



PHILIPPINES'

# Nuclear and Radiation Safety Infrastructure and Activities

BEFORE, DURING AND AFTER  
THE FUKUSHIMA DAIICHI ACCIDENT



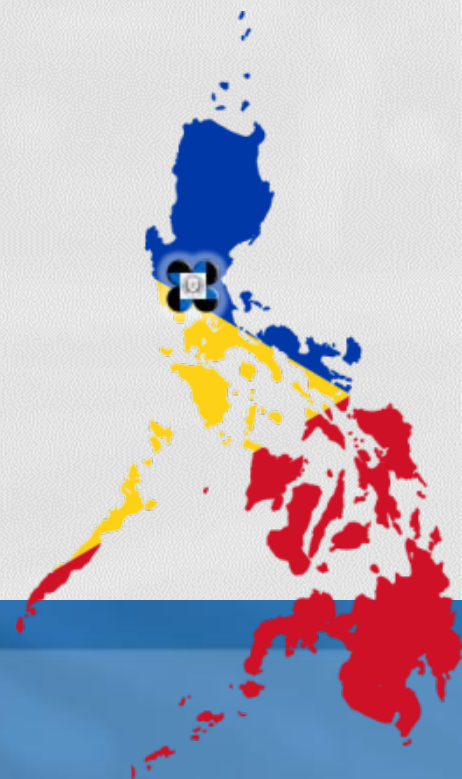
Philippine Nuclear Research Institute · PNRI

Maria V. B. Palattao  
Rolando Y. Reyes

Rhodora R. Leonin  
Ana Elena L. Conjares

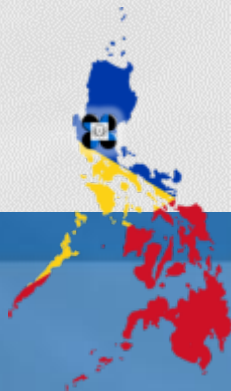
Grace M. Carlos

Joan L. Tugo



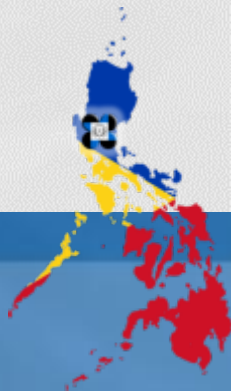
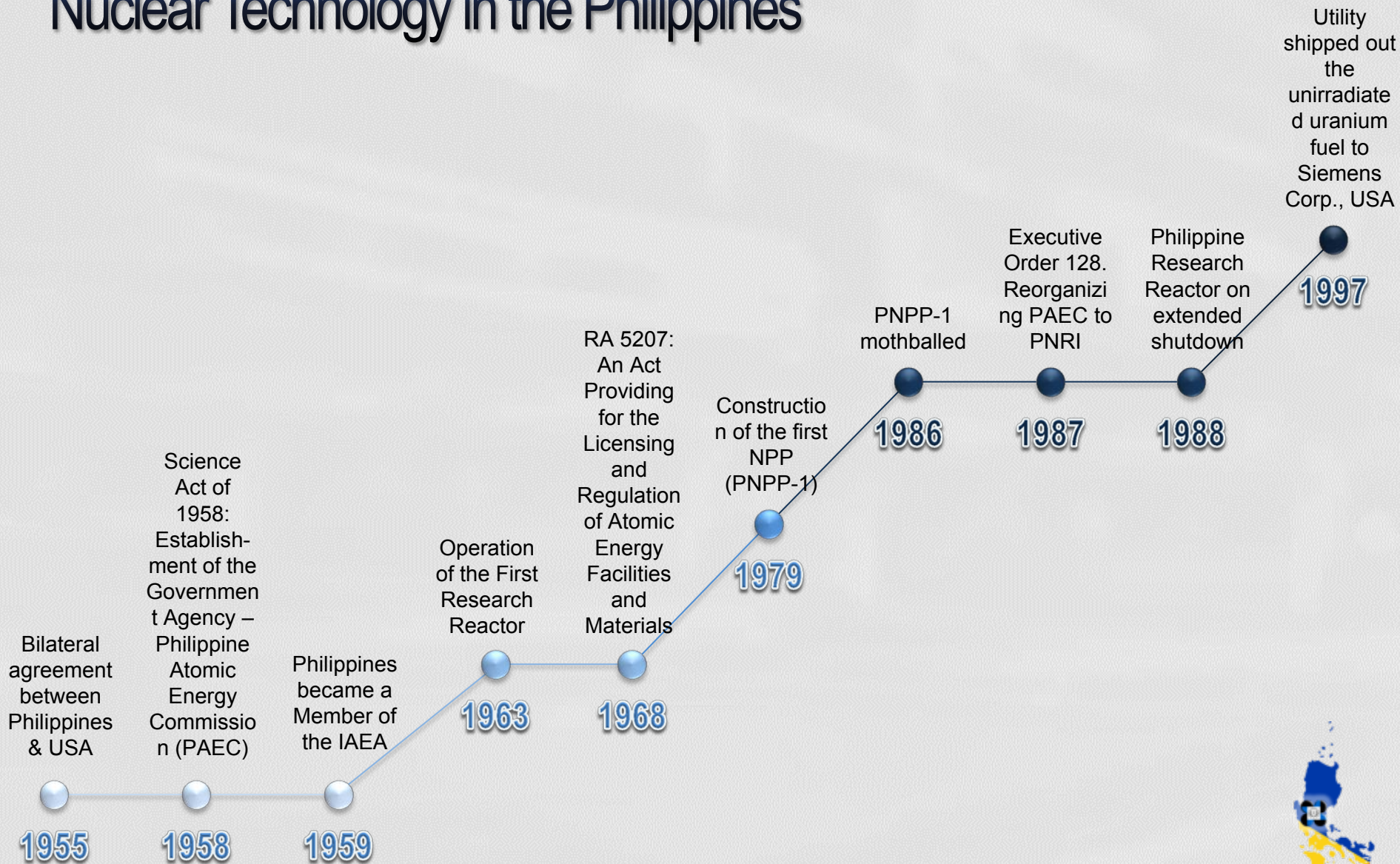
# Presentation Roadmap

- Background
- Legal and Regulatory Framework
- Emergency Planning and Preparedness
- Response During Fukushima Daiichi NPP accident
- Ongoing and Future Plans
- Lessons Learned





# Nuclear Technology in the Philippines



# Current Activities

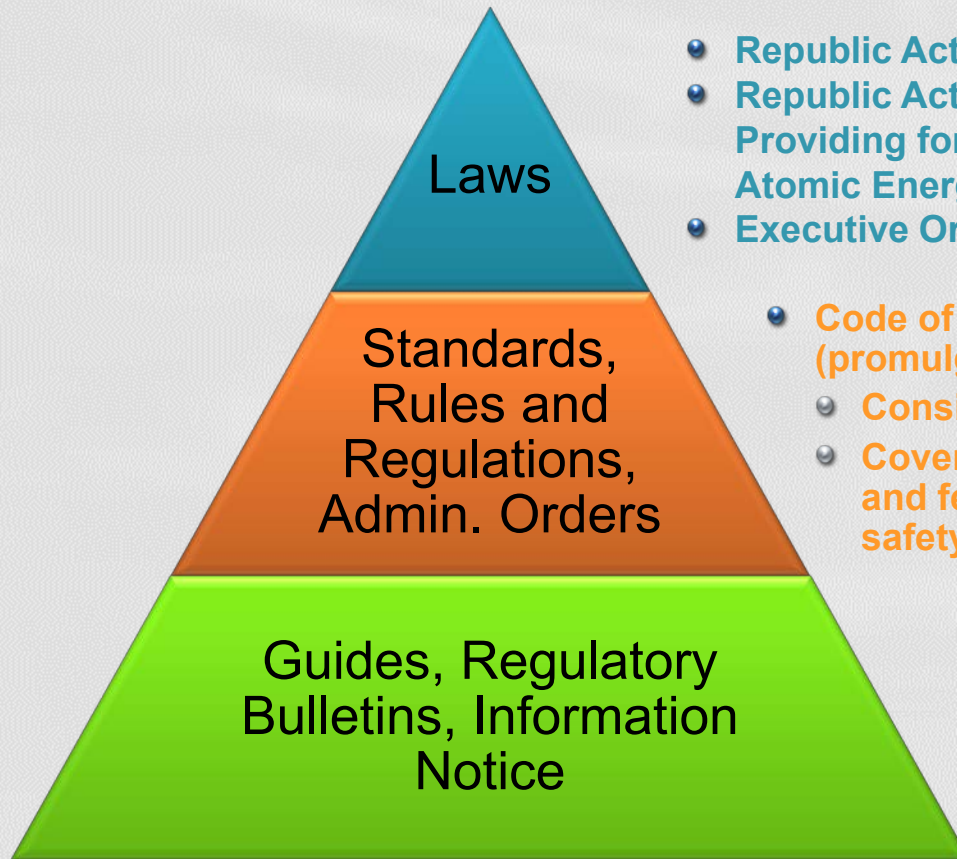
- Application of Radioactive Materials
  - Medical
  - Industrial
  - Education and Research
- Research Reactor for decommissioning
- Nuclear Power Plant mothballed



