

6th Review Meeting of the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management

21 May – 1 June 2018

Greece
Country Group 7

Presentation outline

- Summary of basic information on the national program
- Changes in the national program since the 5th RM
- Actions on suggestions and challenges from the 5th RM
- Significant events since the 5th RM
- Current challenges
- Good practices and efforts
- Planned measures to improve safety
- Q&A



Summary of basic information

- Greece has no NPPs and no intention to build any
- One research reactor (GRR-1) in extended shutdown
- Radioactive waste originates from:
 - non nuclear applications: medical, research, industrial, consumer products
(e.g. lightning rods, smoke detectors)
 - past operation of the reactor
- One facility for storage of RW (NRWIS)

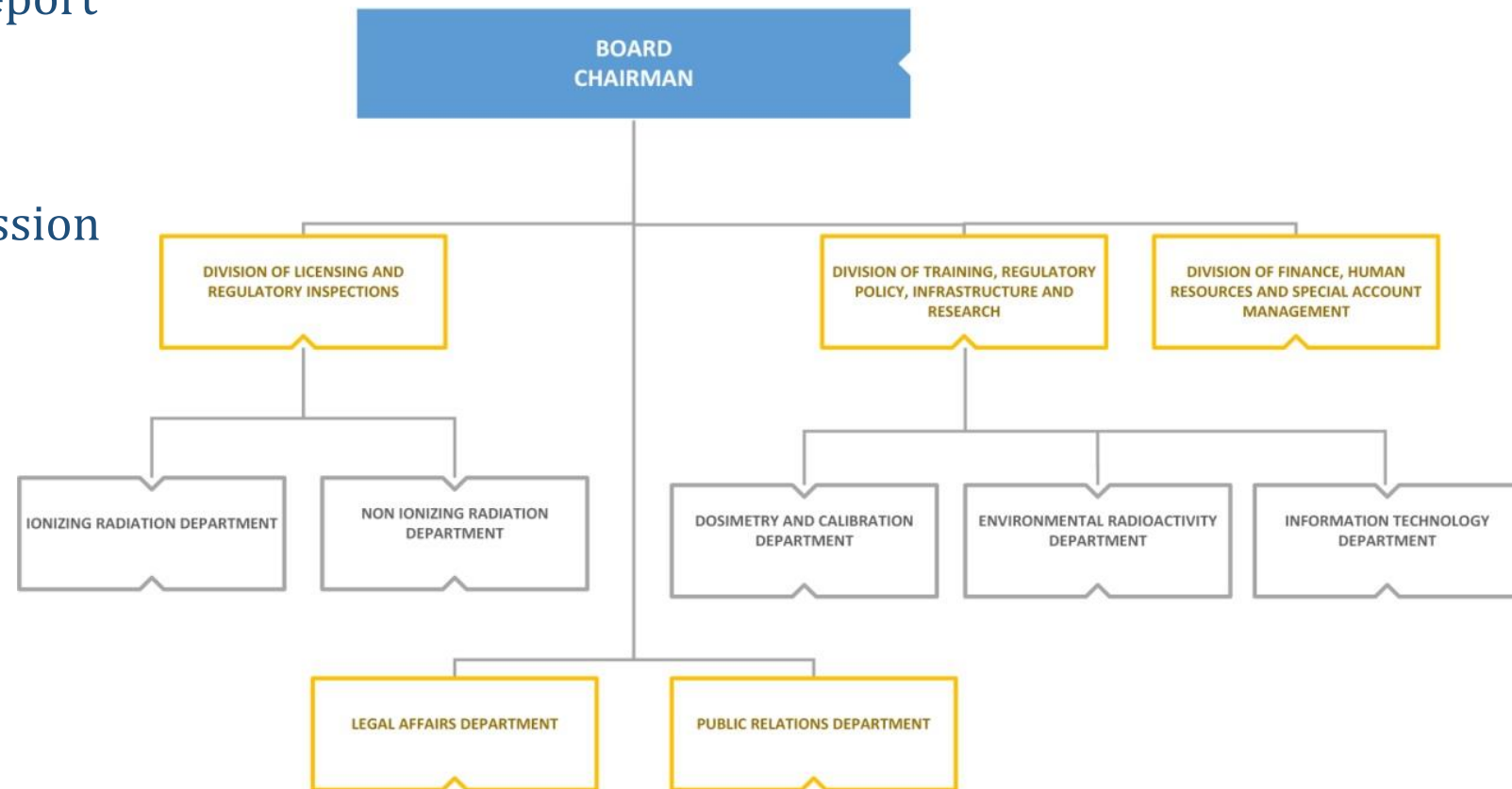
Summary of basic information

- Legislation

The list of the applicable legislation is provided in the National Report

- Regulatory Authority

Greek Atomic Energy Commission



Summary of basic information

○ Spent fuel management policy

- Key principles are provided in the National Policy (MD 131207/I3/2015, PD 122/2013, PD 91/2017).
- Spent fuel to be returned to the country of origin.
- Agreement for fuel return shall be in place prior to any import of nuclear fuel.

○ Spent fuel management practices

- Irradiated LEU fuel is stored in safe wet storage in secure GRR-1 area under licensee's surveillance programme.
- EURATOM and IAEA safeguards are applied.
- Arrangements for shipment back to USA according to the current agreement with the US DOE are under preparation.

Summary of basic information

*Radioactive
waste
management
policy*

- Key principles are provided in the National Policy (MD 131207/I3/2015, PD 122/2013, PD 91/2017).
- RW produced in Greece shall be either cleared according to the clearance levels or disposed in the national territory, unless an agreement is in place for export of the waste, in line with European Union legislation.
- Until the establishment of a national disposal facility, waste shall be stored safely in a licensed storage facility.



Summary of basic information

Other elements are provided in the National Report:

- The production of radioactive waste shall be kept as minimum as possible, through the appropriate measures, including recycling and reuse.
- The interdependencies among the various stages of radioactive waste management shall be taken into account.
- The management of radioactive waste shall be performed with safety, including in the long term with passive means.
- A graded approach shall be followed, in accordance with the magnitude and the characteristics of the potential hazards.
