IAEA
International Atomic Energy Agency

Update on IAEA EP&R activities

Fifth General NERIS Workshop
5 April 2019, Roskilde, Denmark

Department of Nuclear Safety and Security
Incident and Emergency Centre

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Update on Recent and Planned Activities

- Preparedness:
  - Development of Safety Standards and Technical Guidance
  - Capacity Building Activities (Training, EPRIMS, EPREV)

- Response:
  - Notification and official information exchange (USIE, EPR IEComm)
  - Assessment of potential emergency consequences and prognosis of possible emergency progression

Safety Standards and Guidance

Development of Safety Standards

- **DS475** (*Safety Guide on Public Communication*):
  - Expected to be approved in April 2019 and published by this summer

- **DS469** (*Safety Guide on EPR in Transport, revision of TS-G-1.2*):
  - Expected to be approved by December this year and published in 2020

- **DS504** (*Safety Guide on EPR, revision of GS-G-2.1*):
  - Expected completion and approval: 2021

- **DS505** *(Safety Guide on Source, environmental and individual monitoring, revision on RS-G-1.8):*
  - Expected completion: 2021

Development of Technical Guidance (1)

- **EPR Protection Strategy**:
  - Expected approval in Q2 2019, to be published in 2019
  - Pilot training already delivered in November 2018

- **EPR- On-site plan for NPP**:
  - Approved in November 2018, to be published this year
  - Pilot training scheduled in Ljubljana, Slovenia, June 3-7 2019

- **Revision of INES User's Manual:**
  - Technical Meeting: 23-27 April 2018, Vienna

Development of Technical Guidance (2)

- **EPR-NPP Assessment (Revision of TECDOC 955)**
  - Approved in September 2018, to be published this year
  - Pilot training implemented in March 2018

- **EPR Combined Emergencies**
  - Almost completed. To be approved by beginning Q2 2019 and published this year
  - Pilot training to take place in Q4 2019

- **EPR Radiation Monitoring (Revision of TECDOC 1092)**
  - Almost completed. To be approved in Q2
  - Pilot training to take place in Q4 2019

Development of Technical Guidance (3)

- **Revision of EPR First Responders**
  - Almost completed. To be approved in Q2 and published this year
  - Pilot training (Train the trainers) to be implemented in July 2019

- **EPR Radiological OIL's**
  - In advanced degree of completion. To be approved by Q3 2019
  - Pilot training to take place in Q4 2019

- **EPR Series in the medical field**
  - **EPR Series Internal Contamination**. Published July 2018
  - **EPR Series Medical Physicist and Pocket Book.** Approved in November 2018, to be published in 2019
  - **Revision of EPR Medical 2005.** To be approved in Q2 2019
  - **EPR Medical Follow up.** To be approved in Q2 2019

Capacity Building

Capacity Building: Training and Workshops (1)

School of Radiation Emergency Management:

- 3-week training course, to provide a comprehensive training to MS officials involved at mid managerial level in EPR
- **3 Schools** held in 2018
  - 82 experts from 46 MSs trained
- **3 Schools** planned for **3Q-4Q 2019**:
  - Brazil (for MSs in the **Latin America** Region), August 26 to September 13
  - China (TBC) (for MSs in the **Asia & Pacific** Region)
  - TBD (for **Small Island of the Pacific** MS)

Capacity Building: Webinars

Whenever possible to be jointly organized by international organizations, co-sponsors of GSR Part 7 and other interested organizations

- One organized in October 2018 (jointly with FAO):

  Food control during nuclear or radiological emergencies

- Next (2019, IAEA/Interpol):

  Nuclear or Radiological Emergencies triggered by nuclear security events

EPREV Missions

EPREV Missions

- One of the peer reviews offered by the IAEA
- To strengthen nuclear safety in Member States
- Focus on the arrangements and capabilities to prepare for, and respond to, N/R emergencies
- Based on IAEA Safety Standards in EP&R

EPREV Missions

- 46 EPREV missions conducted in 41 MS since 1999
- EPREV Guidelines published in October 2018
- Two EPREV implemented in 2018:
  - Belarus (October)
  - Cuba (November)
- Two already in the pipeline for 2019:
  - Canada (June)
  - UAE Follow-up (September)

Unified System for Information Exchange in Incidents and Emergencies

USIE

Notification and information exchange: USIE

- **USIE 7.1** made available in October 2018

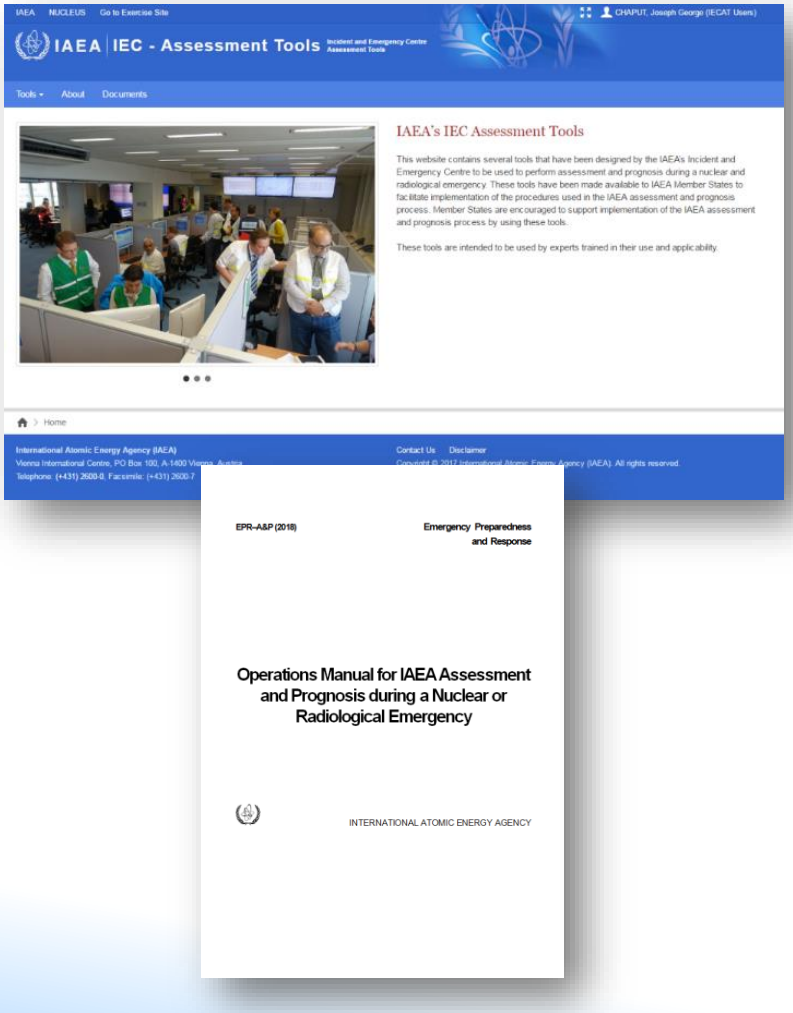
  Highlights of some of the new features:

  - Possibility for short messages
  - Adding information to already published EMERCON forms
  - Encryption possibility – within the forms
  - Other improvements: display of various forms, form suggestion wizard etc.

