

**IAEA**  
**Response and Assistance Network**  
**(RANET)**

**IAEA**  
**Incident and Emergency Centre**



**IAEA**  
International Atomic Energy Agency

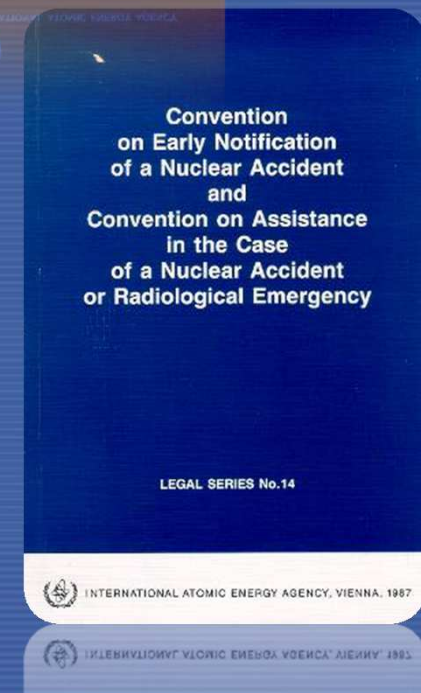
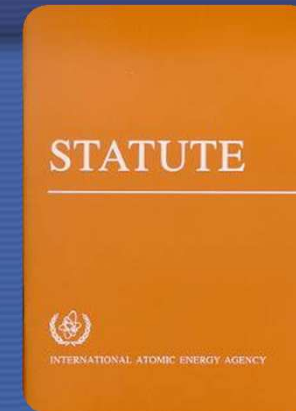
# Incident and Emergency Centre (IEC)

## Mission

Global focal point  
for emergency preparedness and response  
for nuclear and radiological safety or security  
related emergencies, threats or events of  
media interest  
and  
world's centre for coordination of international  
emergency preparedness and response  
assistance

# Basis for IEC Activities

- IAEA Statute
- Convention on Early Notification of a Nuclear Accident
- **Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency**
- Convention on Physical Protection of Nuclear Material



# Assistance Convention



*“Parties to Assistance Convention have undertaken to cooperate among them and with IAEA to facilitate prompt provision of assistance in case of a nuclear accident or radiological emergency, in order to mitigate its consequences.”*

# Assistance Convention



- Defines legal responsibilities and obligations of Parties
- Defines legal responsibilities and functions of IAEA
- IAEA must respond, in accordance with its Statute and this Convention, to a request for emergency assistance by
  - Making available appropriate resources/information/advice through different mechanisms

# Competent Authorities and Warning Points



*“Each State Party shall make known to the Agency and to other States Parties, directly or through the Agency, its **Competent Authorities** and **point of contact** authorized to make requests for and to accept offers of assistance. Such points of contact shall be available continuously.”*



# Notification of capabilities



- Assistance Convention - Article 2, paragraph 4:

*“States Parties shall, within the limits of their capabilities, identify and notify the Agency of experts, equipment and materials which could be made available for the provision of assistance to other States Parties in the event of a nuclear accident or radiological emergency as well as the terms, especially financial, under which such assistance could be provided.”*

# Response and Assistance Network (RANET)

- RANET was established in 2000
  - Operational tool to implement the Assistance Convention
  - Provision of international assistance upon request
- RANET is network of States
  - Capable and willing to provide assistance upon request
  - Appropriately trained, equipped and qualified personnel
  - Respond quickly and effectively to emergencies





# Scope of RANET

- Nuclear accidents or radiological emergencies in context of Emergency Conventions
- Other nuclear or radiological incidents
- Radiological consequences that exceed State's response capabilities

# EPR-RANET 2013

- Effective  
1 Sept 2013
- 8 Functional Areas
  - Defines 41 NAC
  - Covers wide range of response and assistance capabilities