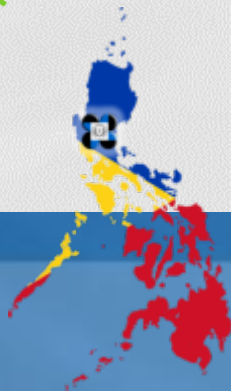


# Legislative and Regulatory Framework

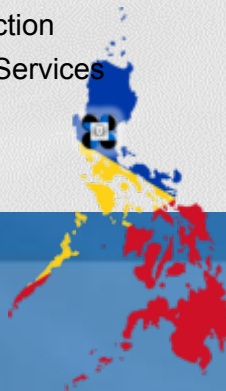
## Atomic energy facilities and materials



- Republic Act 2067 known as the Science Act of 1958
- Republic Act 5207 of 1968 also known as An Act Providing for the Licensing and Regulation of Atomic Energy Facilities and Materials
- Executive Order 128 of 1987
- Code of PAEC/PNRI Regulations (promulgated by PAEC/PNRI Director)
  - Consists of Parts 0-26
  - Covers radiation protection, transport, security and fees and practice specific administrative and safety requirements
- Based on IAEA and USNRC CFR & Guides



# The PNRI Structure

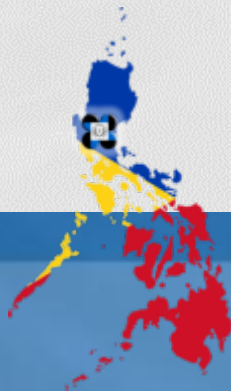




# PNRI Nuclear Regulatory Division

- Major Responsibilities

- Rulemaking
- Authorization
- Inspection and enforcement
- Incident response and emergency preparedness
- Physical protection
- Non-proliferation and safeguards
- Export and import control



# PNRI Licensing Process

**Project Application**

**Environmental Assessment  
(if applicable)**

**Public Hearing  
(if applicable)**

**License**

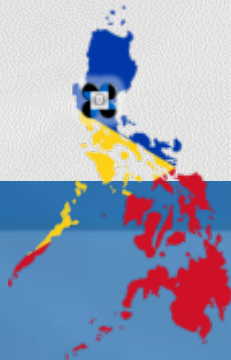
- Prepare, Construct & Operate
- Decommission

## PNRI Oversight

- License Conditions
- Inspection
- Compliance Assurance

## Licensee Obligations

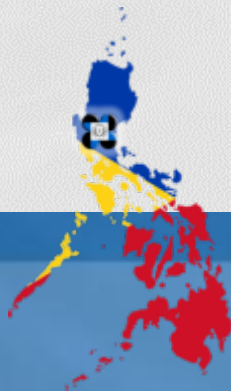
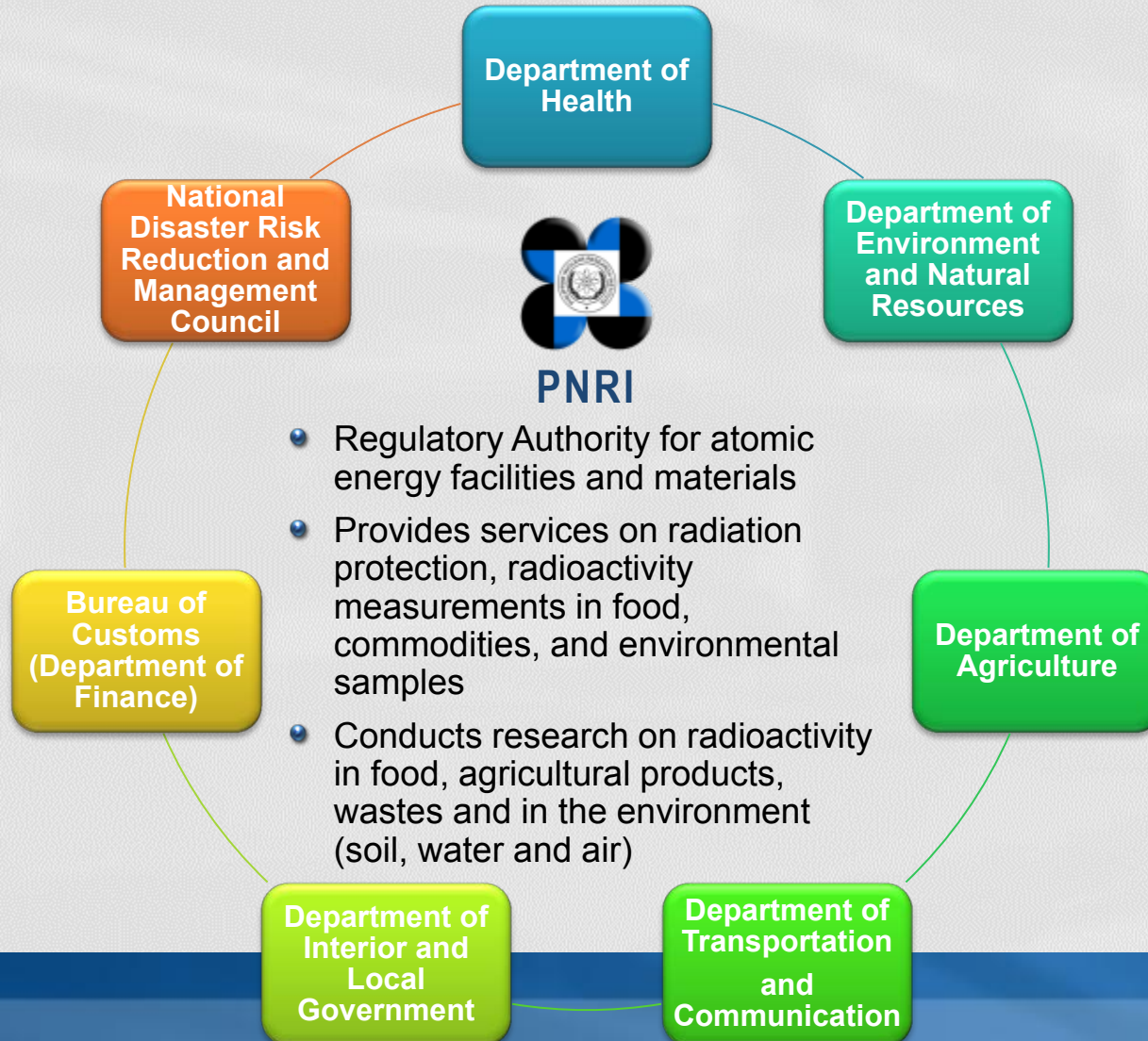
- Health and Safety
- Environmental Protection
- Security
- Monitoring
- Reporting
- Financial Guarantee





# Intergovernmental Linkages

## Radiation protection of the public and environment





## CONTENT SEARCH

## MAIN MENU

- Home
- About PNRI
- Facilities
- Services
- Programs & Projects
- **Nuclear Safety and Regulations**
  - Safety Regulations Database
- PNRI Publications
- Contact Us

## Nuclear Safety and Regulation

The Philippine Nuclear Research Institute (PNRI) is the regulatory body for all matters concerning nuclear energy and radioactive materials in the country. The **Nuclear Regulatory Division (NRD)**, formerly the Nuclear Regulations, Licensing and Safeguards Division, takes the responsibility to act as the regulatory arm of the PNRI.