- 5 **Webinars** on USIE 7.1 held in 2018

Assessment and Prognosis

Assessment and prognosis: Operations Manual



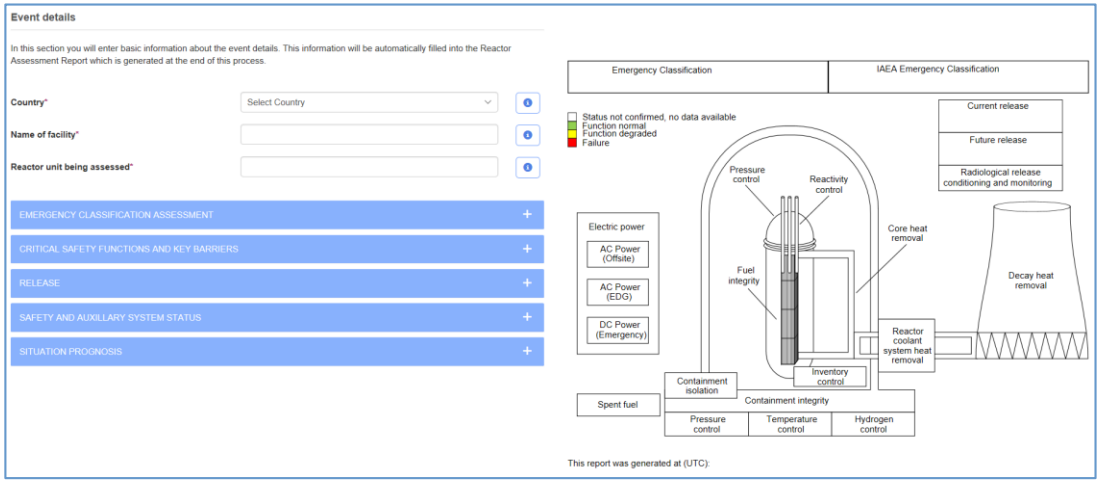
- **EPR – A&P manual** to be published soon
  - Elaborates the IAEA and Accident State assessment and prognosis process
  - Provides objectives, expected timing, information sharing processes and review process with the AS
- To be complemented with a **supporting guide** that provides technical basis for process
  - To be available online on assessment tool website

Overview of the Reactor Assessment Tools

- Assessment and Prognosis (A&P)
  - new IAEA role requested by Member States in September 2011 -

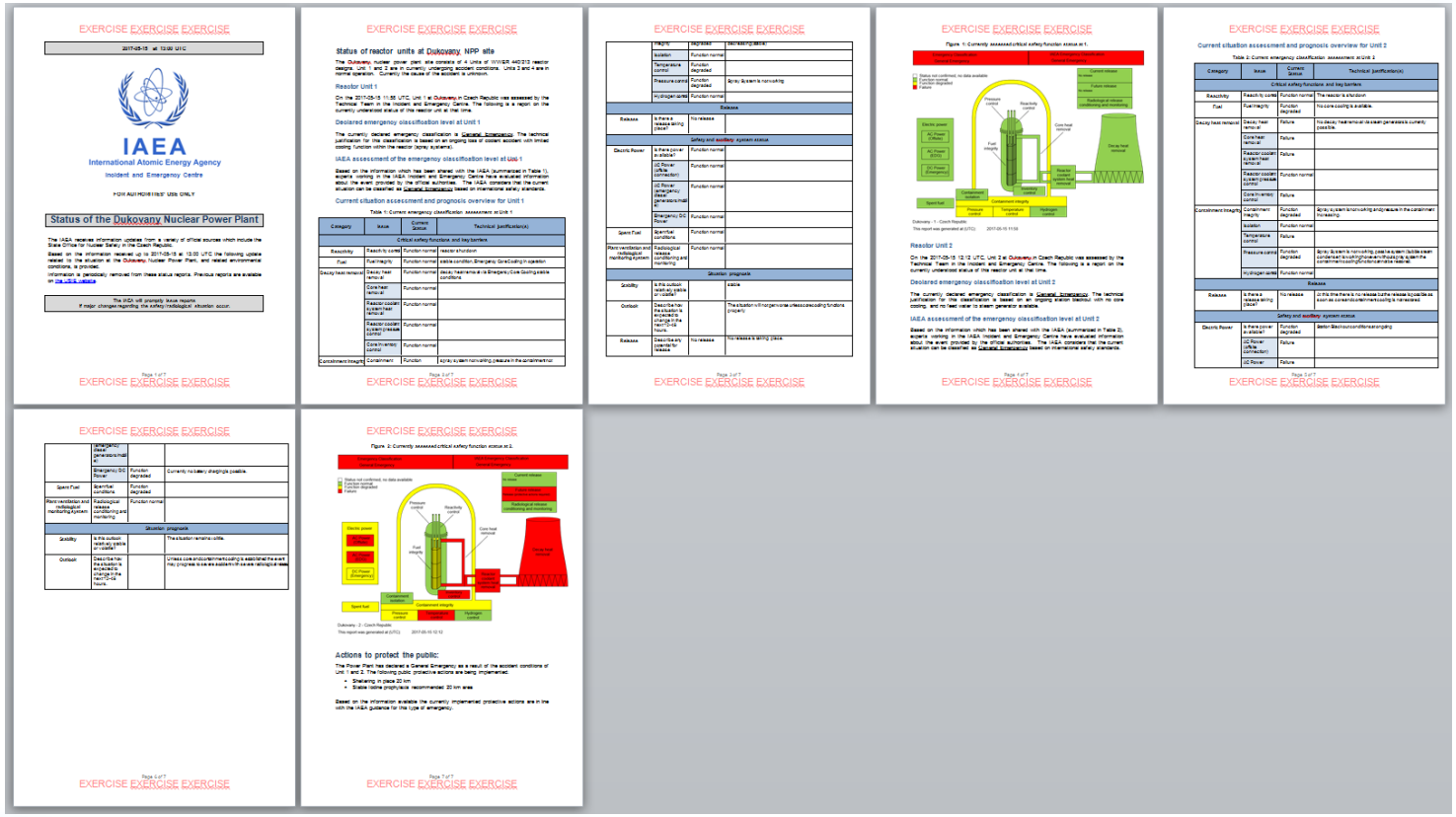
  Assessment of potential emergency consequences and a prognosis of possible emergency progression