- The cost for the management of radioactive waste is borne by the waste producers.
- In all stages of radioactive waste management an evidence-based and documented decision making process shall be implemented.

*Radioactive
waste
management
policy*



Summary of basic information

Radioactive waste management practices

- Short lived waste: storage until decay and clearance.
- Preferred option for RW that cannot be cleared: Storage in producers' authorized storage areas and in NRWIS. The owner may keep the waste on site under safe and secure storage no longer than 10 years.
- Preferred option for disused sources: return to the supplier.
- Orphan sources are managed by the government, temporarily stored in NRWIS.
- EEAE keeps a national inventory for the sources and RW in the country.

Summary of basic information

Type of Liability	Long term management policy	Funding of Liabilities	Current practice/ Facilities	Planned facilities
Spent Fuel	Return to the country of origin	Government	Irradiated fuel wet storage at GRR-1	None
Nuclear Fuel Cycle Waste	N/A	N/A	N/A	N/A
Non-power waste	On site storage, decay and release for short live waste. Longer lived waste are stored until final disposal solution.	Licensee, Government	On site storage, decay and release for short live waste. Longer lived waste are stored until final disposal solution	National RW Interim Storage and Management Facility Options for disposal to be investigated
Decommissioning Liabilities	Decommissioning waste stream to be included in the national program waste streams. Decommissioning plan is required by law	Licensee, Government	No plans have been submitted	
Disused Sealed Sources	Return to the manufacturer. Orphan sources are stored in National RW Interim Storage and Management Facility until final disposal solution	Licensee, Government	Return to the manufacturer. Orphan sources are stored in RWIS	National RW Interim Storage and Management Facility Options for disposal to be investigated
Mining & Milling waste	N/A	N/A	N/A	N/A



Summary of basic information

NRWIS: Licensed activities

- Storage of RW and disused sources
- Low activity sources (e.g. lightning rods) dismantling
- Characterization of RW
- Re-packaging of RW from past operation of reactor (e.g. resins)
- Clearance

Summary of basic information

NRWIS: RW types stored

- Historical waste from past activities in the National Center for Scientific Research “Demokritos”, including from the past operation of reactor (e.g. resins).
- Disused/orphan sources.
- Other radioactive or contaminated objects, from across the country (e.g. lightning rods, parts of aircraft engines with thorium,...) that cannot be managed on-site/by the user.