As mandated by laws (RA 2057 and RA 5207, as duly amended), the NRD is authorized to establish and issue rules and regulations and orders with respect to atomic energy facilities and radioactive materials for the protection of the health and safety of the workers occupationally exposed to radiation, the general public and patients, for the prevention of danger to life and property, for the promotion of the national defense and security, and for the protection of the environment.

The PNRI is committed to provide its clients information with regards to the existing policies on nuclear safety and regulations thus the Institute developed a searchable **PNRI Nuclear Safety and Regulatory Database** which would aid various clients such as researchers, service providers, the academe, among others.

The regulatory body, as a whole, consists of the PNRI Management and the NRD headed by the Chief.

The NRD has 5 Sections that closely work together to ensure the safe use of nuclear facilities and radioactive materials.

### Regulations and Standards Development Section (RSDS)

Develops, formulates and establishes licensing rules and regulations, standards, codes, criteria, regulatory guides, bulletins on nuclear regulation and safety in conformance with international safety standards and best practices.

### Licensing Review, and Evaluation Section (LRES)

Reviews and evaluates applications for radioactive material licenses to assure that activities involving the radioactive material are carried out safely and do not pose unnecessary risk to the health and safety of the workers and the general public.

Get to know how Radioactive Material License is obtained, please click [FLYER](#)

### Inspection and Enforcement Section (IES)

## LATEST INFO BULLETIN

- [PNRI ADMINISTRATIVE ORDER NO. 02](#)
- [SERIES OF 2011 "REGULATORY CRITERIA IN DETERMINING SEVERITY OF VIOLATIONS"](#)
- [The 2013 Philippine Nuclear Science Quiz](#)

## DRAFT REGULATIONS FOR PUBLIC COMMENTS

- [Revised Code of PNRI Regulations \(CPRI\) Part 13 "LICENSES FOR MEDICAL USE OF UNSEALED RADIOACTIVE MATERIALS"](#)
- [Revised Code of PNRI Regulations \(CPRI\) Part 26 "Security of Radioactive Sources"](#)

## SAFETY AND REGULATORY DOCUMENTS

- Republic Acts / Executive Orders / Presidential Decree
- Administrative Order
- Code of PNRI Regulations
- Regulatory Guides, Bulletins and Notices





# Philippine Nuclear Research Institute

Working Towards ISO 9001:2008 Certification



## CONTENT SEARCH

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## OTHER SERVICES

## PNRI Emergency Preparedness Plan

This Web page aims to remind the licensees and to encourage members of the public to notify and report radiological incidents/emergency to the Philippine Nuclear Research Institute (PNRI) of the Department of Science and Technology.

### Call PNRI's Hotline in case of nuclear-related emergencies

Trunkline :	(632) 929-6011 up to 15
Direct Lines :	Office of the Director (632) 920-8738
	Nuclear Regulations Div. Office (632) 920-8796
	Nuclear Services Div. Office (632) 920-8784
	Radiation Protection (632) 920-8757
	Information and Library Section (632) 920-8787

Email Address : [pnrihelp@psni.dost.gov.ph](mailto:pnrihelp@psni.dost.gov.ph)

or Download and Fill-up our [Online Incident Notification Report Form](#) and email to us and our emergency managers will act on your request at the soonest possible time.

For further information refer to [NRLSD Bulletin No. 01-02](#)

## Radiological Emergency

A radiation-related emergency or radiological emergency is an event that poses an actual, potential or perceived danger to public health and safety from radioactive materials or radiation equipment.

## LATEST INFO BULLETIN

- PNRI ADMINISTRATIVE ORDER NO. 02
- SERIES OF 2011 "REGULATORY CRITERIA IN DETERMINING SEVERITY OF VIOLATION/S"
- The 2013 Philippine Nuclear Science Quiz

## DRAFT REGULATIONS FOR PUBLIC COMMENTS

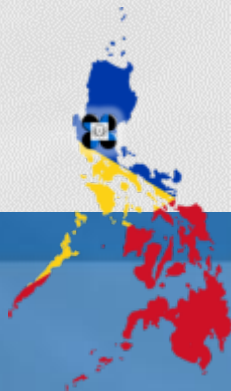
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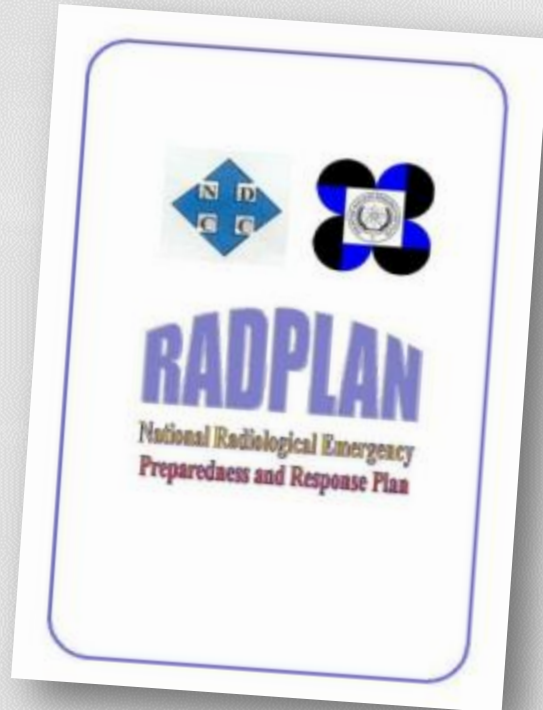
# National Co-ordination for Emergencies

- Coordination for Emergencies is provided by a new law Republic Act No. 10121 , superseding Presidential Decree 1566 (Approved 27 May 2010)
- An Act Strengthening the Philippine Disaster Risk Reduction and Management System, providing for the National Disaster Risk Reduction and Management Framework and institutionalizing the National Disaster Risk Reduction and Management Plan, appropriating Funds therefor and for other purposes
- Implementing Rules and Regulations renames the National Disaster Coordinating Council (NDCC) to the National Disaster Risk Reduction and Management Council (NDRRMC)





# The RADPLAN: National Radiological Emergency Preparedness and Response Plan

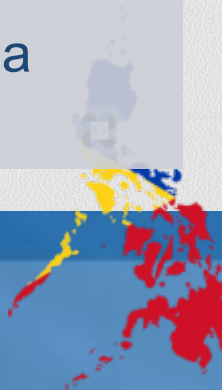


## Objective:

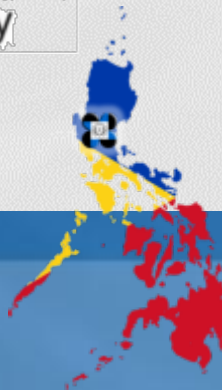
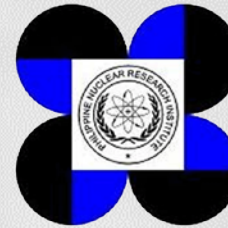
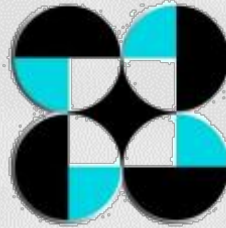
- Establish an organized national emergency response capability

## Scope:

- All kinds of radiological emergencies involving the operation of nuclear and radiation facilities; use and transport of radioactive materials, and accidents occurring outside of the Philippines with a significant impact on the country