- RAT provides a clear and efficient workflow for the study of the status of the barriers of containment and their critical safety functions



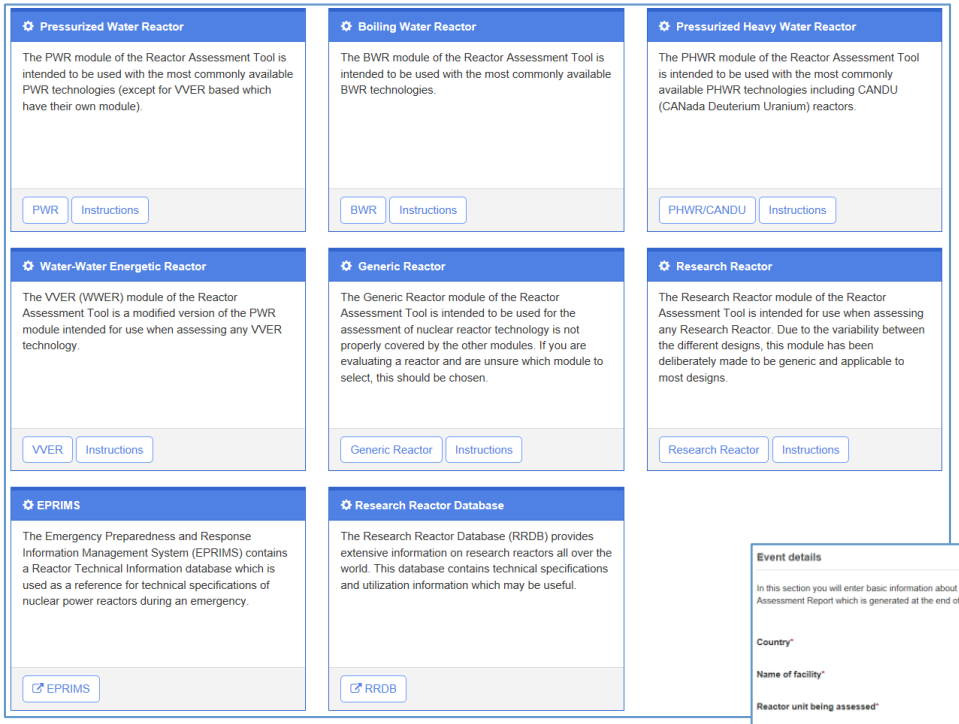
Overview of the Reactor Assessment Tools

- Provides a mechanism for exchanging technical expertise

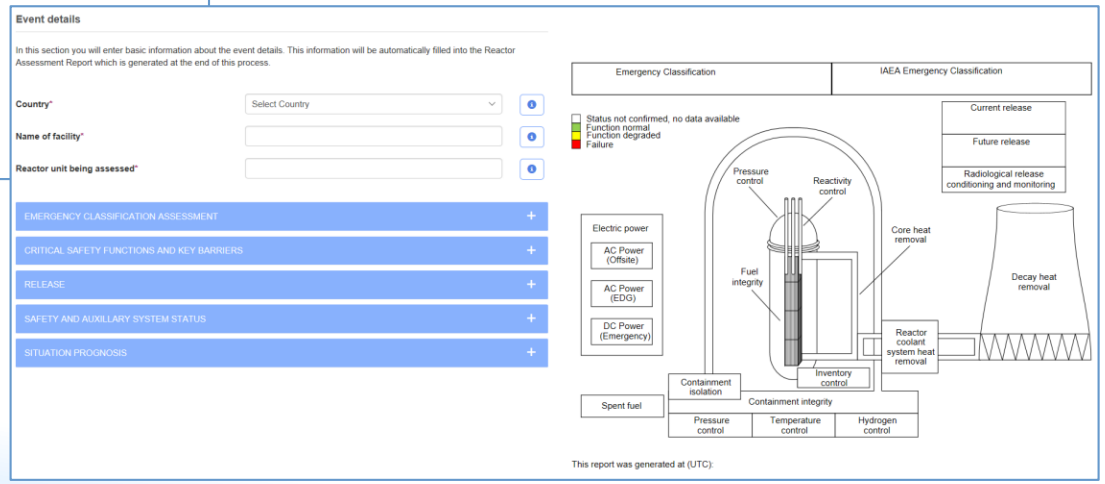


Development of the Reactor Assessment Tools

Current RAT – several modules



A new module created in 2019 for the Advanced Gas-Cooled reactor (AGR)



Development of the Reactor Assessment Tools

Improving the current assessment

Re-arranging the workflow:

- Barrier of containment #1
  - Critical safety function #1-1
  - Critical safety function #1-2
    - Sub-critical safety function i
    - Sub-critical safety function ii
- Barrier of containment #2

