



**Joint Convention on the Safety of Spent Fuel
Management and on the Safety of Radioactive
Waste Management**

Fourth Review Meeting (May 2012)

**Answers to the Questions of Contracting Parties
on the National Report submitted by Greece**

Q.No 1	Country France	Article General	Ref. in National Report A. - p. 4
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Question/
Comment This section (or an Executive Summary) could be added for clearly highlighting the main evolutions and updates that have occurred since the last report. This section could also give an overview of the follow-up of the 3rd Review meeting, addressing among others the challenges and the measures to improve the safety reported for Greece.

Answer Thank you, we will consider your comment for the next report.

Q.No 2	Country France	Article General	Ref. in National Report K. - p. 24
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Question/
Comment Section K of the next report of Greece should, as much as possible, be more detailed regarding the objectives (medium or long term) associated with future activities.

Answer Thank you, we will consider your comment.

Q.No 3	Country Sweden	Article Article 3	Ref. in National Report Section C, p. 8
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Question/
Comment It is stated in the report that the regulated activities inducing NORM waste include the agricultural applications of phosphogypsum, the decommissioning activities of abandoned industries, etc. and that NORM waste is considered in the Greek national report.

Could Greece please provide some additional information on in what way NORM waste has been considered in the Greek national report?

Answer We consider useful to provide information regarding the whole range of radioactive waste management in the country. As it concerns NORM, in p. 7 of the report it is stated that: "GAEC has adopted the EC Radiation Protection 122 ("Practical use of the concepts of clearance and exemption" – Part II) and has issued an explanatory circular for this purpose. Industrial waste produced by NORM industries with radionuclide concentrations exceeding the exemption levels has been exported to a foreign country for recycling." Phosphogypsum is deposited in the form of stacks in places which are under GAEC's regulatory control.

Q.No 4	Country France	Article Article 9	Ref. in National Report K. - p. 24
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Question/
Comment Could Greece indicate how the experience feedback of the Fukushima accident will be taken into account regarding the safety of spent fuel and radioactive waste management in Greece?

Answer A new SAR is under preparation taking into consideration IAEA guidelines and the experience feedback of the Fukushima with relation to the prevention of natural risks.

Regarding radioactive waste management, the step-up of the safety measures against fire and flood for the radioactive waste management facility, as well as the emergency preparedness plan are included in the licensing process.

Q.No	Country	Article	Ref. in National Report
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5	Sweden	Article 10	Section G, p. 18/27
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Question/ Comment It is stated that “all spent fuel from GRR-1 is to be transferred to USA jurisdiction, according to an agreement with the US Department of Energy for shipment until 2019”. In Greece’s report to the 3rd review meeting, the arrangements between Greece and US DOE were until May 2014. There is no explanation for the change in the arrangement as accounted for in the previous report but Sweden concludes that this arrangement has been prolonged with 5 years. It is furthermore reported that, at present (2011) the GRR-1 has not yet started operations since the conversion from HEU to LEU in 2004.

What are the long-term plans for GRR-1 (2012)?

When is a start foreseen?

Are there any decisions on for how long it safely can and will operate?

Answer According to the agreement, the fuel must be discharged from the reactor prior to May 13, 2016. DoE shall not accept fuel after May 12, 2019.

Q.No	Country	Article	Ref. in National Report
6	Australia	Article 11.5	Page 19

Question/ Comment How are non-radioactive hazards taken into account in the safe management of radioactive waste?

Answer Non-radioactive hazards are covered by relevant EU and national legislation when applicable. Waste produced from NCSR “Demokritos” with non-radioactive hazards (e.g. toxicity) are segregated and stored in its facilities. If the waste is radioactive then it is stored separately in the interim storage facility. If it is not radioactive then it is collected by a specialized company in Greece for treatment. In medical application, when radioactive waste exhibits an additional hazard e.g. infectious, its management takes into account both hazards. After decay storage, it is treated according to the non-radioactive hazards as described in national or EU regulations.

Q.No	Country	Article	Ref. in National Report
7	Germany	Article 12	H, 19

Question/ Comment The radioactive waste management practices at the National Centre of Scientific Research (NCSR) “Demokritos” are described in Section H. In the past, some of the aqueous waste originating from the radionuclide production plant in the NCSR was solidified and stored in steel drums. This practice is no longer used today. What is the foreseen disposal option for this kind of waste especially if it contains radionuclides with longer half-lives?

Answer GRR-1 is out of operation. According to the recently drafted regulatory provisions for the licensing process update, GRR-1 is obliged to provide a detailed waste management program and a decommissioning program, including the financial aspects, as part of the application for the operation license.

Greece has not yet defined a final solution for radioactive waste disposal. We recognize this gap and it is in our plans to make the necessary actions in order to formulate a clear policy for radioactive waste management, defining, among others, a feasible and pragmatic end-point. We have to

note that waste management policy is the first policy issue to be discussed in the IRRS mission scheduled for May 2012.

Q.No 8	Country Lithuania	Article Article 12	Ref. in National Report H
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Question/ Comment How long is it planned to store radioactive waste in the storage facility at NCSR “Demokritos”? Have you any plans or long time policy and programme for removing radioactive waste from this storage facility and to dispose it to disposal repository in future?

