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INTEGRATED REGULATORY REVIEW SERVICE (IRRS)

FOLLOW-UP MISSION

TO

THE NETHERLANDS

The Hague, The Netherlands

19-26 November 2018

DEPARTMENT OF NUCLEAR SAFETY AND SECURITY

Integrated Regulatory Review Service
IRRS

IAEA Integrated Regulatory Review Service IRRS

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Mission dates:	19-26 November 2018
Representatives of the regulatory body:	Authority for Nuclear Safety and Radiation Protection (ANVS), Ministry of Health, Welfare and Sport (VWS)
Location:	The Hague, The Netherlands
Regulated facilities and activities:	Nuclear power plants, research reactors, fuel cycle facilities, waste management and storage facilities, radiation sources in industrial and medical facilities, emergency preparedness and response, transport, decommissioning, control of medical exposure, environmental monitoring, control of discharge and public exposure
Organized by:	International Atomic Energy Agency (IAEA)

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IAEA-2018

The number of recommendations, suggestions and good practices is in no way a measure of the status of the regulatory body. Comparisons of such numbers between IRRS reports from different countries should not be attempted.

CONTENTS

EXECUTIVE SUMMARY

At the request of the Government of The Netherlands, an international team of senior safety experts met representatives of the Authority for Nuclear Safety and Radiation Protection (ANVS) and the Ministry of Health, Welfare and Sport (VWS) from 19 to 26 November 2018 to conduct an IRRS follow-up mission. The purpose of the IRRS follow-up mission was to review the measures undertaken to address all the recommendations and suggestions made during the 2014 IRRS initial mission. The review compared the Dutch regulatory framework for safety against IAEA safety standards as the international benchmark for safety. The purpose of the 2014 IRRS initial mission was to review the Dutch regulatory framework for nuclear and radiation safety. The initial IRRS mission and the follow-up mission were formally requested by the Government of The Netherlands on 28 August 2012.

A preparatory meeting for IRRS follow-up mission was conducted from 15 to 16 May 2018 at ANVS Headquarters in The Hague to discuss the purpose, objectives, scope and detailed preparations of the review in connection with the regulated facilities and activities in The Netherlands.

The IRRS team comprised 9 senior regulatory experts from 9 IAEA Member States, 2 observers from IAEA Member States, 3 IAEA staff members and 1 IAEA administrative assistant. The IRRS team carried out the review in the areas covered by the main mission in 2014.

The IRRS review addressed the full scope of regulated facilities and activities by ANVS and VWS. The mission was also used to exchange information and experience between the IRRS team members and the Dutch counterparts in the areas covered by the IRRS.

ANVS provided the IRRS team with advance reference material and documentation including the follow-up self-assessment report. The mission included interviews and discussions with ANVS and VWS staff. It was noted that ANVS made extensive preparation to ensure the success of the mission.

The IRRS team noted that the recommendations and suggestions from the 2014 IRRS mission have been considered systematically and thoroughly. Significant progress has been made in all areas. Of the original 26 recommendations and 19 suggestions only one recommendation, related to the development of the requirements on the end state of decommissioning to release the facility from regulatory control (R17), remained open.

The IRRS team was also requested to review the area of Special Arrangements for the transport of radioactive material, which was not covered in the original mission. The IRRS team concluded that the Dutch Transport Special Arrangements and the overall safety requirements implemented by ANVS are made in accordance with the IAEA transport regulations.

The IRRS team made the following general observations in relation to the progress made by The Netherlands since the 2014 IRRS mission.

The Dutch Government showed a strong commitment to nuclear safety and radiation protection and improvement of regulatory control of the nuclear and non-nuclear sector including:

- The consolidation of all the regulatory functions under one single authority with regulatory decision-making independence;
- The separation of the regulatory body from the ministry that has responsibility for energy policy or that has other responsibilities in respect of the facilities regulated by the regulatory body;
- The consolidation of the National Policy for nuclear safety and radiation protection;
- The provision of adequate resources to the regulatory body to fulfil its statutory obligations.

In several areas of regulatory responsibility, after the amalgamation in 2015, ANVS has made substantial progress from the initial IRRS mission.

The IRRS team highlighted the following achievements of the ANVS:

- Issued high level policy documents to guide the newly amalgamated organization;

- Made considerable progress in the development of its Integrated Management System and fostering strong safety culture in the organisation;
- Made provisions for the necessary professional education and training, research and development to build and maintain the competence of a sufficient number of qualified and experienced experts in nuclear and radiation safety and increase its resilience;
- Consolidated and improved its systems for keeping all records relating to the safety of facilities and activities, including registers and documents related to administrative support;
- Signed an all-inclusive Cooperation Agreement for Radiation Protection to promote the cooperation between the various parties which have statutory duties in the area of radiation protection;
- Has made significant progress in developing and implementing inspection planning and emergency preparedness and response.

A policy discussion about the independence of ANVS has been part of this follow-up mission. The IRRS team concluded that the different roles of the ANVS are compatible with international requirements and practices and its effective independence is ensured.

Throughout the mission, the IRRS team received the full cooperation in regulatory and technical areas by all parties. In particular, the staff of ANVS provided excellent assistance and demonstrated extensive openness and transparency.

The IRRS team findings are summarized in Appendix IV.

At the end of the mission an IAEA press release was issued and a joint IAEA and ANVS press conference was conducted.

I. INTRODUCTION

At the request of the Government of The Netherlands, an international team of senior safety experts met representatives of the Authority for Nuclear Safety and Radiation Protection (ANVS) and the Ministry of Health, Welfare and Sport (VWS) from 19 to 26 November 2018 to conduct an IRRS follow-up mission. The purpose of the peer review was to review the Dutch regulatory framework for nuclear and radiation safety. The follow-up mission was formally requested by the Government of The Netherlands on 28 August 2012. A preparatory meeting was conducted from 15 to 16 May 2018 at ANVS Headquarters in The Hague to discuss the purpose, objectives, scope and detailed preparations of the review in connection with the regulated facilities and activities in The Netherlands.

The IRRS team comprised 9 senior regulatory experts from 9 IAEA Member States, 2 observers from IAEA Member States, 3 IAEA staff members and 1 IAEA administrative assistant. The IRRS team carried out the review in the areas covered by the main mission in 2014.

The Regulatory Body prepared a follow-up summary report addressing the findings of the initial mission. The results of The Netherlands' follow-up report and supporting documentation were provided to the IRRS team as advance reference material (ARM) for the mission. During the mission the IRRS team performed a systematic review of all topics by reviewing the advance reference material, conducting interviews with management and staff from ANVS and VWS.

All through the mission the IRRS team received excellent support and cooperation from The Netherlands counterparts.

II. OBJECTIVE AND SCOPE

The purpose of this IRRS mission was to conduct a review of The Netherlands' radiation and nuclear safety regulatory framework and activities to evaluate its effectiveness and to exchange information and experience in the areas covered by the IRRS. The IRRS review scope included all facilities and activites regulated in The Netherlands. The Dutch government has asked the IAEA to extend the scope of the follow-up mission by adding the subject Special Arrangements Transport. The review was carried out by comparison of existing arrangements against the IAEA safety standards.

It is expected that the IRRS follow-up mission will facilitate regulatory improvements in The Netherlands and other Member States from the knowledge gained and experiences shared between The Netherlands regulatory staff and IRRS reviewers and through the evaluation of the effectiveness of The Netherlands regulatory framework for nuclear safety and its good practices.

The key objectives of this mission were to enhance nuclear and radiation safety, emergency preparedness and response by:

- Providing The Netherlands and ANVS and VWS with an opportunity for self-assessment of its activities against IAEA safety standards;
- Providing The Netherlands and ANVS, with a review of their regulatory programmes and policy issues relating to nuclear and radiation safety and emergency preparedness;
- Providing The Netherlands and ANVS and VWS, with an objective evaluation of the regulatory framework for radiation and nuclear safety and emergency preparedness and response within The Netherlands with respect to IAEA safety standards;
- Contributing to the harmonization of regulatory approaches among IAEA Member States;
- Promoting the sharing of experience and exchange of lessons learned;
- Providing reviewers from IAEA Member States and the IAEA staff with opportunities to broaden their experience and knowledge of their own fields;
- Providing key ANVS staff with an opportunity to discuss their practices with reviewers who have experience with different practices in the same field;
- Providing The Netherlands and ANVS and VWS with recommendations and suggestions for improvement; and
- Providing other Member States with information regarding good practices identified in the course of the review.

III. BASIS FOR THE REVIEW

A) PREPARATORY WORK AND IAEA REVIEW TEAM

At the request of the Government of The Netherlands, a preparatory meeting for the IRRS follow-up was conducted from 15 to 16 May 2018. The preparatory meeting was carried out by the appointed Team Leader Mr Andrej Stritar, the Deputy Team Leader Mr Peter Fundarek and the IRRS IAEA team representatives, Mr Miguel Santini, IAEA Team Coordinator, Mr Ibrahim Shadad, IAEA Deputy Team Coordinator.

The IRRS mission preparatory team had discussions regarding regulatory programmes and policy issues with the senior management of ANVS.

The discussions resulted in agreement that the regulatory functions covering the following facilities and activities were to be reviewed by the IRRS follow-up mission:

- Nuclear power plants;
- Research reactors;
- Waste facilities;
- Radiation sources facilities;
- Decommissioning;
- Transport;
- Patient protection;
- Emergency Preparedness and Response;
- Public and environmental exposure control;
- Policy Discussion: ANVS Independence.

In addition, The Dutch government had asked the IAEA to extend the scope of the follow-up mission by adding the subject Special Arrangements Transport.

Representatives of ANVS made presentations on the national context for nuclear and radiation regulatory framework and the progress made by ANVS since the original mission of 2014.

IAEA staff presented the IRRS principles, process and methodology. This was followed by a discussion on the tentative work plan for the implementation of the IRRS in The Netherlands in November 2018.

The proposed IRRS team composition (senior regulators from Member States to be involved in the review) was discussed and the size of the IRRS team was tentatively confirmed. Logistics including meeting and work space, counterparts and Liaison Officer identification, lodging and transportation arrangements were also addressed.

The Netherlands Liaison Officers for the IRRS mission was confirmed as Ms Johanna Nes, assisted by two deputy Liaison Officers, Mr Machiel Kleemans and Mr Rob Jansen, from ANVS.

ANVS provided the IAEA (and the review team) with the advance reference material for the review at the end of September 2018. In preparation for the mission, the IAEA review team members conducted a review of the ARM and provided their initial review comments to the IAEA Team Coordinator prior to the follow-up mission.

B) REFERENCE FOR THE REVIEW

The most relevant IAEA safety standards and the Code of Conduct on the Safety and Security of Radioactive Sources were used as review criteria. A more complete list of IAEA publications used as the reference for this mission is given in Appendix VI.

C) CONDUCT OF THE REVIEW

The initial IRRS follow-up team meeting was conducted on 19 November 2018 in The Hague, led by the IRRS Team Leader and the IRRS IAEA Team Coordinator, to discuss the general overview, the focus areas and specific issues of the mission, to clarify the basis for the review and the background, context and objectives of the IRRS and to agree on the methodology for the review and the evaluation among all reviewers. They also presented the agenda for the mission.

In addition, the Team Leader and IAEA staff provided refresher training to the IRRS team to ensure a common understanding of the IRRS process, methodology and report preparation. The reviewers also reported their first impressions of the advance reference material.

The Liaison Officer and two deputy Liaison Officers were present at the opening IRRS team meeting, in accordance with the IRRS guidelines, and presented logistical arrangements planned for the mission. In addition, as agreed at the preparatory meeting, a Deputy Liaison Officer, Mr Rob Jansen, presented an update on Fukushima related activities.

