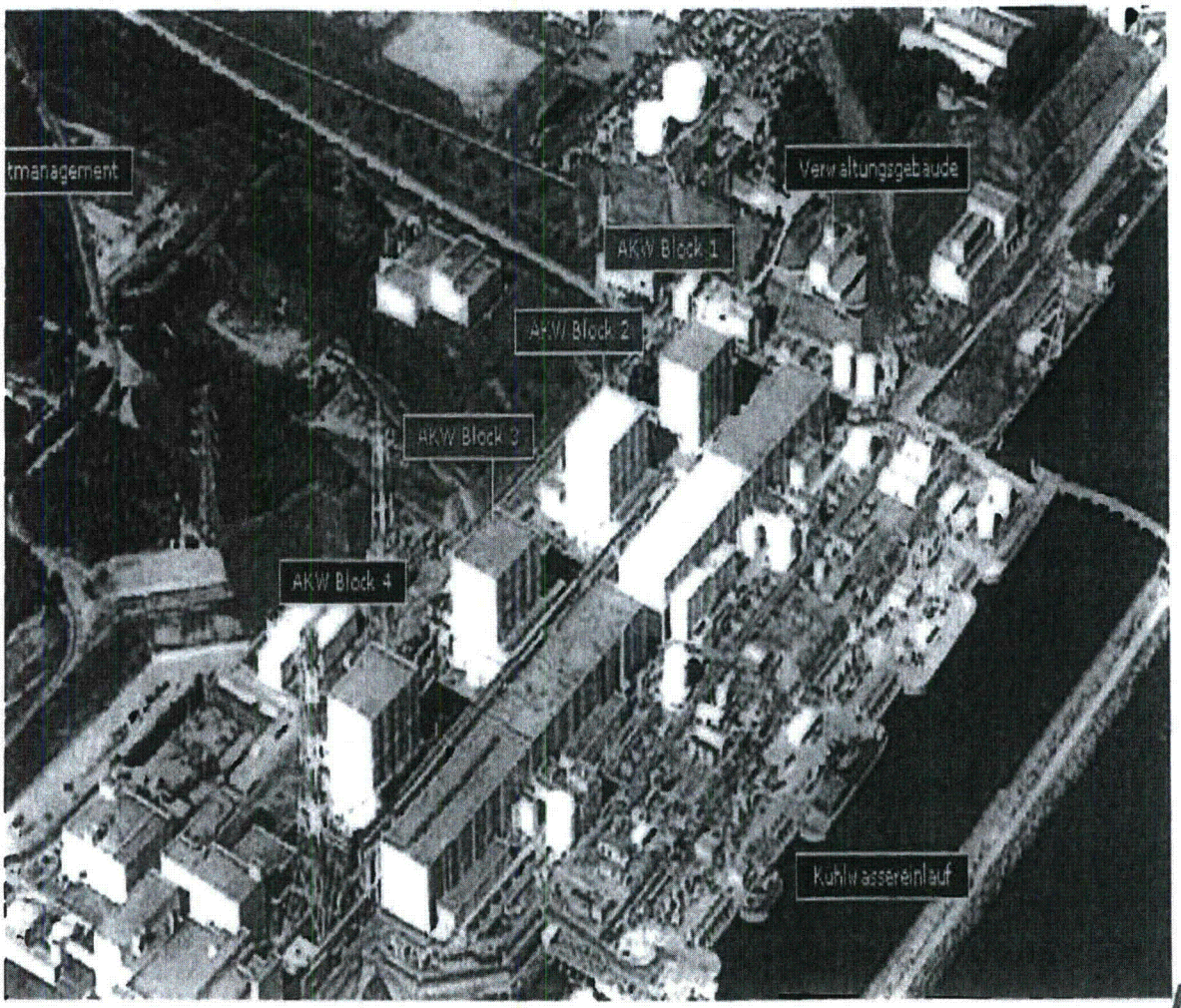
Matthias Braun
PEPA4-G, AREVA-NP GmbH
Matthias.Braun@AREVA.com

AREVA

The Fukushima Daiichi Incident

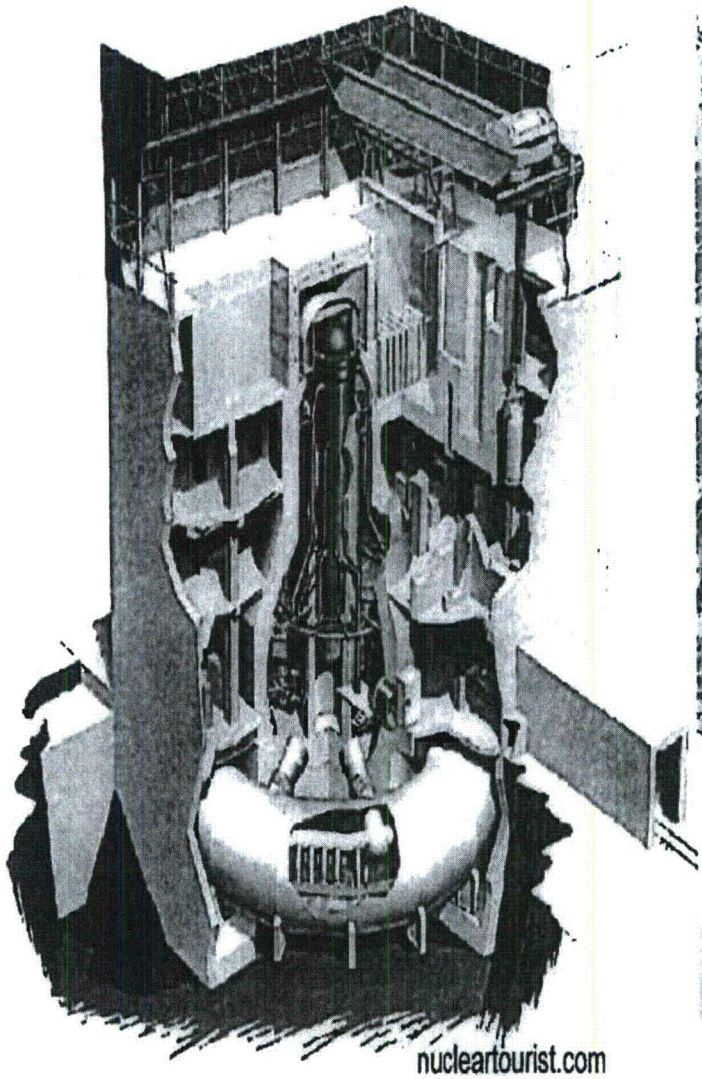
Plant Design

- **Fukushima Daiichi (Plant I)**
  - **Unit I - GE Mark I BWR (439 MW), Operating since 1971**
  - **Unit II-IV - GE Mark I BWR (760 MW), Operating since 1974**



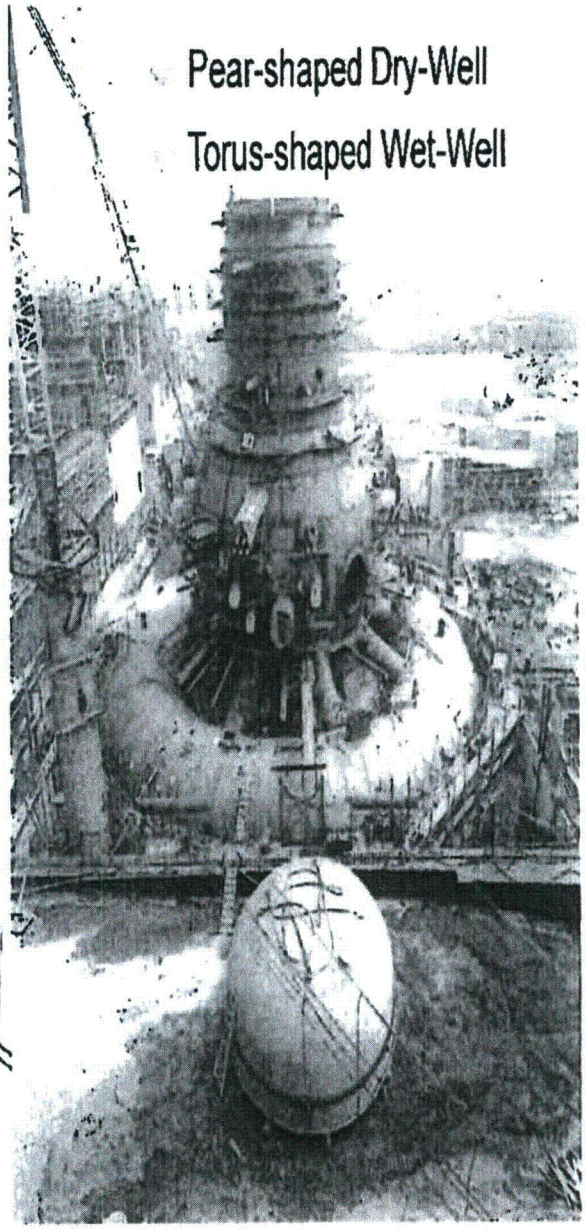
AREVA

- Building structure
  - Concrete Building
  - Steel-framed Service Floor



nucleartourist.com

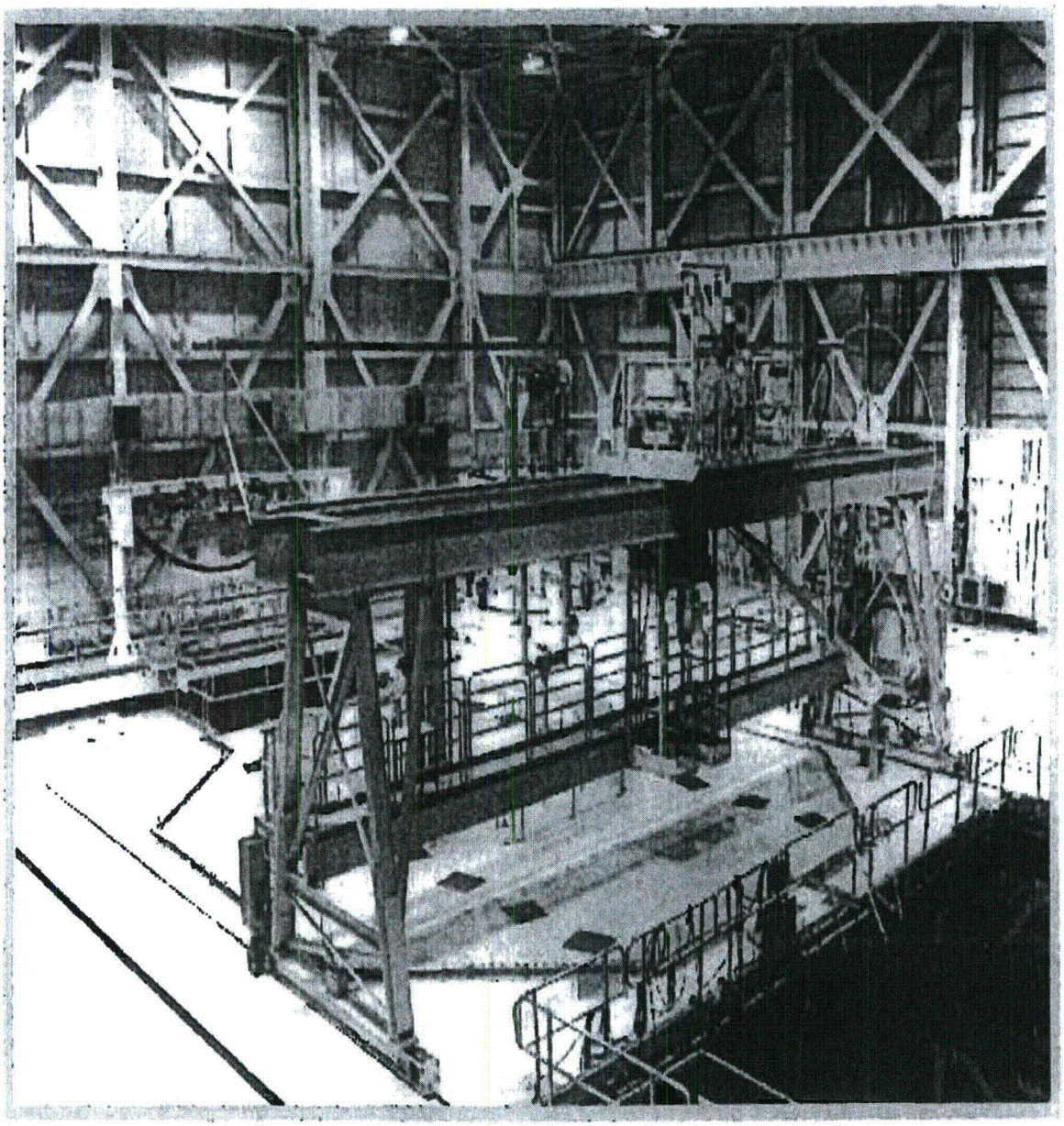
- Containment
  - Pear-shaped Dry-Well
  - Torus-shaped Wet-Well