Answer The intention is to store the waste in the interim storage facility awaiting for a final disposal solution. Greece has not yet defined a final solution for radioactive waste disposal. We recognize this gap and it is in our plans to make the necessary actions in order to formulate a clear policy for radioactive waste management, defining among others a feasible and pragmatic end-point. Waste management policy is the first policy issue to be discussed in the IRRS mission scheduled for May 2012.

Q.No 9	Country Lithuania	Article Article 12	Ref. in National Report H
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Question/ Comment What is assessed doses for population caused by radioactive waste storage facility at NCSR “Demokritos”?

Answer Following the legislation requirements, doses to the population from the research reactor and the waste management must not exceed the dose constraints for the population set at 10 mSv/y. Monitoring results verify that the doses are much lower.

Q.No 10	Country Lithuania	Article Article 12	Ref. in National Report H
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Question/ Comment How is disused depleted uranium containers managed in Greece? Are these containers also stored in the storage facility at NCSR “Demokritos”?

Answer Depleted uranium containers are returned back to the source manufacturer with the source. A few containers that have not been shipped abroad are stored in the interim storage facility at NCSR “Demokritos”.

Q.No 11	Country United States of America	Article Article 12	Ref. in National Report H, 19
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Question/ Comment The report discusses conditioning and storage of past inventories of waste at the Demokritos facility. However, there is no indication of future disposal plans. If waste will be stored indefinitely at the Demokritos facility, what accommodations have been made to ensure and confirm the continued safety of the stored waste (e.g., environmental monitoring and site characterization)?

Answer A draft regulation has been prepared by GAEC providing safety and radiation protection requirements for the interim storage facility at NCSR “Demokritos”. Re-evaluation is obligatory for the renewal of license or when changes occur. Relevant requirements are also included in the proposed action plan prepared by GAEC and will be reconsidered during the IRRS mission. Greece has taken some steps towards the establishment of a clear and pragmatic policy and strategy for radioactive waste management, including safety strengthening according to IAEA standards (IRRS mission, participation in IAEA workshops, preparation of regulatory

and legislative documents, etc).

Q.No 12	Country South Africa	Article Article 15	Ref. in National Report H p20
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Question/ Comment What measures are in place regarding the development and regular review of safety assessment for radioactive waste management facilities?

Answer A draft regulation has been prepared by GAEC providing safety and radiation protection requirements for the interim storage facility at NCSR “Demokritos”. Re-evaluation is obligatory for the renewal of license or when changes happen. Relevant requirements are also included in the proposed action plan prepared by GAEC and will be reconsidered during the IRRS mission.

Q.No 13	Country Australia	Article Article 15.3	Ref. in National Report Page 20
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Question/ Comment What steps are taken to ensure the development and regular review of a systematic safety assessment for radioactive waste management facilities?

Answer A draft regulation has been prepared by GAEC providing safety and radiation protection requirements for the interim storage facility at NCSR “Demokritos”. Re-evaluation is obligatory for the renewal of license or when changes happen. Relevant requirements are also included in the proposed action plan prepared by GAEC and will be reconsidered during the IRRS mission.

Q.No 14	Country France	Article Article 19	Ref. in National Report A. - p. 4
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Question/ Comment As a member state of the European Union (EU), Greece transposes EU Council Directives into its national legislation. Presently, the Report mentions that Greece is in the final stage of the transposition of the EU Council Directive 2009/71/Euratom and also the near future implementation of the EU Council Directive 2011/70/Euratom of 19 July 2011, relating to the safety of spent fuel management and the safety of radioactive waste management.

Could Greece give more detailed information concerning the changes expected in the Greek legislation due to the transposition of the EU Council Directive 2011/70/Euratom and the corresponding schedule?

Answer The Presidential Decree prepared for the transposition of the EU Council Directive 2009/71/Euratom, is in process of signing by the President of the Republic.
As it concerns the transposition of the EU Council Directive 2011/70/Euratom, an internal committee charged with the drafting of legislative document has been appointed; deadline for delivering the final draft to the GAEC Board is 15/11/2012.
The draft will be reviewed by the supervising Ministry and then it will be submitted to the EC according to the provisions of Art. 33 of the EURATOM Treaty. The process will be completed with the publication in the Official Gazette of the Greek Government. Transposition of the Directive into the Greek legislative system must be completed until August 2013.
Following the transposition of the above Directives, lower level documents,

like Ministerial Decrees and/or GAEC Decisions and Circulars will be issued, providing guidelines and technical requirements. Since in Greece the regulations do not cover all the aspects of radioactive waste management, for example there are no specific regulations for the safety criteria (only in draft form, not yet formally issued) covering all the stages of waste management, no significant changes in the current applicable regulations are expected to be necessary. Yet, new documents and legislative instruments will be produced.

Q.No	Country	Article	Ref. in National Report
15	Sweden	Article 19	Section E, p. 12

Question/ What is the legal status of the GAEC Circulars, e.g.:

Comment - “Clearance levels for NORM”, 03.08.2006.

- “Release of patient excreta following nuclear medicine therapy”, 30.11.2006

Answer The Greek Radiation Protection Regulation provides that GAEC Board Decisions can be issued as Circulars, which are legally binding documents, as far as the implementation of regulations is concerned.