The IRRS entrance meeting was held on Tuesday, 20 November 2018, with the participation of ANVS senior management and staff. Opening remarks were made by Mr Jan van den Heuvel, Chairman of the ANVS Board, and Mr Andrej Stritar, IRRS Team Leader. Marco Brugmans, Vice Chairman of the ANVS Board gave an overview of the current status of the national context, regulated facilities and activities, legal and regulatory safety infrastructure, the main changes which have happened since the IRRS initial Mission in 2014, including the issuance of the main Vision document, and main organization strategy documents.

The ANVS had prepared a national follow-up report addressing the findings of the main mission. The results of The Netherlands' follow-up report and supporting documentation were provided to the IRRS team as advance reference material (ARM) for the mission. During the mission the IRRS team performed a systematic review of all topics by assessing the information provided in the advance reference material, and supplementing that information conducting interviews with management and staff from ANVS and VWS. At the request of ANVS the IRRS mission included discussions on policy issues regarding independence of the regulatory body versus its political responsibilities.

The IRRS team performed its activities based on the mission programme given in Appendix II.

The IRRS exit meeting was held on Monday, 26 November 2018. The opening remarks at the exit meeting were presented by Mr Jan van den Heuvel, Chairman of the ANVS Board, and were followed by the presentation of the results of the mission by the IRRS Team Leader Mr Andrej Stritar. Thereafter the State Secretary of the Ministry of Infrastructure and Water Management of The Netherlands, Stientje van Veldhoven-van der Meer, which is primarily responsible for the Nuclear Anergy Act and its regulations, made a number of statements in relation to the commitment of The Netherlands to comply with the international standards and accepted the report from Andrej Stritar. Closing remarks were also made by Mr David Senior, Section Head of the Regulatory Activities Section, Division of Nuclear Installation Safety, IAEA. A press conference followed the final presentations whereby the State Secretary, the ANVS Chairman of the Board, the Senior Representative of the IAEA and the Mission Team Leader answered questions from the press.

An IAEA press release was issued at the end of the exit meeting.

1. RESPONSIBILITIES AND FUNCTIONS OF THE GOVERNMENT

1.1. NATIONAL POLICY AND STRATEGY FOR SAFETY

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: Policy documents exist, but some are not up to date. They are amended from time to time through letters to Parliament (e.g. the waste policy). However, a consolidated, overarching policy documentation is missing including human and financial resources, as well as a framework for research and development.	
(1)	**BASIS: GSR Part 1 paragraph 2.3 (d, e) states that** *"National policy and strategy for safety shall express a long term commitment to safety. The national policy shall be promulgated as a statement of the government's intent. The strategy shall set out the mechanisms for implementing the national policy. In the national policy and strategy, account shall be taken of the following:…* *(d) The need and provision for human and financial resources;* *(e) The provision and framework for research and development;*
(2)	**BASIS: GSR PART 5 Requirement 2 states:** *"To ensure the effective management and control of radioactive waste, the government shall ensure that a national policy and a strategy for radioactive waste management are established. The policy and strategy shall be appropriate for the nature and the amount of the radioactive waste in the State, shall indicate the regulatory control required, and shall consider relevant societal factors. The policy and strategy shall be compatible with the fundamental safety principles and with international instruments, conventions and codes that have been ratified by the State. The national policy and strategy shall form the basis for decision making with respect to the management of radioactive waste"*
R1	**Recommendation: The government should provide a consolidated, overarching national policy and strategy for safety, including radioactive waste management and disposal, and including human and financial resources, as well as a framework for research and development.**

Changes since the initial IRRS mission

Recommendation 1: The Government of The Netherlands and ANVS have prepared the document "*Guide for Readers - National Policy for nuclear safety and radiation protection 2018*" which describes how the various components of the national policy are brought together into a comprehensive strategy document. While there is no consolidated, overarching national policy document, the Guide for Readers includes all of the necessary information, with links to the appropriate legislation and references, to demonstrate a comprehensive and fulsome strategy for safety, including all of the recommended principles.

The topics presented in the Guide for Readers include the National Policy, the statutory framework, the various organizations involved, including the ANVS, and the national strategies for licensing, supervision and enforcement issues, emergency preparedness and response, security and safeguards, radioactive waste management, safety culture, communication initiatives, knowledge retention and financial resources. The foreword of the document is authored by the State Secretary for Infrastructure and Water Management and expresses the commitment of the government to continued safety for people and the environment.

As noted, the document includes a comprehensive list of topics related to the national policy and there is sufficient text associated with each chapter to explain the necessary information. Appendices to this document provide the IAEA principles in the national policy and a list of international agreements.

Status of the finding in the initial mission

Recommendation 1 (R1) is closed as the Guide for Readers on the national policy provides sufficient information, with links to supplementary information and resources, to adequately explain the national policy and strategy related to radiation safety.

1.2. ESTABLISHMENT OF A FRAMEWORK FOR SAFETY

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The regulatory body has the legal power to require financial provisions for decommissioning from licence holders of nuclear power plants, research reactors, HASS and scrap metal facilities. However, there is no legal provision to require such provisions for others nuclear facilities, including fuel cycle facilities.	
(1)	**BASIS: GSR Part 1 paragraph 2.5 (16) states that** *"The government shall promulgate laws and statutes to make provision for an effective governmental, legal and regulatory framework for safety. This framework for safety shall set out the following: …* *(16) Responsibilities and obligations in respect of financial provision for the management of radioactive waste and of spent fuel, and for decommissioning of facilities and termination of activities.*
(2)	**BASIS: GSR Part 6 requirement 9 states that** *"Responsibilities in respect of financial provisions for decommissioning shall be set out in national legislation. These provisions shall include establishing a mechanism to provide adequate financial resources and to ensure that they are available when necessary, for ensuring safe decommissioning.* *(Paragraph 6.2) The cost estimate for decommissioning shall be updated on the basis of the periodic update of the initial decommissioning plan or on the basis of the final decommissioning plan. The mechanism used to provide financial assurance shall be consistent with the cost estimate for the facility and shall be changed if necessary.* *(Paragraph 6.3) If financial assurance for the decommissioning of an existing facility has not yet been obtained, adequate financial resources shall be put in place as soon as possible. Approval of a renewal or extension of the authorization for operation of the facility shall include provisions for financial assurance.*
R2	**Recommendation: The government should make legal provisions to require financial provisions for nuclear and non-nuclear facilities, for the management of radioactive waste and of spent fuel, and for decommissioning of facilities and termination of activities.**

Changes since the initial IRRS mission

Recommendation 2: This recommendation is related to the information required for Recommendation 18 in Chapter 9.

The IRRS team was advised that there is a legal requirement for businesses in The Netherlands to make a provision for termination of their activities. This requirement applies to all companies, not just those regulated by the ANVS. All companies are required to document the funds necessary to terminate their business activities and to make a financial accounting of this value. Therefore, there is an existing requirement by the government to make financial provisions.

The IRRS team was informed that The Netherlands maintains a graded approach for the assurance of financial resources needed for timely and safe decommissioning of all regulated facilities.

For nuclear facilities, in accordance with Article 15f of the *Nuclear Energy Act*, facilities with nuclear reactors are required to have a financial security which is protected from bankruptcy proceedings. The IRRS team was informed that the financial security (including the costs of radioactive waste management) should be approved by the Minister of Infrastructure and Water Management and the Minister of Finance, and updated every five years. A financial security is presently provided by the licence holders of nuclear reactors with the exception of the Dodewaard nuclear power plant. The reactor of Dodewaard is in a state of safe enclosure. At present a legal procedure is going on against the owner of the Dodewaard nuclear power plant about the provision of financial security for the decommissioning costs.

Last year NRG increased the provision for the decommissioning costs for other facilities at the Petten site that are not covered by the High Flux Reactor (HFR) licence (laboratories, processing facilities, etc.). This provision is in a secured bank account controlled by the Ministry of Economic Affairs and Climate Policy.

COVRA is the state-owned company which oversees the management of radioactive waste produced in The Netherlands. The Dutch Ministry of Finance is sole shareholder of COVRA. Ongoing and future costs associated with waste management at COVRA are covered by the fees paid by generators of waste on transfer to COVRA. This includes a provision on the balance sheet for COVRA decommissioning costs. COVRA-operated facilities are not expected to undergo decommissioning before 2130.

The IRRS team was informed that the Government is investigating the usefulness and necessity to extend the requirement for financial security to COVRA and NRG (other facilities than the reactors) in line with art 15f of the NEA.

The IRRS team was further informed that in 2017 the Government decided to extend the requirements of financial security for the decommissioning costs. The necessary legislation for the URENCO enrichment facility in Almelo (URENCO-NL) is being prepared and is expected to be finalized within the next two years. This will ensure that this facility has the same financial security requirements as nuclear reactors.

Other than the foregoing, there are no other nuclear facilities present in The Netherlands. Based on the graded approach, the following arrangements have been made for other facilities.

In addition to nuclear facilities, licensees with high-activity sealed sources (HASS - Article 4.15 Bbs and Article 4.3 Rbs) or scrap metal collection (for orphan sources - Article 7, Decree of 3 October 2002 containing rules on the detection of radioactively contaminated scrap) must set aside a financial security, which is protected from bankruptcy, to ensure that decommissioning of these activities can be completed if the company is no longer able to do so. This is in line with EU-policy (Directive 2013/59/Euratom).

The ANVS has conducted research on the costs of decommissioning of all non-nuclear activities and has introduced requirements to establish financial provisions for decommissioning of certain categories of activity. Four categories of activities have been identified with relatively high decommissioning costs. These include cyclotrons/accelerators, coal-fired power production, oil and gas production and exploration and thermal phosphorus production. In the Bbs there is a requirement stipulating that licence holders with these activities need to have a decommissioining plan including a description of financial provision for future decommissioning (Article 10.8 Bbs). Additionally, the Minister of Economic Affairs can also require a financial assurance for licence holders under the Mining Act who have gas and oil production facilities.

The ANVS has published guidance for the contents of decommissioning plans of non-nuclear activities. In the licensing process the decommissioning plan is evaluated by the ANVS. The ANVS can deny a licence in case of an insufficient or incomplete decommissioning plan (Article 3.7 Bbs).

In the case of the bankruptcy of a company using radioactive material in The Netherlands, a trustee will be appointed as a receiver. The trustee assumes all rights and responsibilities to meet the regulatory requirements. If a new owner is identified, upon request the ANVS will transfer the licence for the company in bankruptcy to a new licence holder. The ANVS will only grant permission if the new licence holder is trustworthy, competent and financially solvent (Article 70 NEA). The requirements for the notification, by companies, terminating their activities including bankruptcy or filings associated with potential business failures is stated in the Bbs (Article 3.6). If no new owner is identified, then for the termination of activities the authorized undertaking must transfer all radioactive materials to the supplier or the waste storage/disposal facilitiy within two years (Article 10.8 Bbs). In all cases, the ANVS ensures that any radioactive materials that are not sufficiently controlled through these means will be transferred to COVRA. The costs will be imposed to the owner, if needed by enforcement.

For orphan sources outside regulatory control, the ANVS must be notified of the source (NEA Articles 22 and 33) and the ANVS will arrange safe transfer to COVRA. If the owner can be identified, then these costs will be imposed to this owner by enforcement.

In the case of insufficient financial resources, the Government assumes the ultimate responsibility to protect the public and the environment and will provide funding for safe storage/disposal of the sources.

The ANVS also maintains that these requirements are consistent with other members of the European countries in the area and feels that it is important to maintain equal regulatory responsibilities for all countries, thereby not imposing an unnecessary regulatory burden on The Netherlands.