Summary of basic information

NRWIS: Safety

- In the renewed license of the NRWIS, conditions have been posed so that the facility achieves alignment with the IAEA standards, notably: revision of the safety documentation to include a safety and accident analysis and development of Waste Acceptance Criteria.
- Fire is one of the most important hazards for NRWIS. Measures have been identified and taken in collaboration with the National Fire Service for the improvement of the facility fire protection.

Changes since the 5th Review Meeting

- Significant new legislation has been issued, in particular for RW:
 - Amendment of the existing legislation
 - New legislation: National Program, National Policy
- Establishment of the National committee for RW management.
- IRRS follow up mission.
- Transposition of the new European Basic Safety Standards (EC Directive 2013/59/Euratom) leading to extensive update of the present regulatory and legislative framework .
- Actions were taken to improve transparency and communication with the public (details in the National Report).
- Upgrade of the NRWIS (facility, human resources).

Changes since the 5th Review Meeting

IRRS follow-up mission

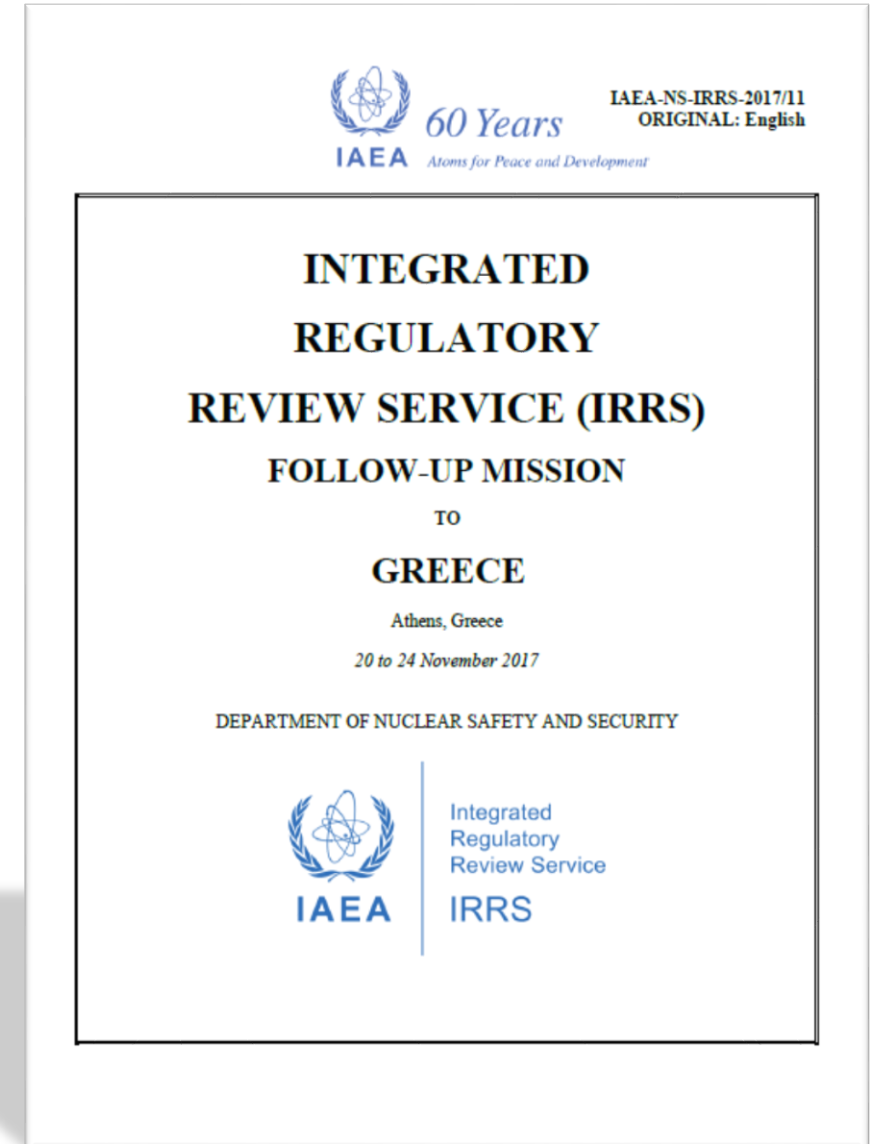
- All Recommendations and Suggestions, but one Suggestion (S8) which remains open, were assessed as “closed” or “closed on the basis of progress made and confidence in effective completion”.
- The follow-up mission resulted to one new Recommendation on the procedure for license renewal and one new Good Practice related to clinical audits. Both are not directly related to the area of radioactive waste management.