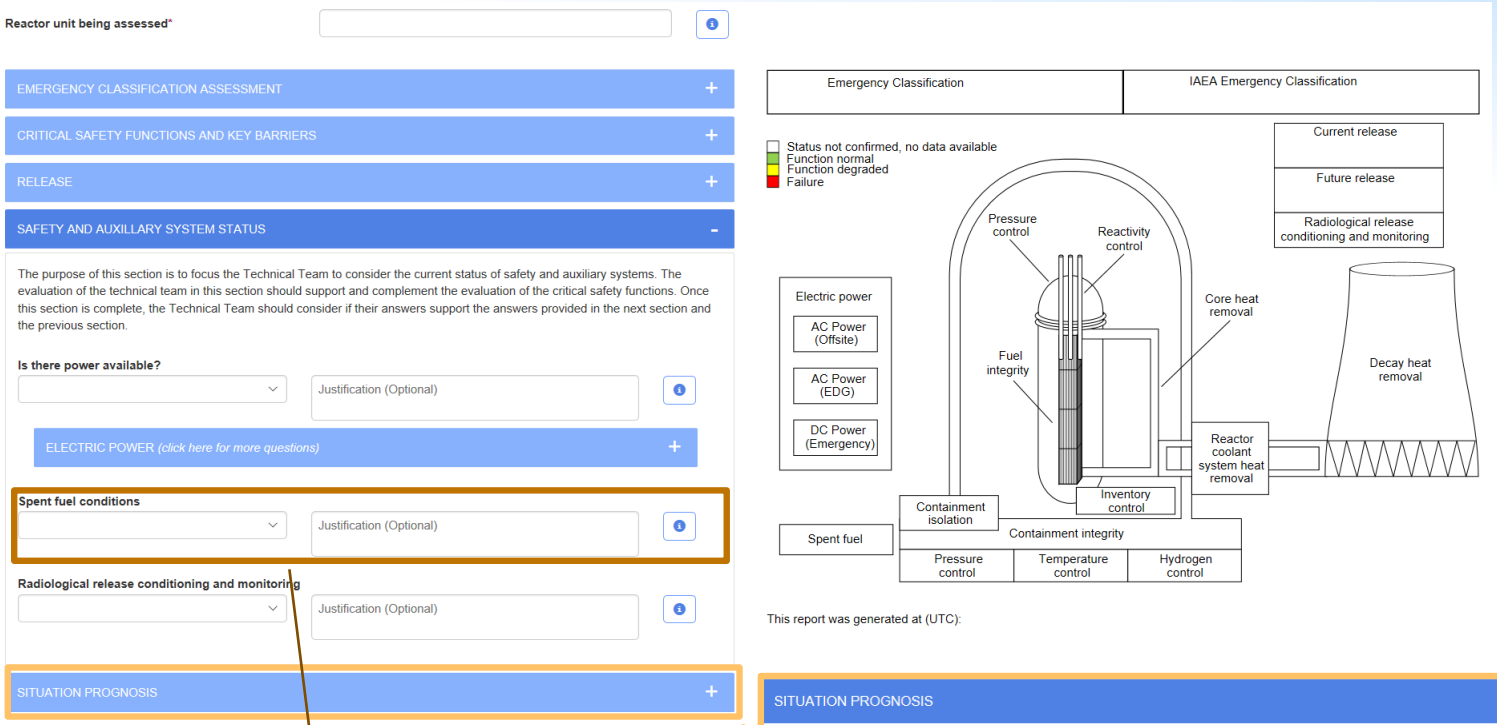
  …
- Barrier of containment #3

  …

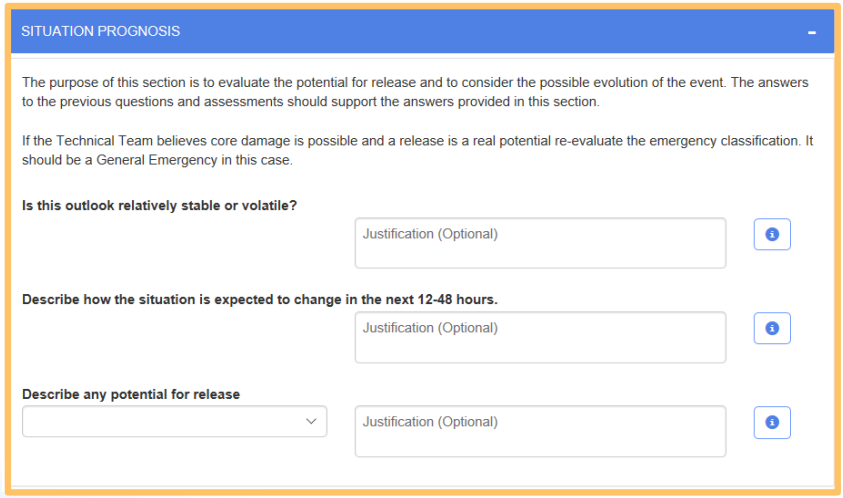
Links to EPRIMS > Reactor Technical Information

Other suggested improvements

New developments for the Reactor Assessment Tools



To be covered by two new dedicated tools

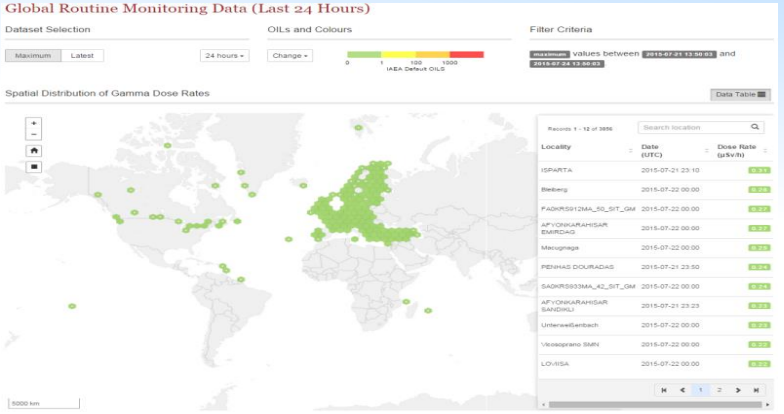


International Radiation Monitoring Information System

IRMIS

Overview of IRMIS (1/2)

- Supports implementation of the Early Notification Convention
- Provides a mechanism for the global exchange of large quantities of radiation monitoring data
- Gamma dose rates, isotope specific ground deposition and air concentration from fixed monitoring stations

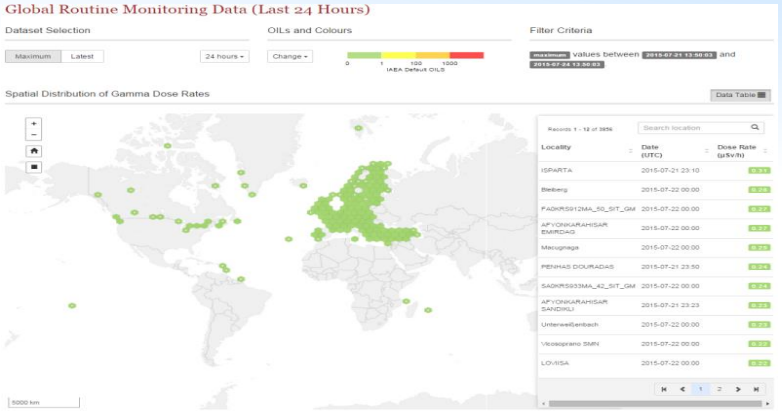


Global Routine Monitoring data

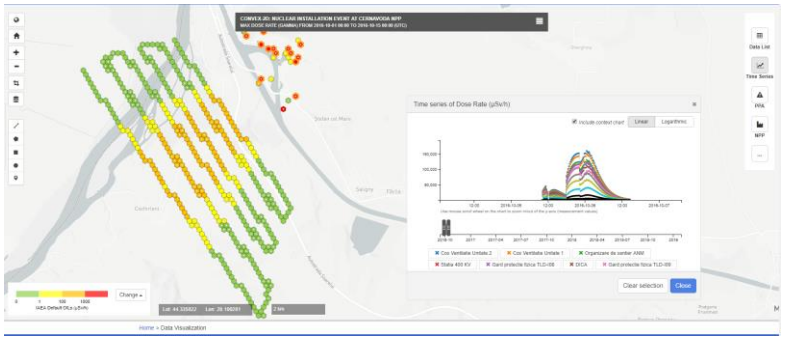
Emergency Monitoring Data

Overview of IRMIS (2/2)