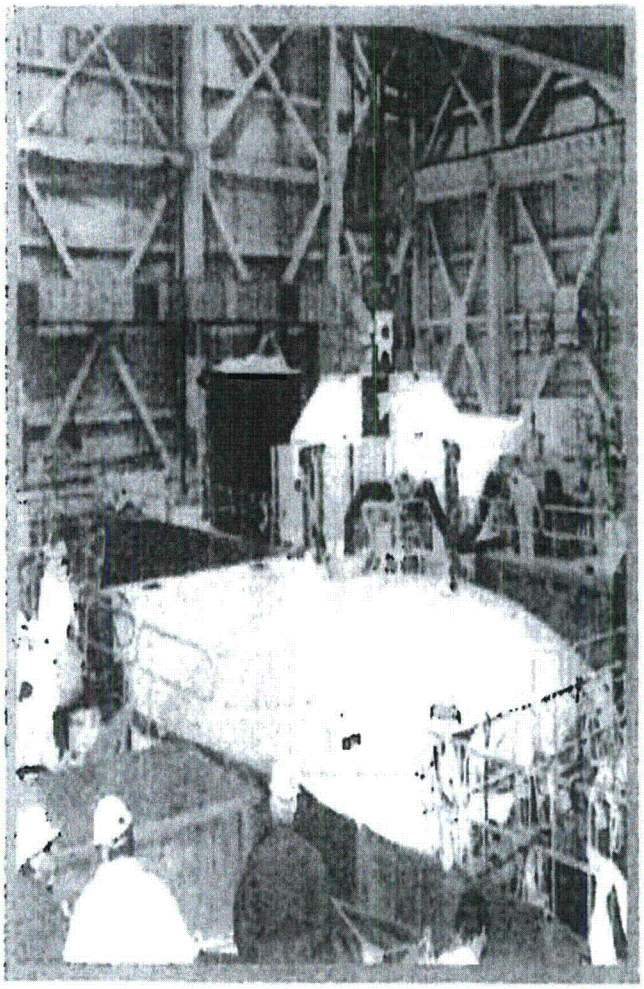
en.wikipedia.org/wiki/Browns_Ferry_Nuclear_Power_Plant

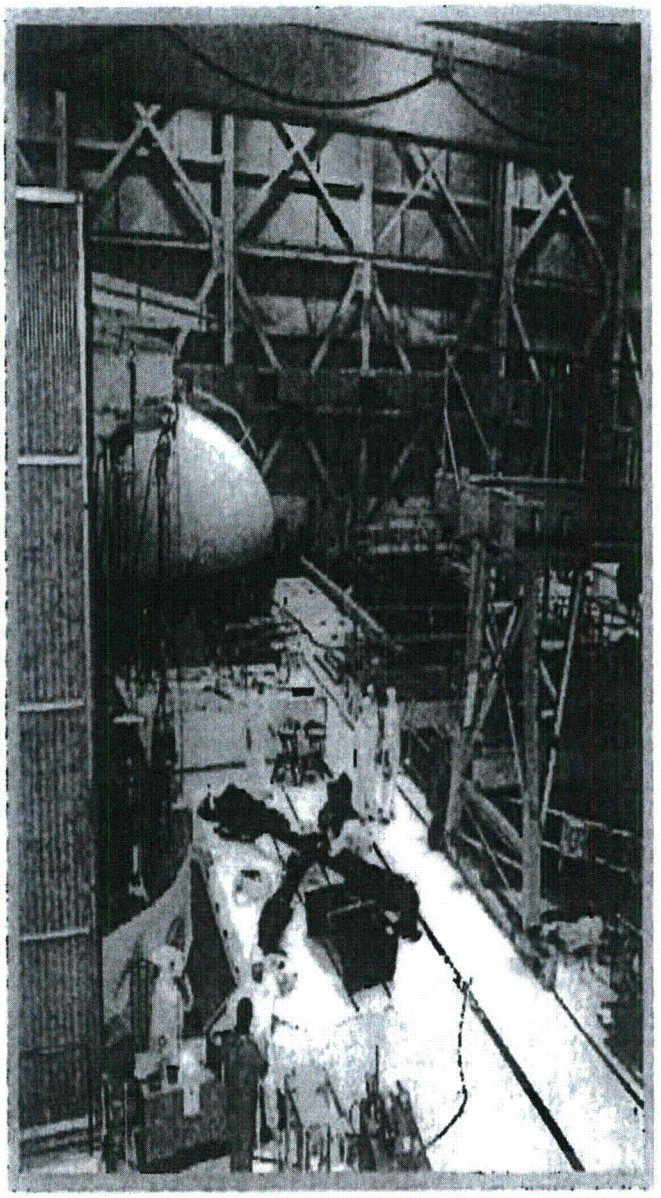
AREVA

Service Floor

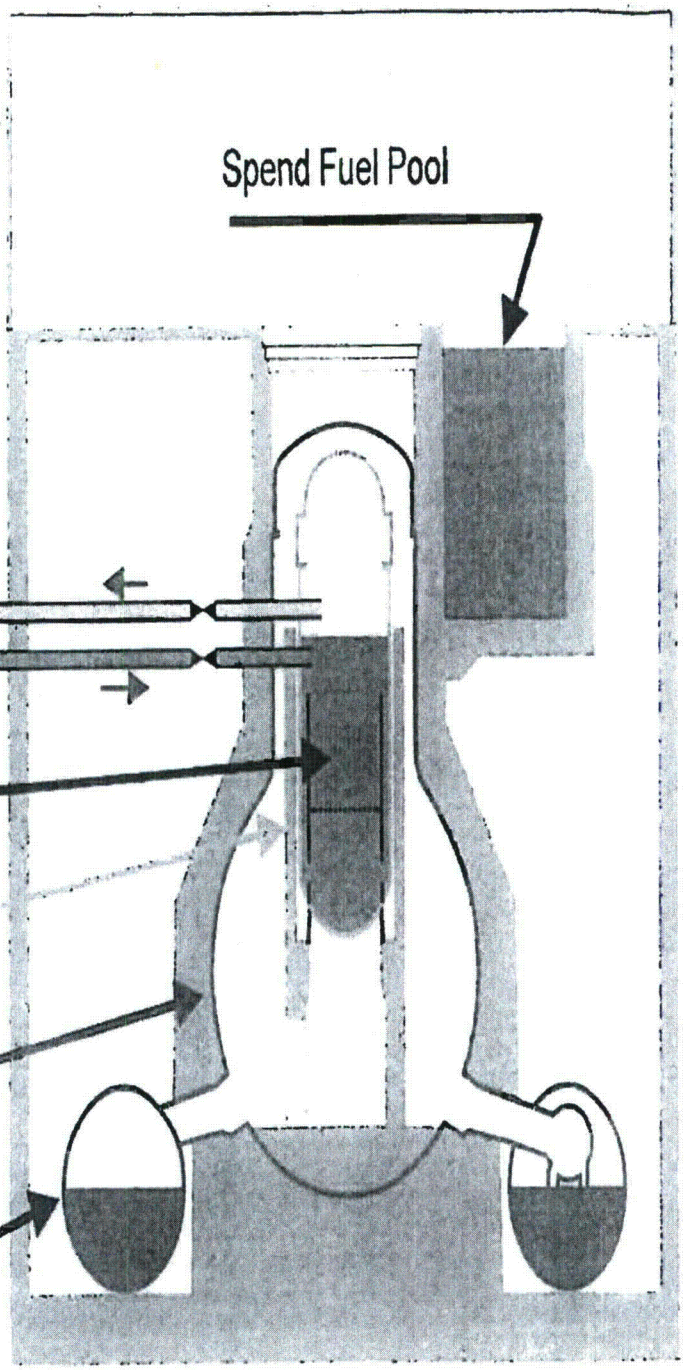


- Lifting the Containment closure head

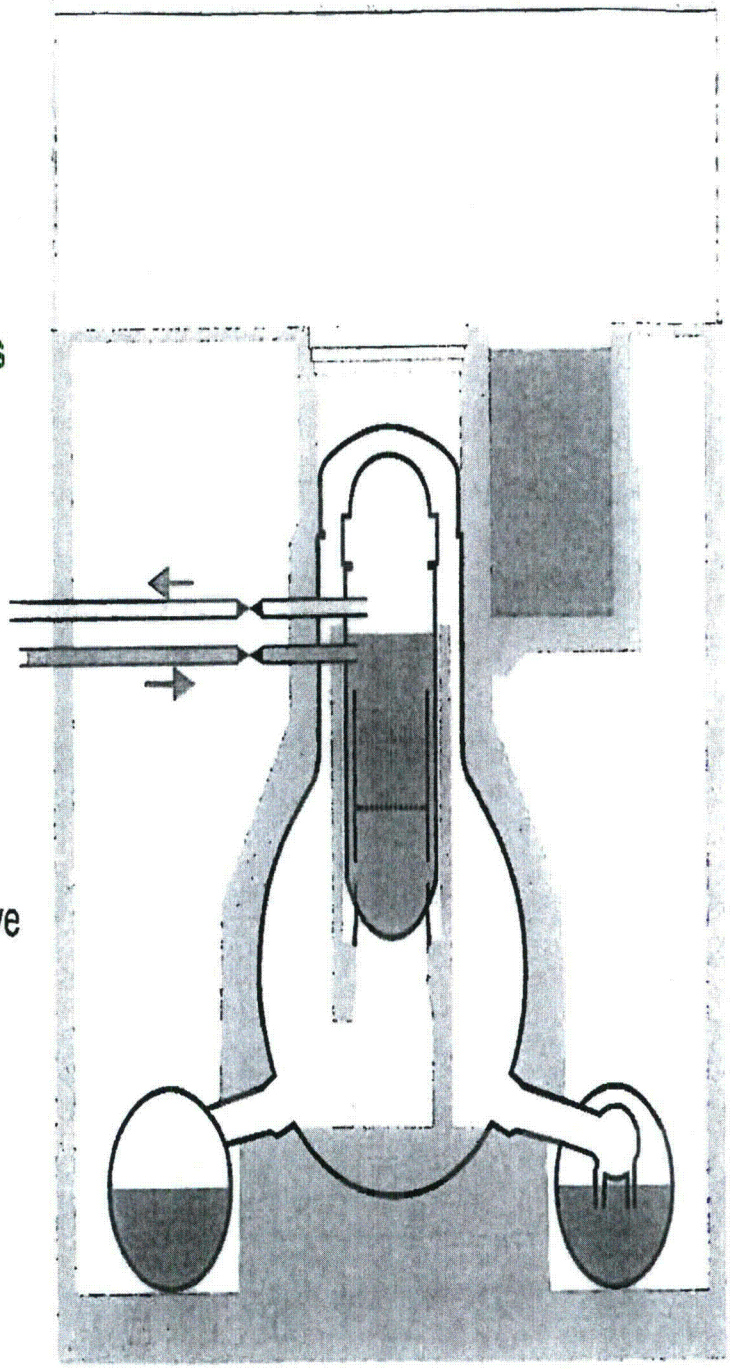




- Reactor Service Floor (Steel Construction)
- Concrete Reactor Building (secondary Containment)
- Reactor Core
- Reactor Pressure Vessel
- Containment (Dry well)
- Containment (Wet Well) / Condensation Chamber