Q.No	Country	Article	Ref. in National Report
16	Sweden	Article 20	Section E, p. 12

Question/ It is stated in the report that GAEC is an autonomous, decentralized, civil
 Comment service supervised by the General Secretariat for Research and Technology under the Ministry of Education, Lifelong Learning and Religious Affairs. It is also stated that GAEC is governed by a seven member Board of Governors, appointed by the Minister of Education, Lifelong Learning and Religious Affairs.

How is the independence of the GAEC ensured as appointment of members of the Board of Governors is made by the Minister of Education, Lifelong Learning and Religious Affairs, when the GAEC is supervised by the General Secretariat for Research and Technology, under the same ministry?

Answer In Greece, according to the common practice, the responsibilities of Ministries are allocated in lower levels of hierarchy; every Ministry has one or more General Secretariats to which specific responsibilities are assigned. In the case of Ministry of Education, Lifelong Learning and Religious Affairs, the General Secretariat for Research and Technology is entitled with the responsibility to coordinate research-related issues and supervise research and technological bodies. In this perspective, the fact that GAEC Board is appointed by the Minister of Education, Lifelong Learning and Religious Affairs does not raise any conflict. Moreover, GAEC establishment Law states that the jurisdiction for GAEC Board appointment is given to the competent Minister.

Q.No	Country	Article	Ref. in National Report
17	Sweden	Article 20	Section E, p. 12

Question/ It is stated that GAEC’s participation in the “General Civil Protection Plan”
 Comment entails responsibilities for the prevention, preparedness and response to radiological emergencies.

How is the “preventive” part of this responsibility carried out by GAEC?

How is the distribution of tasks and liabilities between the participating parties of the “General Civil Protection Plan” arranged?

Answer An effective system for protective actions to reduce radiation risks associated with emergency events is in place. These actions concern prevention measures for sources in order not to become unregulated, detection measures of orphan / disused sources and other radioactive materials (including NORM) and management of sources and contamination from past activities. The following provisions have been taken:

- adoption of IAEA Code of Conduct on the Safety and Security of Radioactive Sources;
- the melting factories are obliged (by law) to install portal detectors; every metal processing factory has installed and operates radiation portals for the detection of radiation sources or radioactive material in scrap metal. Metal products from these factories are also checked for contamination by the installed portals.
- portal detectors and portable equipment exist in the country's entrance points; at country borders, main ports and airport (Athens) radiation portals have been installed and operate, while custom officers use portable dosimetry equipment (survey meters and spectrometers) for further monitoring and assessments. GAEC is immediately informed for every alarm or radiation source event and acts accordingly.
- the national registry of radioactive sources is kept and updated by GAEC;
- establishment of import / export requirements. The import and export of radioactive material and sources is licensed. GAEC issues these licenses irrespectively of the activity, type and isotope of the radioactive material / source. It performs regular inspections while for every single source there is a RPA/RPO appointment. In this respect, there are not unregulated sources other than orphan sources.
- justification principle applies to all activities with ionizing radiation and sources.
- provisions for the safe and secure interim storage of orphan sources or sources that cannot be exported to manufacturer or other source management facility (e.g. in case of bankrupt, facility closure, etc.) are in place.

Apart from GAEC, several governmental authorities are involved in the emergency plan including: the General Secretariat for Civil Protection, the Ministries of Interior, Health and Social Solidarity, Rural Development and Food, Education - Lifelong Learning and Religious Affairs, Defence, Infrastructure, Transport and Networks, the National Meteorological Service, the Police, the Fire Brigade, the Coast Guard, the General Chemical State Laboratory and other civil services and institutes, such as collaborating laboratories.

GAEC, as the competent authority in radiation protection issues in Greece, shall justify the intervention and shall recommend putting the emergency plan into action when conditions require. To deal with any emergency situation which could seriously threaten to expose the population to radiation, emergency plans shall be implemented according to the

seriousness and magnitude of the situation.

The Secretary-General for Civil Protection has the responsibility for the broad implementation of the General Civil Protection Plan “Xenokratis”, Annex “R”, following the proposal of GAEC. It has a key role in broad scale emergency situations and it has the coordination of the first responder teams of the Fire, Police and First aid departments. These actions are described in the Xenokratis part “R” emergency plan.

A network of collaborating laboratories under the responsibility of GAEC (gamma radiation dose rate, concentration of isotopes in the atmosphere, radioactive fallout, etc.) have specific role in providing measurements data, as described in the Xenokratis emergency plan.

Q.No	Country	Article	Ref. in National Report
18	Sweden	Article 20	Section E, p. 13

Question/ Comment The list of activities related to the protection of the public from ionising and non-ionising radiation activities specifies “training activities” as one item.

What types of training are GAEC arranging? Is emergency preparedness training activities included?