- Data in Visualization page are color coded in terms of user defined Operational Intervention Levels (OILs) to assist in the decision making process to protect the public during an emergency



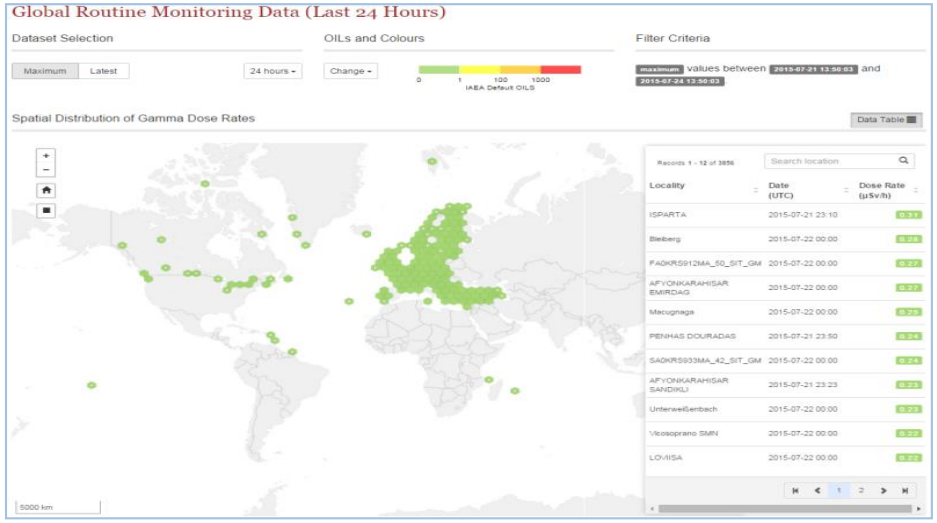
Global Routine Monitoring data



Emergency Monitoring Data

IRMIS data providers

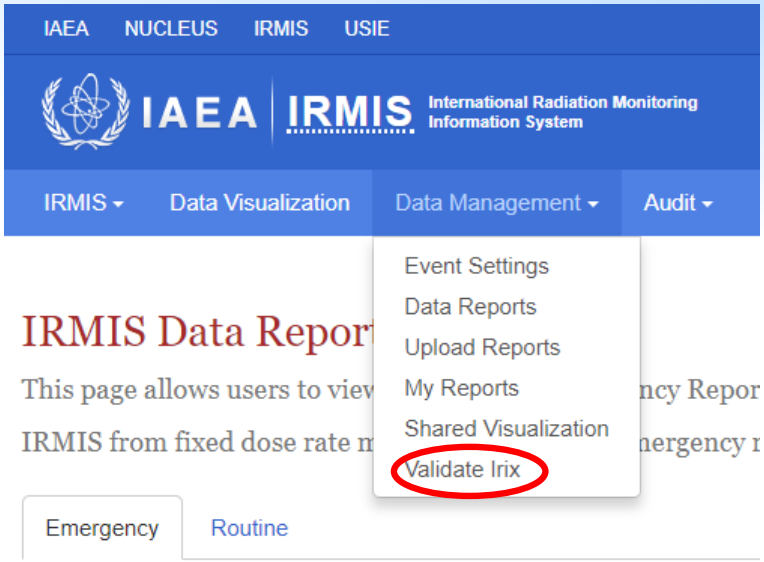
Countries providing IRMIS Routine Monitoring Data: 39



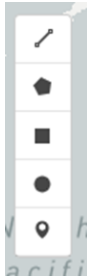
Countries who established Contact Points or Data Providers for IRMIS: 42

New features and tools in IRMIS

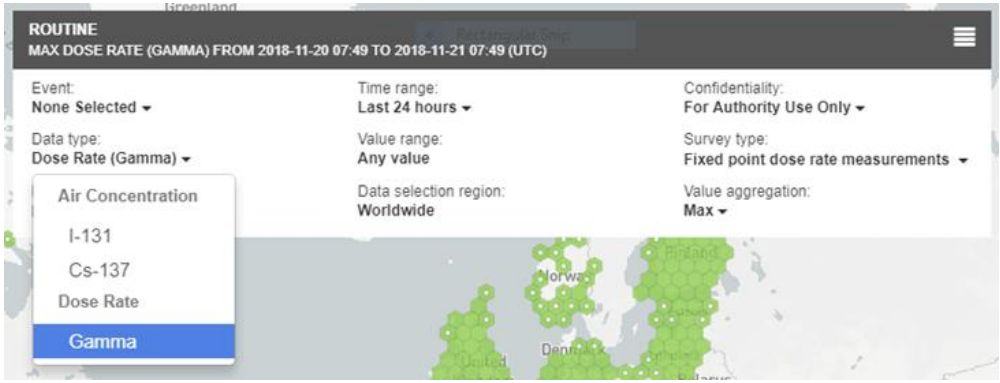
- Validation of user developed IRIX formatted data reports from IRMIS before submission from Data Management



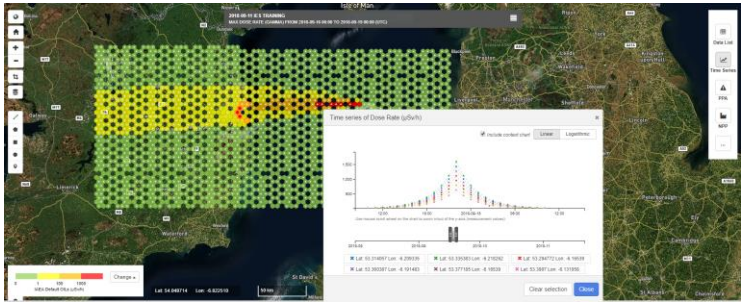
- Drawing Tools



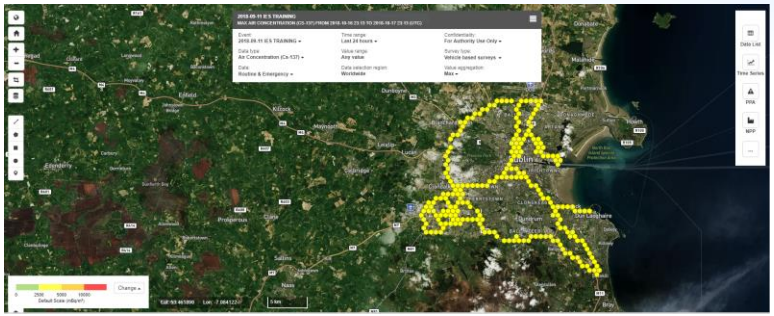
- Environmental Monitoring Data
  - Air Concentration (Cs-137 & I-131)
  - Ground Deposition (Cs-137 & I-131)



