

# **US Nuclear Energy Industry Response to Fukushima Event**

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# Great Eastern Earthquake of Japan

- Tragic loss of life
- Wide-spread devastation
- Countless acts of heroism and courage that continue through the present



# **US Nuclear Energy Industry Response In Japan**

- **Activated Industry Support Team in Tokyo**
  - **Included industry organizations, utilities and service companies interfacing directly with TEPCO**
  - **Provided assistance to stabilize units including technical reviews, analysis and material support**
  - **Provided independent input with a safety perspective**
  - **Communicated information directly to the U.S. nuclear energy industry**

# **US Nuclear Energy Industry Immediate Response in the US**

- **Activated emergency response centers for operational support (INPO), technical support (EPRI), and communications/government liaison (NEI)**
- **Established daily communication schedules for Tokyo-US, US industry-wide, and US industry-government**
- **Implemented immediate response actions at every US operating reactor**

# **US Nuclear Energy Industry Immediate Response to Enhance Safety**

- **Verified that critical safety measures for extreme events are in place and functioning**
- **Evaluated protection of used fuel storage pools**
- **Assessed reactor operator training for managing severe events**
- **Assessed ability to maintain cooling and containment integrity if a plant loses all AC power**
- **Evaluated the use of backup equipment and supplies pre-staged at regional facilities**

# Communication on Radiation

- **The tiny amounts of radiation from Fukushima detected in the U.S. posed no threat to human health**
- **Americans showed heightened concerns about radiation from Fukushima**
- **Mixed messages within the government and in the media fueled concerns and confusion**

# **U.S. Nuclear Industry Environmental Monitoring**

- **Industry instituted enhanced environmental monitoring for radioactivity from Fukushima**
  - **Built upon existing nuclear plant environmental monitoring programs**
  - **Established web-based reporting system**
  - **Shared results with federal and state agencies**
- **U.S. plants identified low levels of I-131 and Cs-137 in air and water samples**
- **Detectable results have occurred intermittently in other environmental media**

# Special Web Page Created



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## NEWS & EVENTS

### Information on the Japan Earthquake and Reactors in That Region

*The thoughts and prayers at the start of the Nuclear Energy Institute are with our friends in Japan who have lost loved ones, homes and businesses during the earthquake and subsequent tsunami. We send our heartfelt sympathy and concern.*

#### Latest NEI Updates

**\*\*NOTE: Refresh your Web browser periodically to ensure you receive the latest updates appearing on this page.\*\***



Industry Action to Ensure Plant Safety



Follow NEI's New Twitter Feed for Updates on Events in Japan



**UPDATE AS OF 11:30 A.M. EDT, MONDAY, MARCH 20:**  
Radiation levels in the seawater near the Fukushima Daiichi nuclear power plant remained high on Monday, but dropped considerably from the levels reported on Sunday. Monday's sampling near the plant's south discharge outlet showed that radioactive iodine levels were 250 times normal, reduced significantly from 1,850 times normal.

Radiation dose rates also remained elevated in the turbine buildings of reactors 1, 2, 3 and 4. Tokyo Electric Power Co. on Monday said that workers had found similarly high radiation levels in water in drainage conduits outside reactors 1 and 2. The company said that rubble at reactor 3 prevented measures from being taken there on Monday.

#### Health and Radiation Safety

See updates, resources and quotes from experts on the health and safety effects of radiation.