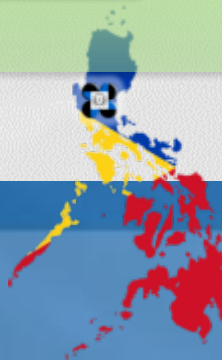
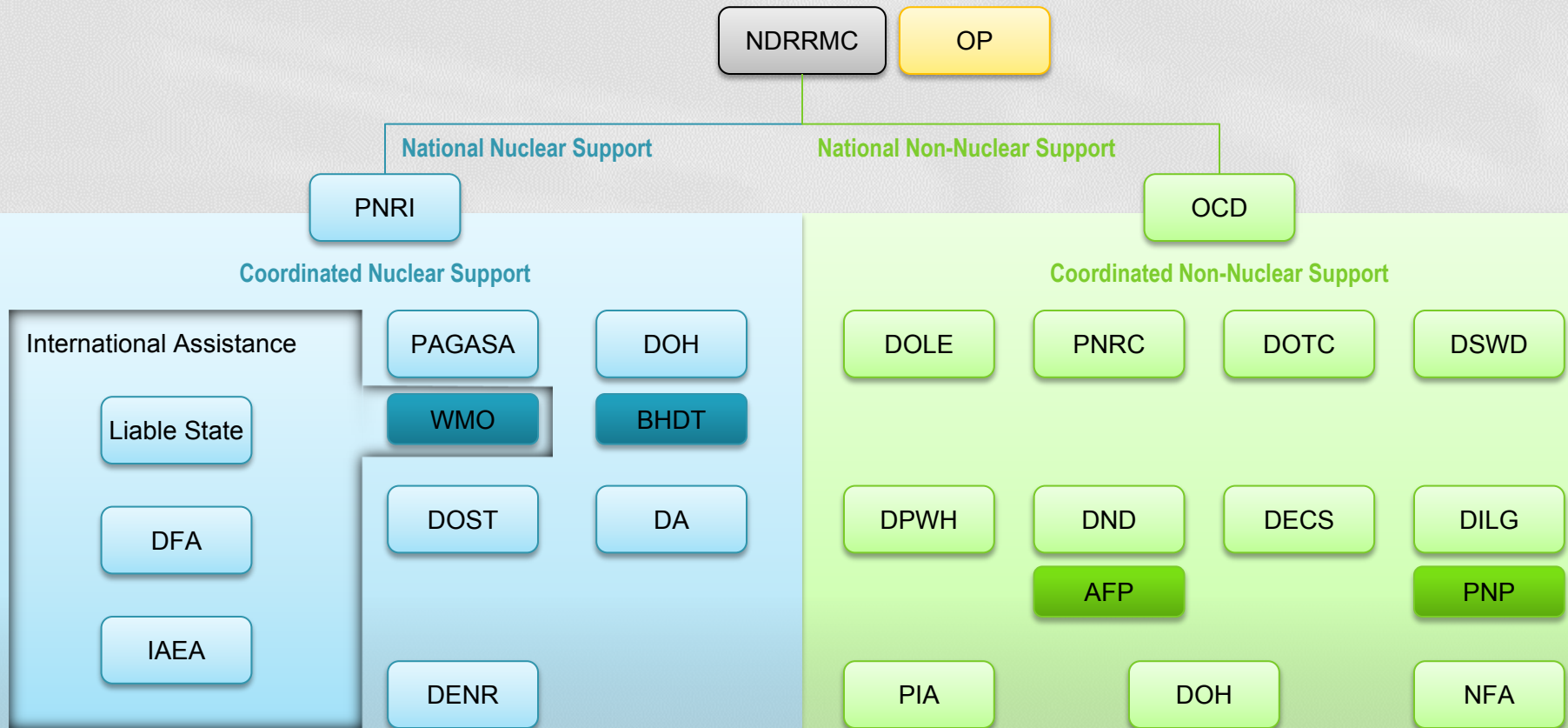


# RADPLAN Agencies





# National Response Management

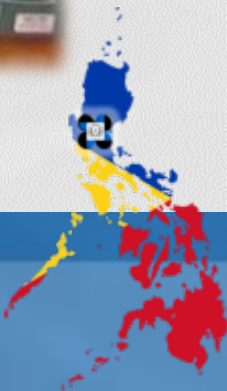


# PNRI Nuclear Response and Support Center



Primarily utilized as:

- Command control center
- Central communication
- Central storage area for the equipment for emergency preparedness and response



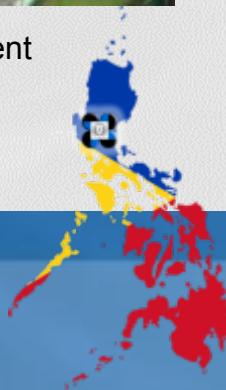


# Development of Medical Response Capability

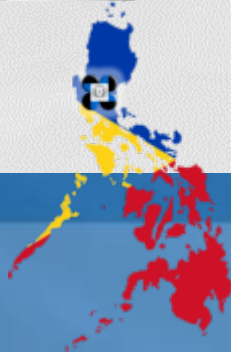


- Recent DOH Order issued by the Undersecretary of Health organizing Technical Working Group for the Development of the Preparedness and Medical Response Plan for Radio-Nuclear Emergencies

- Four specialized hospitals identified for treatment of victim of radiation accidents

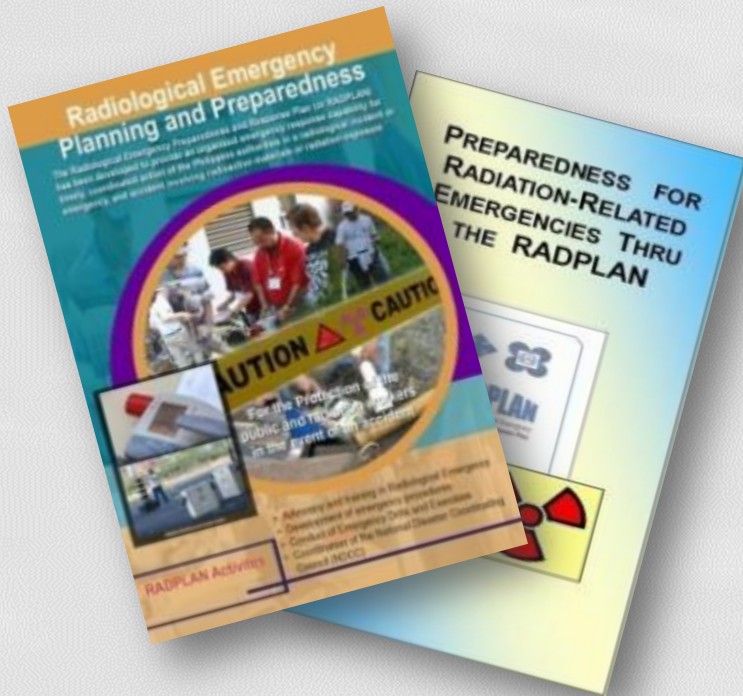


# Emergency Drills, Training and Exercises

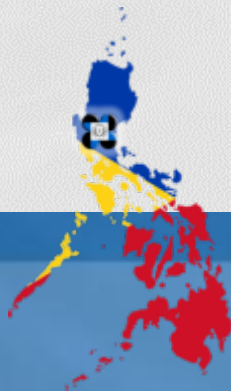




# Public Communication during Radiological Emergencies



- Existing procedures and arrangements in place using NDRRMC infrastructure
- National arrangements are in coordination with NDRRMC procedures and framework
- Advocacy and training programs being designed for news media practitioners, local government officials, emergency management personnel and members of public