- 11.3.2011 14:46 - Earthquake
  - Magnitude 9
  - Power grid in northern Japan fails
  - Reactors itself are mainly undamaged
- SCRAM
  - Power generation due to Fission of Uranium stops
  - Heat generation due to radioactive Decay of Fission Products
    - After Scram ~6%
    - After 1 Day ~1%
    - After 5 Days ~0.5%



- Containment Isolation

  Closing of all non-safety related Penetrations of the containment

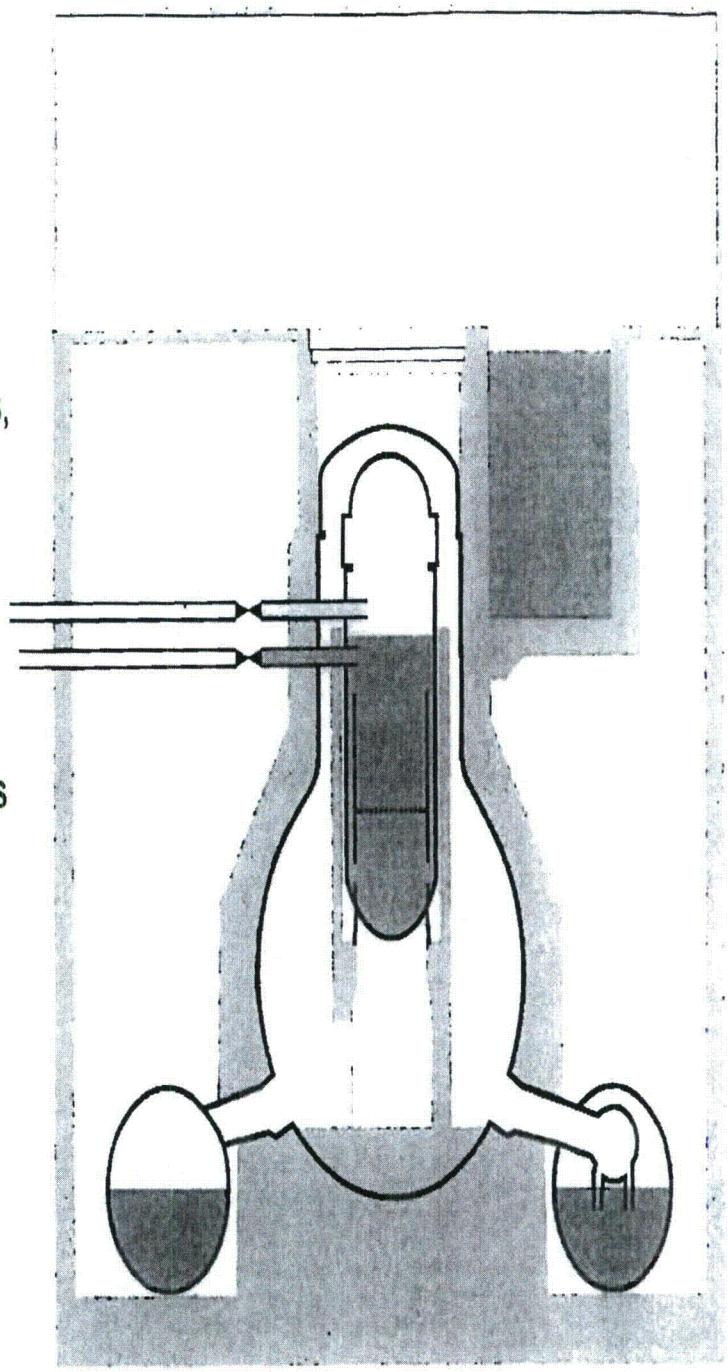
  Cuts off Machine hall

  If containment isolation succeeds, a large early release of fission products is highly unlikely

- Diesel generators start

  Emergency Core cooling systems are supplied

- Plant is in a stable save state



- 11.3. 15:41 Tsunami hits the plant

  Plant Design for Tsunami height of up to 6.5m

  Actual Tsunami height >7m

  Flooding of

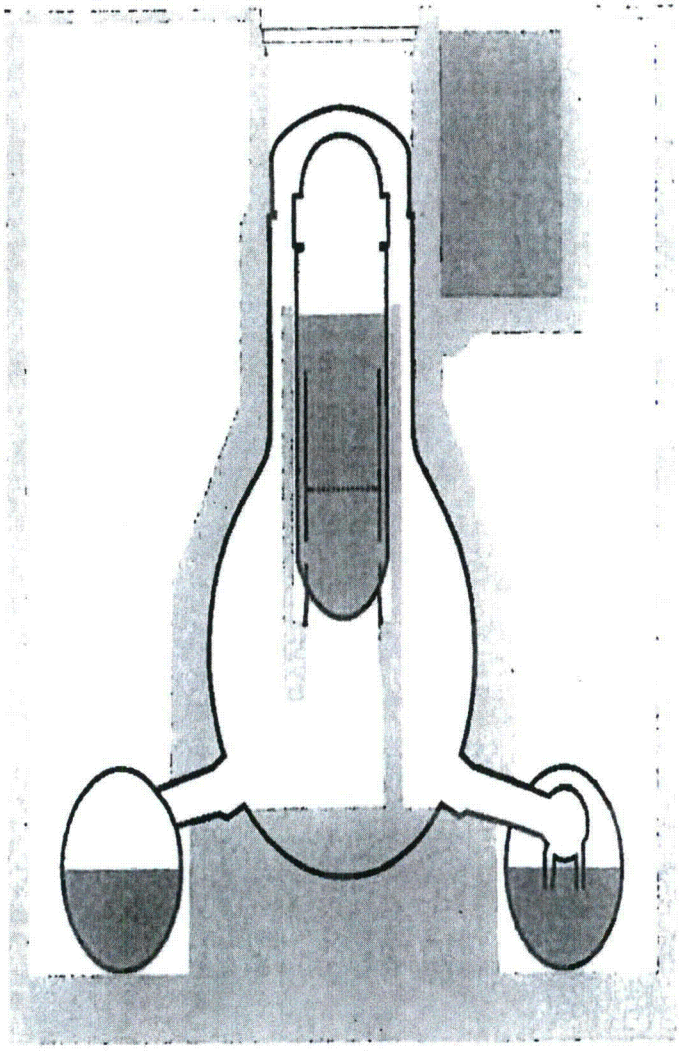
  - Diesel Generators and/or
  - Essential service water building cooling the generators

- Station Blackout

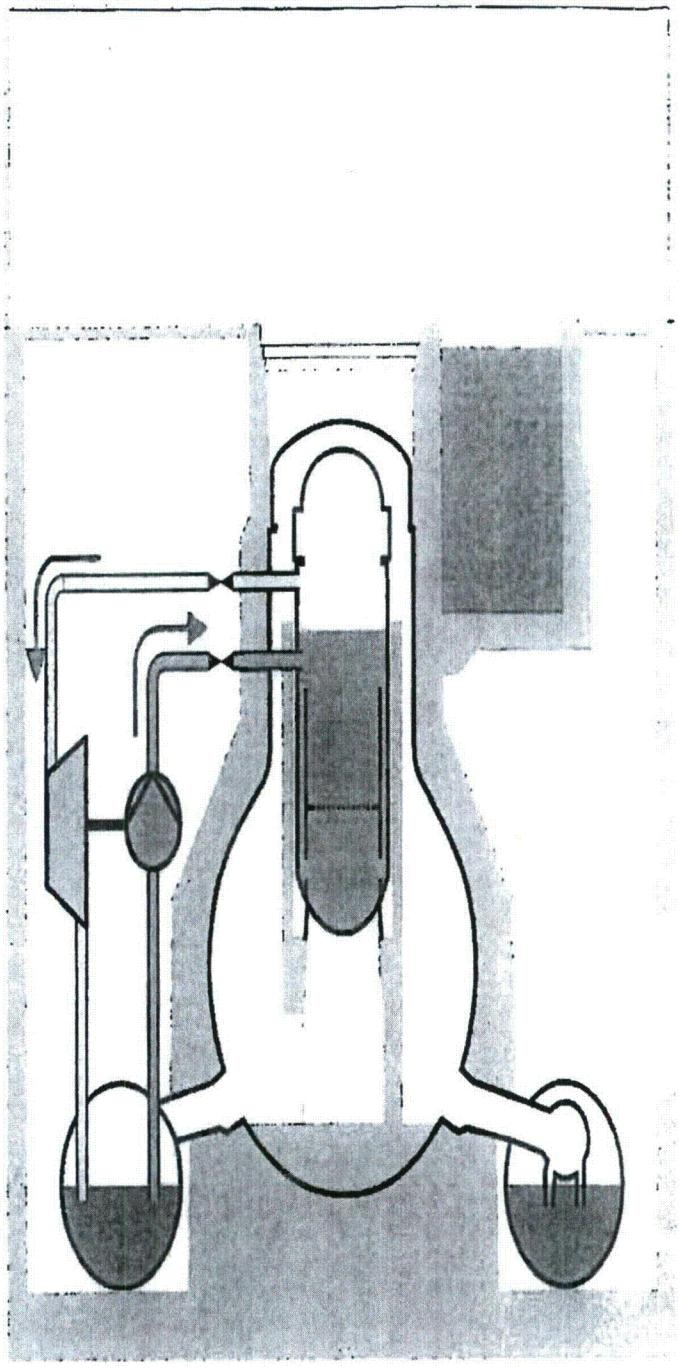
  Common cause failure of the power supply

  Only Batteries are still available

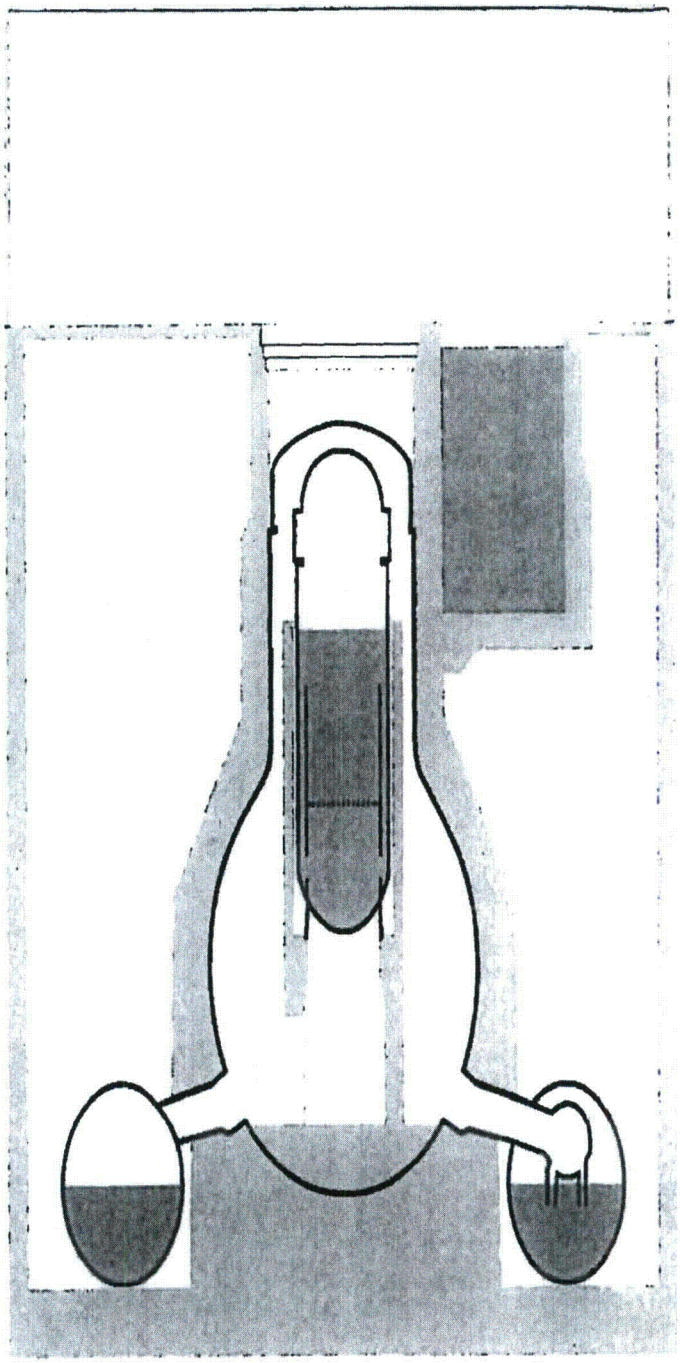
  Failure of all but one Emergency core cooling systems