In summary, the ANVS has implemented a graded approach to ensure that sufficient funds are available to complete decommissioning and manage all radioactive wastes generated as a result. Facilities and activities which pose a high risk or which may have significant costs associated with decommissioning are required to have segregated, protected funds sufficient for the eventual decommissioning work. In other cases, the ANVS will take the necessary actions to ensure that the decommissioning is carried out properly and, if necessary, seek funds from the Government to cover costs where the owner is not available to do so.

Status of the finding in the initial mission

Recommendation 2 (R2) is closed on the basis of progress made and confidence in the effective completion as the Government and the ANVS have implemented a graded approach to the provision of financial resources for decommissioning of all facilities, relying on the Government as a means of last resort.

1.3. ESTABLISHMENT OF A REGULATORY BODY AND ITS INDEPENDENCE

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The position of the regulatory body within the Ministry of EZ that is also responsible for the nation's energy policy may be perceived to be a conflict of interest for the ministry. This raises concern regarding the independence of the regulatory body.	
(1)	**BASIS: GSR Part 1 paragraph 2.8 states that** *"To be effectively independent, the regulatory body shall have sufficient authority and sufficient staffing and shall have access to sufficient financial resources for the proper discharge of its assigned responsibilities. The regulatory body shall be able to make independent regulatory judgements and decisions, free from any undue influences that might compromise safety, such as pressures associated with changing political circumstances or economic conditions, or pressures from government departments or from other organizations. Furthermore, the regulatory body shall be able to give independent advice to government departments and governmental bodies on matters relating to the safety of facilities and activities.*
R3	**Recommendation: The government should separate the regulatory body from the ministry that has responsibility in respect of the facilities regulated by the regulatory body or responsibility for energy policy.**

Changes since the initial IRRS mission

Recommendation 3: The *Decision of the Minister of Infrastructure and Environment of 17 December 2014*, (Official Gazette, no. 37291) includes information in the addendum to Article 20 (new Article 20a – page 5) that the ANVS will only be involved in nuclear safety and radiation protection. Promotion of nuclear energy or delivering energy policy is excluded from the scope of ANVS mandate.

The *Royal Decision of 10 April 2015* (Official Gazette, no. 11080) transfers the responsibility for the national policy in the areas of nuclear safety, radiation protection, the corresponding emergency preparedness, the corresponding security and safeguards, radioactive waste, as well as the responsibility for the Nuclear Energy Act from the Minister of Economic Affairs to the Minister of Infrastructure and Environment. The explanatory memorandum makes it clear, that there is a separation between the regulatory oversight of nuclear safety and radiation protection, from the ministry that remains responsible for energy policy.

In Section 3 of the amended *Nuclear Energy Act* (Official Journal 2016, 180), the responsibilities of the ANVS are clearly identified and do not include responsibility for energy policy or development of nuclear policy.

The documents entitled "*Amendment of Several Decrees on the basis of the Nuclear Energy Act with regard of the establishment of the ANVS* (Official Journal 2017, 233) and "*Amendment of Several Ministerial Regulations on the basis of the Nuclear Energy Act with regard of the establishment of the ANVS*" (Official Gazette 2017, no. 27098) list amendments of other regulations and decrees which confirm that the ANVS is the responsible authority (regulatory body) for nuclear safety and radiation protection.

There is adequate documentation to demonstrate that the ANVS has been set up with sufficient independence and authority to provide for nuclear safety and radiation protection. This information also demonstrates that there is sufficient separation between the ANVS and the ministry responsible for energy policy to ensure independent regulatory decision making.

Status of the finding in the initial mission

Recommendation 3 (R3) is considered closed as the documentation clearly demonstrates the independence of the ANVS and the separation between it and the ministry responsible for energy policy.

1.4. COMPLIANCE WITH REGULATIONS AND RESPONSIBILITY FOR SAFETY

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The fundamental principle of prime responsibility for safety is currently not explicitly stated in the legal framework.	
(1)	**BASIS: Safety Fundamentals SF-1, Principle 1 states that** *"The prime responsibility for safety must rest with the person or organisation responsible for facilities and activities that give arise to radiation risks."*
(2)	**BASIS: GSR Part 1 paragraph 2.14 states that** *"The legal framework for safety shall be established in such a way that the authorized party retains the prime responsibility for safety throughout the lifetime of facilities and the duration of activities, and shall not delegate this prime responsibility."*
S1	**Suggestion: The government should consider explicitly stating in the legal framework that the fundamental principle of prime responsibility for safety rests with the person or organisation responsible for facilities and activities, that give rise to radiation risks.**

Changes since the initial IRRS mission

Suggestion 1: The *Ministerial Nuclear Safety Regulation for nuclear installations* explicitly states in Section 2, Article 3, that the prime responsibility for safety rests with the person or organization responsible for the licence (licence holder). Furthermore, this includes the responsibility for actions/products of contractors, subcontractors and suppliers.The *Nuclear Energy Act* (NEA) has legislative requirements for persons authorized to possess radioactive material and licence holders of nuclear installations. The NEA also applies to licences for facilities and activities with materials that give rise to radiation risks. This responsibility cannot be transferred to another person or organization without the consent of the ANVS.

The *Decree on Basic Safety Standards for Radiation Protection* in four parts, provides information on the application of radiation protection principles, including the principle that the primary responsibility for safety rests with the person or organization responsible for facilities and activities that give rise to radiation risks. It further confirms that the licence holder is responsible for all practices and activities, applying radiation protection principles and regulatory control. This responsibility cannot be transferred without the explicit consent of the ANVS.

Status of the finding in the initial mission

Suggestion 1 (S1) is closed as The Netherlands has provided sufficient evidence to demonstrate that the legal framework is aligned with the IAEA Safety Fundamentals SF-1, Principle 1.

1.5. COORDINATION OF AUTHORITIES WITH RESPONSIBILITIES FOR SAFETY WITHIN THE REGULATORY FRAMEWORK

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES
Observation: Restricted communication and cooperation between and within the regulatory bodies appear to hamper the quality and effectiveness of the regulatory activities.

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	**BASIS: GSR Part 1 paragraph 2.18 states that** *"Where several authorities have responsibilities for safety within the regulatory framework for safety, the government shall make provision for the effective coordination of their regulatory functions, to avoid any omissions or undue duplication and to avoid conflicting requirements being placed on authorized parties.* *This coordination and liaison can be achieved by means of memoranda of understanding, appropriate communication and regular meetings. Such coordination assists in achieving consistency and in enabling authorities to benefit from each other's experience.*
(2)	**BASIS: GS-G-1.3 paragraph 4.33 states that** *"Inspection reports should be distributed according to established procedures in order to provide for the following information to regulatory staff responsible for the development of requirements for authorization or new regulations"*
R4	**Recommendation: The government should make provisions to foster the effective coordination of and collaboration between and within the regulatory authorities.**

Changes since the initial IRRS mission

Recommendation 4: The formation of the ANVS, by the Government of The Netherlands, has had the most influence on improving communication amongst the groups responsible for regulating the use of nuclear materials in the country and those responsible for radiation protection. This amalgamation brought together the licensing staff, the supervision (inspectors) and the policy makers into one organization, thus fostering improved communication.

The ANVS reported to the IRRS team that communication issues have been resolved and that there is close cooperation and collaboration at all levels. The ANVS promotes an open door policy, encouraging discussions at all levels within the organization. Where differences of opinion persist, the involved parties are encouraged to resolve the issue together but there also exists a dispute resolution mechanism, if needed. Therefore, the formation of ANVS has removed the previously-existing barriers to communication within the organization.

Cooperation and collaboration between the ANVS and other organizations with responsibility in the area of nuclear safety has been improved in many ways. There are regular meetings between senior members of all groups, including deputy heads of ministries, which help to promote communication.

A cooperation agreement on radiation protection was signed by 11 parties in The Netherlands, which forms the framework for working arrangements related to: policy development, licensing, supervision, enforcement, communication, education and international participation. This has resulted in the development of working arrangements, such as ANVS-SZW-VWS, which is scheduled to be approved in December 2018.

The ANVS has also recently entered into an agreement concerning customs and border services to better coordinate the movement of radioactive materials and regulated devices across the EU border.

Status of the finding in the initial mission

Recommendation 4 (R4) is considered closed as the formation of ANVS has removed the previously-existing barriers to communication and collaboration. The ANVS continues to work with other groups in The Netherlands to promote working relationships and collaboration.

1.6 SYSTEM FOR PROTECTIVE ACTIONS TO REDUCE UNREGULATED RADIATION RISKS

There were no findings in this area in the initial IRRS mission.

1.7. PROVISIONS FOR DECOMMISSIONING AND MANAGEMENT OF RADIOACTIVE WASTE AND SPENT FUEL

There were no findings in this area in the initial IRRS mission.

1.8. COMPETENCE FOR SAFETY

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: There is no sufficient commitment in the national policy and strategy for safety to make provisions for the necessary professional education and training for building and maintaining the competence of a sufficient number of suitably qualified and experienced experts in nuclear and radiation safety and increasing its resilience.	
(1)	**BASIS: GSR Part 1, Requirement 7, paragraph 2.34 states that** *"As an essential element of the national policy and strategy for safety, the necessary professional training for maintaining the competence of a sufficient number of suitably qualified and experienced staff shall be made available.*
(2)	**BASIS: GSR Part 1 paragraph 2.36 (b) states that** *" The government (b) Shall make provision for adequate arrangements for the regulatory body and its support organizations to build and maintain expertise in the disciplines necessary for discharge of the regulatory body's responsibilities in relation to safety.*
R5	**Recommendation: The government should, as an essential element of the national policy and strategy for safety, make provisions for the necessary professional education and training, research and development to build and maintain the competence of a sufficient number of suitably qualified and experienced experts in nuclear and radiation safety and increase its resilience.**

Changes since the initial IRRS mission

Recommendation 5: The Government of The Netherlands and ANVS have a comprehensive programme for training and maintenance of qualifications for staff in the ANVS. This will enable the ANVS to maintain the expertise of staff and ensure that new talent is developed as necessary.

For nuclear installations, the Government has included in the nuclear safety regulation the obligation for licence holders to set up a programme for the training of workers regarding conventional health and safety including nuclear safety and radiation protection. This programme includes the required instruction and training to develop competence, with a recognition of that training through certification.

Dutch law recognizes, through a registration programme, two levels of experts in radiation protection. The Radiation Protection Officer has expertise in a specific application of radiation. The Radiation Protection Expert is a recognized level that is qualified to provide expert advice regarding radiation protection. The ANVS maintains both levels of experts within the organization and maintains their qualifications so as to ensure their qualifications and their registration status. The registration must be renewed every five years and continued registration requires attendance at training courses, conferences and symposia as well as other continuing education credits.

All ANVS staff also have access to training programmes for their work and maintain training plans that are discussed at least bi-annually with their team leader. In addition to formal education courses, the ANVS utilizes informal, voluntary learning opportunities, including presentations and workshops. The ANVS is also conducting a competence gap analysis, through an employee knowledge survey, to assess the organization's education and development capabilities.

As a result of the findings of the Berenschot Report, the ANVS has increased the number of employees and built capacity to allow staff to have time to participate in education and training. This is an important improvement for the ANVS.

Staff requiring specific expertise, such as inspectors, receive the specific training required and participate in a mentoring programme with more experienced staff before completing work on their own. In addition, they are provided with the training and information required to safely complete their tasks in the various work environments that they may encounter. The inspector qualification process includes instruction for all the procedures necessary to complete inspections and practical experience in the field, combined with the evaluation by a senior inspector. Inspectors also receive training on a comprehensive range of potential workplace hazards that they may encounter, both general (such as chemicals and physical hazards) as well as specific hazards related to the physical locations

where they may conduct their inspections. Through this training programme, the ANVS recognizes their duty of care to these workers and encourages their ongoing safety through education.