# National Assistance Capabilities

- State Parties register National Assistance Capabilities (NAC) in RANET
- **Field Assistance Teams (FAT)**
  - Deployable assets consisting of qualified and equipped experts
- **External Based Support (EBS)**
  - Reach-back or off-scene capabilities
  - Assessment, analysis and advice



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# RANET Functional Areas

- Source Search and Recovery (SSR)
- Radiation Survey (RS)
- Environmental Sampling and Analysis (ESA)
- Radiological Assessment and Advice (RAA)
- Decontamination (DE)
- Medical Support (MS)
- Dose Assessment (DA)
- **Nuclear Installation Assessment and Advice (NAA)**

# Growing RANET capabilities

- February 2012 meeting concluded:
- *“There is a need to fully utilize RANET, as envisaged by the Assistance Convention, enabling possible expansion of its functional areas e.g. with assessment and advice to competent authorities on on-site response activities to mitigate impact of emergencies at nuclear facilities.”*
- Expanded Functional Areas, Capabilities and Resources are included in EPR-RANET 2013

# RANET Capabilities

## Nuclear Installation Assessment and Advice

- Nuclear Power Reactor Design Advice
- Nuclear Power Reactor Operations Advice
- Nuclear Power Reactor Accident Analysis
- Research Reactor Assessment and Advice
- Fuel Fabrication Facility Assessment and Advice
- Spent Fuel Storage Assessment and Advice
- Spent Fuel Reprocessing Assessment and Advice
- Operation of specialized technology



# RANET Capabilities

## NAA1: Nuclear Power Reactor Design Advice

- Provide advice from design perspective following an incident or emergency
- Assess plant status, accident evolution.
- Advise possible mitigation
- Competence in
  - ✓ plant design,
  - ✓ reactor physics,
  - ✓ electrical systems,
  - ✓ I&C,
  - ✓ thermohydraulics,
  - ✓ materials,
  - ✓ chemistry,
  - ✓ accident modelling

# RANET Capabilities

## NAA2: Nuclear Power Reactor Operations Advice

- Provide advice from operations perspective following an incident or emergency
- Assess plant status, plant parameters, operability of available systems
- Advice possible mitigation
- Competence in
  - ✓ operation,
  - ✓ radiation protection,
  - ✓ maintenance,
  - ✓ I&C,
  - ✓ thermohydraulics,
  - ✓ simulators

# RANET Capabilities

## NAA3: Nuclear Power Reactor Accident Analysis

- Perform accident analysis based on known plant status following an incident or emergency
- Assess potential actions for mitigation
- Competence in
  - ✓ performing safety and accident analysis,
  - ✓ severe accident management guidelines,
  - ✓ calculation of source terms

# RANET Capabilities

## NAA4: Research Reactor Assessment and Advice

- Provide advice based on the design of the research reactor following an incident or emergency
- Assess plant status
- Advice plant status, accident evolution, capabilities of available system, possible mitigation
- Competence in
  - ✓ reactor design & physics,
  - ✓ power systems,
  - ✓ I&C,
  - ✓ thermohydraulics,
  - ✓ materials,
  - ✓ chemistry,
  - ✓ core modelling

# RANET Capabilities

## NAA5: Fuel Fabrication Facility Assessment and Advice

- Following an accident at facility, assess criticality, chemical toxicity and radiological hazard, source term calculations
- Advice related to response and/or suitable mitigation
- Competence in
  - ✓ design of fuel assemblies,
  - ✓ fuel fabrication,
  - ✓ UF6 management,
  - ✓ criticality accident analysis

# RANET Capabilities

## NAA6: Spent Fuel Storage Assessment and Advice

- Following an accident with spent nuclear fuel in wet/dry storage
- Assess potential release terms, thermal output, criticality and toxicity hazard, source term
- Advice proper handling, suitable mitigation
- Competence in
  - ✓ design fuel assemblies,
  - ✓ wet/dry storage design,
  - ✓ thermal load calculations,
  - ✓ handling techniques,
  - ✓ criticality accident analysis