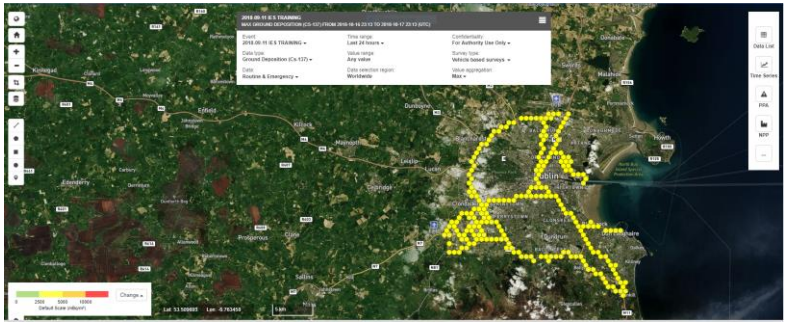
Examples of simulated Gamma dose rate data, deposition data, air concentration data used in exercises



Combination of Aerial & Fixed Station simulated Gamma dose rate data

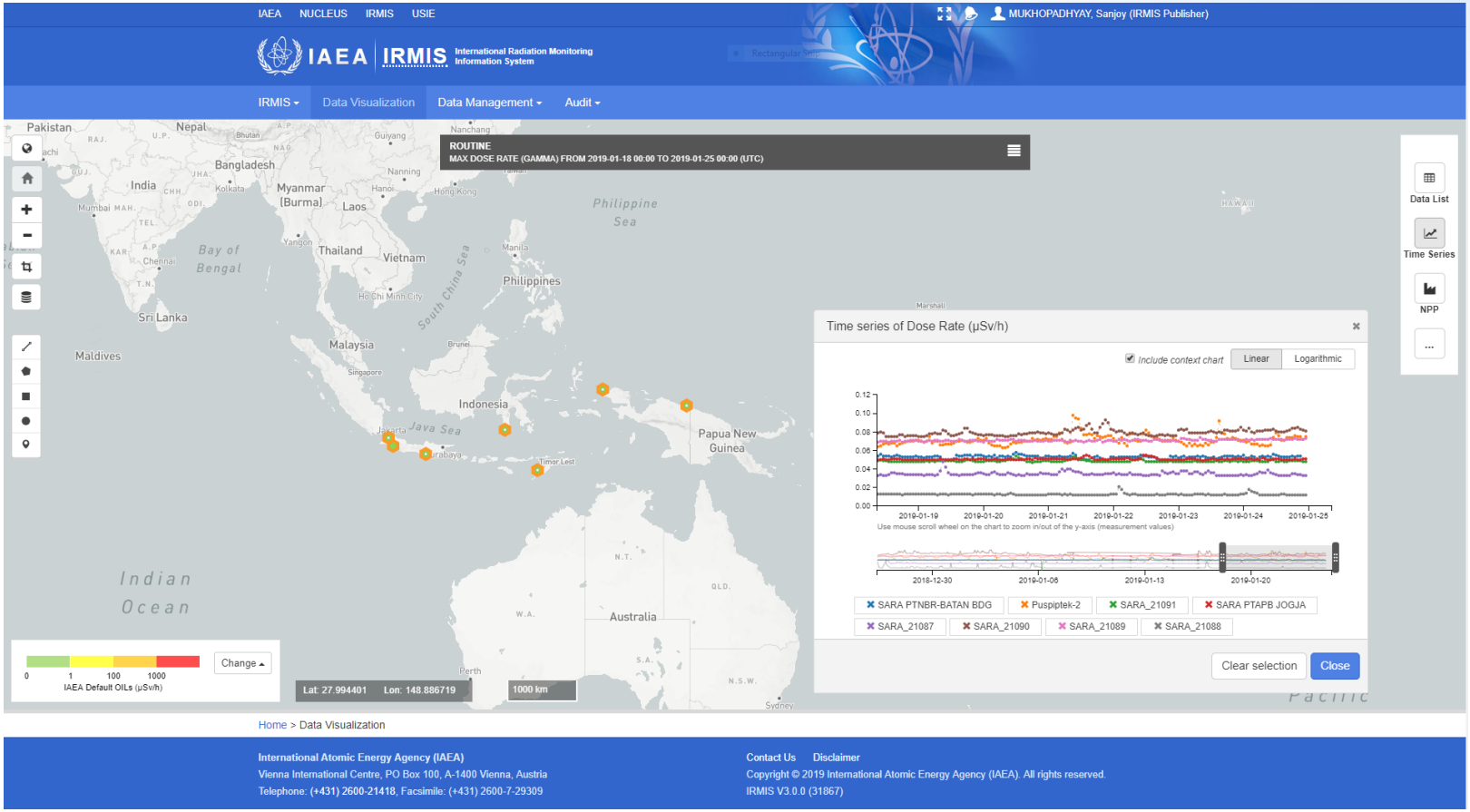


Simulated air concentration data, Cs-137



Simulated ground deposition data, Cs-137

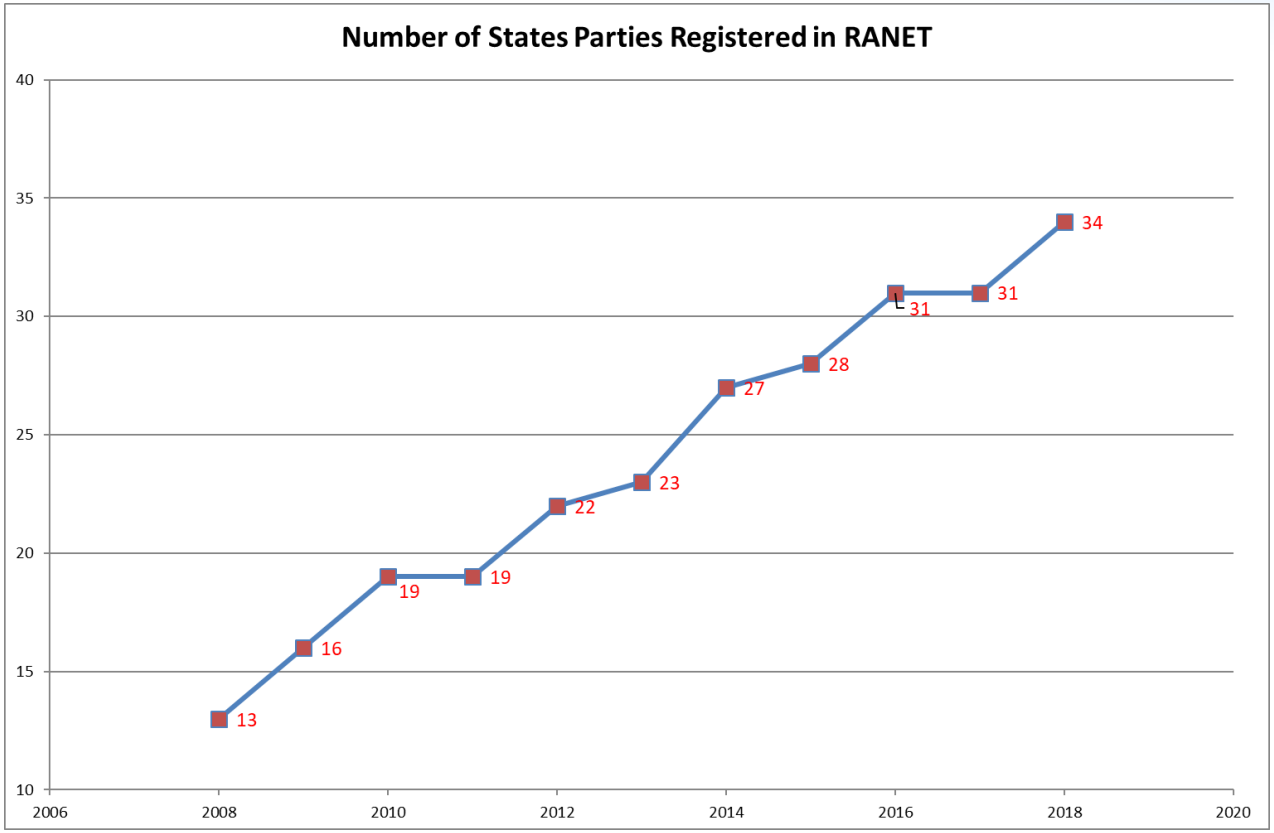
Example of Routine Monitoring Data - Indonesia



Response and Assistance Network

RANET

RANET Registrations



State Parties Registered in RANET

Country	Radiation Survey	Sampling and Analysis	Source Search and Recovery	Radiological Assessment and Advice	Medical Support	Dose Assessment	Decontamination	Nuclear Installation Assessment and Advice
Argentina						FAT EBS		
Australia	FAT EBS	FAT	FAT				FAT	
Austria	FAT EBS		FAT EBS					
Belarus, Republic of	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	EBS
Belgium	FAT	FAT	FAT					
Bulgaria	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS
Canada						EBS		EBS
China	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	
Czech Republic	EBS	EBS	EBS	EBS		EBS		
Denmark	FAT EBS		FAT EBS	EBS				
Egypt	FAT EBS	FAT EBS	FAT EBS	EBS	EBS		EBS	
Finland	FAT	EBS		EBS		EBS	EBS	
France	FAT	FAT EBS	FAT	EBS	FAT EBS	FAT EBS		
Germany	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT	
Hungary	FAT	FAT EBS	FAT	FAT EBS	FAT	EBS	EBS	
Ireland		EBS		EBS				
Israel	FAT EBS	FAT EBS	FAT	EBS		EBS		