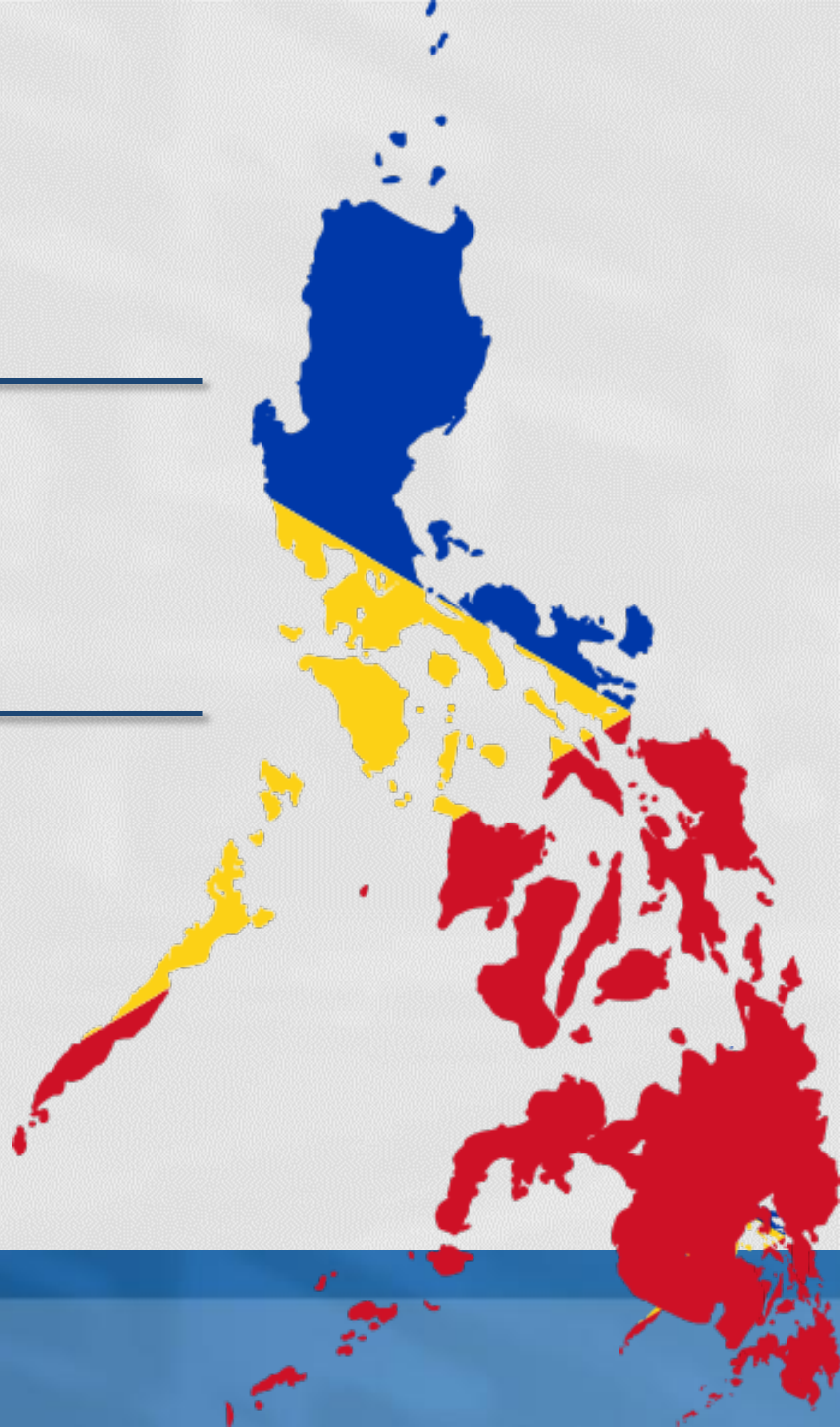
PHILIPPINES'

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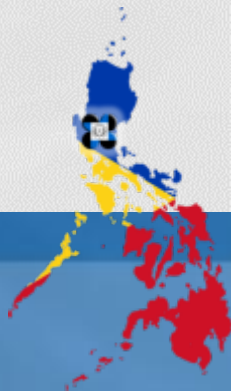
# RESPONSE

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DURING THE FUKUSHIMA ACCIDENT



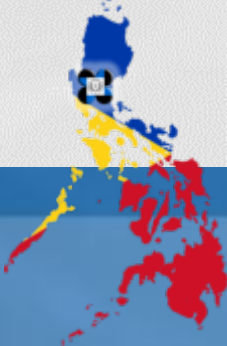






# Initial Phase

- Department Secretary convened PNRI senior management and key technical personnel at PNRI for briefing on the accident
- Briefing at the NDRMMC
- Press Briefing
- Briefing at the Office of the President

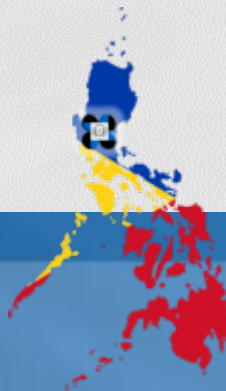
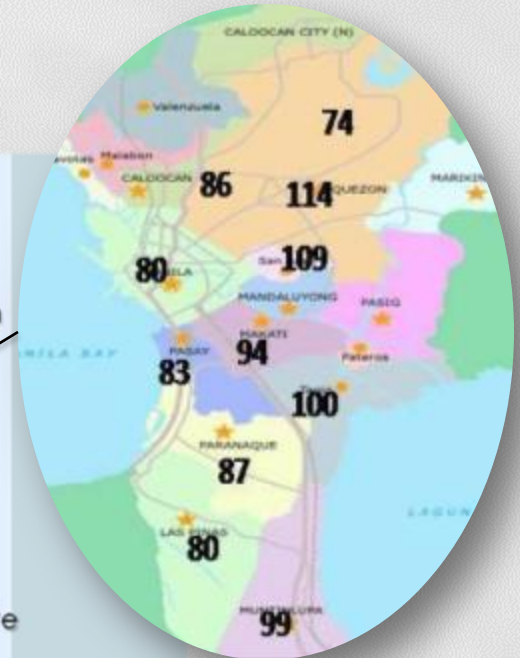




# Ambient Radiation Monitoring

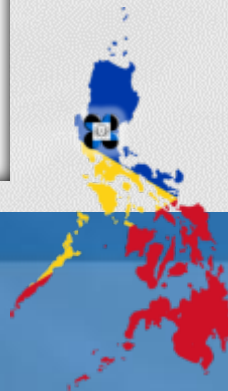
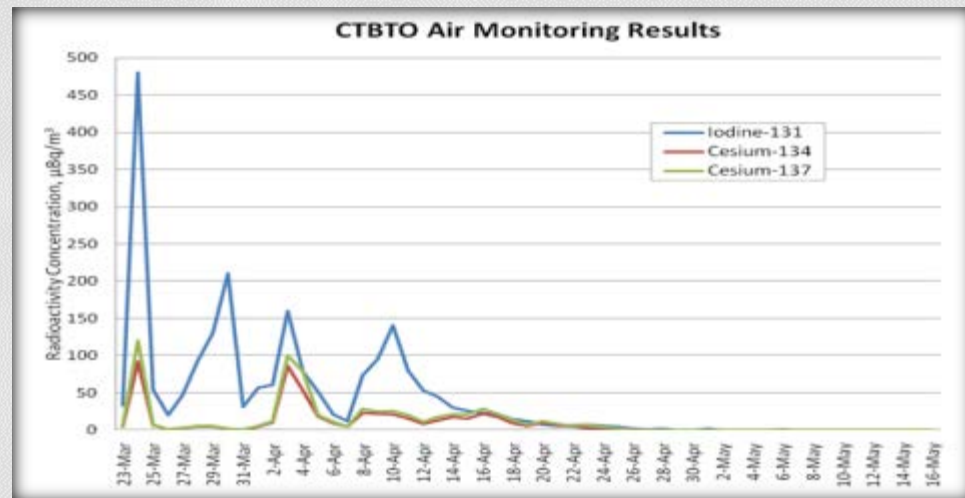


- All ambient dose rate measurements taken at PNRI and in selected areas of the country