# RANET Capabilities

## NAA7: Spent Fuel Reprocessing Assessment and Advice

- Following an accident at a spent fuel reprocessing facility
- Assess criticality, chemical, and radiological hazard, source term
- Advice handling of chemicals, suitable mitigation
- Competence in
  - ✓ design of facilities,
  - ✓ chemical processes & equipment involved,
  - ✓ handling techniques,
  - ✓ countermeasure of accident scenarios

# RANET Capabilities

## NAA8: Operation of Specialized Technology

- Assistance using specialized technology e.g. robotics, UAVs
- Competence in
  - ✓ programming,
  - ✓ operation of the technology,
  - ✓ detailed manipulation using remote control,
  - ✓ on-site maintenance/modification of technology

# Registering Resources

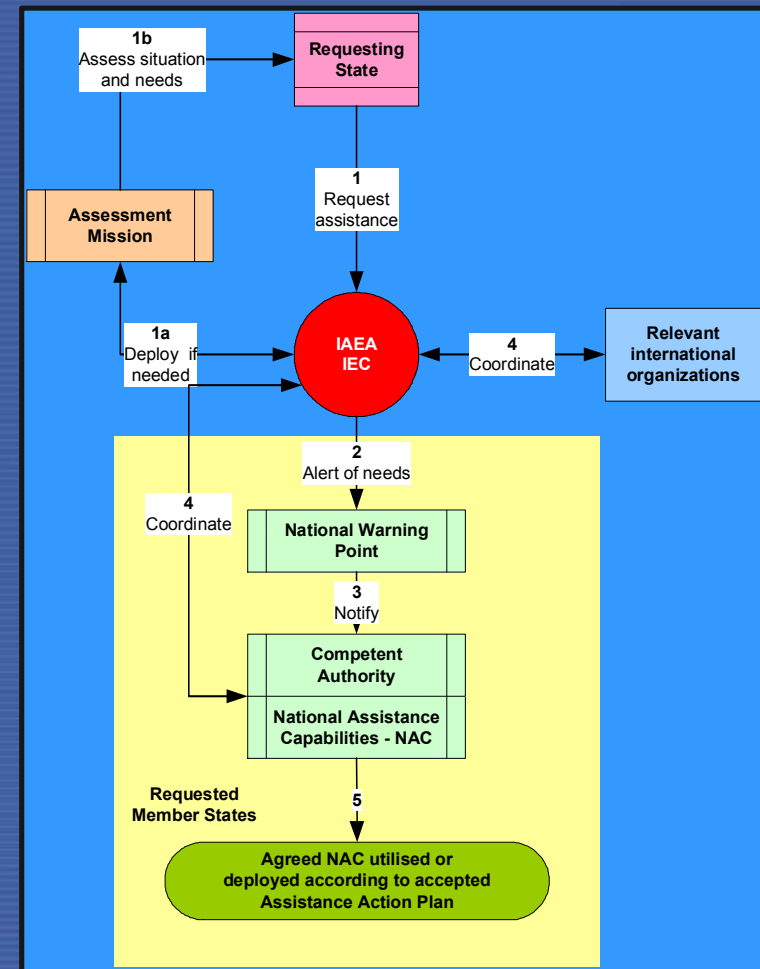
- Following lessons identified by Japan:
  - States may identify and register the resources that they may be able to provide to a requesting State

## Examples of resources:

- Radiation survey instruments;
- Personal dosimetry;
- Medical equipment and supplies;
- Measurement systems;
- Personal protective equipment;
- Electrical generators and supplies;
- Cooling and purification systems;
- Criticality control materials;
- Ventilation systems;
- Specialized resources (e.g. robotics, aircraft, shielding); and
- General supplies to support field activities.