Answer GAEC provides education and training in the fields of radiation protection and nuclear safety and security. The educational activities are fully supported by the experienced scientific personnel and state of the art technical infrastructure. In detail, GAEC:

- organizes education and training courses at national, regional and international level, for occupationally exposed workers in the medical, industrial and research applications of ionizing radiation, to workers in transport of radioactive material, in customs offices and airports, where audits for illicit trafficking of radioactive sources are performed, as well as to people involved in emergency response plans;
- participates to and partly hosts the Inter-University Postgraduate Course in Medical-Radiation Physics. The Course duration is three semesters and is attended by about 10 to 15 physicists. The successful completion of all educational stages leads to a Master’s Degree in Medical Radiation Physics;
- conducts the Postgraduate Educational Course on Radiation Protection and the Safety of Radiation Sources. After the successful completion of the Education and Training Appraisal (EduTA) mission in 2008, GAEC was recognized as the IAEA’s Regional Training Center in Europe for Radiation, Transport and Waste Safety. A Long Term Agreement between the Government of the Hellenic Republic and the IAEA, to support GAEC as a Regional Training Centre in Europe for Radiation, Transport and Waste Safety was signed on July 11, 2011. This agreement is now on the procedure of its ratification by the Parliament of the Hellenic Republic.
- organizes seminars and workshops in collaboration with professional and scientific institutions.
- provides on the job training to scientists proposed by the IAEA, in issues of radiation protection, such as regulatory control, dosimetry, calibration of ionizing radiation equipment and environmental radioactivity.

Since the organization of Athens 2004 Olympic Games, an extensive program of training and exercises in the field of the emergency response has been provided to persons working for several national organizations involved in the national emergency plan (military forces, police, coast guards, fire brigade, first line officers, etc.). Seminars addressed to the personnel of these organizations are organized frequently, in order to assure the sustainability of national operational capability on preparedness and response. During presentations, table top exercises and field exercises organized, among issues discussed are: the role of first responders, instrumentation, identification of radiological threat, delineation of emergency zones, entrance and exit to/from hot zone, detection procedures inside hot zone, use of codes/software, decontamination, communication among organizations.

Following, are some recent training events organized by GAEC:

- International Training Course on Detection and Response – Techniques and Coordination for Front Line Officers and Mobile Expert Support Teams (2010)
- Training seminars for various professional groups, such as cargo handlers, army experts, industrial radiography personnel (2010). In total 51 persons participated.
- GAEC certifies the competency in radiation protection issues of non medical staff of ionizing radiation laboratories (2010). In this framework GAEC organized 50 3-day seminars in 10 cities. In total, 2440 radiological technologists, occupationally exposed in medical laboratories, attended these seminars.
- Training of fire brigade special units on radiological emergency response (2011). 43 participants.

Also, a training program for GAEC personnel with responsibilities in the emergency organization is organized annually. Valuable experience is also gained through the participation in international exercises (e.g. ECURIE, CONVEX) and in the European Union Civil Protection Mechanism, under which several courses are organized.

Q.No	Country	Article	Ref. in National Report
19	Sweden	Article 20	Section E, p. 13

Question/ Comment The section provides for an account of number of staff and educational level of the GAEC.

What processes are in place and what analyses have been made to justify the need for number of staff and need for competence at the GAEC?

Answer The effectiveness and sustainability of the radiation protection and nuclear safety system in the country is supported by GAEC qualified and well-trained personnel. GAEC organizational structure and its resources are commensurate to the tasks, the workload and the risks associated with radiation facilities and activities in the country. For example:

- a. the criteria used for staffing GAEC departments are the number of the facilities and the radiation risk, as reflected on the workload;
- b. the progress made in staffing GAEC is related to the increase of the

facilities and activities.

The competence of GAEC personnel is reassured by a 3-step process:

(a) Qualifications upon recruitment. Detailed legal provisions describe the academic and professional skills required for GAEC personnel. This is the rule for the permanent posts, such as the Special Scientific Personnel, but it is followed accordingly for other categories of posts, like posts under definite time contract. The recruitment criteria for personnel are known in advance, in accordance with the quality management system requirements.

(b) On the job training. The newly-hired personnel, especially those involved in inspections and licensing activities, is trained on practical issues for a period of six months. During this adaptation period, they are supervised. At the end of this period the personnel's skills are re-assessed.

(c) Internal training programme. A specific training programme is designed and implemented annually for GAEC personnel, implementing the quality management system requirements. The Scientific Head in cooperation with the Technical Head and the Quality Manager of each laboratory are liable for recognizing the personnel's training needs in each laboratory, taking into consideration:

- his/her theoretical background on Quality Management and the measurements to be performed during his/her work;
- his/her ability and effectiveness in the performance of measurements;
- his/her commitment to quality;
- the importance of his/her work;
- his/her seniority;
- the need to be retrained;
- the need to acquire new knowledge and techniques that may improve the quality and effectiveness of his/her work.

Especially for the inspectors, GAEC makes sure that they have:

- proper knowledge for the performance of inspections and the assessment of the supporting documents submitted;
- proper scientific and technical knowledge of the associated fields inspected, including instrumentation;
- required knowledge and judgment for the analysis and assessment of inspection results and the preparation of required documents.

Furthermore, GAEC takes advantage of IAEA and other educational activities organized at international or European level. Therefore, GAEC encourages, facilitates and finances the participation of its employees in training courses, networks, conferences, seminars, etc. (indicatively the period 2009-2011 GAEC personnel members participated in 121 training courses/conferences/workshop organized mainly abroad). Also, it closely follows the developments in the area of its competence and disseminates the relevant information.

Staffing processes are included in the QMSs of GAEC.

Q.No	Country	Article	Ref. in National Report
20	Sweden	Article 20	Section E, p. 13

Question/ Comment It is stated in the report that GAEC's financial resources, adequately covering its needs, come from the public budget as well as from licensing

fees and radiation protection services.

What processes are in place and what analyses have been carried out to determine that GAEC's current financial resources are adequate?

What share of financial resources comes from public budget, licensing fees and radiation protection services, respectively?