The advisory body to the ANVS has recognized the need for the organization to maintain its knowledge over time, especially as the use of some types of radioactive material may be decreasing in the upcoming decades. In a draft proposal the advisory body has recommended the development of a board for knowledge management and the increase in the use of language programmes. Improving language programmes will allow The Netherlands to attract expertise from other countries and broaden the pool of experts to which it has access.

Status of the finding in the initial mission

Recommendation 5 (R5) is considered closed as there is a national requirement for training and the ANVS has also implemented education and training programmes to maintain necessary expertise as well as to ensure the safety of the persons who do work on its behalf.

1.9. PROVISION OF TECHNICAL SERVICES

There were no findings in this area in the initial IRRS mission.

1.10. POLICY DISCUSSION: INDEPENDENCE OF THE REGULATORY BODY VERSUS POLITICAL RESPONSIBILITIES

A policy issue discussion took place related to the independence of the regulatory body versus its political responsibilities to the government.

The ANVS stated that the State Secretary for Infrastructure and Water Management is accountable to the Parliament on the general performance of the ANVS and for ANVS' deliverance of its mandate. Within this system, the State Secretary for Infrastructure and Water Management, with the political responsibility for performance of the ANVS in general, has specific powers on ANVS governance. On the other hand, Members of Parliament frequently ask questions about the nuclear safety policy and legislation on nuclear security and radiation protection, concerning nuclear facilities in The Netherlands and neighbourhood countries, which requires ANVS to fulfil an advisory role to the State Secretary.

Furthermore, in The Netherlands, ministers and state secretaries are accountable to Parliament for the policy of their portfolio. This means the Secretary of State for Infrastructure and Water Management is responsible for policy in the areas of nuclear safety and radiation protection. This responsibility cannot be delegated to the regulators.

The above shows that the principle of “independence”, as it is formulated in the Convention on Nuclear Safety, among other things, is strongly interwoven with the principle that the government must be accountable to the elected parliament. Although ANVS makes its regulatory decisions based on technical bases and independently, the interactions with the Ministry and the State Secretary could be perceived, by the Parliament or third parties, as an interference from the government and an infringement of the independence of the regulator.

A representative of the State Secretary, the Director General for Environment and International Affairs of the Ministry of Infrastructure and Water Management, responsible for the regulations and laws affecting ANVS and its duty to assess performance of the ANVS, attended the session and presented the views of the Ministry. The expert technical advice of ANVS is needed when the State Secretary is asked to inform the Parliament on nuclear safety and radiation protection issues, and more specifically, safety of nuclear power plants in neighbouring countries.

The IRRS team members shared their countries’ experience and practices on the matter.

In many countries the situation is very comparable to that of ANVS, where reporting through a minister to the Parliament is normal practice. In some cases, it is beneficial to report to a minister or a level of the government who has some influence or weight on budgetary decisions, to ensure that the regulatory body gets adequate resources to deliver its mandate. However, regardless of the reporting mechanism, the independence of the regulatory authority for technical decisions cannot be jeopardized or challenged by the Government.

In other countries, besides the independence on decision making, regulatory decisions by the regulatory body can only be challenged by applicants or interest groups on the bases of adherence to process through a judicial process and not on the basis of the technical soundness of the decision made by the regulatory authority.

Regardless of the potential dilemma on independence presented by ANVS, the IRRS team agreed that the ANVS regulatory body maintains adequate independence on its regulatory decisions, and the situation in The Netherlands is broadly similar to that in many other jurisdictions.

As regulatory bodies are part of the government, it is the prerogative of the government of any Member State to audit and evaluate performance of its regulatory body on the basis of the effective use of the resources assigned. As such, ANVS is regularly monitored to evaluate its performance. This is a normal activity in any Member State and it can be carried out without interference in the regulatory decision making process.

Also ANVS has the role of technical adviser to the State Secretary on the safety of nuclear power plants, especially on safety of nuclear power plants in neighbouring countries. This advisory role does not jeopardize the independent decision making of ANVS but it may be perceived as interference of the Government on the day to day business of the regulatory body and specifically on its regulatory decision making. The Netherlands' government and ANVS should emphasize that these advisory activities do not challenge the independent decision making, but that ANVS expert advice on nuclear safety and radiation protection is used by the Government in making policy decisions and to develop views on the safety and security of nuclear facilities in neighbouring countries based on the assurance gained by interactions with the sovereign regulator and government.

2. GLOBAL NUCLEAR SAFETY REGIME

2.1. INTERNATIONAL OBLIGATIONS AND ARRANGEMENTS FOR INTERNATIONAL COOPERATION

There were no findings in this area in the initial IRRS mission.

2.2. SHARING OF OPERATING EXPERIENCE AND REGULATORY EXPERIENCE

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: Activities related to operating and regulatory experience feedback at the regulatory body are currently not deployed in a structured and systematic way.	
(1)	**BASIS: GSR Part 1 Requirement 15 states that** *"The regulatory body shall make arrangements for analysis to be carried out to identify lessons to be learned from operating experience and regulatory experience, including experience in other States, and for the dissemination of the lessons learned and for their use by authorized parties, the regulatory body and other relevant authorities".*
R6	**Recommendation: The regulatory body should organize activities related to operating and regulatory experience feedback (e.g. exchange of information including experience from other countries, analysis and reporting) in a structured and systematic way. This should also include feedback on measures taken in response to information received.**

Changes since the initial IRRS mission

Recommendation 6: ANVS has developed and implemented a process to quarterly analyse and disseminate within the ANVS the operating experience feedback (OEF) from international OEF databases in a structured and systematic way. In parallel it has developed a similar process for regulatory experience feedback (REF) collection and dissemination. Inputs for OEF are collected from a number of international databases for example IRS (Incident Reporting System), IRSRR (Incident Reporting System for Research Reactors), FINAS (Fuel Incident Notification and Analysis System), EU Clearinghouse, GRS Operational Feedback. There are provisions in place to also collect domestic data coming from licensees through the reports on unusual events or through inspection findings.

Inputs for REF are categorized into three groups. REF-1 focusses on regulations and policies, REF-2 collects lessons learned from the experiences by regulatory bodies and REF-3 provides feedback on the functioning of the ANVS as observed by others. In the first group, they are scanning all IAEA Safety Standard Committees, all EURATOM Directives [Nuclear safety, Spent fuel and radioactive waste management, Basic safety standards], the WENRA reference levels. Inputs to REF-2 come from IAEA [INSAG and ARTEMIS documents, good practices observed, for example at CNS or Joint Convention], from the EU [Topical Peer Review, ENSREG stress tests with National Action Plans, ETSON and RHWG benchmarks, HERCA, WENRA], from OECD/NEA [CNRA & CNSI], from the ANVS itself [previous REF reports, the OEF reports, inspection and enforcement reports, reports of business trips]. For REF-3, inputs come from the IRRS missions, the quinquenial evaluation of the ANVS (legally binding, starting 2019); the ANVS Advisory Board (which provides both solicited and unsolicited advice).

Besides the sources mentioned above, feedback of regulatory and operational experience is also performed in the context of international working groups and bilateral arrangements. The Netherlands participates in several international organizations (e.g. OECD/NEA, ENSREG, HERCA, WENRA, and ERDO), their related working groups and specific committees. ANVS also participates in KWUREG. Furthermore, The Netherlands has agreements with various countries, for example a formal agreement with Germany (NDKK), cooperation agreements between the ANVS and the US NRC and between the ANVS and the Belgium authority FANC.

Depending on the analysis of the international and national information collected from the various sources, actions are deduced, relevant to ANVS or its licence holders. For the actual implementation of identified actions, priorities will be set in the annual work plan of the ANVS. Where necessary, consultations will also be held with the parties involved in the implementation e.g. the legal department when legislation is proposed.

By including the recurring feature of the REF-report in the management process, and by using previous REF-reports as input, feedback on the measures taken will be ensured and prioritized.

The IRRS team had the opportunity to see how the information system handling both OEF and REF is set up. It was demonstrated that it is operational, but some procedures have only been issued recently, hence the database of processed information is not yet populated. This will be done in the near future.

Status of the finding in the initial mission

Recommendation 6 (R6) is closed on the basis of progress made and confidence in the effective completion as ANVS has developed a well-structured system for operating and regulatory experience collection and feedback and the missing procedures are expected to be developed very soon.

3. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY

3.1. ORGANIZATIONAL STRUCTURE OF THE REGULATORY BODY AND ALLOCATION OF RESOURCES

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: Regulatory functions have been distributed to several organizations resulting in a fragmented distribution of the responsibilities and unnecessary organisational boundaries reducing the effective implementation of the regulatory functions. The new ANVS will start operation on 1 January 2015. Following this, continuation of the policy of limiting or controlling the free communication and cooperation between the policy making and licensing part and inspection part of the new organisation would be likely to continue to reduce effectiveness.	
(1)	**BASIS: GSR Part 1 requirement 16 states that** *"The regulatory body shall structure its organization and manage its resources so as to discharge its responsibilities and perform its functions effectively; this shall be accomplished in a manner commensurate with the radiation risks associated with facilities and activities."*
(2)	**BASIS: GSR Part 1, requirement 19 paragraph 4.15.(3) states that** *"The management system of the regulatory body…is to foster and support a safety culture in the regulatory body through the development and reinforcement of leadership, as well as good attitude and behaviour in relation to safety on the part of individuals and teams"*
R7	**Recommendation: The regulatory body should ensure that its structure and organisation enable effective fulfilment of its statutory obligations and there are no restrictions to the exchange of information between policy making, developing regulations and guides, licensing, review and assessment, inspection and enforcement functions at all levels.**
R8	**Recommendation: The regulatory body should develop and implement policies and practices to promote common safety culture.**

Changes since the initial IRRS mission

Recommendation 7: The ANVS was formed on 1 January 2015 in the Ministry of Infrastructure and Environment. ANVS combines all regulatory functions under one authority. There are three departments at the ANVS, the department of Nuclear Safety and Security, the department of Radiation Protection and Crisis Management, and the department of Steering, Communication and Support. Oversight departments consist of inspectors, policy officers and licensers working on these topics. ANVS still has separation of regulatory functions/roles, meaning that there are different persons working in the field of policy making, developing regulations and guides, licensing, review and assessment, inspection and enforcement, inspections and licensing activities. An employee with an executive role in the licensing of an installation can never be the same person who determines whether or not this same installation is in compliance with the licence conditions. However, all of these functions are within the same department, which has improved the exchange of information compared to that which was observed during the initial mission.

All statutory tasks and responsibilities of the ANVS were institutionalized by law of 26 April 2016 in Article 3 of the Nuclear Energy Act, entered into force 1 August 2017. The Ministry of Infrastructure and Environment and ANVS agreed on the terms of the governance role of the Ministry on the ANVS in September 2016. To ensure unlimited cooperation between the ANVS and other ministries, a cooperation agreement was signed in 2017. Furthermore, there are liaison officers at the ANVS and the different ministries, including the Ministry of Infrastructure and Water Management, who are responsible for information exchange.

Recommendation 8: ANVS's mission states: "The Authority for Nuclear Safety and Radiation Protection (ANVS) is independent and professional; it continuously monitors and promotes nuclear safety, radiation protection and security for this and future generations". In addition, six leading principles for the organization were defined: "safety first; individual responsibility and justified trust; continuous improvement; risk oriented; separation of functions/roles; connecting". With reference to these guiding principles, ANVS has implemented several elements

of safety culture, such as the open-door policy, feedback on the results of weekly management team meetings, employee perception surveys. Additionally, ANVS has adopted other measures to promote safety culture, such as the introduction of shared vocabulary, an oath for new employees, periodic integrity surveys, creation of a confidential counsellor and reinforcing the application of the Whistle Blower Authority Act.