# How RANET is activated

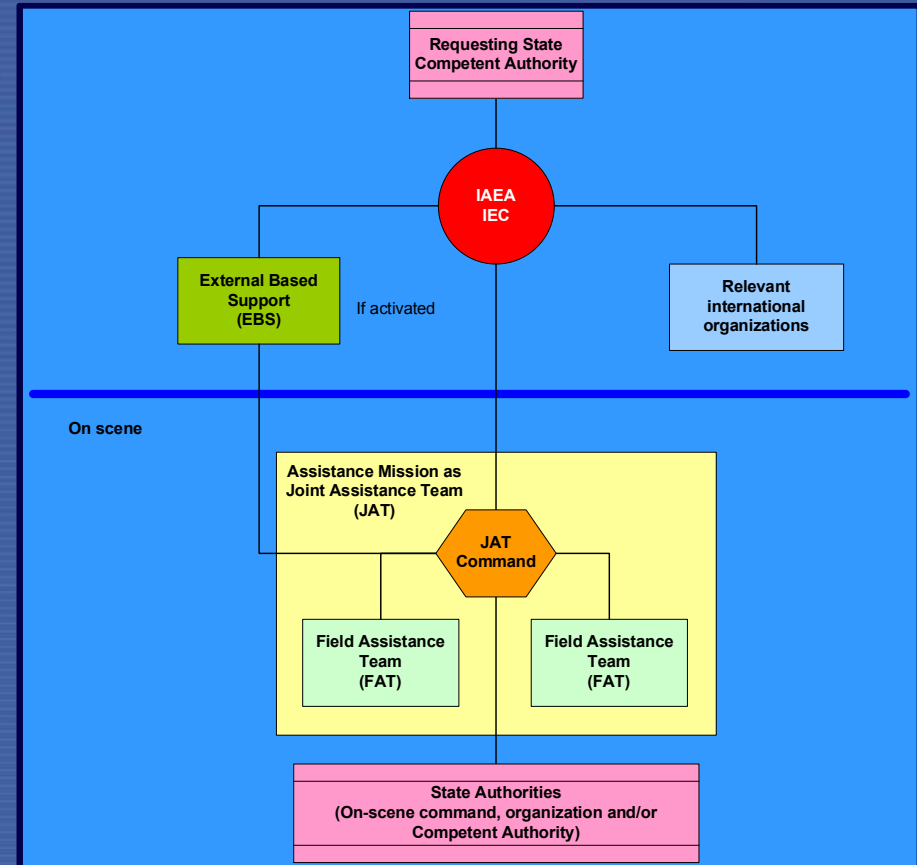
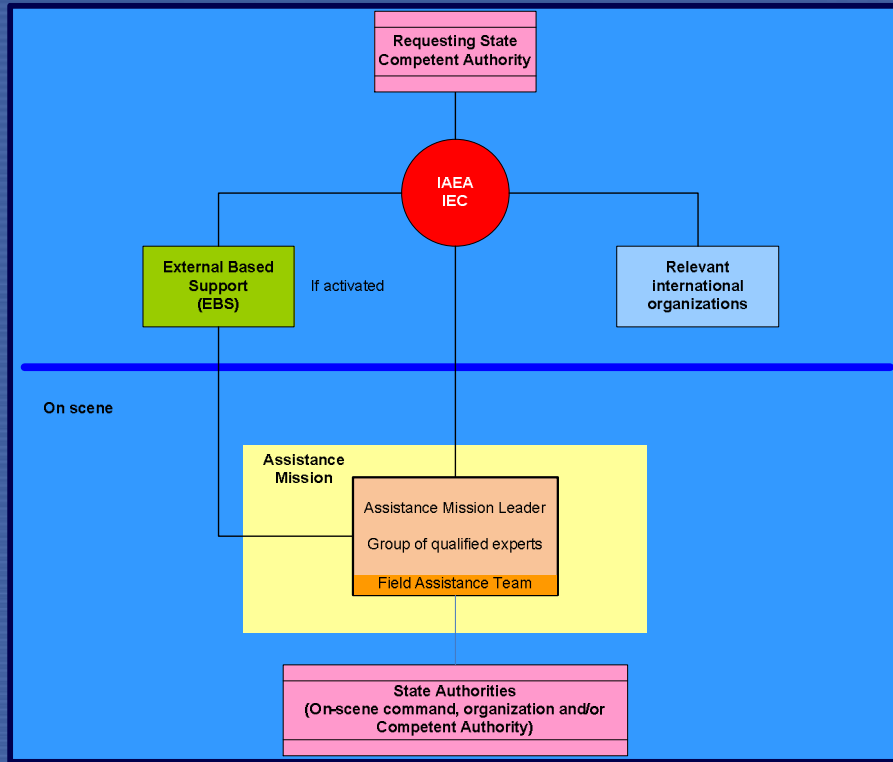
- IEC operates 24/7 on-call system
- RFA made by CA or PM:
  - USIE, Fax, Telephone
- IEC assess and alerts RANET partners
- Develop plan
  - Deploy Assistance Mission
  - Provide advice remotely