Changes since the 5th Review Meeting

IRRS follow-up mission

- Suggestion 8 (open): *“Even if the IAEA classification scheme is generally applied in regulatory oversight, EEAE has not incorporated it into its regulatory system.”*
- Development and publication of the classification system is provided in the national program to be undertaken by EEAE within the next couple of years.



Actions on suggestions and challenges from the 5th Review Meeting

Implementation of the National Program road map

- The National Program has been endorsed and issued by the Government.
- National Program milestones:
 - Establishment of the National Committee for Radioactive Waste Management (EEDRA): Established in April.
 - Update of the RW Inventory and Classification.
 - Establishment of the National Storage and Radioactive Waste Management Facility.
 - Collection and export for recycling of radioactive sources.
 - Decision on national options for the management and disposal of RW (2030).



Actions on suggestions and challenges from the 5th Review Meeting

Implementation
of the
National
Program road
map

- National Committee for Radioactive Waste Management (EEDRA)
 - Several Ministries and other organizations involved.
 - Monitors and oversees the implementation of the National Program according to the National Policy and update of the National Program.
 - Proposes and supervises the relevant projects for the implementation of the actions.
 - Develops the plan for funding the implementation of the National Program.

Actions on suggestions and challenges from the 5th Review Meeting

Decommissioning Plan for GRR-1

- There are no final decisions for the future of the reactor yet.
- No decommissioning plan has been submitted.
- The relevant waste streams are roughly estimated in the National Program.

Significant events since the 5th RM

- No events regarding RW management in Greece



Current challenges

- Implementation of the National Program
 - Definition of the option for up-to-end management of each waste stream is an ongoing effort that extends in the long term.
 - No technical solutions have been specified at the moment.



Good practices and efforts

- Significant efforts have been undertaken for improving openness and transparency and communication with the public.
- License, regulatory evaluation reports and inspection reports are publicly available through the internet.
- Invitation and completion of the IRRS follow-up mission.