The management team of the ANVS has enforced an internal policy document that describes the guiding principles and different elements of the ANVS safety culture. In 2018, a so called "reflection spiral" was developed (a "serious game" on safety culture). The aim of this conversation setting was to promote an open discussion on safety culture and was perfomed with all teams within the ANVS. This is obligatory for all employees. The ANVS safety culture focus group will summarise emerging themes, present them to the management team, and use them for planning for maintaining awareness of the important topics. The focus group will also define the steps that need to be taken to further improve safety culture and to engage staff members.

ANVS has plans to evaluate the experiences and improvement measures in 2020 and will discuss the necessary follow-up steps. One of the options mentioned is to conduct a self-assessment in accordance with IAEA standards.

Status of the finding in the initial mission

Recommendation 7 (R7) is closed as the formation of ANVS combines all regulatory functions under one authority. The structure of ANVS ensures exchange of information between policy making, development of regulations and guides, licensing, review and assessment, inspection and enforcement functions.

Recommendation 8 (R8) is closed as ANVS has developed a safety culture policy and initiated several activities to foster a strong safety culture throughout the organization.

3.2. EFFECTIVE INDEPENDENCE IN THE PERFORMANCE OF REGULATORY ACTIVITIES

There were no findings in this area in the initial IRRS mission.

3.3. STAFFING AND COMPETENCE OF THE REGULATORY BODY

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The planned resources of the ANVS are equal to the current personnel of the NIV, RVO/TSB and KFD plus 20 persons for the support, legal and communication functions. In the planning of the new ANVS it has been estimated that the need for resources is higher. However, the actual need for the resources can only be made after the establishment of the new organization. Several gaps in the fields of expertise were identified during the mission. There is in use a pre-licensing process for which there is no mechanism to cover the costs of the regulatory review and assessment by the potential licence applicant if the project is cancelled or put on hold for an indefinite time.	
(1)	**BASIS: GSR Part 1 Reg 16 states that** *"The regulatory body shall structure its organization and manage its resources so as to discharge its responsibilities and perform its functions effectively; this shall be accomplished in a manner commensurate with the radiation risks associated with facilities and activities."*
R9	**Recommendation: The regulatory body should assess its resources and competency needs, against the strategies and regulatory functions and take the measures to ensure it has sufficient resources to fulfil its statutory obligations.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES
Observation: NIV, RVO and KFD have training programmes and annual planning of the training needed by the staff. However no systematic, formalised and structured training programme is in place for NIV, RVO/TSB and KFD staff to become qualified regulatory personnel. Also there is no formal maintenance of qualifications of the staff members. The efficiency of the training programme of NIV, RVO/TSB or KFD has not been evaluated. Some

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
technical competencies necessary for in depth safety assessment are not available within NIV or KFD and are not supported by a TSO.	
(1)	**BASIS: GRS part 1 Requirement 18 states that** *"The regulatory body shall employ a sufficient number of qualified and competent staff, commensurate with the nature and the number of facilities and activities to be regulated, to perform its functions and to discharge its responsibilities."*
(2)	**BASIS: GSR part 1 paragraph 4.11 states** that *"The regulatory body has to have appropriately qualified and competent staff. A human resources plan shall be developed that states the number of staff necessary and the essential knowledge, skills and abilities for them to perform all the necessary regulatory functions."*
(3)	**BASIS: GSR part 1 paragraph 4.12 states that** *"The training programme shall cover principles, concepts and technological aspects, as well as the procedures followed by the regulatory body for assessing applications for authorization, for inspecting facilities and activities, and for enforcing regulatory requirements"*
R10	**Recommendation: The regulatory body should develop a systematic, structured and formalised training programme for current and new staff involved in the management and implementation of the regulatory activities. In particular the verification of adequate competence of certified inspectors should be included. The efficiency of the programme should be verified periodically.**

Changes since the initial IRRS mission

Recommendation 9: Section 9 of the Nuclear Energy Act states that the Minister of Infrastructure and Environment shall make sufficient funding available to the ANVS for the exercise of its duties. ANVS began on 1 January 2015 with the employees of the former governmental organizations that were combined into the ANVS. An additional 20 FTE (full-time equivalent) were added for the support functions such as human resources, finance, ICT and communications.

At the end of January 2016 the Management Consultancy Agency, Berenschot, was contracted to examine the required organizational size, to allow the ANVS to perform its legal responsibilities and functions in an effective manner. In December 2016 the final report was drafted and the Minister of Infrastructure and Environment agreed with the conclusion of Berenschot to increase the workforce of ANVS by 19 FTE. The management team prioritized the 19 vacancies in two batches: the first batch of 12 FTE (mitigation of urgent risks and decreasing the backlog of some regulatory functions) and the second batch of 7 FTE (less urgent) for other functions. Beginning in May 2017, the ANVS started the recruitment process for the first batch of vacancies. After recruiting these additional urgent resources, ANVS could start the internal development work, including drafting of strategic documents, the development of the management system (see R12), the case management system (see R11) to record regulatory work, and allowing staff to complete overdue training courses. When developing strategic documents, ANVS made an assessment of the most important risks in different regulatory sectors to be focused on in future using a graded approach. These assessments were based on expert judgement of ther own experts and experts from the TSO organizations.

The recruitment process of the second batch started in March 2018. The increase of the workforce has been funded from the assigned budget by the Ministry.

Recommendation 10: ANVS started developing new training programmes in 2017. An introductory training course for new employees was developed, as well as a training programme for crisis management. In The Netherlands, there is a legal registration system for radiation workers, including a points system (permanent education) to maintain the knowledge and keep it up to date.

In the first quarter of 2018, the ANVS training policy was formalized, with legal and individual ANVS training requirements being formulated for each function group in accordance with the IAEA knowledge quadrant. The ANVS has a goal to have a fully developed training policy and training system in place by the end of 2020. In addition to developing management information and systematic evaluation procedures, this system will also allow inspectors to

be certified annually.

The first human resource plan was the output from the Berenschot report which determined the minimum size of the ANVS for an adequate performance of its tasks (see R9). At the end of 2018 the ANVS will complete a new HR plan, which will then be updated on a yearly basis.

Status of the finding in the initial mission

Recommendation 9 (R9) is closed as ANVS has been increasing its resources based on its own and external assessment to fulfil its statutory obligations.

Recommendation 10 (R10) is closed on the basis of progress made and confidence in the effective completion as the training programme is expected to be finalised by 2020.

3.4. LIAISON WITH ADVISORY BODIES AND SUPPORT ORGANIZATIONS

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: NIV and KFD do not have Advisory bodies. Advice have been asked on case-by-case based from international organizations. Beside of that RVO/TSB has an Advisory body for the registration of radiation experts.	
(1)	**BASIS: GSR part 1 Reg. 20 states that** *"The regulatory body shall obtain technical or other expert professional advice or services as necessary in support of its regulatory functions, but this shall not relieve the regulatory body of its assigned responsibilities."*
(2)	**BASIS: GSR part 1 paragraph 4.20 states that "***If this is not possible domestically, then the necessary advice or assistance shall be sought from organizations in other States or, as and where appropriate, from international organizations which have no such conflicts of interest."*
(3)	**BASIS: GSG – 4 paragraph 2.7 states that** "*The following list covers most of the main sources of advice, but is not intended to be all inclusive:* *— Sources of advice from within the State include: • Advisory bodies: many governments and regulatory bodies appoint experts in the form of an advisory committee to assist and provide advice. Such experts may be from other States, but should be appointed in accordance with clearly defined terms of reference that include criteria for their selection (see Ref. [4], paragraphs 3.30–3.32).*"
S2	**Suggestion: The regulatory body should consider establishing an advisory body or bodies to give technical or other expert professional advice as necessary in support of regulatory functions. The regulatory body should consider inviting participation of international experts to such Advisory body/bodies.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: NIV, RVO/TSB or KFD use national and international TSO organizations. These organizations are on the approved supplier list. There are in the agreements provisions concerning the impartiality. However NIV, RVO/TSB or KFD have not audited these organizations.	
(1)	**BASIS: GSR Part 1 paragraph 4.20 states that** "Arrangements shall be made to ensure that there is no conflict of interest for those organizations that provide the regulatory body with advice or services."
S3	**Suggestion: The regulatory body should consider making arrangements to ensure and verify that there is no conflict of interest in its technical support organisations.**

Changes since the initial IRRS mission

Suggestion 2: In April 2018 the ANVS made decisions to establish an Advisory Council and to appoint the members of the Advisory Council. This new advisory body provides advice at the request of the ANVS, but the advisory body can also give advice on its own initiative. All advice would be made publically available, unless security or

confidentiality reasons apply.

The advisory body consists of six experts on different fields: nuclear safety, radiation protection, oversight, (cyber)security, governance, and government. All members of the advisory body have international experience. Four of them are Dutch, one is Belgian, and the sixth is Canadian. Independence from the regulated installations and activities was considered when selecting the experts and there is a rule for conflicts of interest in the ANVS's decision. ANVS covers the travel expenses costs of the advisory body members and pays a small nominal fee for their work. The members of the advisory body can also request external expert support on topics on which they are giving advice through ANVS budget.

The advisory body has at least four scheduled meetings per year. The third official meeting will be held late in November 2018. The first topics to be discussed were agreed in the first meeting in June 2018. Those topics include maintaining knowledge and expertise while the nuclear industry is shrinking, cyber security, and ANVS's role in the management of radioactive waste.

Suggestion 3: To reduce the possibility of a conflict of interest in the case of TSOs, ANVS included within the new framework agreements with these organisations, a paragraph specific to preclude no conflict of interest issues. In the Framework Agreement the prevention of conflicts of interest in the performance of the service is of utmost importance. The Contractor guarantees that the Contractor will take all necessary measures to prevent conflicts of interest. If the Contractor becomes aware of a circumstance that may indicate the existence or the appearance of conflicts of interest, the Contractor shall immediately report this in writing to the ANVS.

The ANVS published in the official gazette a general rule on prevention and resolution of conflict of interest (ANVS procedural regulation on conflict of interest).

By means of the same Framework Agreements, the ANVS is authorized to perform independent audits on the measures taken by the Contractor to prevent conflicts of interest. The Contractor must cooperate in audits on the design, existence and operation of measures to prevent conflicts of interest. Each party shall bear its own costs. In addition, the Contractor guarantees that only the employees of the Contractor who are involved in the content of the advice to ANVS, can dispose of the information that is provided to them. All information about the ANVS, excluding publically available information about ANVS, must be treated strictly confidentially by the aforementioned employees of the Contractor. During the contract negotiations with aforementioned parties, ANVS stated an audit will take place at the end of 2018, and/or beginning 2019; such audit has been requested to The Netherlands Central Audit Service.

Status of the finding in the initial mission

Suggestion 2 (S2) is closed as the advisory body has been established and it includes also international experts.

Suggestion 3 (S3) closed on the basis of progress made and confidence in the effective completion as ANVS made arrangements to ensure there is no conflict of interest with its technical support organisations. Additionally, ANVS made arrangments and plans to audit a TSO in the near future**.**

3.5. LIAISON BETWEEN THE REGULATORY BODY AND AUTHORIZED PARTIES

There were no findings in this area in the initial IRRS mission.

3.6. STABILITY AND CONSISTENCY OF REGULATORY CONTROL

There were no findings in this area in the initial IRRS mission.