- Reactor Core Isolation Pump still available
  - Steam from the Reactor drives a Turbine
  - Steam gets condensed in the Wet-Well
  - Turbine drives a Pump
  - Water from the Wet-Well gets pumped in Reactor
  - Necessary:
    - Battery power
    - Temperature in the wet-well must be below 100°C
- As there is no heat removal from the building, the Core isolation pump cant work infinitely



- Reactor Isolation pump stops
  - 11.3. 16:36 in Unit 1 (Batteries empty)
  - 14.3. 13:25 in Unit 2 (Pump failure)
  - 13.3. 2:44 in Unit 3 (Batteries empty)
- Decay Heat produces still steam in Reactor pressure Vessel
  - Pressure rising
- Opening the steam relieve valves
  - Discharge Steam into the Wet-Well
- Descending of the Liquid Level in the Reactor pressure vessel



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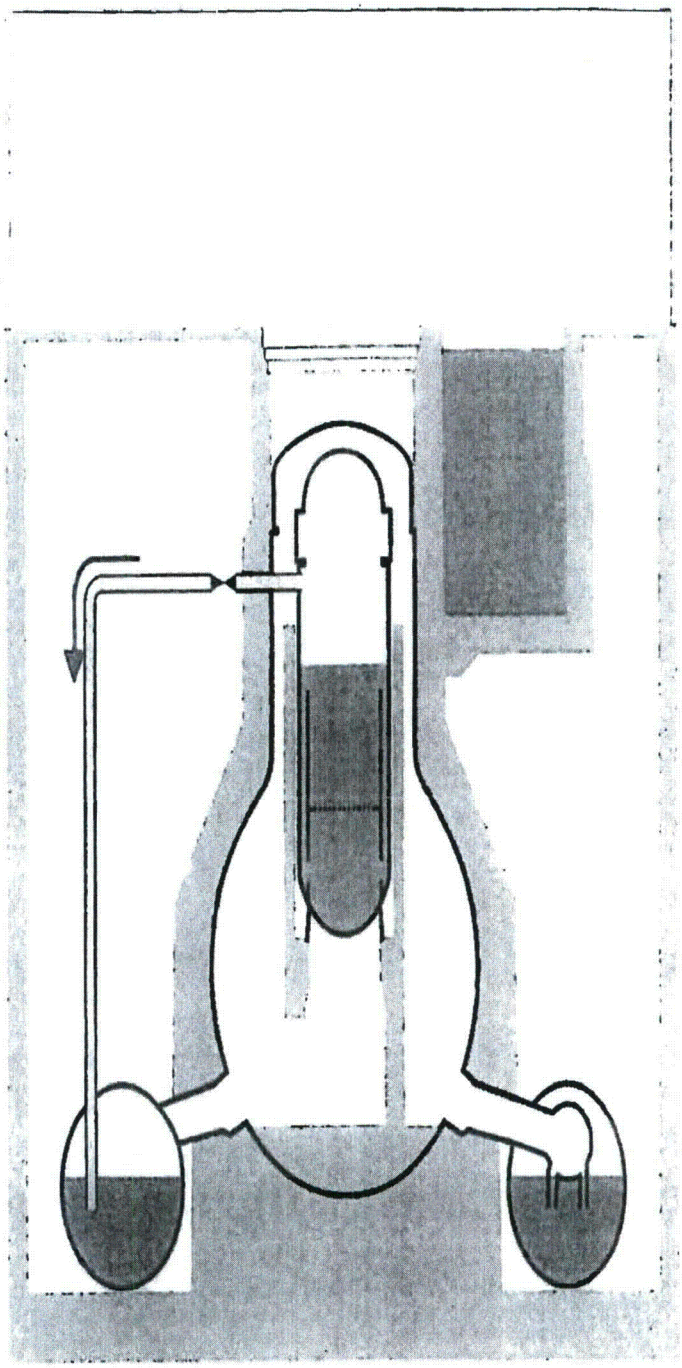

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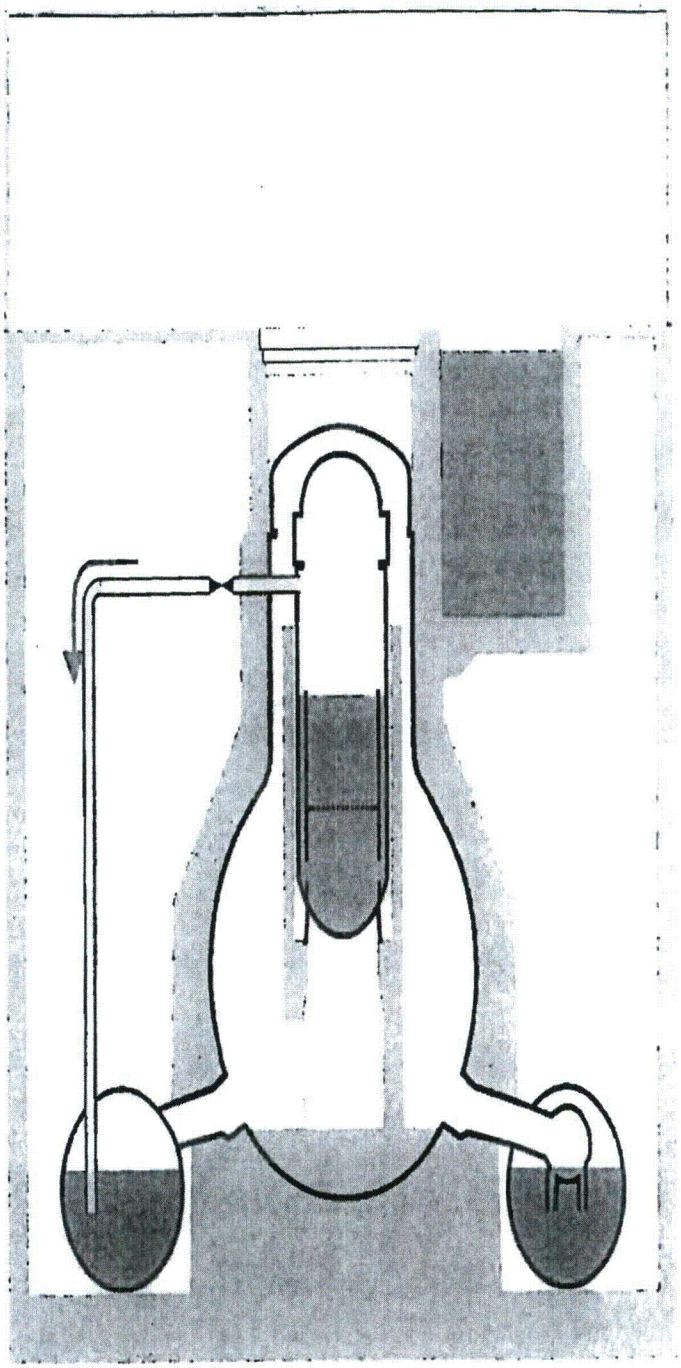

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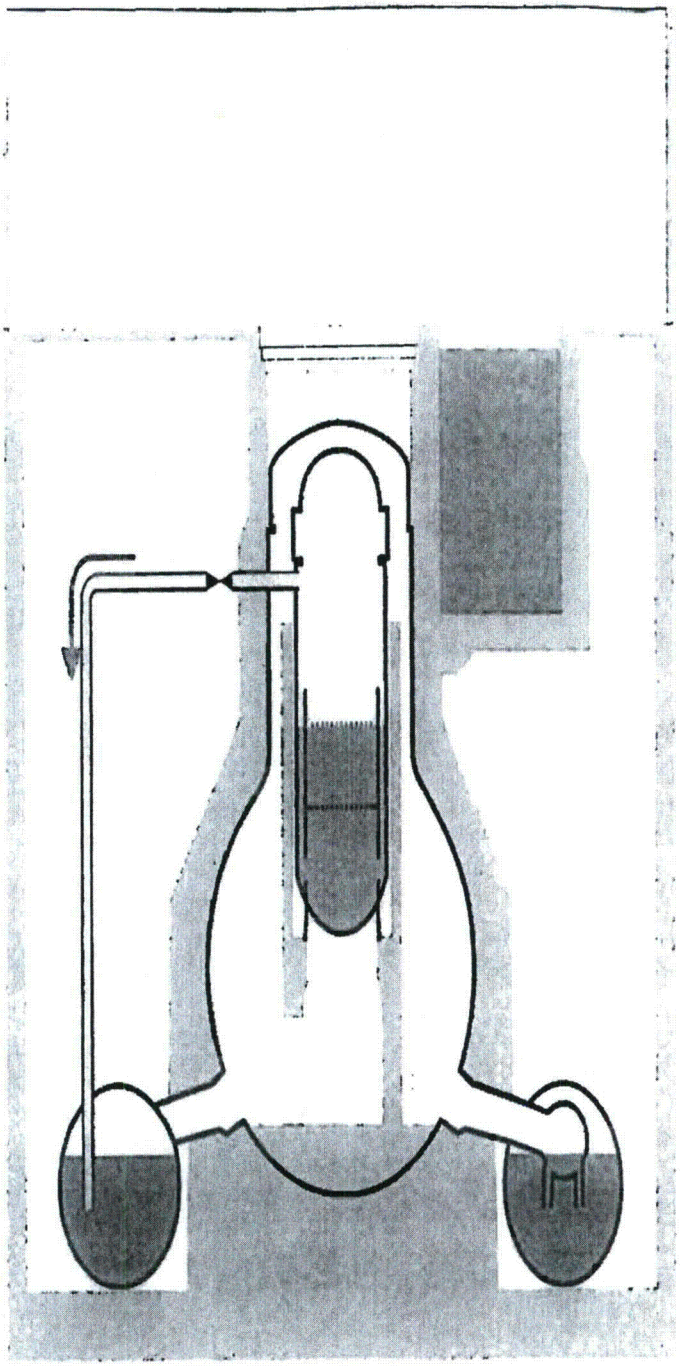