Japan	EBS	EBS		EBS	EBS	EBS		FAT EBS
Korea, Republic of	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	EBS
Mexico	FAT	FAT	FAT			FAT		
Nigeria	FAT	FAT	FAT	FAT			FAT	
Norway	FAT	FAT EBS	FAT					
Pakistan	FAT EBS	FAT EBS	FAT EBS	EBS	EBS	EBS		FAT EBS
Romania	FAT EBS	FAT EBS	FAT	FAT EBS		EBS	FAT	
Russian Federation	EBS	EBS		EBS	FAT EBS	FAT EBS		
Slovenia	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	EBS
Spain				EBS				FAT EBS
Sri Lanka	FAT	FAT	FAT					
Sweden	FAT	FAT EBS	FAT	EBS				
Switzerland	FAT EBS	FAT EBS	FAT EBS			EBS		
Turkey	FAT EBS	FAT EBS	FAT EBS	EBS		EBS		
Ukraine	FAT EBS	FAT EBS	FAT EBS	EBS			FAT EBS	FAT EBS
United Kingdom		EBS		EBS		EBS		
United States of America	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS	FAT EBS		EBS

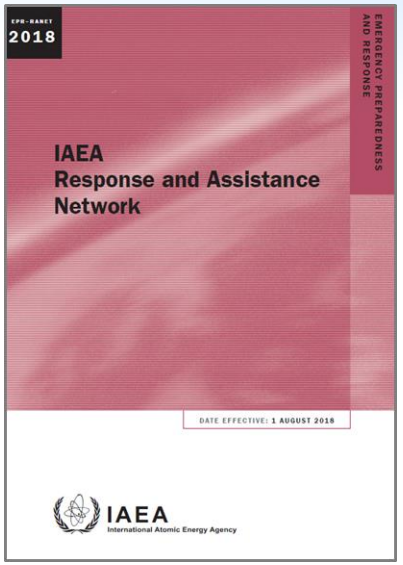
Field Assistance Team External Based Support

EPR-RANET through the years

- 8 Functional Areas
  - Defines 46 NAC
  - Covers wide range of response and assistance capabilities
- EPR-RANET 2018

Changes in EPR-RANET 2018 (1/3)

- Addition of new National Assistance Capability to address:
  - assistance and advice on geographic data mapping in nuclear or radiological emergencies regardless of their origin
  - provision of requested assistance in nuclear or radiological emergencies, regardless of their origin

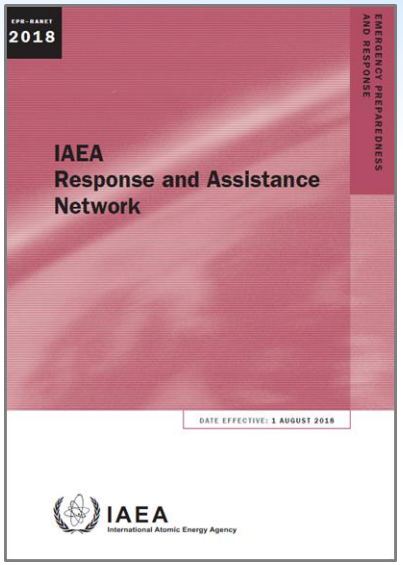


- Updated (Sample) RANET Assistance Action Plan (Appendix B)