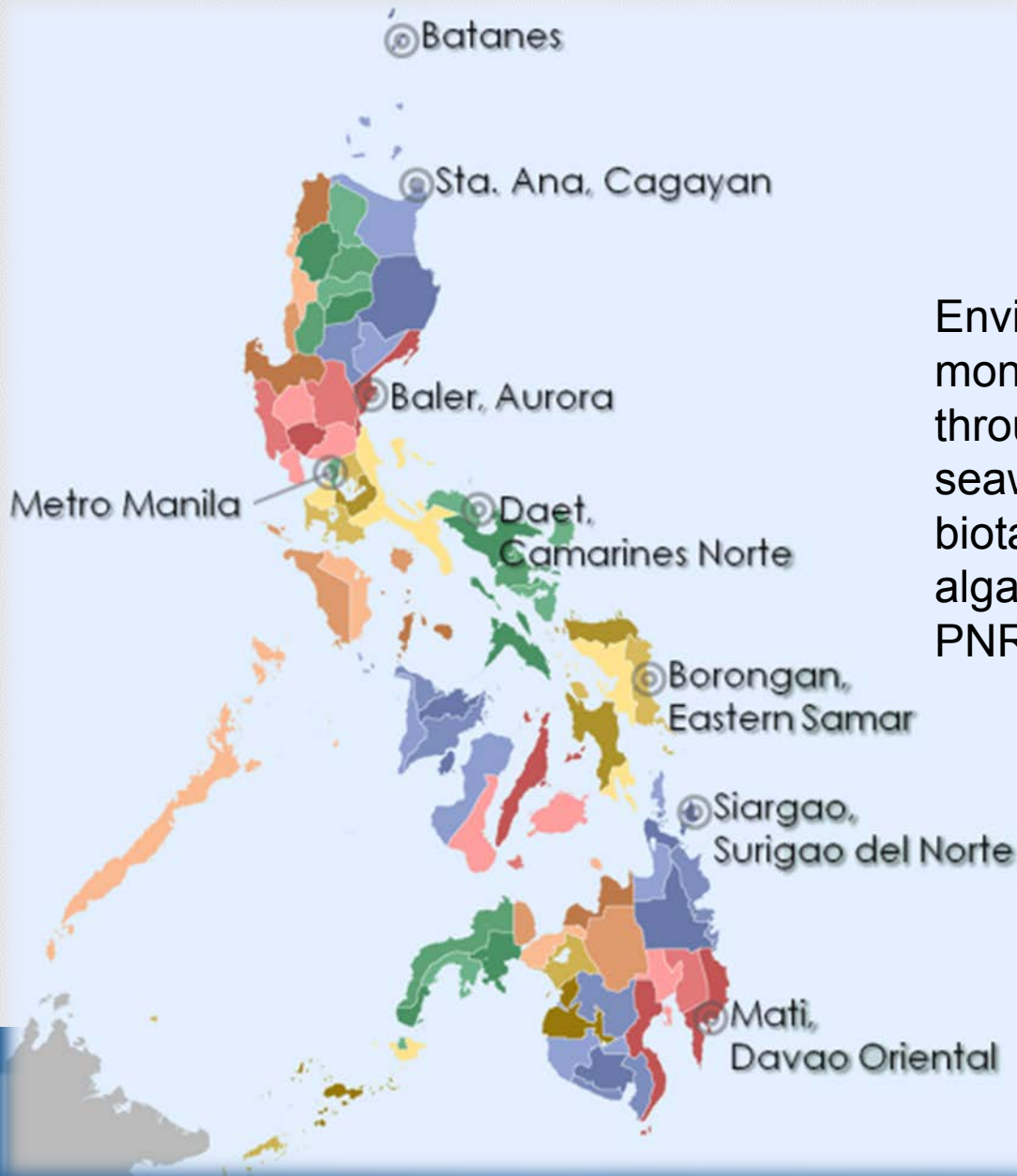


## CTBTO Radionuclide Monitoring Station (RN52) in Tanay, Rizal

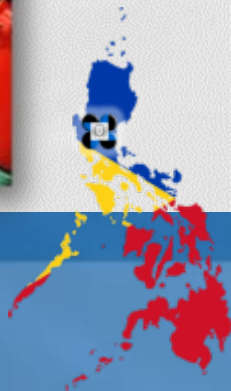




# Environmental Monitoring



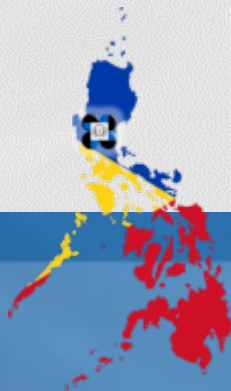
Environmental radioactivity monitoring in the Philippines through collection of soil, grass, seawater, marine sediments and biota (fish, crustaceans, molluscs, algae) and sample analyses at PNRI



# Media Briefings



- Media briefings via a network of government agencies such as the Philippine Information Agency and the privately-owned media

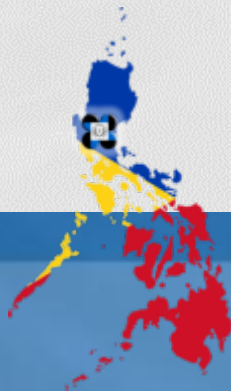




# Public Communication



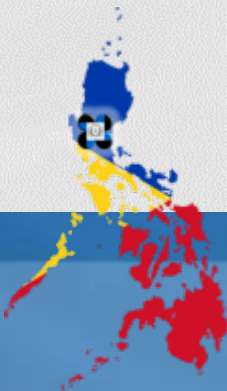
- 16 press conferences/media briefings
- 48 TV coverages
- >50 radio interviews with officials and scientists



# Public Communication



- Responded to hoax messages being disseminated by unknown sources through short message service (SMS) or text messages, emails, the internet and other means of communication

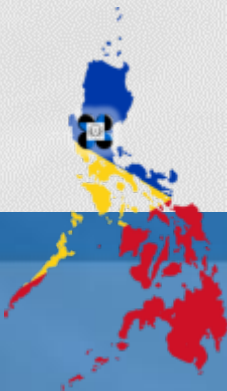




# Public Communication: Media Access



- PNRI scientists were made accessible to the media. Here, a PNRI nuclear engineer explains the nuclear accident to media



# Public Communication: Media Access



- Media was given access to laboratories and facilities used in measuring radioactivity in food products





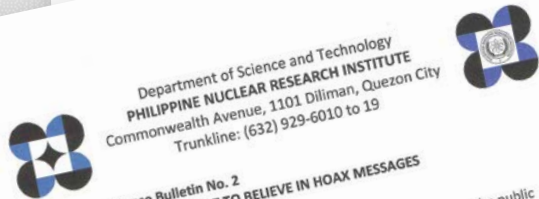
# Public Communication: Media Access



- Media was given access to radiation instruments for ambient radiation monitoring



# Daily Issuance of Information Bulletin



Department of Science and Technology  
**PHILIPPINE NUCLEAR RESEARCH INSTITUTE**  
Commonwealth Avenue, 1101 Diliman, Quezon City  
Trunkline: (632) 929-6010 to 19

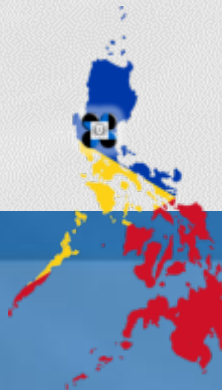
Emergency Response Bulletin No. 2  
DOST ADVISES THE PUBLIC NOT TO BELIEVE IN HOAX MESSAGES

14 March 2011  
2:30 PM

- Department of Science and Technology Secretary Mario Montejo said the public should not believe in rumors that the alleged nuclear meltdown in "Fukushima", or other places in Japan threatens to affect other places with radiation.
- The advice circulating that people should stay indoors and to wear raincoats if they go outdoors has no basis and did not come from DOST or the National Disaster Risk Reduction Management Center.
- **DOST CLARIFIES THAT THERE IS NO IMMEDIATE DANGER TO THE PHILIPPINES.**
- DOST advises the public not to believe these rumors currently spreading through text messages, emails, the Internet, and other means of communication.
- DOST also advises the public not to entertain these rumors and to stop forwarding such messages so as not to sow panic among the people.
- DOST maintains a 24/7 link-up with the International Atomic Energy Agency, the highest authority on nuclear matters for advice on the current situation of the Fukushima Daiichi plant. Available data do not indicate any immediate threats to the Philippines.
- DOST is committed to bringing accurate, reliable, and timely information regarding the Fukushima event and its possible effects to the Philippines.
- For more queries, pls. call DOST-PNRI Emergency Response Center at (632) 929-4719 or 920-8738