#### Emergency Planning: Protecting the Public and Environment



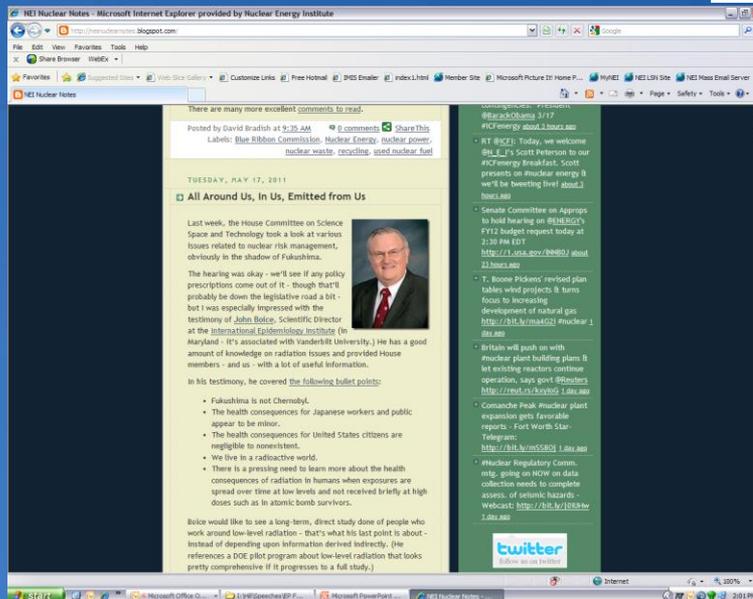
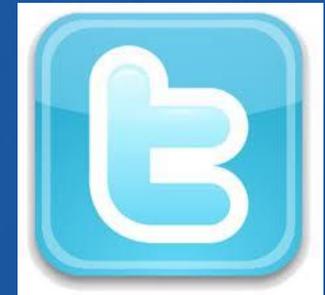
[Click here for an enlarged graphic \(JPG\)](#)

# Total Website Hits Per Day



# Social Media

- Experts on YouTube
- Twitter
- NEI Blog



#fukushima

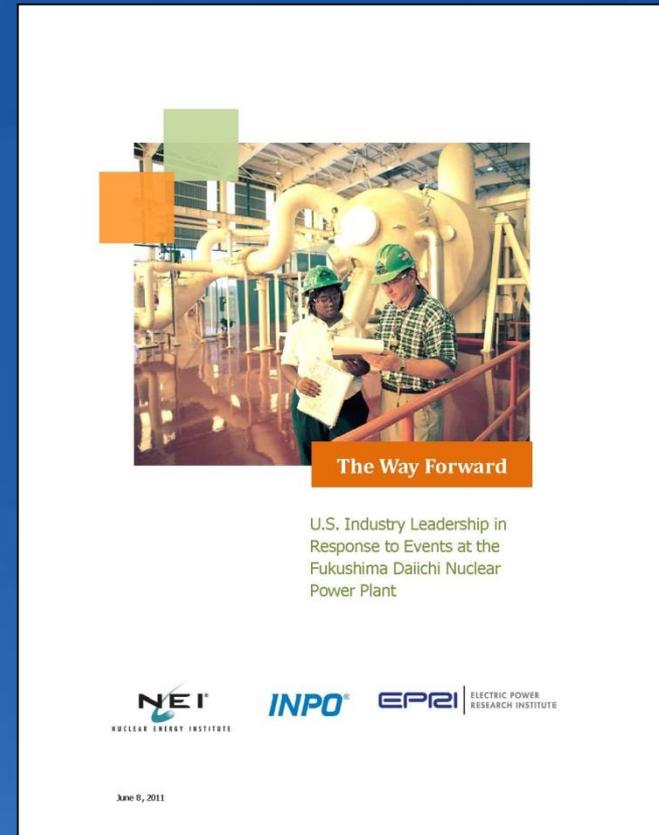
#japan

#nuclear



# U.S. Industry Steering Committee

- Includes executives and chief nuclear officers from
  - Electric companies
  - Industry associations
  - Reactor technology



# **The Way Forward: Coordinated Industry Activities**

- **Maintain and improve safety at America's 104 reactors**
- **Identify and share lessons learned from Fukushima**
- **Improve U.S. industry's response plan**
- **Conduct strategic communications outreach**
- **Manage the industry's response to new regulatory requirements**
- **Capture lessons learned from international investigations**
- **Focus on existing technical solutions and adjustments to R&D priorities to support new safety programs**

# The FLEX Concept

FLEX enhances a plant's ability to handle whatever Mother Nature has in store for it.