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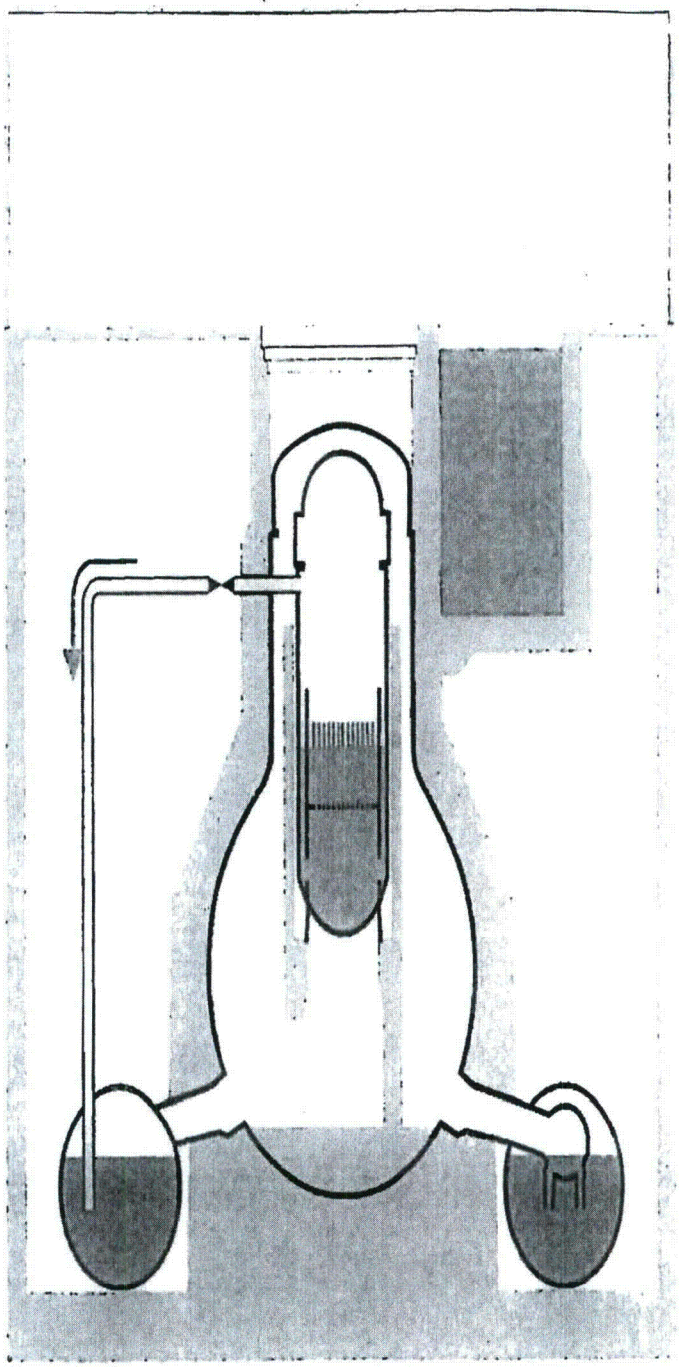
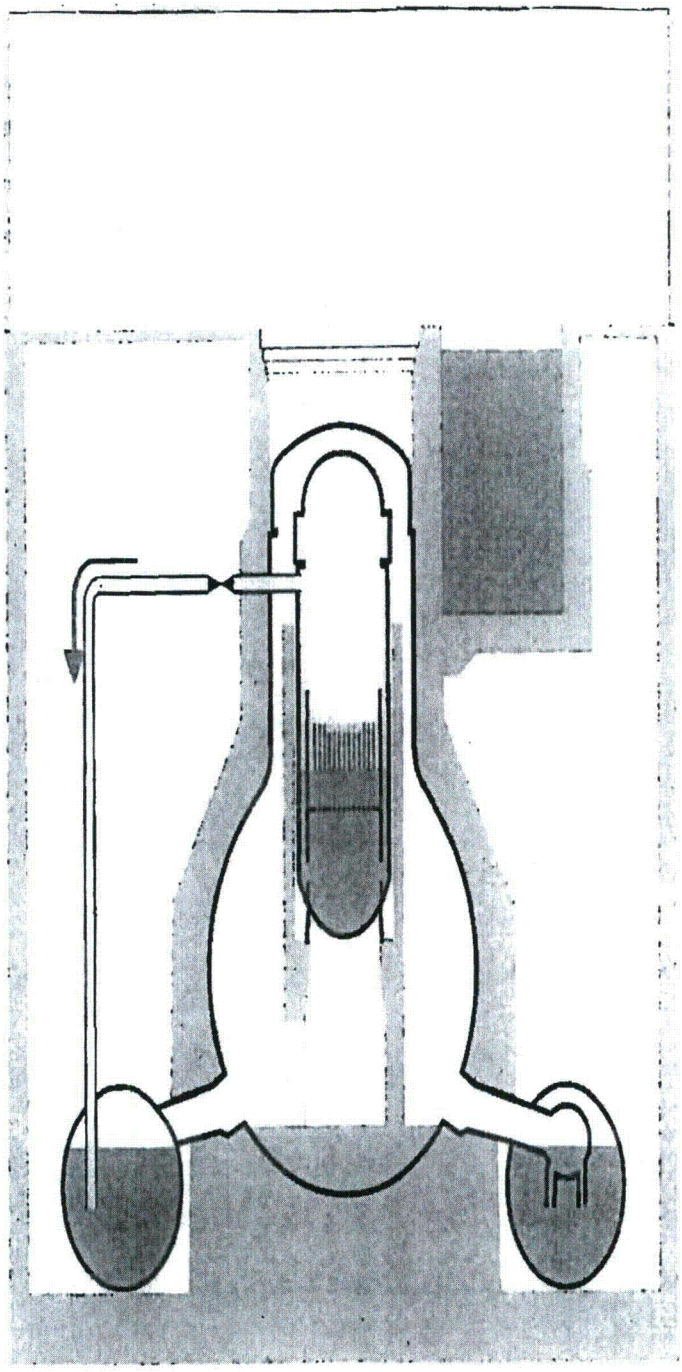
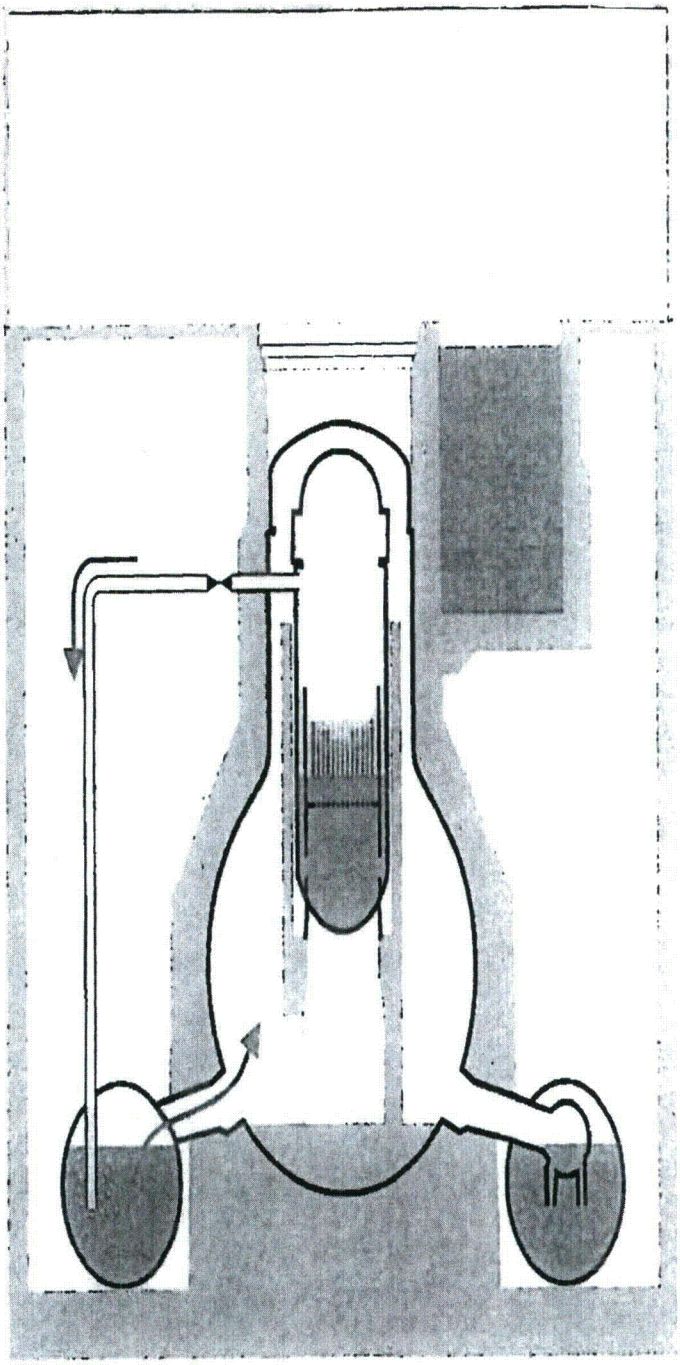


- Measured, and here referenced Liquid level is the collapsed level. The actual liquid level lies higher due to the steam bubbles in the liquid

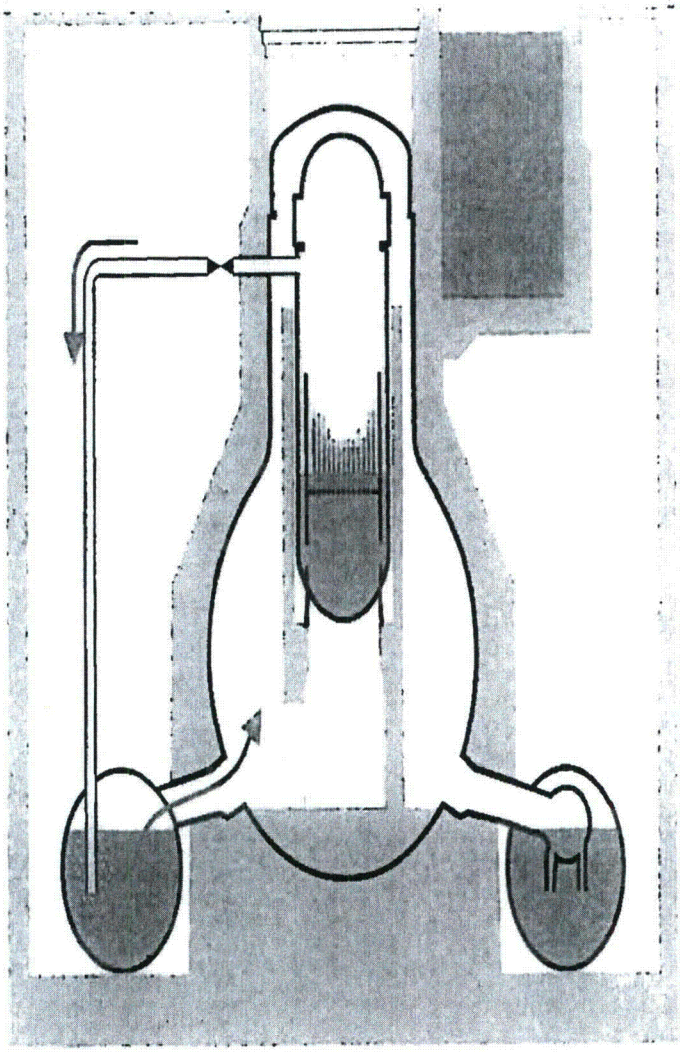


- ~50% of the core exposed
  - Cladding temperatures rise, but still no significant core damage
- ~2/3 of the core exposed
  - Cladding temperature exceeds ~900°C
  - Balooning / Breaking of the cladding
  - Release of fission products form the fuel rod gaps

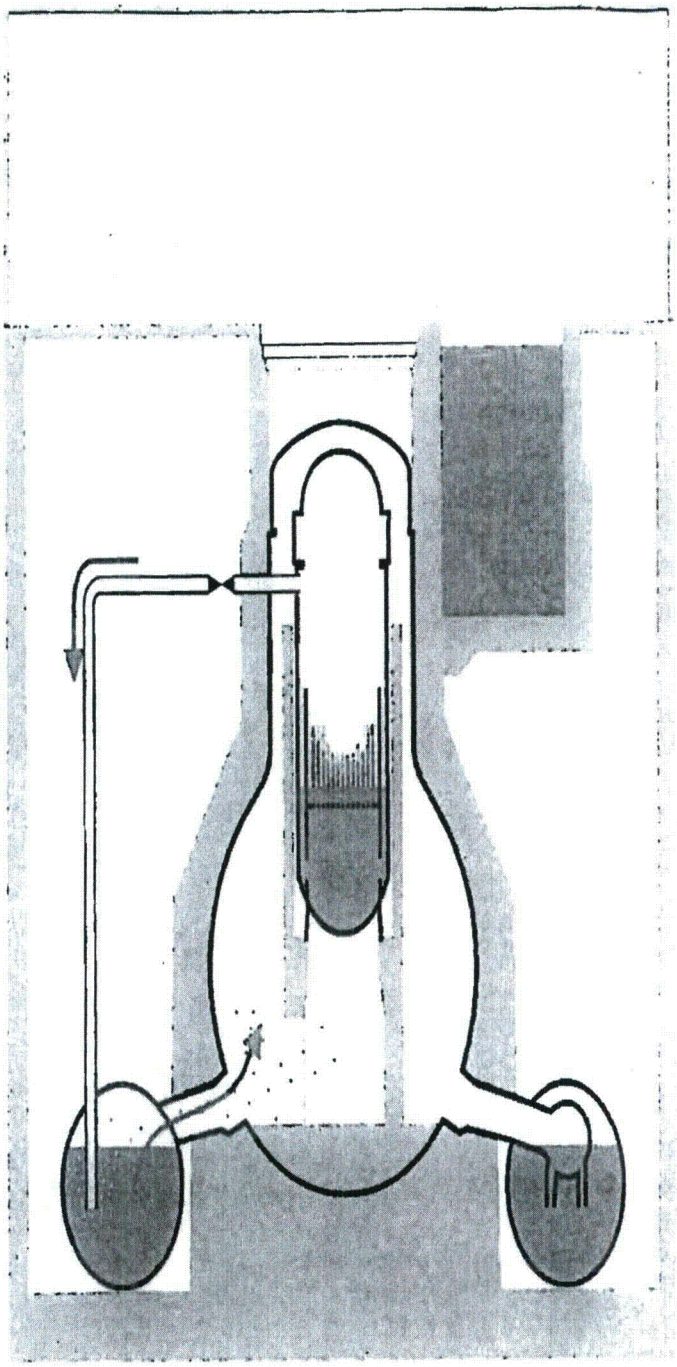
- ~3/4 of the core exposed
  - Cladding exceeds ~1200°C
  - Zirconium in the cladding starts to burn under Steam atmosphere
  - $Zr + 2H_20 \rightarrow ZrO_2 + 2H_2$
  - Exothermal reaction further heats the core
  - Generation of hydrogen
    - Unit 1: 300-600kg
    - Unit 2/3: 300-1000kg
  - Hydrogen gets pushed via the wet-well, the wet-well vacuum breakers into the dry-well