# Assistance Missions

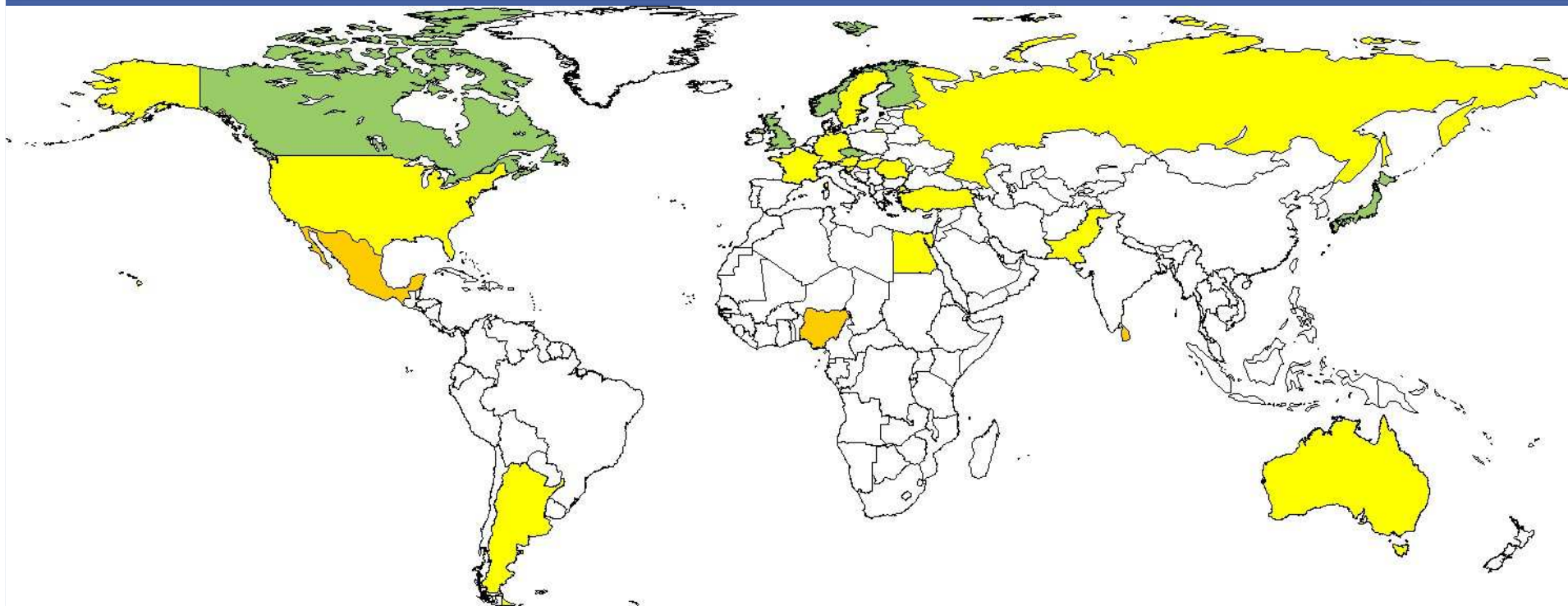
- An Assistance Mission is performed by a group of qualified experts and can be:
  - A deployed **Field Assistance Team (FAT)**
  - an **External Based Support (EBS)**; or
  - a **Joint Assistance Team (JAT)** comprising of a combination of FAT and/or EBS