Answer GAEC is financially supported by two sources: the governmental budget and the special account. The ratio of their contribution to GAEC total income for the year 2011 was 43% and 57% respectively. For the years 2008, 2009 and 2010 this ratio was 41%-59%, 44%-56% and 43%-57% respectively.

As it concerns the governmental budget, on annual basis GAEC submits its request to the Government with the proper justification. The allocated budget is included in the national budget approved by the Greek Parliament. This budget covers mainly the annual contribution to international organizations (IAEA), the salaries of the permanent staff and a few operational expenses.

Regarding the special account, its revenues come from fees, the provision of services and the implementation of research and other projects. It covers the salaries of the non-permanent staff and the majority of operational expenses, like equipment purchase, travel expenses, etc. Every requirement for expense has to be justified and is subjected to prior approval. In case of equipment purchase, a special committee decides on its approval prior to the payment. An annual financial audit is performed by certified auditors, covering both funding sources.

All relevant documents are kept by the Division of Administration and Technical Support.

Additionally, for internal audit reasons, a detailed report is prepared annually and summary reports quarterly, in order that the Chairman and the Directors are informed about the financial status of GAEC and its divisions/departments. These data are discussed during the regular meetings among the Chairman and the heads of departments. Relevant provisions are included in GAEC Quality Management System.

Q.No	Country	Article	Ref. in National Report
21	Slovakia	Article 22	p. 14

Question/ Comment The GRR is owned and operated by the Ministry of Education, Lifelong learning and Religious Affairs. The GAEC is governed by Board of Governors appointed and supervised by the same ministry. This is in contradiction with article 20 of the Joint Convention. Explanation would be welcomed.

Answer GAEC is not owned, neither is operated by the Ministry of Education, Lifelong learning and Religious Affairs. GAEC is an autonomous civil service governed by a seven-member Board appointed by the Minister of Education, Lifelong learning and Religious Affairs. The Board has the authority to decide independently; this status applies also to the licensing of research institutions belonging to the same Ministry. The Ministry does not interfere in the process.

Q.No	Country	Article	Ref. in National Report
22	United States of America	Article 24	F, 15

Question/ Comment An inspection was performed under Article 35 of the EURATOM Treaty in September 2005; have there been additional inspections since then? Please describe the outcomes?

Answer EC has scheduled the next inspection for October 2012.

Q.No	Country	Article	Ref. in National Report
23	Bulgaria	Article 25.2	F p.17

Question/ Comment What organization does bear the prime responsibility for preparation and conducting national emergency exercises and who is responsible for evaluation of the emergency exercises? Could Greece provide some examples of improvements in the emergency preparedness resulting from the exercises?

Answer The responsibility for preparation and conducting national emergency exercises is not assigned to one specific body. All involved bodies (e.g. General Secretariat for Civil Protection, Police, Fire brigade) have to organize their own exercises. The responsibility or exercises involving all partners belongs to the General Secretariat for Civil Protection. The lessons learnt from the exercises organized so far, concern mainly communication and organizational aspects, which were taken into consideration.

Q.No	Country	Article	Ref. in National Report
24	France	Article 26	K. - p. 24

Question/ Comment In 2009, answering a question from France, Greece reported that the Greek Atomic Energy Commission (GAEC) had been notified by the operator of the research reactor (GRR-1) that a report regarding the preliminary version of the decommissioning plans of this installation would be submitted by the end of 2009.

In Section K, it is mentioned that "the update of the licensing process of the GRR-1, according to which decommissioning plan and waste management will be submitted as part of the safety analysis report".

Could Greece provide further information on this topic?

Answer In 2011 the decommissioning plan of the primary cooling system of the GRR-1 was submitted by the operator and approved by GAEC (April 2011). This plan does not consist the plan for the future final decommissioning of the installation, but it is a part of the actual refurbishment works. Recently, GAEC prepared drafts of regulatory provisions for the licensing process update. According to the provisions NCSR "Demokritos" has to select between an operation or an extended shutdown license for the GRR-1. In both cases, GRR-1 is obliged to provide to GAEC appropriate safety analysis documents, along with a decommissioning plan and a program for radioactive waste management.

Q.No	Country	Article	Ref. in National Report
25	Slovakia	Article 26	F,17

Question/ Comment What further management/disposal option is considered for waste from decommissioning of your research reactor and for stored waste, which do not meet criteria for release?

Answer Recently, GAEC prepared drafts of regulatory provisions for research

reactors' licensing process update. According to the provisions, NCSR "Demokritos" has to select between an operation or an extended shutdown license for the GRR-1. In both cases, GRR-1 is obliged to provide to GAEC appropriate safety analysis documents, along with a decommissioning plan and a program for radioactive waste management.

Greece has not yet defined an end-point solution for the final disposal of radioactive waste. Option for interim storage of radioactive waste exists in the interim storage facility at NCSR "Demokritos". However, a re-assessment of the safety of the facility needs to be performed, in order to determine the period for its safe operation according to IAEA standards, taking into account the anticipated waste from the decommissioning of the research reactor. Discussion for radioactive waste management policy issues has been decided to be a priority in the IRRS mission in May 2012.

Q.No	Country	Article	Ref. in National Report
26	United States of America	Article 27	I, 22

Question/ Comment Section I mentions the installation of portal monitors at transboundary points in advance of the 2004 Olympic games. How have the equipment and personnel been maintained/retained?