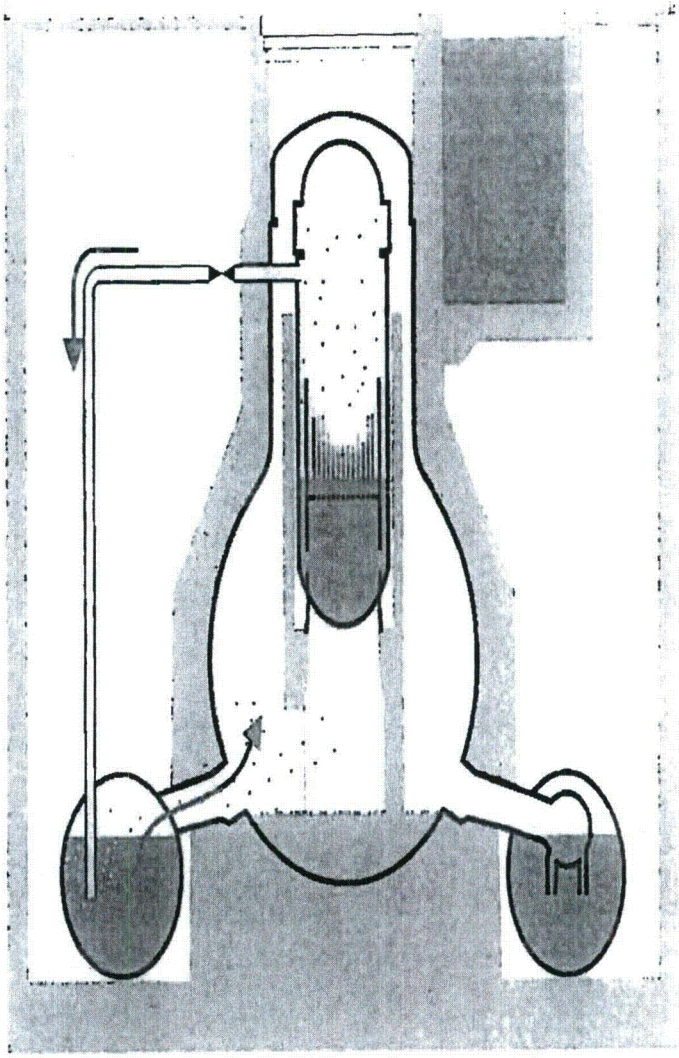
- at ~1800°C [Unit 1,2,3]
  - Melting of the Cladding
  - Melting of the steel structures
- at ~2500°C [Block 1,2]
  - Breaking of the fuel rods
  - debris bed inside the core
- at ~2700°C [Block 1]
  - Melting of Uranium-Zirconium eutectics
- Restoration of the water supply stops accident in all 3 Units
  - Unit 1: 12.3. 20:20 (27h w.o. water)
  - Unit 2: 14.3. 20:33 (7h w.o. water)
  - Unit 3: 13.3. 9:38 (7h w.o. water)



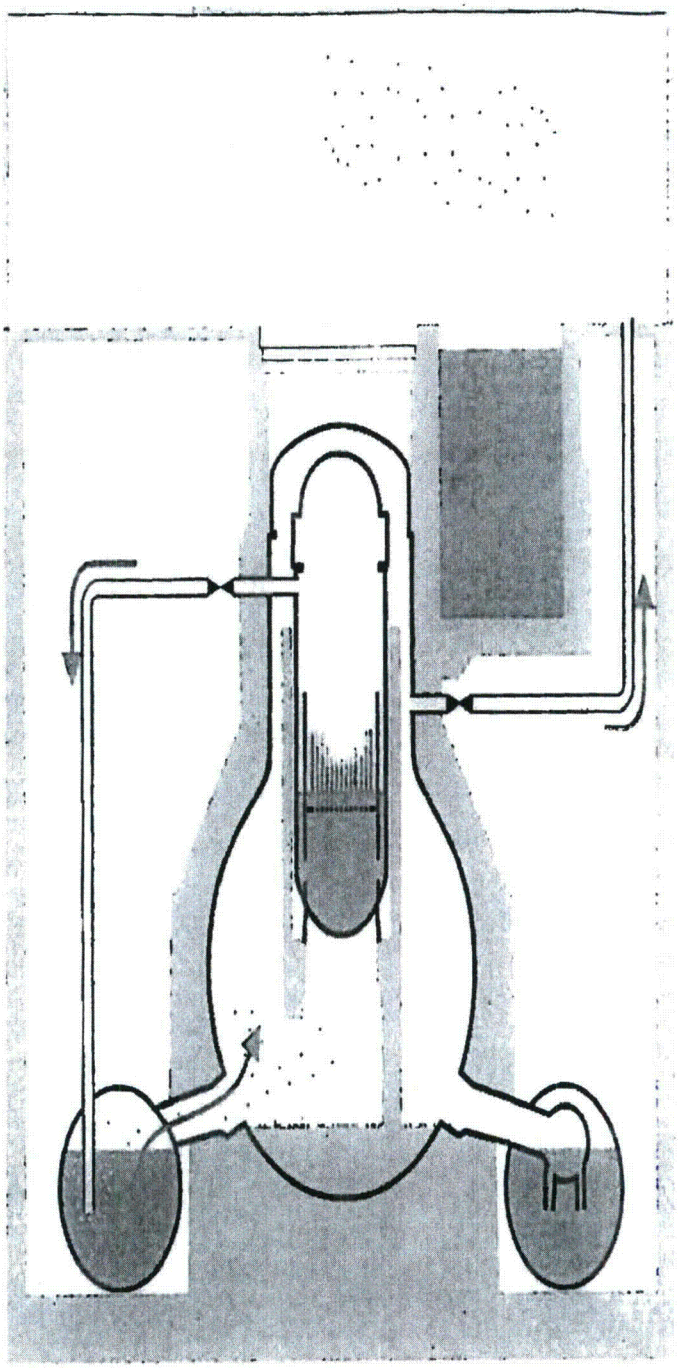
- Release of fission products during melt down
  - Xenon, Cesium, Iodine,...
  - Uranium/Plutonium remain in core
  - Fission products condensate to airborne Aerosols
- Discharge through valves into water of the condensation chamber
  - Pool scrubbing binds a fraction of Aerosols in the water
- Xenon and remaining aerosols enter the Dry-Well
  - Deposition of aerosols on surfaces further decontaminates air



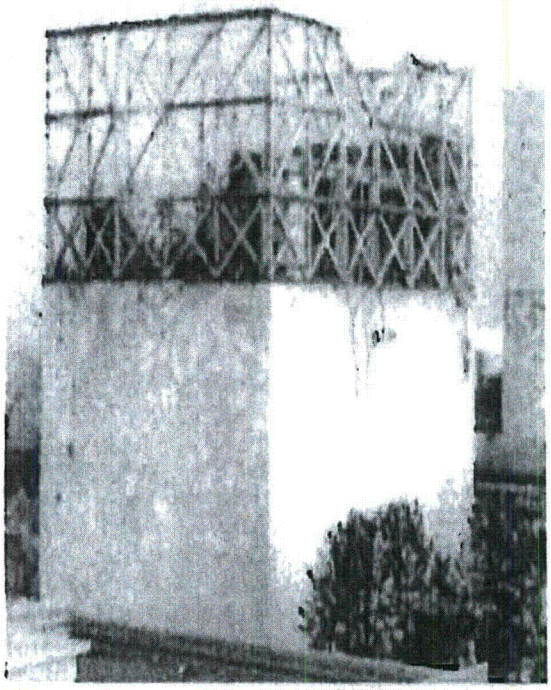
- Containment
  - Last barrier between Fission Products and Environment
  - Wall thickness ~3cm
  - Design Pressure 4-5bar
- Actual pressure up to 8 bars
  - Normal inert gas filling (Nitrogen)
  - Hydrogen from core oxidation
  - Boiling condensation chamber (like a pressure cooker)
- Depressurization of the containment
  - Unit 1: 12.3. 4:00
  - Unit 2: 13.3 00:00
  - Unit 3: 13.3. 8.41

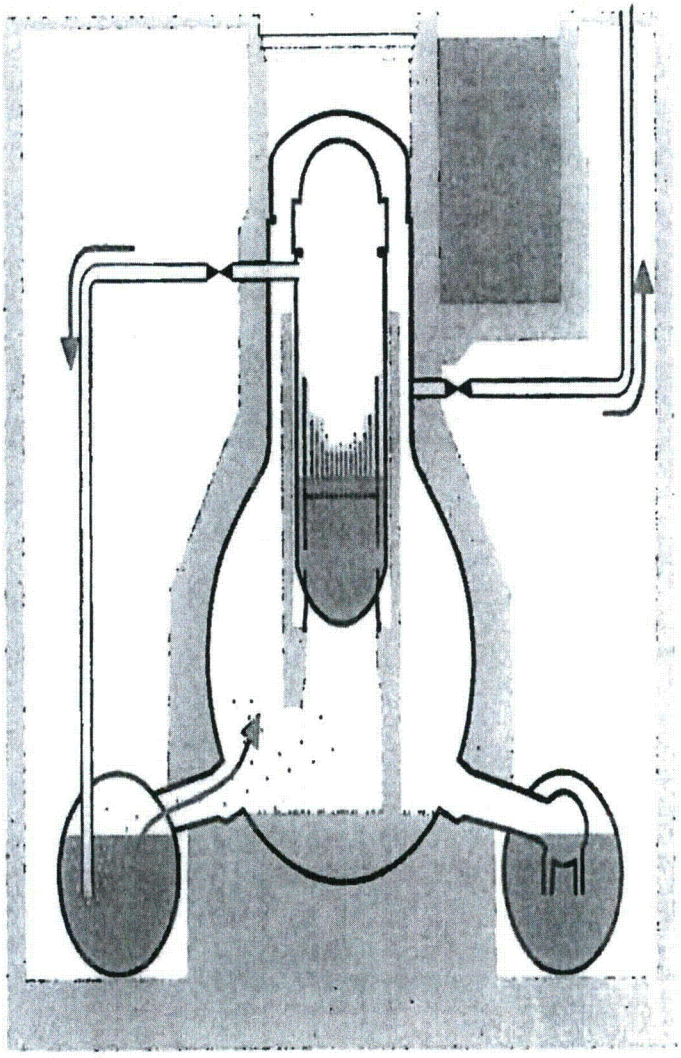


- Positive und negative Aspects of depressurizing the containment
  - Removes Energy from the Reactor building (only way left)
  - Reducing the pressure to ~4 bar
  - Release of small amounts of Aerosols (Iodine, Cesium ~0.1%)
  - Release of all noble gases
  - Release of Hydrogen
- Gas is released into the reactor service floor
  - Hydrogen is flammable