*Signatures*

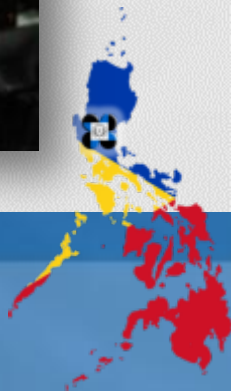
Published in the PNRI  
Website: [pnri.dost.gov.ph](http://pnri.dost.gov.ph)





# Personal Monitoring

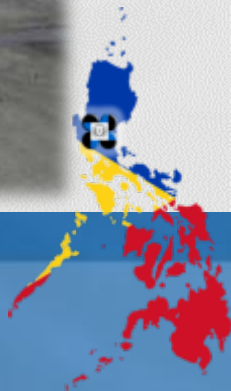
- External monitoring and thyroid monitoring for radioiodine uptakes



# Screening for Radioactivity



- Container vans and cargo from abroad were screened for radioactivity using the radiation monitoring system (RMS) at the Port of Manila

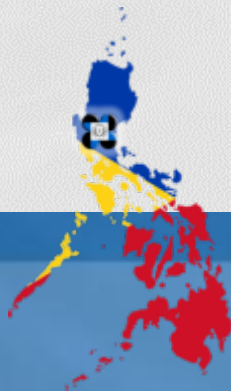




# Analysis of Food Samples Imported from Japan



- Cs-137, Cs-134, I-131
  - At LLD more or less for Cs-134, Cs-137
  - $< 1$  Bq/kg of Iodine-131



# Radioactivity in Food

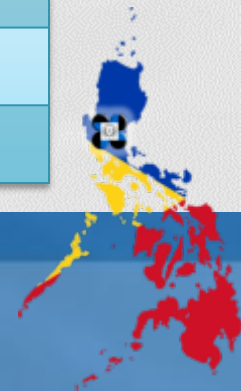
PNRI Administrative Order No. 1 Series of 2009:

Guidance Levels for Representative Radionuclides in Foods Following Accidental Nuclear Contamination

FOODS DESTINED FOR GENERAL CONSUMPTION

Dose per unit intake factor (Sv/Bq)	Representative Radionuclides	Level (Bq/Kg)
$10^{-6}$	$^{241}\text{Am}$ , $^{239}\text{Pu}$	10
$10^{-7}$	$^{90}\text{Sr}$	100
$10^{-8}$	$^{131}\text{I}$ , $^{134}\text{Cs}$ , $^{137}\text{Cs}$	1000
Milk and Infant Foods		

Dose per unit intake factor (Sv/Bq)	Representative Radionuclides	Level (Bq/Kg)
$10^{-6}$	$^{241}\text{Am}$ , $^{239}\text{Pu}$	1
$10^{-7}$	$^{90}\text{Sr}$ , $^{131}\text{I}$	100
$10^{-8}$	$^{134}\text{Cs}$ , $^{137}\text{Cs}$	1000







PHILIPPINES'

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# NUCLEAR SAFETY

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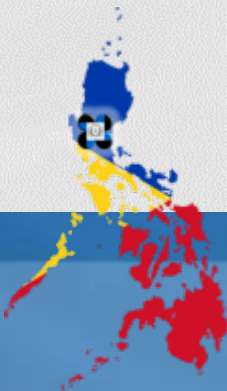
POST FUKUSHIMA ACCIDENT



# Legal Framework Initiative

- Comprehensive Nuclear Regulation and Safety Act 2012
- Comprehensive Hazardous and Waste Management Act

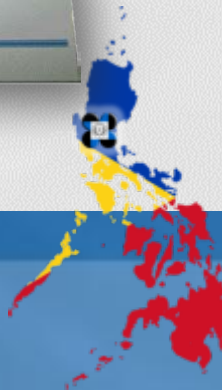
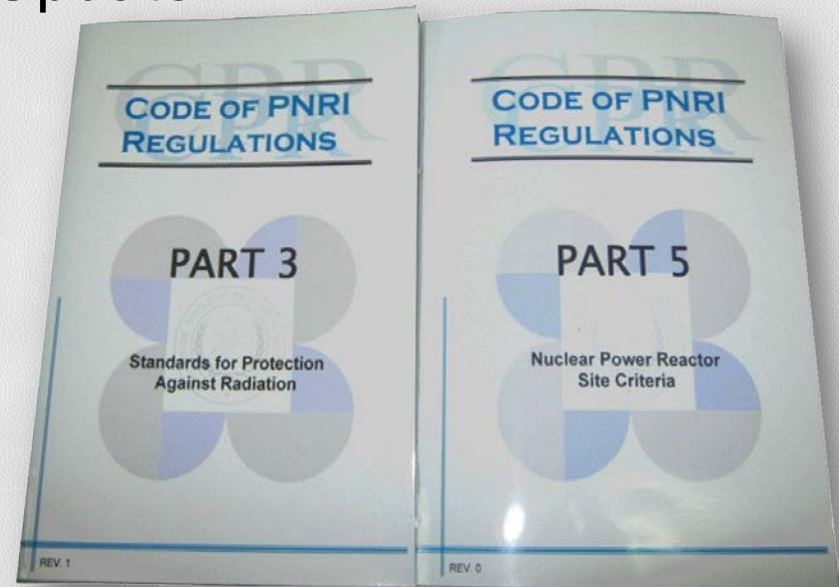
Addresses gaps in the law  
to be consistent with  
international developments,  
standards and best practices





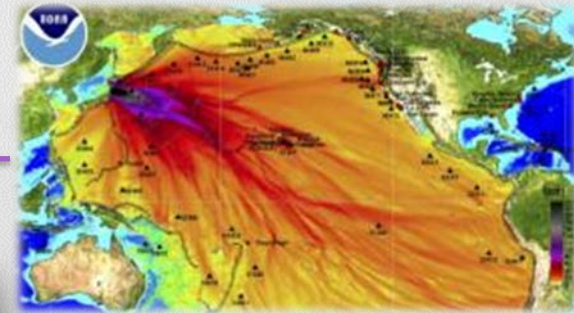
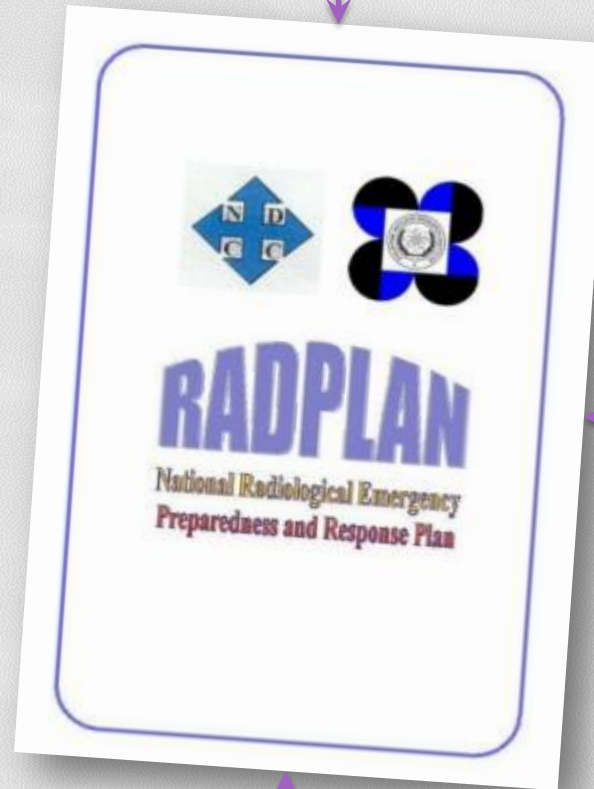
# Nuclear Safety Policy, Standards and Regulations

- Establish Nuclear Safety Policy and Strategy
  - Complete self assessment activities based on IAEA SSG 16
- Revision, Modification and Update
  - Site selection, evaluation and criteria
  - Safe Design and beyond design basis accident
  - Nuclear Damage and Liability
  - Emergency Preparedness and Response