Answer In the light of Athens Olympic Games in 2004 collaboration between IAEA, US DoE and GAEC was established and an ambitious project was put in place: radiation detection portals were installed in the country's entrance points in order to combat the radioactive and nuclear materials illicit trafficking. The collaboration was sealed by a "Declaration of Intent" concerning cooperation to prevent the illicit trafficking in nuclear and other radioactive material.

The security infrastructure, the training and the safety culture acquired are some of the components of Athens Olympic Games heritage. Greece is still attributing high priority to security issues; therefore the sustainability of the project is reassured. In this respect, on November 10, 2008 an agreement was signed between GAEC and the Ministry of Finance regarding the maintenance and calibration of the radiation detection systems located at customs offices. The undertaking of this project, on behalf of GAEC, confirms the know-how acquired and the expertise of the personnel.

Q.No	Country	Article	Ref. in National Report
27	Germany	Article 28	23

Question/ Comment It is reported that "legacy sources have been collected and exported to a foreign country", and that this practice will be repeated in future if necessary.

How many legacy sources have been detected in the past (e. g. last 5 years) and what are the inventories (activity, nuclides)?

- Are there indications that unacceptable radiation exposures may have occurred to the general public?

- Which country have these legacy sources been exported to?

Answer About 120 sources have been collected since 2006, with a total activity of about 40 TBq. Source's nuclides are Co-60, Sr-90/Yr-90, Cs-137, Ra-226, Pm-147. A number of lightning rods and fire detectors have also been collected. Detailed inventory is maintained.

No indications of unacceptable exposure exist.

The sources were exported to a recycling company in Germany.

Q.No 28	Country United States of America	Article Article 28	Ref. in National Report J, 23
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Question/
Comment In Section J, the report states that spent and disused sources are collected at an interim storage facility and exported to a foreign government for recycling. If the disused sources can't be exported, what provisions are there for disposition?

Answer Greece has not defined yet an end-point solution for the final disposal of radioactive waste and disused sources in case that they cannot be exported. Currently, the option is storage in the interim storage facility at NCSR "Demokritos". Radioactive waste management has been defined as a policy issue for the IRRS mission to be held in May.

Q.No 29	Country France	Article Article 32	Ref. in National Report B. - p. 6
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Question/
Comment In the Report, it is mentioned that "the fuel of the decommissioned sub-critical assembly of the National Technical University of Athens (NTUA) is under dry interim storage in NTUA premises, under the control and supervision of the Nuclear Technology Laboratory of NTUA. Preliminary actions have already been taken, in conjunction with IAEA, to explore the feasibility of the repatriation of the fuel to the country of origin". These elements constitute an answer to a previous question from France.

Could Greece provide detailed information on the current status of these actions?

Answer The fuel is practically fresh. Greece has formally informed the country of origin (UK) that the owner of the fuel (NTUA) is prepared to negotiate the return of the nuclear material to the UK, in accordance with the Greek Government's public accountancy rules.

Q.No 30	Country France	Article Article 32	Ref. in National Report D. - p. 10
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Question/
Comment In 2009, answering a question from France, Greece reported that a characterization project of radioactive waste produced in the past at the National Centre of Scientific Research (NCSR) "Demokritos" was in progress.

In the Report, table (e) in Section L shows the radionuclide activities in the primary resin waste and it is mentioned that "the radiological characterization of the resins was performed as part of the ongoing project for the characterization of the NCSR "Demokritos" legacy waste".

Could Greece provide more information on the current status of this project?

Answer The project for the characterization of the legacy waste is progressing slowly. Some preliminary non destructive measurements were performed for randomly selected solidified (in cement) sludge of aqueous waste, originating from a radionuclide production plant operating in the past. The preliminary results showed that a significant number of drums didn't seem to be contaminated by artificial gamma emitters. The next step is the collection of samples from the drums for laboratory analyses. Furthermore, a research proposal was prepared for radiological sorting alongside with the

qualitative sorting of waste items which are contained in the waste drums.

Q.No 31	Country Slovakia	Article Article 32	Ref. in National Report p.9
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Question/ Comment The report states that all spent fuel produced until 2004 was exported to US. A number of irradiated assemblies are still in the facility. What will be the fate after their use?

Answer All spent fuel will be returned back to US, according to an existing agreement with the US DoE.

Q.No 32	Country Slovakia	Article Article 32	Ref. in National Report p. 6
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Question/ Comment What is Greece's involvement in the establishment of a shared disposal facility? What activities were performed in this regard?

Answer In our knowledge, there are no actions taken by any country in this respect so far.

Q.No 33	Country Slovakia	Article Article 32	Ref. in National Report B,6, letter c
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Question/ Comment What are your regulatory requirements for disposal of your radioactive waste abroad (interregional repository)?

Answer No specific requirements exist.