Planned measures to improve safety

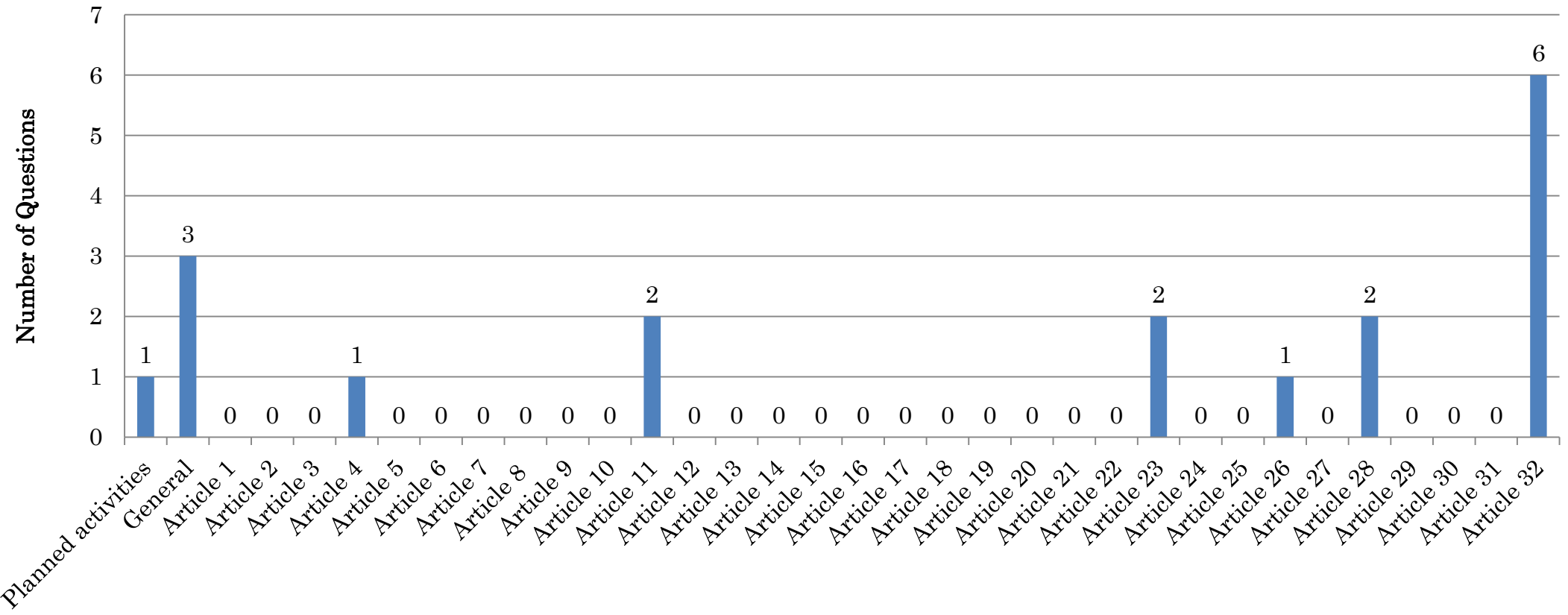
- Improvement of the safety of the existing storage facility:
 - Analysis and demonstration of safety
 - Quality management
 - Physical protection
- Selection of the National Radioactive Waste Storage and Management facility.