# Assistance Missions





# State Parties Registered in RANET



FAT



EBS



FAT + EBS

October 2013: 23 State Parties



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# State Parties Registered in RANET

September  
2013:

23 State  
Parties

Registered	Registration Date	Source Search and Recovery	Radiation Survey	Environmental Sampling and Analysis	Assessment and Advice	Medical Support	Dose Assessment	Decontamination	Nuclear Installation A&A
Argentina	26-Sep-2008						FAT EBS		
Australia	19-Mar-2008	FAT	FAT	FAT	FAT EBS		FAT EBS	FAT	
Austria	13-Apr-2010	FAT EBS	FAT EBS						
Canada	16-Oct-2012						EBS		
Czech Republic	15-Apr-2009						EBS		
Egypt	11-Aug-2009	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS		FAT EBS	
Finland	17-Dec-2007						EBS		
France	19-Aug-2008	FAT	FAT	FAT EBS	FAT EBS	FAT EBS	FAT EBS		
Germany	17-Jun-2013	FAT EBS	FAT EBS	FAT EBS	FAT EBS		FAT EBS	FAT	
Hungary	9-Jun-2008	FAT	FAT	FAT EBS	FAT EBS	FAT	EBS	EBS	
Japan	18-Jun-2010		EBS	EBS	EBS	EBS	EBS		
Mexico	18-Dec-2007	FAT	FAT	FAT			FAT		
Nigeria	29-Aug-2008	FAT	FAT	FAT	FAT		FAT		
Norway	5-Nov-2012			EBS					
Pakistan	11-Feb-2008	FAT EBS	FAT EBS	FAT EBS	FAT EBS				
Romania	16-May-2008		FAT EBS	FAT EBS	EBS		EBS		
Russian Federation	23-Jul-2010		EBS	EBS	EBS	FAT EBS	FAT EBS		
Slovenia	5-Feb-2008	FAT EBS	FAT EBS	FAT EBS	FAT	FAT	FAT		
Sri Lanka	13-Dec-2007	FAT	FAT	FAT					
Sweden	11-Mar-2008			EBS	EBS		EBS		
Turkey	11-Mar-2008	FAT EBS	FAT EBS	FAT EBS	EBS		EBS		
United Kingdom	4-Sep-2012		EBS	EBS	EBS		EBS		
USA	20-Dec-2007	FAT EBS	FAT EBS	FAT EBS	EBS	FAT EBS	FAT EBS		



# Registration in RANET

- Prerequisites
  - State must be Party to Assistance Convention
  - Competent Authority must complete and submit application
- Information needed
  - Statement of endorsement by Competent Authority
  - Information on resources and areas of expertise of NAC
    - May include nominal list of generalized experience and equipment lists, statement of ability, quality and timeline for deployment of FAT and activation of EBS

**REGISTRATION OF NAC RESOURCES**  
IN THE RESPONSE AND ASSISTANCE NETWORK – RANET

**PART A: GENERAL INFORMATION**

1. Applying State/International Organization  
Name: \_\_\_\_\_

2. Competent Authority  
Name: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Email: \_\_\_\_\_ Web site: \_\_\_\_\_ (optional)

3. NAC coordinator  
Name: \_\_\_\_\_  
Org: \_\_\_\_\_  
Address: \_\_\_\_\_  
Telephone: \_\_\_\_\_ Fax: \_\_\_\_\_  
Email: \_\_\_\_\_

# Conclusion

- Assistance Convention is the legal basis for provision of international assistance
- RANET is operational tool to implement Assistance Convention
- RANET mechanism has been used effectively in assistance requests
- Continued success depends on:
  - Additional capabilities registered
    - Both FAT and EBS
  - Regional distribution
  - Preparedness to respond timely

# Thank you!



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