Q.No 34	Country South Africa	Article Article 32	Ref. in National Report B (c) p6
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Question/ Comment Please provide more detail on the national radioactive waste policy and in particular how the policy addresses waste arising from the decommissioning of facilities such as the GRR-1

Answer Recently, GAEC prepared drafts of regulatory provisions for research reactors' licensing process update. According to the provisions NCSR "Demokritos" has to select between an operation or an extended shutdown license for the GRR-1. In both cases, GRR-1 is obliged to provide to GAEC appropriate safety analysis documents, along with a decommissioning plan and a program for radioactive waste management. Greece has not defined yet an end-point solution for the final disposal of radioactive waste. Option for storage of radioactive waste exist in the interim storage facility of NCSR "Demokritos", however a re-assessment of the safety of the facility needs to be performed, in order to determine the period for its safe operation according to IAEA standards, taking into account the anticipated waste from the decommissioning of the research reactor. Radioactive waste management has been defined as a policy issue for the IRRS mission to be held in May.

Q.No 35	Country Sweden	Article Article 32	Ref. in National Report Section B, p.6
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Question/ Comment It is stated that Greece supports the idea that sharing of disposal facilities in the context of an agreement between the countries, taking into account the conditions specified in the recently adopted European Council Directive 2011/70/Euratom is a beneficial, cost-effective and safe option, and believes that it consists a feasible option.

Has Greece considered volunteering to host a disposal facility that would accommodate also radioactive waste from other countries?

If not, what would be the justification to expect another country would volunteer to host a disposal facility that would accommodate also radioactive waste from Greece?

What plans are in place in case such cooperation will not materialise?

Answer In our view the establishment of a radioactive waste disposal facility in a non-nuclear country is not a pragmatic approach. Greece doesn't claim or ask any justification from any particular country in accommodating its radioactive waste. The arrangements made so far were on a commercial basis, respecting all relevant legislation or particular terms. Policy for radioactive waste in Greece is currently under re-assessment and international peer review (forthcoming IRRS mission). In this context, final disposal in Greece or collaboration with other countries for a regional or International solution may be considered and is formally included in the last European Council Directive 2011/70/Euratom (recital 33). Naturally, the national policy and strategy cannot rely only on this option.

Q.No 36	Country Sweden	Article Article 32	Ref. in National Report Section B, p.7
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Question/ Comment It is stated that “In light of the described situation and arrangements, there are no plans to create a long-term storage or disposal facility. Short-term interim storage of radioactive sources and waste awaiting disposal is provided in facilities located at the NCSR “Demokritos”, which however, in the light of the near future implementation of the EC Directive 2011/70/Euratom, shall be reconsidered in terms of regulatory control.

Is there any legal definition in Greece on what is meant by long-term or short-term storage?

Are there specific requirements on the conditioning of waste in connection with long-term or short-term storage?

Answer In Greek regulation there are no specific requirements or definitions of long term waste management. Long term, in the referred statement in our report, means a final solution for radioactive waste management. In addition to the upgrade of the regulatory control, the policy for radioactive waste management will also be assessed and may be re-formulated as an outcome of the efforts that are presently being undertaken (e.g IRRS mission) concerning radioactive waste management in Greece. There are not specific requirements for conditioning of radioactive waste. IAEA standards are used. Conditioning of the radioactive waste produced during its operation was used to be made in the research reactor waste management facility (e.g. solidification, evaporation etc), according to the radioactive waste management program of the research reactor. Currently, the research reactor is out of operation, so no waste is produced and no conditioning is performed. Waste from other practices, like disused sources, is confined in drums and stored in the interim storage facility. In this way, retrievability and traceability of the waste is facilitated.

Q.No 37	Country Sweden	Article Article 32	Ref. in National Report Section B, p.7
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Question/ Comment It is stated that “Greek national authorities are responsible for the availability of technical infrastructure and equipment related to the treatment of radioactive waste”.

Which authorities are these which are referred to here?

Has GAEC any such responsibility? How is this responsibility carried out in practice?

Answer According to the legislation, the responsibility for the availability of technical infrastructure and equipment remains with the licensee, regularly inspected by GAEC. The above sentence can be read as: Greek national authorities are responsible for the availability of technical infrastructure and equipment related to the treatment of radioactive waste at state owned facilities.

Q.No	Country	Article	Ref. in National Report
38	Sweden	Article 32	Section B, p.7

Question/ Comment It is stated that “Special retention tanks might be required in nuclear medicine laboratories using I-131”.

Is there any decisions made regarding such tanks?

Have the resulting doses from direct release to sewage systems exceeded any action or reference levels?

Answer GAEC has issued a circular for “Patients’ excreta release after nuclear medicine treatments (therapies)”. This Circular regulates issues related to:
I. the interpretation of Radiation Protection Regulations on patients’ excreta release after nuclear medicine treatments (therapies);
II. establishment of dose constraints for not occupationally exposed workers in the drainage system and waste water treatment plants;
III. establishment of criteria concerning the necessity of delay tanks’ use for collecting patients’ excreta in Nuclear Medicine departments of category A3.
In this circular, criteria concerning the necessity of delay tanks’ use for collecting patients’ excreta in Nuclear Medicine departments of category A3 are provided. The criteria were established based on calculations and were validated by on site measurements.

The resulting doses have not exceeded action or reference levels.

Q.No	Country	Article	Ref. in National Report
39	Sweden	Article 32	Section B, p.7

Question/ Comment It is stated that “Industrial waste produced by NORM industries with radionuclide concentrations exceeding the exemption levels has been exported to a foreign country for recycling”.

Could Greece please give more information on this?

What type of material was processed and how could it be “recycled”?

Answer The exported materials were surface contaminated metal parts (pipes etc), coming from the dismantling of a fertilizer industry. The shipment was made to a specialized scrap metal recycling industry in Germany.