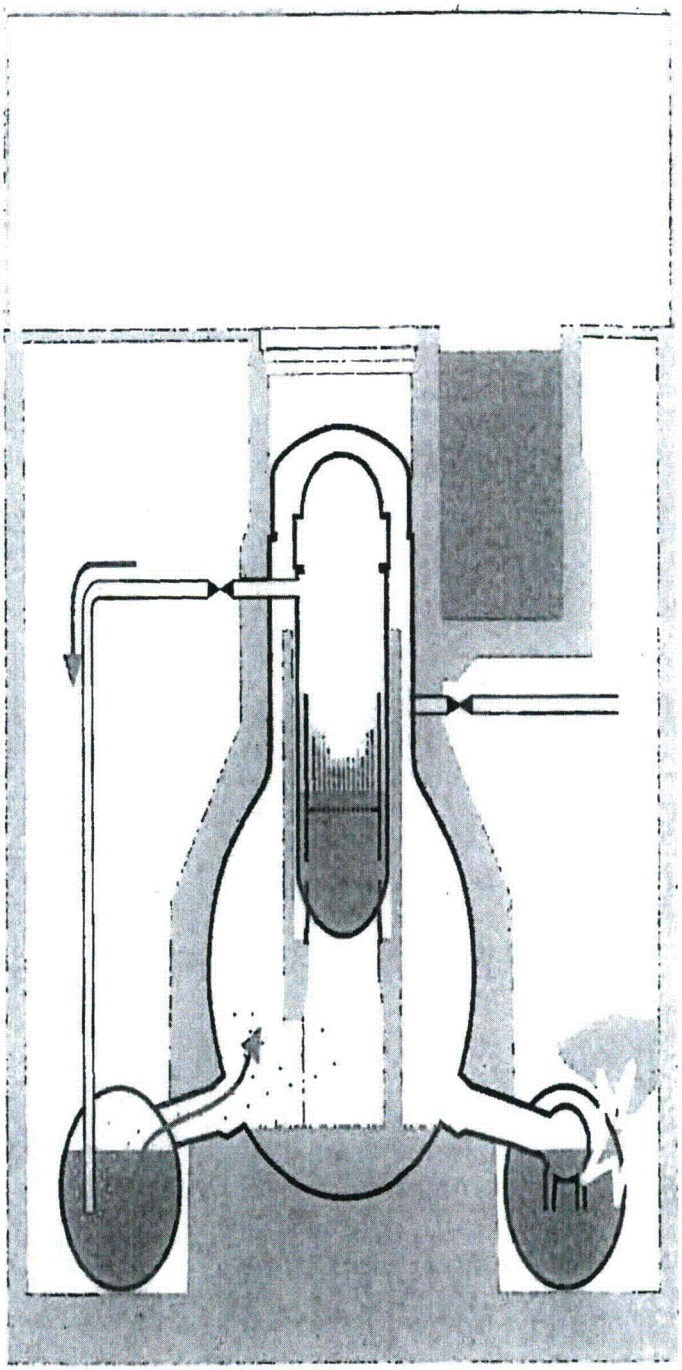


- Unit 1 und 3
  - Hydrogen burn inside the reactor service floor
  - Destruction of the steel-frame roof
  - Reinforced concrete reactor building seems undamaged
  - Spectacular but minor safety relevant



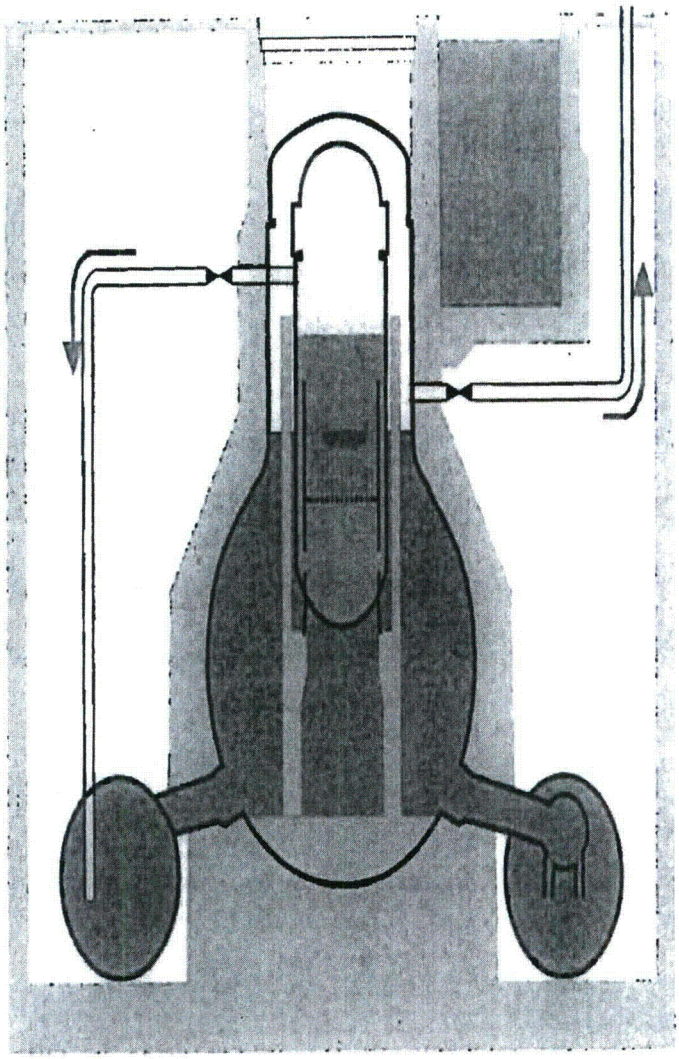


- Unit 2
  - Hydrogen burn inside the reactor building
  - Probably damage to the condensation chamber (highly contaminated water)
  - Uncontrolled release of gas from the containment
  - **Release of fission products**
  - Temporal evacuation of the plant
  - High local dose rates on the plant site due to wreckage hinder further recovery work



- No clear information's why Unit 2 behaved differently

- Current status of the Reactors
  - Core Damage in Unit 1,2, 3
  - Building damage due to various burns Unit 1-4
  - Reactor pressure vessels floode in all Units with mobile pumps
  - At least containment in Unit 1 flooded
- Further cooling of the Reactors by releasing steam to the atmospher
- Only small further releases of fission products can be expected



- Directly on the plant site

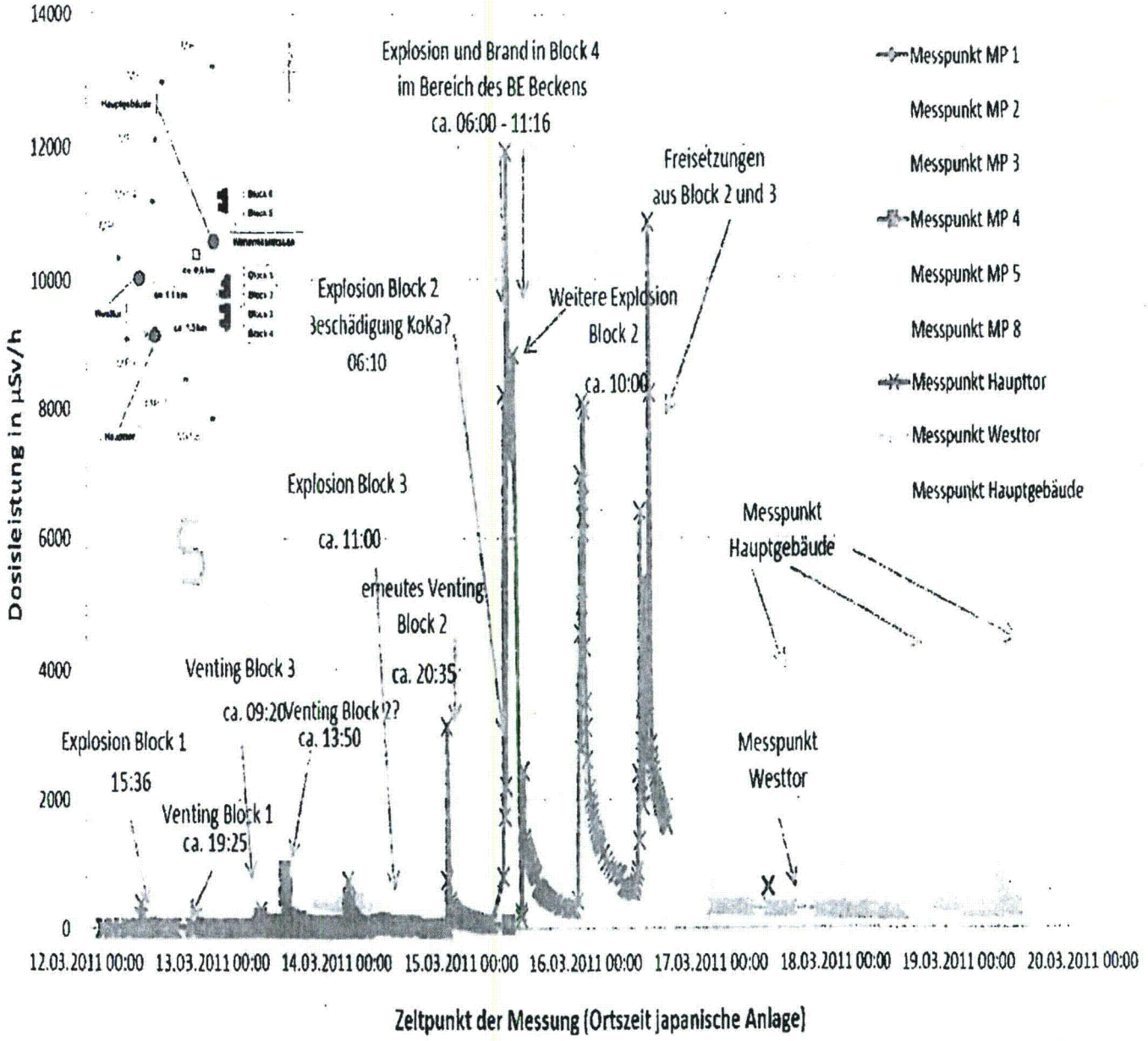
  Before Explosion in Unit Block 2

  - Below 2mSv / h
  - Mainly due to released radioactive noble gases
  - Measuring posts on west side. Maybe too small values measured due to wind

  After Explosion in Unit 2 (Damage of the Containment)

  - Temporal peak values 12mSv / h
  - (Origin not entirely clear)
  - Local peak values on site up to 400mSv /h (wreckage / fragments?)
  - Currently stable dose on site at 5mSv /h
  - Inside the buildings a lot more

  Limiting time of exposure of the workers necessary


14000
12000
10000
8000
6000
4000
2000
0
Dosisleistung in µSv/h
Explosion und Brand in Block 4
im Bereich des BE Beckens
ca. 06:00 - 11:16
Freisetzungen
aus Block 2 und 3
Explosion Block 2
Beschädigung KoKa?
06:10
Weitere Explosion
Block 2
ca. 10:00
Explosion Block 3
ca. 11:00
Messpunkt
Hauptgebäude
erneutes Venting
Block 2
ca. 20:35
Venting Block 3
ca. 09:20
Venting Block 2?
ca. 13:50
Explosion Block 1
15:36
Venting Block 1
ca. 19:25
Messpunkt
Westtor
Messpunkt MP 1
Messpunkt MP 2
Messpunkt MP 3
Messpunkt MP 4
Messpunkt MP 5
Messpunkt MP 8
Messpunkt Haupttor
Messpunkt Westtor
Messpunkt Hauptgebäude
12.03.2011 00:00
13.03.2011 00:00
14.03.2011 00:00
15.03.2011 00:00
16.03.2011 00:00
17.03.2011 00:00
18.03.2011 00:00
19.03.2011 00:00
20.03.2011 00:00
Zeitpunkt der Messung (Ortszeit japanische Anlage)

- Outside the Plant site

  As reactor building mostly intact
  => reduced release of Aerosols (not Chernobyl-like)

  Fission product release in steam
  => fast Aerosol grows, large fraction falls down in the proximity of the plant

  Main contribution to the radioactive dose outside plant are the radioactive noble gases