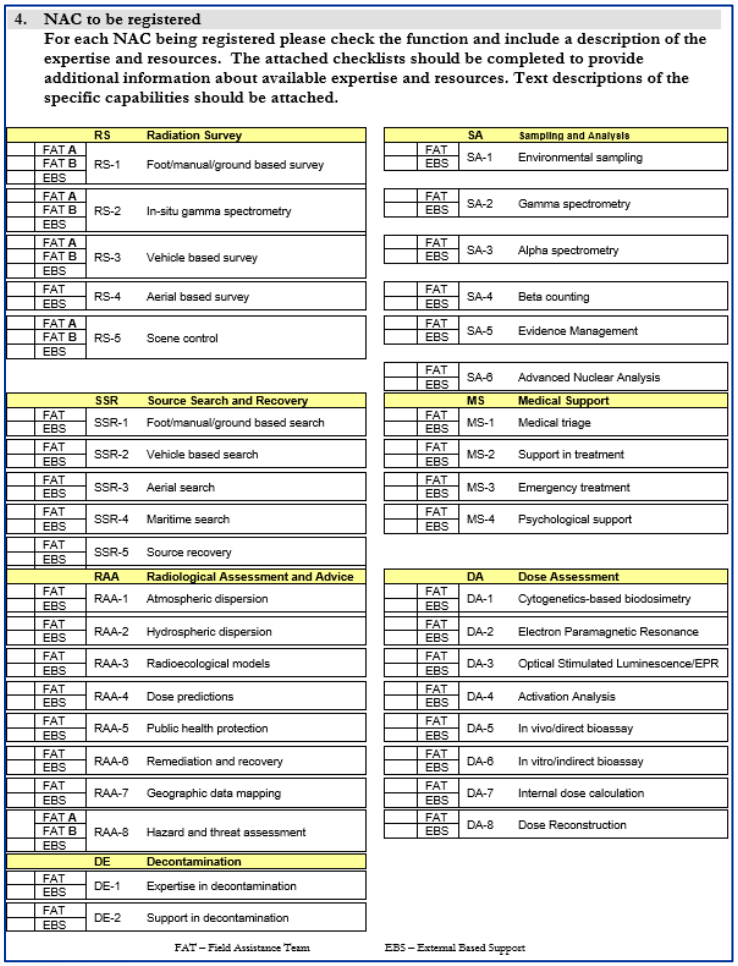
Changes in EPR-RANET 2018 (2/3)

- Changes to the registration form to reflect the recent developments in RANET

- Three new appendices:
  - International ATA Carnet document for customs equipment documentation
  - an example request for assistance
  - an example offer of assistance



Changes in EPR-RANET 2018 (3/3)



4. NAC to be registered

For each NAC being registered please check the function and include a description of the expertise and resources. The attached checklists should be completed to provide additional information about available expertise and resources. Text descriptions of the specific capabilities should be attached.

RS	**Radiation Survey**		
FAT A / FAT B / EBS	RS-1	Foot/manual/ground based survey	
FAT A / FAT B / EBS	RS-2	In-situ gamma spectrometry	
FAT A / FAT B / EBS	RS-3	Vehicle based survey	
FAT / EBS	RS-4	Aerial based survey	
FAT A / FAT B / EBS	RS-5	Scene control	
SSR	**Source Search and Recovery**		
FAT / EBS	SSR-1	Foot/manual/ground based search	
FAT / EBS	SSR-2	Vehicle based search	
FAT / EBS	SSR-3	Aerial search	
FAT / EBS	SSR-4	Maritime search	
FAT / EBS	SSR-5	Source recovery	
RAA	**Radiological Assessment and Advice**		
FAT / EBS	RAA-1	Atmospheric dispersion	
FAT / EBS	RAA-2	Hydrospheric dispersion	
FAT / EBS	RAA-3	Radioecological models	
FAT / EBS	RAA-4	Dose predictions	
FAT / EBS	RAA-5	Public health protection	
FAT / EBS	RAA-6	Remediation and recovery	
FAT / EBS	RAA-7	Geographic data mapping	
FAT A / FAT B / EBS	RAA-8	Hazard and threat assessment	
DE	**Decontamination**		
FAT / EBS	DE-1	Expertise in decontamination	
FAT / EBS	DE-2	Support in decontamination	

SA	**Sampling and Analysis**		
FAT / EBS	SA-1	Environmental sampling	
FAT / EBS	SA-2	Gamma spectrometry	
FAT / EBS	SA-3	Alpha spectrometry	
FAT / EBS	SA-4	Beta counting	
FAT / EBS	SA-5	Evidence Management	
FAT / EBS	SA-6	Advanced Nuclear Analysis	
MS	**Medical Support**		
FAT / EBS	MS-1	Medical triage	
FAT / EBS	MS-2	Support in treatment	
FAT / EBS	MS-3	Emergency treatment	
FAT / EBS	MS-4	Psychological support	
DA	**Dose Assessment**		
FAT / EBS	DA-1	Cytogenetics-based biodosimetry	
FAT / EBS	DA-2	Electron Paramagnetic Resonance	
FAT / EBS	DA-3	Optical Stimulated Luminescence/EPR	
FAT / EBS	DA-4	Activation Analysis	
FAT / EBS	DA-5	In vivo/direct bioassay	
FAT / EBS	DA-6	In vitro/indirect bioassay	
FAT / EBS	DA-7	Internal dose calculation	
FAT / EBS	DA-8	Dose Reconstruction	

FAT – Field Assistance Team EBS – External Based Support

National Assistance Capabilities:

Field Assistance Team (FAT) expertise applicable in the case of (an) actual or suspected malicious act(s) may be registered as ‘FAT-B’ under some NACs.

Practical arrangements with other IOs

- EPR-JPLAN - Framework for coordinated and harmonized inter-agency EPR
- Practical arrangements (PA's) between the IAEA and International organizations (IO's) co-sponsors of the EPR-JPLAN (18 organizations)
- Cosponsors of this EPR-JPALN are the IACRNE* (Inter-Agency Committee on Radiological and Nuclear Emergencies):
  - Participating organizations
  - Corresponding organizations

- Other organizations, not in EPR-JPLAN: IFRC, UNSCEAR, WANO

Practical arrangements with other IOs

- **Regular 24th IACRNE meeting proposal (2014):**

  to initiate revisions and/or development of agreements between IAEA and other IACRNE organizations in a form of Practical Arrangements

- **Purpose of the PA's**:

  to establish the framework for non-exclusive cooperation between the IAEA and IO's in the area of response to nuclear and radiological emergencies

- **Latest status of the PA's:**
  - Signed and in force: CTBTO, PAHO (General PA), WANO, WMO, WHO (General PA)
  - Under extension: ICAO
  - Draft PA's sent to all of the rest IO's for coordination – feedback is expected

To conclude

Mark the calendar - 2019

- *Technical Meeting on Advances in Emergency Preparedness and Response Technology and Arrangements*

  8-12 April 2019, Vienna

- *Technical Meeting to Review the Revision of the IAEA Safety Standards Series No. GS-G-2.1*

  25-29 November 2019, Vienna

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Thank you!