Q.No 40	Country Sweden	Article Article 32	Ref. in National Report Section K, p. 24 (27)
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Question/ Comment Greece has asked for an IRRS-mission that will take place in May 2012.

Provided for that the IRRS-mission is finished before the Review Meeting commences, it would be appreciated if Greece could present some preliminary conclusions regarding RW &SF management during their national presentation at the Review Meeting.

Answer Thank you for the remark. The mission will take place 20-30 May 2012. GAEC intends to make public the mission report.

Q.No 41	Country United States of America	Article Article 32	Ref. in National Report B, 6
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Question/ Comment Although EC Directive 2011/70/Euratom is referenced in the text of Greece's National Report, it is not identified as part of the legal and regulatory framework. What is the status of implementing this recent EC Directive?

Answer The EC Directive must be transposed to the Greek legislation until August 2013, as provided by the Directive. So far, GAEC has taken the necessary action for preparing the draft piece of legislation (appointment of an internal committee having as task the preparation of the draft, the latest by November 2012).

Q.No 42	Country Germany	Article Article 32.1.1	Ref. in National Report B, 6
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Question/ Comment It is reported that investigations are under way aiming at the repatriation of the spent fuel from a sub-critical assembly of the National Technical University of Athens to the country of origin. Which country supplied the assembly originally?

Answer United Kingdom supplied the assembly.

Q.No 43	Country Germany	Article Article 32.1.1	Ref. in National Report B, 7,13
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Question/ Comment It is reported that the Greek Atomic Energy Commission (GAEC) performs about 664 inspections per anno, 10 % without prior notification.

Could you describe a typical inspection team (qualifications, number of team members)? Are the personnel resources reported on page 13 regarded as sufficient to perform and record the inspections in a comprehensive manner?

Answer The Licensing and Inspection Department (LID) of GAEC is accredited following the terms of IEC/ISO 17020 standard.

The licensing process and requirements are included in the Quality Manual. A few hints follow:

1. A typical inspection team consists of two GAEC's inspectors.
2. For the performance of inspections and other activities of the department, LID has the competent scientific and technical personnel with all the required skills, training, experience and targeted knowledge. More

specifically, LID personnel who participate in inspections have:

- The knowledge required for the performance of inspections and the assessment of the supporting documents submitted,
- proper knowledge on construction technology and use of inspected systems,
- required knowledge and judgment for the analysis and assessment of inspection results and the preparation of required documents.”

The personnel resources are considered sufficient in order to cover the inspection needs.

Q.No 44	Country Germany	Article Article 32.1.3	Ref. in National Report B, 6
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Question/ Comment Greece supports the idea that sharing of disposal facilities in the context of an agreement between the countries, taking into account the conditions specified in the recently adopted European Council Directive 2011/70/Euratom, is a beneficial, cost-effective and safe option, and believes that it is a feasible option.

- Has Greece definitely decided not to build a domestic disposal facility in deep geological formations?
- Is Greece making its own efforts towards siting a radioactive waste repository within its national boundaries?
- Is Greece currently taking part in any international project in this field? If not, which practical steps are planned to be taken in near future in order to realise a partnership for the utilisation of a shared radioactive waste disposal facility or follow up a home based disposal facility as a backup solution?

Answer Policy for radioactive waste in Greece is currently under re-assessment and international peer review (forthcoming IRRS mission). One of the existing gaps is the lack of a clear solution for the final disposal of radioactive waste. In this context, final disposal in Greece or collaboration with other countries for a regional or International solution may be considered. GAEC has initiated efforts for strengthening its competency concerning radioactive waste management and participates in organized projects or events (e.g. participation in IAEA workshops).

Q.No 45	Country Germany	Article Article 32.1.5	Ref. in National Report B, 6
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Question/ Comment Radioactive waste in Greece originates from medicine, research and industry (including industries generating waste with NORM). According to the Third Joint Convention report, low-level and intermediate-level waste derives from these sources. The current report does not mention the generation of intermediate-level waste anymore.

Could you briefly explain the reason for this? Does the modified waste categorisation originate from the implementation of the new IAEA General Safety Guide No. GSG-1 "Classification of Radioactive Waste" published in 2009?

Answer The research reactor is out of operation. No other activity is producing currently intermediate level waste.

Q.No	Country	Article	Ref. in National Report
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46	Germany	Article 32.2.4	D, 10
Question/ Comment	<p>As briefly stated in the report, a project for the characterization of legacy waste inventory stored at the National Centre of Scientific Research (NCSR) “Demokritos” is on-going. However, this project is not mentioned in Section K (planned activities to improve safety).</p> <ul style="list-style-type: none"> - Could you provide some information on the current status and progress achieved so far in this project? - Do you have any time schedule for the completion of the project? 		
Answer	<p>The project for the characterization of the legacy waste is progressing slowly. Some preliminary non destructive measurements were performed for randomly selected solidified (in cement) sludge of aqueous waste, originating from a radionuclide production plant operating in the past. The preliminary results showed that a significant number of drums didn't seem to be contaminated by artificial gamma emitters. The next step is the collection of samples from the drums for laboratory analyses. Furthermore, a research proposal was prepared for radiological sorting alongside with the qualitative sorting of waste items which are contained in the waste drums.</p>		