  Carried / distributed by the wind, decreasing dose with time

  No „Fall-out" of the noble gases, so no local high contamination of soil

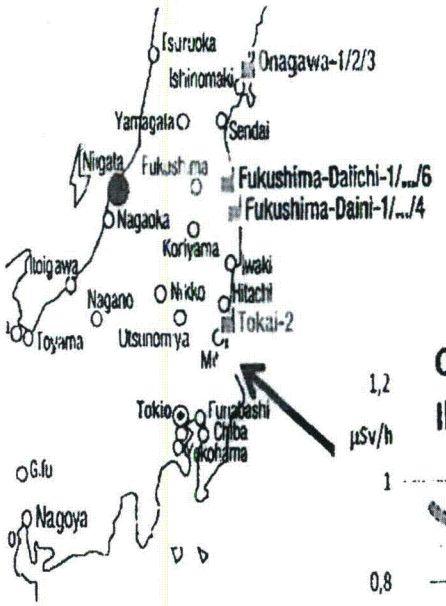
- ~20km around the plant

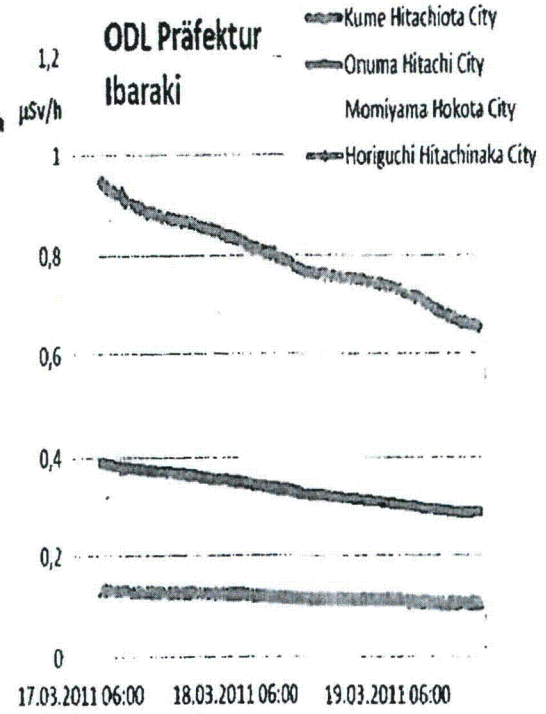
  Evacuations were adequate

  Measured dose up to 0.3mSv/h for short times

  Maybe destruction of crops / dairy products this year

  Probably no permanent evacuation of land necessary

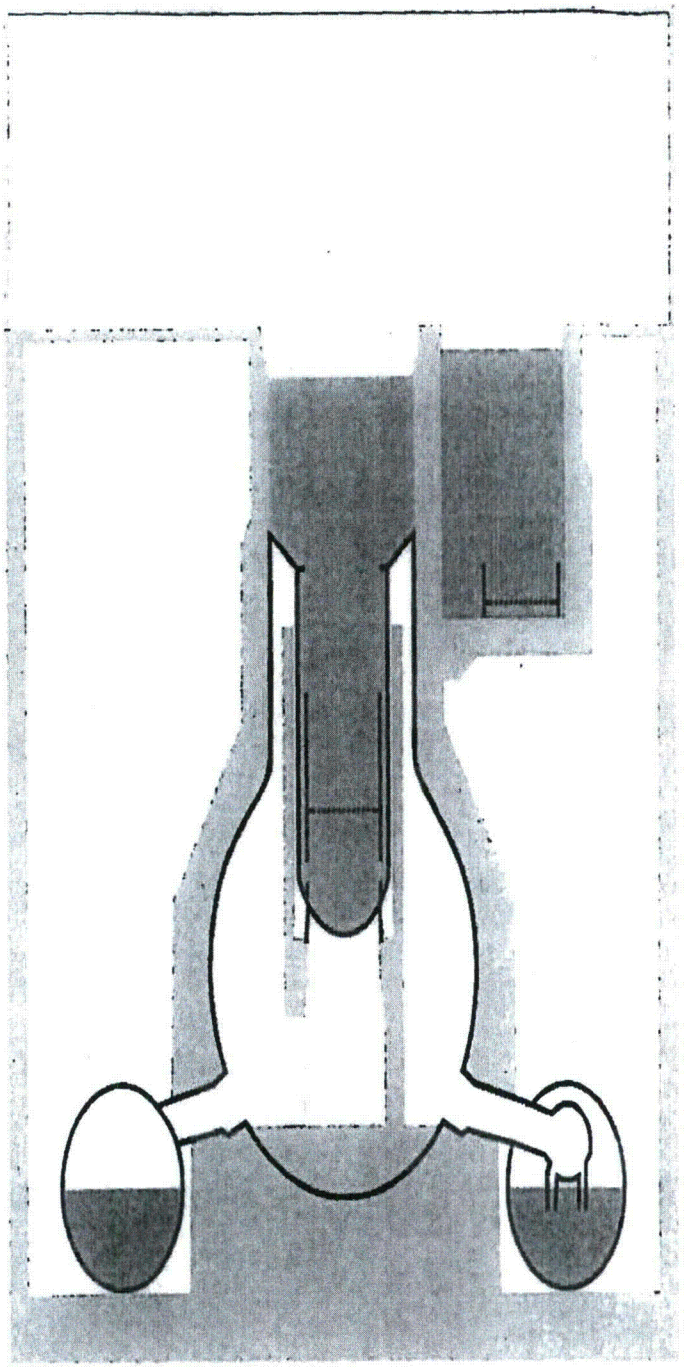




- ~50km around the plant
  - Control of Crop / Dairy products
  - Usage of Iodine pills (Caution, pills can interfere with heart medicine)

AREVA

- Spend fuel stored in Pool on Reactor service floor
  - Due to maintenance in Unit 4 entire core stored in Fuel pool
  - Dry-out of the pools
    - Unit 4: in 10 days
    - Unit 1-3,5,6 in few weeks
  - **Leakage of the pools due to Earthquake?**
- Consequences
  - Core melt „on fresh air "
  - Nearly no retention of fission products
  - Large release



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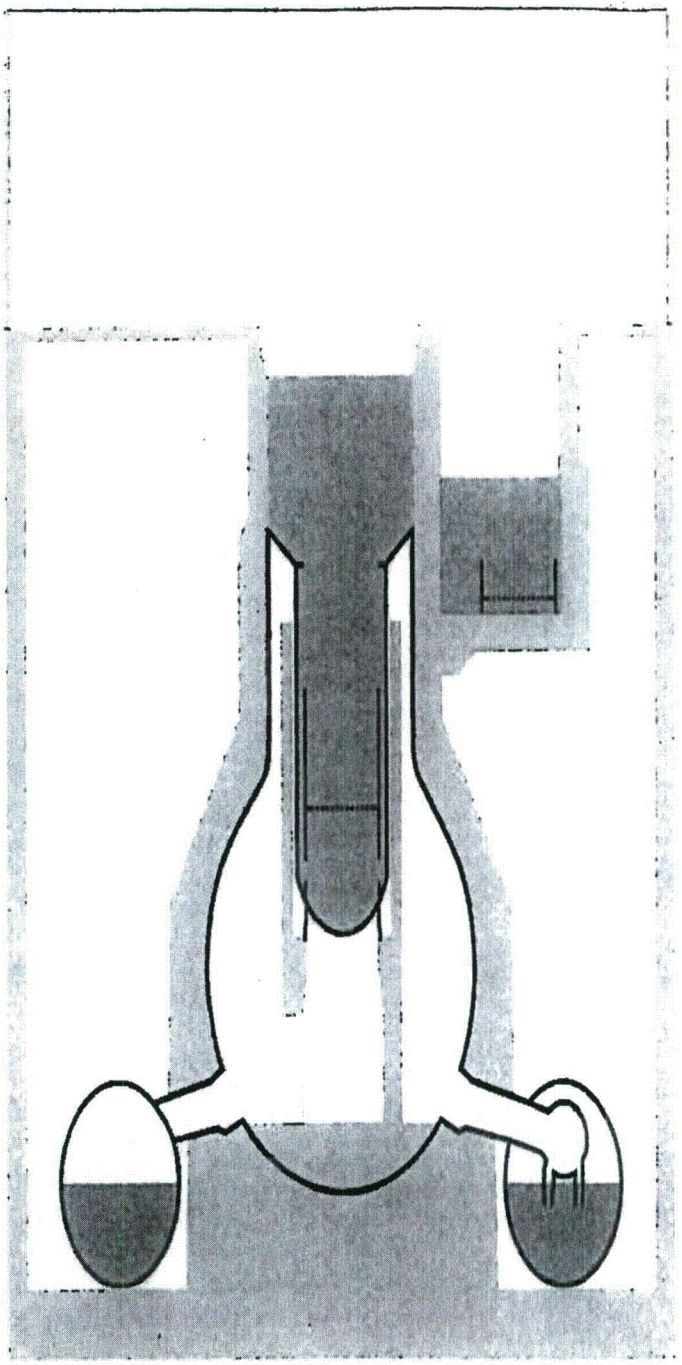

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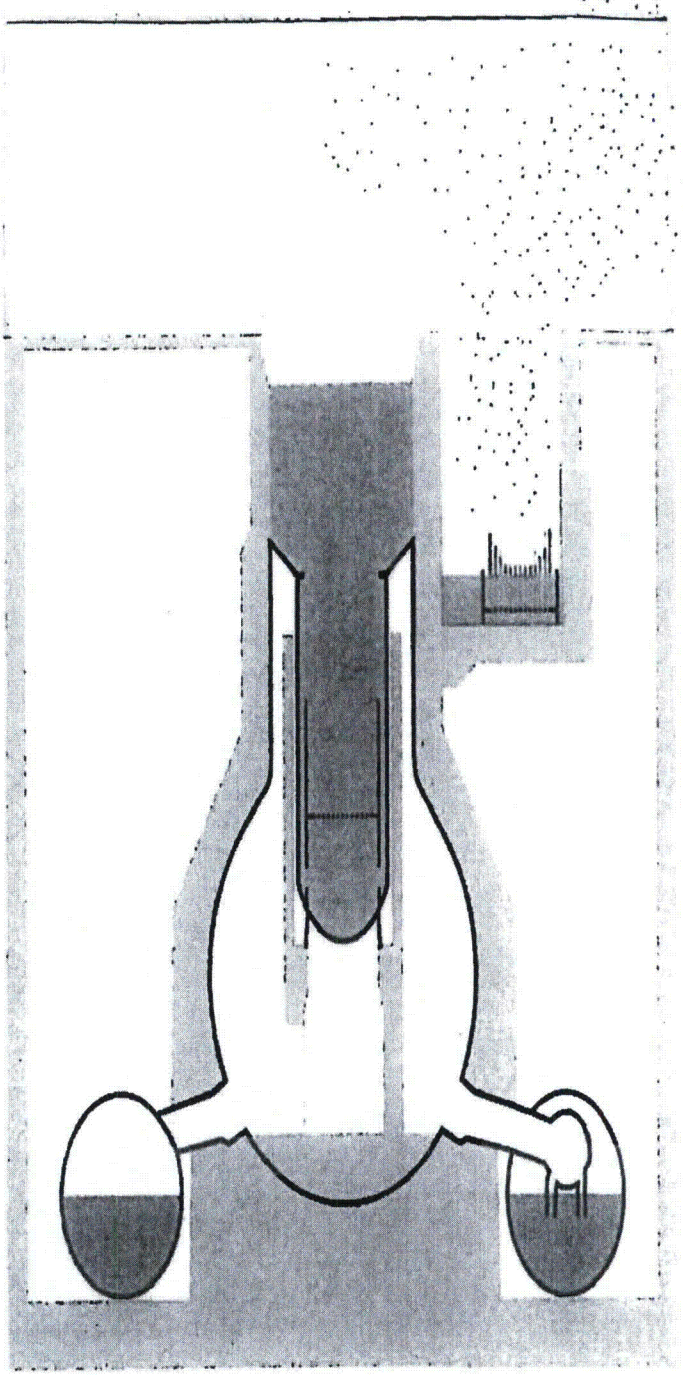
- **It is currently unclear if release from fuel pool already happened**



- Good sources of Information

  Gesellschaft für Reaktorsicherheit [GRS.de]

  - Up to date
  - Radiological measurements published
  - German translation of japanese/englisch web pages

  Japan Atomic Industrial Forum [jaif.or.jp/english/]

  - Current Status of the plants
  - Measurement values of the reactors (pressure liquid level)

  Tokyo Electric Power Company [Tepco.co.jp]

  - Status of the recovery work
  - Casualties

- May too few information are released by TEPCO, the operator of the plant