Questions and comments received

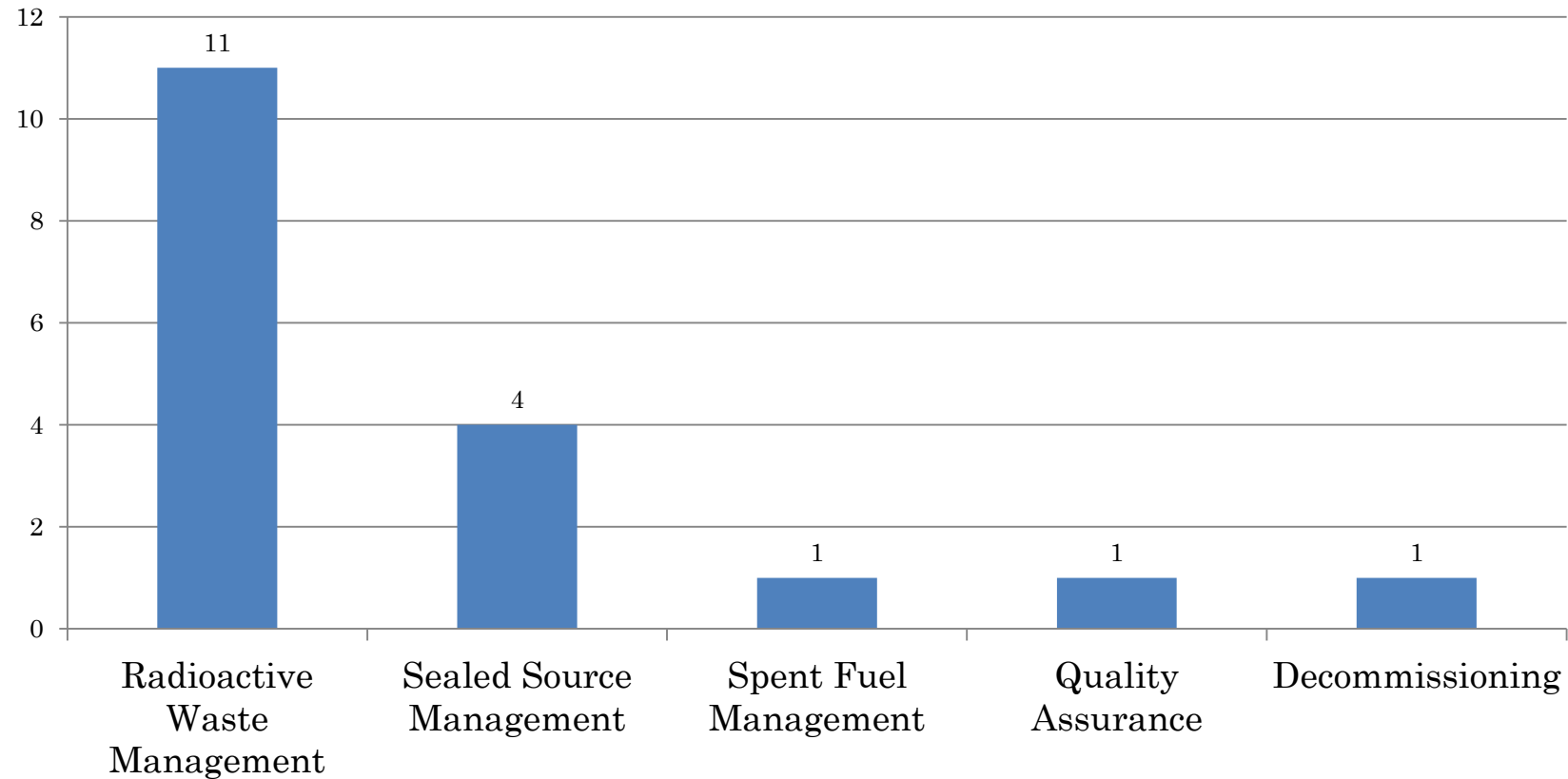
(Source: Coordinator report)

18 questions from 7 countries on Articles:



Questions and comments received

Topics identified in questions and comments:



Questions and comments received

Topics identified in questions and comments:

Article	C/Qs	QUESTION/COMMENT	TOPIC
Planned activities	1	Guidance on radioactive waste acceptance criteria.	RAWM
General	3	Results of review mission regarding radioactive waste; Management (packaging and repackaging) of waste; Timeline for developing waste disposal capacity.	RAWM RAWM RAWM
4	1	Timely decommissioning and return of spent fuel.	SFM
11	2	Timely development of a disposal facility; Licensing processes.	RAWM RAWM
23	2	Ensuring quality assurance; Procedures for waste management.	QA RAWM
26	1	Environmental monitoring to detect releases.	DECOM
28	2	Ensuring the safety of stored disused sealed sources that cannot be returned or exported for recycle/reuse; Management of disused sealed sources.	SSM SSM SSM
32	6	Conditioning of disused sealed sources prior to export for recycling; Security and ensuring the disposal of radioactive waste and disused sealed sources; Inspections at non-nuclear fuel cycle facilities; Legacy waste management; Determining radioactive waste inventories; Waste treatment without waste acceptance criteria.	SSM SSM RAWM RAWM RAWM RAWM
Total	18		



Questions and comments received

Status of Greece answers to questions: all questions answered

Name of CPs	Country Group	Number of Cs/Qs asked	Number of Cs/Qs withdrawn	Number of Cs/Qs answered
Montenegro	7	1	0	1
Slovakia	3	1	0	1
USA	1	3	0	3
Brazil	7	3	0	3
Ukraine	7	3	0	3
Romania	7	5	0	5
UAE	7	2	0	2
TOTAL		18	0	18



Conclusions

- The legislative framework has been significantly reinforced and the National Program has been issued.
- Implementation of the National Program has launched and the overseeing committee has been established.
- Enhancement of the safety level of the existing storage facility has been required.
- Selection and establishment of the National RW Storage and Management is foreseen to take place within the next years.



Thank you!



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