3.7. SAFETY RELATED RECORDS

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES
Observation: NIV, RVO/TSB and KFD have several different document management systems and safety related registers that do not communicate with each other. There is a plan to review and assess all the ICT systems and

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
safety related registers in use and make an overall planning of the ICT systems and registers to be utilized by ANVS in support of the regulatory functions.	
(1)	**BASIS: GSR Part 1 Reg. 35 states that** *"The regulatory body shall make provision for establishing, maintaining and retrieving adequate records relating to the safety of facilities and activities."*
(2)	**BASIS: GSR Part 1, Requirement 35 states that** *"The regulatory body shall make provision for establishing, maintaining and retrieving adequate records relating to the safety of facilities and activities.* *The regulatory body shall make provision for establishing and maintaining the following main registers and inventories:* *—Registers of sealed radioactive sources and radiation generators[9]…"* *The regulatory body specifies which sources are to be included in the registers and inventories, with due consideration given to the associated risks.*
R11	**Recommendation: The regulatory body should consolidate and improve its systems for keeping all records relating to the safety of facilities and activities, including registers and documents related to administrative support.**
S4	**Suggestion: The regulatory body should consider including all authorized radiation sources in the national source register.**

Changes since the initial IRRS mission

Recommendation 11: After the ANVS was formed, it investigated the information systems in use. The findings were that the systems were not integrated and could not easily be integrated. These findings resulted in the start of the ZAPP project (in Dutch: Zaaksysteem ANVS Primaire Processen). The ZAPP project was asked to implement a case management system to support the ANVS' primary processes to capture all records relating to the safety of facilities and activities meeting the requirements of the Directive on Basic Safety Standards for Radiation Protection (BSS). This system will be implemented throughout the organization as an efficient, integrated and user-friendly case management system. ZAPP is being developed in three stages. First, implementing BSS (finished February 2018). Second, through the set up (VIZA-1; in Dutch: Vervolg Implementatie Zaaksysteem ANVS) to complete the recording of all licensing activities. This has been delivered in the beginning of November 2018. The last, third stage, VIZA-2 on supervision and enforcement, transport licences and sealed radioactive sources (categorie 1, 2 and 3) notifications and register is planned to be delivered in April 2019.

Suggestion 4: According to Article 4.19 of The Netherlands' Decree on Basic Safety Standards for Radiation Protection of 2017, ANVS has decided to develop on the basis of a graded approach a national register system that contains up-to-date information on sealed radioactive sources (categories 1, 2 and 3) that are present and in use at all facilities. This register is continuously updated based on the notifications from licensees according to Article 4.18 of the Decree on Basic Safety Standards for Radiation Protection of 2017.

Recently, ANVS developed a system that contains up-to-date information of all authorized radiation sources owned or likely to be used by the licensees (all radioactive sources and radiation generators). This system gives information to ANVS on the potential number and types of radiation sources that could be acquired and in use by the licensees. This overview will be incorporated in the case management system for online authorization applications. The IRRS team was informed that the actual number and types of sealed radioactive sources categories 4 and 5 that are authorized in the licence could only be determined through the inspections carried by ANVS.

Currently, ANVS has no dedicated electronic system for its sources registry and is using an Excel spread sheet to keep a record of all registered radioactive sources categories 1,2 and 3 in the country. The IRRS team was informed that ANVS will introduce a new electronic sources register system as part of the digital case management system (see R11) that is being developed by ANVS. The new system will enable the licensees to send the information of their radiation sources electronically for ANVS to include them in the national register. The IRRS team was informed that the old Excel data will be migrated to the new system and it will be operational before mid 2019.

Status of the finding in the initial mission

Recommendation 11 (R11) is closed on the basis of progress made and confidence in the effective completion as a project to implement an information system to support the ANVS in establishing, maintaining, and retrieveing adequate records has been developed with completion planned in the near future.

Suggestion 4 (S4) is closed as ANVS has developed an overview of all authorized sources owned by the licensees. ANVS is using graded approach in sources registry. Only Category 1, 2 and 3 sources are registered which is in line with requirement 35 of GSR Part 1 (rev. 1) and the Code of Conduct on safety and security of radioactive sources.

3.8. COMMUNICATION AND CONSULTATION WITH INTERESTED PARTIES

There were no findings in this area in the initial IRRS mission.

4. MANAGEMENT SYSTEM OF THE REGULATORY BODY

4.1. IMPLEMENTATION AND DOCUMENTATION OF THE MANAGEMENT SYSTEM

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTCES	
Observation: The regulatory body in The Netherlands has not completely established and implemented an Integrated Management System. Some elements of a management system are already in place and defined by documented processes. In January 2015 KFD, NIV and RVO/TSB will be merged into one single authority called ANVS. KFD, NIV and RVO/TSB have started elaborating and executing a Safety Culture development process. The Management System of the regulatory body is not adequately documented. Identification and documentation of the processes are under development. NIV and RVO/TSB have developed about half of their processes in the new system, and KFD has developed the core processes but not yet all of the supporting processes. NIV and RVO/TSB have not elaborated the complexities of processes and their interactions. KFD has elaborated its processes and the interactions between them, but not for all the processes.	
(1)	**BASIS: GSR Part 1, R. 19 states that** *"*The regulatory body shall establish, implement, and assess and improve a management system that is aligned with its safety goals and contributes to their achievement."
(2)	**BASIS: GS-R-3; paragraph 2.1.states that** *"A management system shall be established, implemented, assessed and continually improved. It shall be aligned with the goals of the organization and shall contribute to their achievement."*
(3)	**BASIS: GS-R-3; paragraph 2.5. states that** *"The management system shall be used to promote and support a strong safety culture by:* *—Ensuring a common understanding of the key aspects of safety culture within the organization;* *—Providing the means by which the organization supports individuals and teams in carrying out their tasks safely and successfully, taking into account the interaction between individuals, technology and the organization;* *—Reinforcing a learning and questioning attitude at all levels of the organization;* *—Providing the means by which the organization continually seeks to develop and improve its safety culture."*
(4)	**BASIS: GS-R-3; paragraph 2.8. states that** *"The documentation of the management system shall include the following:* *—The policy statements of the organization;* *—A description of the management system;* *—A description of the structure of the organization;* *—A description of the functional responsibilities, accountabilities, levels of authority and interactions of those managing, performing and assessing work;* *—A description of the processes and supporting information that explain how work is to be prepared, reviewed, carried out, recorded, assessed and improved."*
R12	**Recommendation: The regulatory body should complete its programme for establishing and implementing an Integrated Management System. This should include development of all processes, description of interactions between processes, internal procedures to perform different tasks and promotion and support of strong safety culture in the organisation.**

Changes since the initial IRRS mission

Recommendation 12: The ANVS has developed an Integral Management System called AIM (ANVS Integrated Management system) which is based on changed organizational insights, new strategic documents, new legislation, and new procedures and processes based on how people/functions interact with each other. A total of 116 procesess have been recognised and organised in three categories. The heart of the AIM is the description of the primary work-processes. There are also steering processes and the supporting processes such as HR, Finance and Communication. The ANVS management team has stated that the recording of processes in AIM is important especially for those

processes that are frequently used by employees. This has resulted in a prioritization within the 116 ANVS processes. By the end of November 2018, 69 processes have been placed in AIM (around 60%) and are being used within the organization. The most important processes are described and recorded. The processes of less importance (30%) will be placed by the end of 2019. However, the operational effectiveness (usability and improvements) cannot be proved at this point as the ANVS has not yet worked with this system for a long period of time.

Status of the finding in the initial mission

Recommendation 12 (R12) is closed on the basis of progress made and confidence in the effective completion of ANVS' effort to establish and implement an Integrated Management System. There are many efforts made in the ANVS to promote and support strong safety culture in the organisation (see R8).

4.2. MANAGEMENT RESPONSIBILITY

There were no findings in this area in the initial IRRS mission.

4.3. RESOURCE MANAGEMENT

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The human and financial resources' of the merging organizations are not sufficient to establish, implement, assess and continually improve the management system.	
(1)	**BASIS: GS-R-3 paragraph 4.1 states that** *"Senior management shall determine the amount of resources necessary and shall provide the resources to carry out the activities of the organization and to establish, implement, assess and continually improve the management system.*
S5	**Suggestion: The regulatory body should consider allocating sufficient resources to establish, implement, assess, maintain and continually improve the management system.**

Changes since the initial IRRS mission

Suggestion 5: Enough human and financial resources have been allocated to meet with the given target of the management team for the establishment and implementation of the ANVS integrated management system. The Minister of Infrastructure and Water Management made sufficient funding available to the ANVS for exercising its duties. The ANVS participates in the ministerial budgetary process. After receiving the funds and formation at the start of the year, the available formation and budgets are distributed within the ANVS organization.

At the end of Q3 2018 the management team decided to start recruitment of a new staff in support of the assessment, maintainance and continous improvement of the ANVS integrated management system. In November 2018 the staffing action for a"Quality advisor" was published. It is expected that in April 2019 Quality advisor will start with assessment of operational effectiveness of the management system. This includes starting management reviews and internal auditing programme.

Status of the finding in the initial mission

Suggestion 5 (S5) is closed as sufficient resources have been allocated to establish, maintain and continuously improve the management system.

4.4. PROCESS IMPLEMENTATION

There were no findings in this area in the initial IRRS mission.

4.5. MEASUREMENT, ASSESSMENT AND IMPROVEMENT

There were no findings in this area in the initial IRRS mission.

5. AUTHORIZATION

5.1. GENERIC ISSUES

There were no findings in this area in the initial IRRS mission.

5.2. AUTHORIZATION OF NUCLEAR POWER PLANTS

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: Due to the small number of nuclear facilities and their variety the regulatory body has chosen not to develop a general regulatory framework and prefers to specify precise safety requirements in the individual licences (so-called "Dutch approach"). The operating licence of the Borssele nuclear power plant refers to the Dutch NVR-guides which form an integral part of the licence. However for other types of nuclear facilities, no similar NVR-guides exist, in some cases reference is made to specific IAEA Safety standards and guides, in other cases no such reference is made.	
(1)	**BASIS: GSR Part 1 paragraph 4.28 states that** *" There shall be consistency in the decision making process of the regulatory body and in the regulatory requirements themselves, to build confidence among interested parties".*
R13	**Recommendation: The regulatory body should enhance the consistency of different licences by using similar reference documents in the licences of all nuclear facilities (NVR and/or IAEA Safety standards and guides).**

Changes since the initial IRRS mission

Recommendation 13: ANVS has developed in 2017 an overall plan for updating the Dutch Safety Rules (NVR) for Nuclear Power Plants and developing NVRs for Research Reactors, Waste Management facilities and Fuel Cycle facilities.

For all types of facilities, the plan aims at harmonizing the specific requirements of NVRs with the IAEA Safety Standards. In general, all IAEA safety standards are considered in the overall plan scope and there are clear bases why a limited number of them were screened out. For example, there is no NVR embedding IAEA SSG-47, "Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities"; however this guideline is already included in the Ministerial Regulations within the legally binding framework.

One of ANVS's objectives is to maintain state-of-the-art nuclear safety in nuclear power plants and research reactors. To fulfil this objective, the Periodic Safety Review approach according to IAEA SSG-25, "Periodic Safety Review for Nuclear Power Plants" is used. In the plan for updating and completing NVRs, there is no distinction between nuclear power plants and research reactors. Considering that NVRs are typically attached to the licences and thus are binding, a graded approach should be incorporated in the scope of the different safety factors or a reduced set of safety factors may be needed for facilities other than NPPs. ANVS is already aware of this situation and is considering a revision to the NVR's development plan.

Regarding the plan's timetable, ANVS is confident that the completion of the development of new NVRs for nuclear installations other than nuclear power plants will be done at the end of 2018. Thereafter, the inclusion of NVRs within the licences is planned for 2019. The IRRS team confirmed that ANVS is managing this task using an appropriate schedule aligned to ANVS´s challenges/licensing projects.

The update of the NVRs and of the Borssele NPP licence is scheduled to start in 2019 and will be completed in 2020, which fits with the requirement to timely develop the next Periodic Safety Review Scope by the operator.

Status of the finding in the initial mission

Recommendation 13 (R13) is closed on the basis of progress made and confidence in the effective completion. Good progress is being made by ANVS in the development of NVRs for all nuclear facilities and there is confidence that ANVS will keep this task on schedule.