- **Design basis of a nuclear energy facility provides the basis for the designer to assure that safety requirements are met**
- **Facilities are well-protected for extreme natural phenomena within the design basis**
- **Risk comes from beyond-design-basis conditions → FLEX mitigates this risk**

# Building Layer Upon Layer of Safety

Diverse, flexible approach

- Portable pumps, generators, batteries, compressors, hoses, debris-clearing equipment
- Pre-staged onsite and offsite
- Mitigate the effects of any extreme event



# Portable Pumps

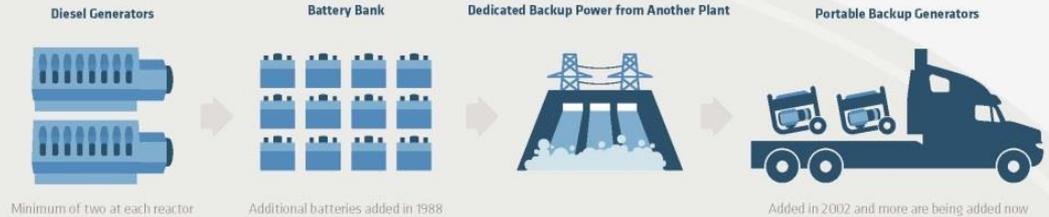


# MAKING SAFE NUCLEAR ENERGY SAFER AFTER FUKUSHIMA

FLEX is a flexible and diverse strategy developed by the nuclear energy industry to quickly and effectively implement the Nuclear Regulatory Commission (NRC's) Fukushima task force recommendations. The FLEX protection strategy addresses the main safety challenges at Fukushima—the loss of cooling capability and electrical power resulting from a severe natural event that exceeded the plant's design basis—to make U.S. facilities even safer. It builds on safety steps taken by industry during the past three decades by providing a fast, effective and efficient way to apply the lessons learned from Japan's experience.

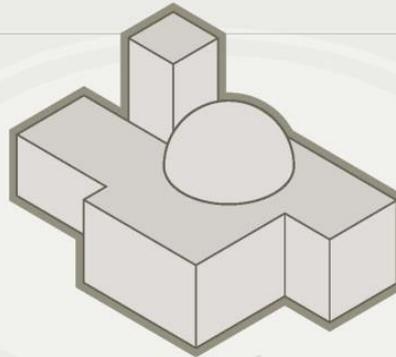
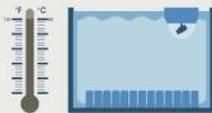
## MULTIPLE LAYERS OF POWER SUPPLY

Backup generators provide reliable electrical power and cooling capability if an extreme event disables the normal plant equipment. Additional battery banks provide electrical power and cooling capability if an extreme event disrupts regular and other backup power supply.



## ADDITIONAL SPENT FUEL MONITORING

Additional equipment in spent fuel storage pools will provide another layer of monitoring to ensure temperature and water levels are maintained.



## ADDITIONAL PUMPS

To ensure cooling procedures are maintained during and after an extreme event, additional pumps can supply water where needed.



## PREPARING OUR PEOPLE

Nuclear plant and emergency response workers will use the FLEX approach to support key safety functions across multiple reactors. Capabilities and training will be verified for nuclear plant workers to assure the continued viability and reliability of equipment. Communications capabilities will be expanded to include satellite phones and equipment to connect personnel at the plant with government emergency communications networks. Specific strategies include the following:

### Enhanced Training



### Expanded Maintenance and Testing of Equipment



### Satellite Communications



## REGIONAL CENTERS

Additional emergency equipment will be stationed in off-site support centers to provide another layer of safety and ensure prolonged reliable operation.



## PUBLIC OPINION

**74%** of Americans believe that U.S. nuclear power plants are safe and secure

**80%** of Americans believe U.S. nuclear power plants have been made safer as we've learned from experience and added technology

Biscardi Research Inc. with ORR Paper survey of 1,000 U.S. Adults February 2012

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## **Strategic Goal #8**

- **Accident response procedures provide steps for controlling, monitoring, and assessing radiation and ingestion pathways during and following an accident together with timely communication of accurate information**

# Goal 8 Objectives

- 1. Establish and maintain an accurate database for Fukushima onsite and offsite radiological conditions to support industry activities**
- 2. Enhance procedures to protect emergency responders against extreme radiological conditions**
- 3. Engage in and support activities addressing lessons learned related to radiological protection during the post-release phase (e.g., ingestion pathway)**
- 4. Develop methods for timely collection and communication of radiological protection information**

# Larger Lessons-Learned Opportunities

- **Enhanced communication and education on radiation**
- **Continued scientific research on low dose radiation health effects**
- **Improved coordination between international organizations, governments, and the nuclear energy industry**