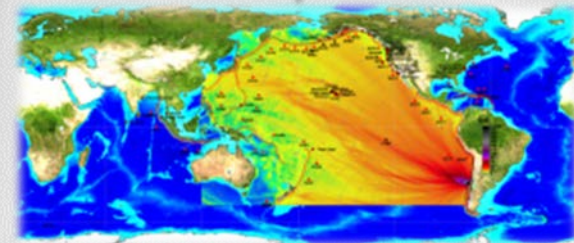


# Post Fukushima Activities

- Update RADPLAN to incorporate lessons learned in the Fukushima incident
- Continuing conduct of training and workshop on emergency response

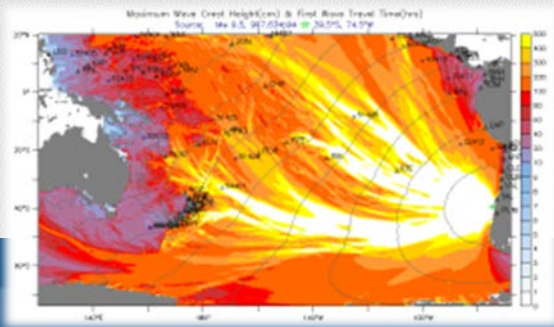


March 11, 2011  
M9.0 Japan height <1 m



February 27, 2010  
M8.8 Chile height ~1 m

May 1960  
M9.5 Chile height 1-6 m; 20 dead

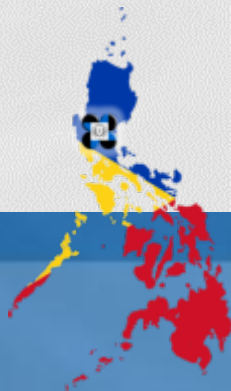




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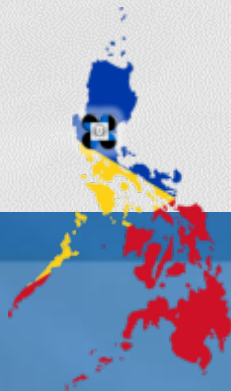


- IAEA marine project “Marine benchmark study on the possible impact of the Fukushima radioactive releases in the Asia-Pacific Region” (RAS/7/021)
  - Objective:  
To enable the RCA Member States to evaluate the extent and the potential impact of the discharges of radioactivity from the Fukushima



# Continuing Information, Education and Communication

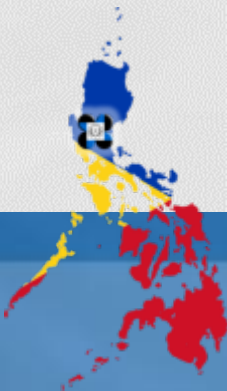
- Conduct of Nuclear Awareness Seminars
- Dialogue with Media/Press Conference





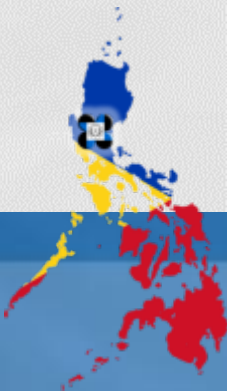
# Capacity Building for Nuclear Regulators

- Staffing Pattern and Training Needs Analysis
- Self Assessment Methodologies
- Design of Training Programs
- Cross Training of Inspectors and Evaluator on Safety & Security
- In-House Training Programs



# International Collaboration

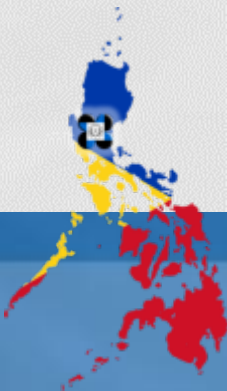
- For competency development and enhancement of regulatory and technical support organizations (1)
  - European Union (European Nuclear Safety Training and Tutoring Institute (ENSTTI))
  - France Institute for Radiological Protection and Nuclear Safety
  - USA International Regulatory Development Program
  - Asian Nuclear Safety Network
  - Forum for Nuclear Cooperation in Asia
  - IAEA Regional Cooperation Agreement (RCA), EBP and TCP



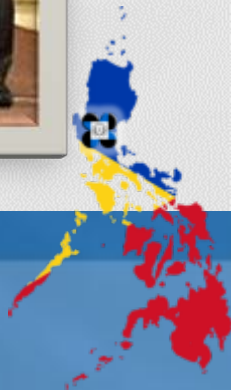


# International Collaboration

- For competency development and enhancement of regulatory and technical support organizations (2)
  - Participation in graduate school with Korea Advanced Institute of Science and Technology (KAIST)
  - Local Cooperation
  - Universities
  - Other government agencies



# ASEAN Nuclear Regulators Forum (ASEANTOM)



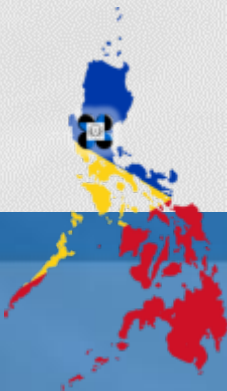


# International Commitments

- Treaties and Conventions

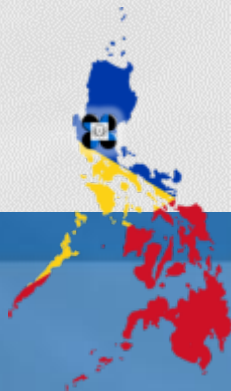
- In July 2013, close coordination with DFA
- Convention on Nuclear Safety
- Convention on the Safety of Spent Fuel and Safety on Radioactive Waste Management

For ratification  
by the Philippine Senate  
before the next national  
elections in 2016



# Current Government Program (1)

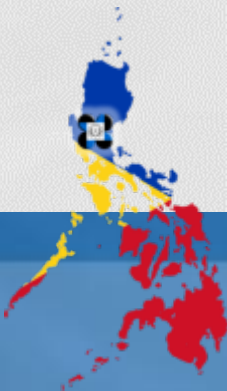
- In consideration with the Fukushima accident, the government issued a moratorium on its nuclear energy program until the safety issues concerning Nuclear Power Plant construction and operation have been properly addressed and resolved.
- The Philippines has also indicated its commitment to participate in setting the ASEAN standard for the region's nuclear energy development program. In 2010, it has joined the ASEAN in adopting the terms of reference for the Nuclear Energy Cooperation Sub-sector Network which underscores the importance of reinvigorating and improving the manpower skills in nuclear power projects to guide the region's nuclear development route.





## Current Government Program (2)

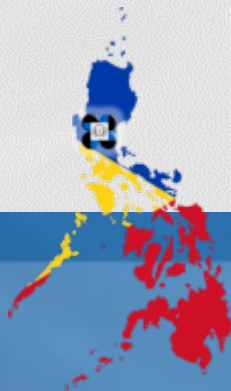
- In line with commitments to harmonize its nuclear power development program with counterparts in the southeast Asia region , the government through the DOE will jumpstart its own technical feasibility study leading to policy direction



# Lessons Learned

- The Philippines, being prone to natural disasters, should make a complete review of its nuclear regulations to consider extreme events that triggered the F-D NPP accident
- A non NPP country like the Philippines cannot afford to be complacent in its radiological emergency preparedness and response program
- Emergency Plan, no matter how good on paper, will never be enough unless tried and tested regularly
- Communicating nuclear safety in layman's language is not easy. It requires a communication plan; good nuclear safety communicator.

*“Given the voluminous information coming from different organizations during the time, it would be an advantage if the IAEA can make a timely and independent assessment for use and basis of countries having inadequate expertise in responding to radiological emergencies.”*





Thank you very much

ありがとうございます

Merci beaucoup

ขอขอบคุณเป็นอย่างมาก

Terima kasih banyak

Bohoma istuti

cảm ơn bạn rất nhiều

Onek dhonyobad

Maraming salamat po



Bohol Tarsier:  
Smallest primate in the  
world and found only in  
Bohol, Philippines