5.3. AUTHORIZATION OF RESEARCH REACTORS

There were no findings in this area in the initial IRRS mission.

5.4. AUTHORIZATION OF FUEL CYCLE FACILITIES

There were no findings in this area in the initial IRRS mission.

5.5. AUTHORIZATION OF RADIOACTIVE WASTE MANAGEMENT FACILITIES

There were no findings in this area in the initial IRRS mission.

5.6. AUTHORIZATION OF RADIATION SOURCES FACILITIES

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: Under the Dutch system, the import/export of high activity sealed radioactive sources is not covered by an authorisation process.	
(1)	**BASIS: GSR Part 1, Requirement 23 states that** *"Authorization by the regulatory body, including specification of the conditions necessary for safety, shall be a prerequisite for all those facilities and activities that are not either explicitly exempted or approved by means of a notification process".*
(2)	**GS-G-1.5 paragraph 3.29 states that** *"In principle, a licence should be required for the higher risk or more complex practices, including those for which the radiation protection depends significantly or largely on human performance, as with some medical applications (e.g. radiotherapy) and industrial radiography, for example".*
S6	**Suggestion: The regulatory body should consider extending the scope of authorisation to include the Import/Export of high activity sealed radioactive sources.**

Changes since the initial IRRS mission

Suggestion 6: According to Article 27(a) of the Dutch Decree for the Transport of Fissionable Materials, Ores and Radioactive Material, issued in February 2018, all activities with high activity sealed sources (HASS), including the transport, import and export of HASS, require a licence.

Article 5(1) of the Decree prohibits the transport and storage in transit of radioactive substances without a licence; Article 5(3) extended the prohibition to the transport and the storage in transit of a high activity sealed source.

Status of the finding in the initial mission

Suggestion 6 (S6) is closed since the Dutch Decree for the Transport of Fissionable Materials, Ores and Radioactive Material issued in Febrauary 2018 provides that all activities with high activity sealed sources (HASS), including the transport, import, export and storage in transit of HASS require a licence.

5.7. AUTHORIZATION OF DECOMMISSIONING ACTIVITIES

There were no findings in this area in the initial IRRS mission.

5.8. AUTHORIZATION OF TRANSPORT

There were no findings in this area in the initial IRRS mission.

6. REVIEW AND ASSESSMENT

6.1. GENERIC ISSUES

There were no findings in this area in the initial IRRS mission.

6.1.1. MANAGEMENT OF REVIEW AND ASSESSMENT

There were no findings in this area in the initial IRRS mission.

6.1.2. MANAGEMENT OF REVIEW AND ASSESSMENT

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The basic principles and generic guidelines for licensing are described in a NIV document "Dutch Licensing Policy" which is not yet made public. A draft NIV document "Organisational Review Plan" gives guidance on the organisational aspects of the NIV review process. A draft NIV document "Technical Review Plan" contains more detailed review recommendations and gives more detailed guidance on the required contents of a Safety Analysis Report in support of an operating licence application.	
(1)	**BASIS: SSG-12 paragraph 2.26 states that** *"The regulatory body should develop regulations for the licensing process of nuclear installations and should provide guidelines for applicants in order to provide clarity and transparency in the licensing process."*
(2)	**BASIS: GSR Part 1 paragraph 4.34 states that** *"The regulatory body shall issue guidance on the format and content of the documents to be submitted by the applicant in support of an application for an authorization."*
S7	**Suggestion: The regulatory body should consider finalizing and publishing the "Dutch Licensing Policy", "Organisational Review Plan" and "Technical Review Plan" in order to provide clarity and transparency in the licensing process.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: A draft Dutch Review Plan is being developed by NIV for the review and assessment of reactors (nuclear power plants and research reactors). At the moment this review plan is focussed on the design stage of new reactors and modifications. As several new-build projects are foreseen in the near future (Pallas research reactor, Oyster project), a need will arise for the regulatory body to clarify its procedures and guidance for "construction, commissioning and operating" licence applications and related review activities during construction and commissioning.	
(1)	**BASIS: SSG-12 paragraph 2.26 states that** *" The regulatory body should develop regulations for the licensing process of nuclear installations and should provide guidelines for applicants in order to provide clarity and transparency in the licensing process."*
(2)	**BASIS: GSR Part 1 paragraph 4.34 states that** *"The regulatory body shall issue guidance on the format and content of the documents to be submitted by the applicant in support of an application for an authorization. …"*
(3)	**BASIS: GSR Part 1 paragraph 4.29 states that** *"Different types of authorization shall be obtained for the different stages in the lifetime of a facility or the duration of an activity. The regulatory body shall be able to modify authorizations for safety related purposes. For a facility, the stages in the lifetime usually include: site evaluation, design, construction, commissioning, operation, shutdown and decommissioning (or closure). …"*
S8	**Suggestion: The regulatory body should consider extending the scope of the "Dutch Review Plan" to give guidance on the licensing and review and assessment for** • **other types of nuclear facilities (including fuel cycle facilities and waste management facilities)**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	• **all stages of the life cycle of the nuclear facility (siting, design, construction, commissioning, operation and decommissioning).**

Changes since the initial IRRS mission

Suggestion 7: ANVS has finalized and published the "ANVS Licensing Policy" in August 2017, simultaneously with the start of the ANVS as an Independent Regulator. This document describes how the ANVS works on the basis of the applicable legislation and includes a commitment that it must be updated when new legislation comes into force. Currently the Licencing Policy is being revised due to fact that in February 2018 the Radiation Protection Decree (Bs) was replaced by the Basic Safety Standards Radiation Protection Decree (Bbs).

Regarding the "Technical Review Plan", in 2016 ANVS finished a final draft version of the document: "Guidance on the Technical Review of the Safety Analysis Report as Part of Nuclear Reactor Licensing in The Netherlands"; but it has been decided not to publish it. Additionally the "Organisational Review Plan" will not be published either. Instead, both documents are available upon request by licence applicants in the context of preliminary consultation on a licence application.

ANVS has pointed out that these are internal guidance documents and because of that, neither should be considered as guidelines for applicants nor as regulatory requirements.

Suggestion 8: According to ANVS Licensing Policy, there is a set of non binding guidelines which provide regulatory expectations for nuclear reactors related to: technical preconditions, safe design and operation (VOBK), and continuous improvement of nuclear safety. They also provide initial information to enable preliminary consultations between the applicant and the ANVS, and can be used as an aid by the licence applicant in drawing up the licence application.

In addition, ANVS has developed the "Organisational Review Plan" (ORP) and the "Technical Review Plan" (TRP) describing the review and assessment process for the Safety Analysis Report, that are applicable for nuclear power plants and research reactors in a graded approach. Regarding the "Technical Review Plan", the final draft version was finished in 2016 and provides a comprehensive way to review the safety analysis report, in which all topics significant for safety have to be addressed appropriately. It further contributes to a consistent review approach for all experts involved and equal treatment to all applicants' submissions.

The "Technical Review Plan" addresses various stages in the life cycle of nuclear reactors, including: design, construction, commissioning, operation and decommissioning. Currently, it is being used for the pre-licensing activities of the PALLAS project, in conjuction with ORP and VOBK.

The IRRS team noted that requirements on decommissioning for nuclear facilities are primarily found in the 'Nuclear Installations, Fissionable Materials and Ores Decree' (in Dutch: Besluit kerninstallaties, splijtstoffen en ertsen – Bkse) and the shutdown and decommissioning regulation (in Dutch: Regeling buitengebruikstelling en ontmanteling nucleaire inrichtingen – Rboni). According to Article 3 (1) (f) and (2) of the Rboni, the preliminary decommissioning plan (during operation of the facility) contains a general description of the measures necessary to ensure the safety of the workers, the public and the environment, and the degree of detail of this description shall increase as the age of the facility increases. According to the Rboni the decommissioning plan shall be reviewed and updated every 5 years. Guidance for the assessment of the decommissioning plans is given in the ANVS procedure "Approval decommissioning plans".

The IRRS team confirmed that both ORP and TRP will be sufficient for the periodic regulatory review and assessment of the safety reports of facilities, submited by the licensees.

Status of the finding in the initial mission

Suggestion 7 (S7) is closed. ANVS Licensing Policy was issued and published, making it available to all stakeholders. The Technical Review Plan and Organisational Review Plan are available upon request by licence applicants.

Suggestion 8 (S8) is closed. Dutch Review Plans (TRP and ORP) in conjunction with the existent regulations on decommissioning (Bkse and Rboni), provide guidance on the licensing and review and assessment for all types of nuclear facilities for the whole life cycle.

6.1.3 PERFORMANCE OF REVIEW AND ASSESSMENT

There were no findings in this area in the initial IRRS mission.

6.2 REVIEW AND ASSESSMENT FOR NUCLEAR POWER PLANTS

There were no findings in this area in the initial IRRS mission.

6.3. REVIEW AND ASSESSMENT FOR RESEARCH REACTORS

There were no findings in this area in the initial IRRS mission.

6.4. REVIEW AND ASSESSMENT FOR FUEL CYCLE FACILITIES

There were no findings in this area in the initial IRRS mission.

6.5. REVIEW AND ASSESSMENT FOR WASTE MANAGEMENT FACILITIES

There were no findings in this area in the initial IRRS mission.

6.6. REVIEW AND ASSESSMENT FOR RADIATION SOURCES FACILITIES

There were no findings in this area in the initial IRRS mission.

6.7. REVIEW AND ASSESSMENT FOR DECOMMISSIONING ACTIVITIES

There were no findings in this area in the initial IRRS mission.

6.8. REVIEW AND ASSESSMENT FOR TRANSPORT

There were no findings in this area in the initial IRRS mission.

7. INSPECTION

7.1. GENERIC ISSUES

There were no findings in this area in the initial IRRS mission.

7.1.1. INSPECTION APPROACHES, METHODS AND PLANS

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: KFD has developed and continues to develop an approach to the prioritisation of inspection activities across the nuclear licensees and other duty holders. The current approach appears to give the right outcomes, but the degree of rigour is unclear. KFD rarely exercises its authority to plan and perform unannounced inspections. KFD does not systematically conduct inspections of emergency preparedness and does not conduct inspections or infrequently on different kinds of facilities and activities with a somewhat lower risk (hospitals, dentists, luggage control, waste storage sites, laboratories, industries etc). The Netherlands Shipping Inspectorate component of the Human Environment and Transport Inspectorate (ILT) has not conducted any inspection of maritime Class 7 (Radioactive Materials) transport shipments since sometime in 2011 or 2012.	
(1)	**GSR Part 1 Requirement 28 states that: "***Types of inspection of facilities and activities Inspections of facilities and activities shall include programmed inspections and reactive inspections; both announced and unannounced."*
(2)	**GSR Part 1 paragraph 4.50 states that** *"The regulatory body shall develop and implement a programme of inspection of facilities and activities, to confirm compliance with regulatory requirements and with any conditions specified in the authorization. In this programme, it shall specify the types of regulatory inspection (including scheduled inspections and unannounced inspections), and shall stipulate the frequency of inspections and the areas and programmes to be inspected, in accordance with a graded approach."*
R14	**Recommendation: The regulatory body should implement an inspection planning process that defines a baseline plan which includes adequate sampling of all regulated activities and facilities, types of inspections (scheduled and reactive, both announced and unannounced), frequency of inspections and areas and programmes to be inspected. This baseline should then allow prioritization.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: KFD has general inspection guidance which defines the basic inspection process and activities and is an essential foundation to the varying types and levels of inspection required for the major nuclear licensees and for other regulated duty holders. Detailed guidance is available for some inspections on non-nuclear facilities and activities. For the major licensees this guidance is neither facility nor inspection theme/scope specific.	
(1)	**BASIS: GS-G-1.3 paragraph 4.1c states that** *"For Internal Guidance … appropriate subjects for guidance and instructions for inspectors could include the use of regulatory requirements, regulations and guides and industrial standards."*
(2)	**GS-G-1.3 paragraph 4.1 also states that** *"To ensure that all nuclear facilities in a State are inspected to a common standard and that their level of safety is consistent, the regulatory body should provide its inspectors with written guidelines in sufficient detail."*
S9	**Suggestion: The regulatory body should consider developing detailed guidance to address specific types of inspections.**

Changes since the initial IRRS mission

Recommendation 14: ANVS policy for planning inspections has been published in the "ANVS inspection and enforcement strategy".

The implementation of the policy is now in progress, and ANVS anticipates this to be finished before the end of the second quarter of 2019.

The ANVS uses three inspection programmes:

- Inspection programme for Medical and Industrial
- Inspection programme for Transport
- Inspection programme for Nuclear Installations

Plans for all of these programmes were supplied as part of the follow-up review.

The inspection plans for nuclear facilities show that all key elements are being inspected (based on IAEA SSG-13, Appendix IV), that performance is being accounted for, a graded approach is applied, and plans include Emergency Preparedness. However, work to develop a baseline for nuclear installations continues.

The approach for the Medical and Industrial team has two elements; a reactive approach based on events and changes within the licensees, and pro-active inspections based on specific projects (e.g. an administrative check of the annual reports and project investigation of the scrap metal sector). The Medical and Industrial team is further developing the pro-active annual risk based inspection programme, and has completed development of the basic data to support the risk based programme and will use this to develop the future pro-active inspection programme.

The Transport inspection team has an annual risk based inspection programme. Some inspections are reactive on notifications or incidents. The annual inspection plan was examined and shows a small number of inspections. ANVS has done joint inspections with the transport and environment inspectorate (Inspectie Leefomgeving en Transport (ILT)) on the transport modes (road, rail, sea, air), but this has halted recently. More work to develop detailed joint inspection arrangements between ANVS and ILT is in progress, and needs to be in place to reintroduce transport modal inspections.

Suggestion 9: ANVS has developed the inspection and enforcement strategy document which describes at high level the types of inspection which are performed and how they are prioritised. In addition, the ANVS integrated management system (AIM), which includes the core regulatory function of oversight and surveillance has also been developed.

The AIM oversight module includes specific sections for different types of inspection (nuclear safety, security, transport, etc.,) and the IRRS team looked at the detail below several of these areas. Each of the detailed sections includes the process flow for the inspection process, and each stage then has further, function specific, guidance. Each section of ANVS Central has a process owner and the complete system allows for feedback and review to improve the guidance based on the user feedback.

Status of the finding in the initial mission

Recommendation 14 (R14) is closed on the basis of progress made and confidence in the effective completion of future planned work. The progress includes developing detailed plans for all sectors regulated by ANVS and future planned work includes further improvements to the risk based approach to inspections, developing baselines and agreeing joint inspection arrangements with ILT for transport.

Suggestion 9 (S9) is closed. This is based on the work completed creating both high level and detailed guidance for inspections.

7.1.2. INSPECTION PROCESSES AND PRACTICES

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: KFD uses a registration system HOLMES which can be used to account for the total number and due dates for actions. The ARM and the mission found that use of this system is inconsistent.	
(1)	**BASIS: GS-G-1.3 paragraph 3.1 states that** *"The management within the regulatory body of inspection activities is an important element of the authorization process. Consideration should be given to assigning managerial responsibility to a single individual or organizational unit. These responsibilities should include: ensuring that follow-up actions from inspections, including dissemination of findings, are taken*
S10	**Suggestion: The regulatory body should consider implementing measures to ensure that the action tracking system is consolidated and consistently used so that it provides a high level of confidence that all of the inspection findings are tracked and closed in pre-determined timescales, delays are escalated for resolution as necessary, and actions can be collated and reviewed to help inform regulatory feedback and learning processes.**

Changes since the initial IRRS mission

Suggestion 10: In the long term ANVS will take three measures to follow-up this suggestion:

1. Developing a case management system – this is closely tied with R11, and is in the final stage of development (VISA-2), the system will support inspection and enforcement processes, including the capture and management of issues arising from inspections.
2. Describing and implementing work processes to implement the changes arising from the case management system.
3. Developing methods of data analysis involves using the information captured in the case management system to analyse and manage the closeout of actions.

In the interim, since the original mission, the inspection teams use spreadsheets or Holmes to record and track actions arising from inspections and subsequently use this information to escalate actions at periodic meetings between the ANVS management and the licensee management teams of the nuclear installations: they are also part of the periodic reviews of nuclear licensee performance held at ANVS, supporting feedback and learning processes. ANVS anticipates that the action tracking spreadsheets will be readily uploaded into the new case management system.

Status of the finding in the initial mission

Suggestion 10 (S10) is closed on the basis of progress made and confidence in the effective completion via the interim solution on action tracking, and confidence that a long term solution will be delivered through the later stages of the ZAPP and VISA project.

7.1.3. INSPECTORS

There were no findings in this area in the initial IRRS mission.

7.2. INSPECTION OF NUCLEAR POWER PLANTS

There were no findings in this area in the initial IRRS mission.

7.3. INSPECTION OF RESEARCH REACTORS

There were no findings in this area in the initial IRRS mission.

7.4. INSPECTION OF FUEL CYCLE FACILITIES

There were no findings in this area in the initial IRRS mission.

7.5. INSPECTION OF WASTE MANAGEMENT FACILITIES

There were no findings in this area in the initial IRRS mission.

7.6. INSPECTION OF RADIATION SOURCES FACILITIES

There were no findings in this area in the initial IRRS mission.

7.7. INSPECTION OF DECOMMISSIONING ACTIVITIES

There were no findings in this area in the initial IRRS mission.

7.8. INSPECTION OF TRANSPORT

There were no findings in this area in the initial IRRS mission.

8. ENFORCEMENT

8.1. ENFORCEMENT POLICY AND PROCESSES

There were no findings in this area in the initial IRRS mission.

8.2. ENFORCEMENT IMPLEMENTATION

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: KFD has developed a process for enforcement which gives significant responsibility to individual inspectors and uses their peer review "4 eyes" process and the expertgroup meetings to generate a level of consistency. The clarity of the level of management approval in this process is currently open for interpretation.	
(1)	**BASIS: GS-G-1.3 paragraph 5.6 states that** *"In normal situations, decisions concerning enforcement actions, particularly those involving fines, curtailment of activity or suspension of authorization, should be approved by the regulatory body in accordance with the procedures established in the State concerned."*
S11	**Suggestion: The regulatory body should consider a change to the enforcement procedures to define criteria when the issue is sensitive and requires management participation in all significant enforcement actions, excepting those which require urgent regulatory intervention.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: No system exists in which the effectiveness of regulatory enforcement actions is monitored.	
(1)	**BASIS: GS-G-1.3 paragraph 6.1 states that** *"The regulatory body should have a system to audit, review and monitor all aspects of its inspection and enforcement activities to ensure that they are being carried out in a suitable and effective manner..."*
S12	**Suggestion: The regulatory body should consider developing and implementing a system to monitor the effectiveness of its enforcement actions.**

Changes since the initial IRRS mission

Suggestion 11: Since 2015, ANVS management is involved in enforcement decisions as part of standard practice. The procedure is described in chapter 3 of the "ANVS inspection and enforcement strategy", and in the management system, AIM, (see also R12) chapter 3 which states that all letters (including enforcement actions) have to be checked and signed by a member of the ANVS management team. The mandate of the management teams for routine enforcement and for individual inspectors in urgent situations has been defined by the Decree Mandate and Sub-mandate, Power of Attorney and Authorization Authority for Nuclear Safety and Radiation Protection 2017.

Suggestion 12: ANVS has records of all inspection and enforcement actions. ANVS can track all enforcement actions. Based on evidence supplied to the ANVS by licensees or information collected during inspections the effectiveness of an enforcement action can be determined by the ANVS.

Since 2014, for nuclear installations, internal review meetings include information from the combined inspection and licensing capabilities within ANVS, including licensing, radiation protection, security, etc. This cross team collaboration enables a broad view of the effectiveness of the enforcement action to be made. Enforcement activity is also reviewed as part of the periodic review meetings (at least once every 6 months) held between the senior management of ANVS and the major licensees.

Currently records of enforcement action are not stored in a format that allows quantitative analysis because all the information is stored in separate text files. This means that a broader picture of the effectiveness of enforcement actions cannot be made yet – an enhancement that may be useful for nuclear installations, but would be particularly effective for medical and industrial facilities. For this reason ANVS is planning to extend the case management

system to, amongst other functions, record inspection and enforcement actions. The specification of this system extension includes a requirement that all records can be searched and analysed (see also S10).

Status of the finding in the initial mission

Suggestion 11 (S11) is closed as management is included in all enforcement decisions and correspondence, except for urgent actions which can be done by an inspector alone.

Suggestion 12 (S12)) is closed based on progress made and confidence in the effective completion of the VISA system which will improve regulatory effectiveness and help target regulation of the broader medical and industrial industries.

9. REGULATIONS AND GUIDES

9.1. GENERIC ISSUES

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The regulatory body considers IAEA requirements as appropriate and attaches them as licence conditions. Heavy reliance on licence conditions for individual facilities could lead to inconsistent regulation of similar safety issues within the different licences.	
(1)	**BASIS: GSR Part 1 Requirement 32 states that** *"The regulatory body shall establish or adopt regulations and guides to specify the principles, requirements and associated criteria for safety upon which its regulatory judgements, decisions and actions are based."*
S13	**Suggestion: The regulatory body should consider further development of its regulations and guides to ensure the consistent regulation of all facilities.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The regulatory body does not have in place a mechanism to periodically revise the existing regulations.	
(1)	**BASIS: GSR Part 1 Requirement 33 states that** "Regulations and guides shall be reviewed and revised as necessary to keep them up to date, with due consideration taken of relevant international safety standards and technical standards and of relevant experience gained."
R15	**Recommendation: The regulatory body should develop and implement a procedure on the development and periodic revision of regulations and guides.**

Changes since the initial IRRS mission

Suggestion 13: The IRRS team was advised that the ANVS has a comprehensive regulatory framework which starts with the Nuclear Energy Act, followed by Orders and Decrees, then Ministerial regulations and by ANVS regulations. All of this part of the regulatory framework comprises the legally binding requirements on the licence holder.

The ANVS regulations can be made under the sole authority of the ANVS and do not require higher levels of government or ministry approval in order to be promulgated. The ANVS has an advisory role to the government into the development and revision of higher levels of the regulatory framework. The ANVS is expected to provide input into the process but the decision on the final document remains with the government or ministry.

The non-legally binding requirements, such as the NVR regulatory guides and the international standards and guides, form the lower tiers of the regulatory framework and can only become legally binding if they are referenced in the licences issued by ANVS.

NVRs have three sections: 1) the introduction and scope, 2) the content and 3) the references. The content section of the NVRs is taken, with minimal revision, from the relevant IAEA requirement or guide document. During the development of this section, the ANVS considers if it is necessary to make any modifications and ensures that any such changes are minimal and do not affect the intent of the document.

The introduction and scope and the references sections are considered administrative matters and will be addressed by the ANVS once the content of the NVRs has been established.

It is the intention of the ANVS to reference the NVRs into existing licences and all new licences, beginning in 2019.

Following the formation of the ANVS in 2015, the regulatory authority undertook a review of all documentation in the regulatory framework. In 2017, ANVS developed a plan to update all of the NVRs, including making new NVRs for all types of nuclear facilities (research reactors, waste management facilities and uranium enrichment facilities).

The ANVS has prepared a schedule for the updating and development of NVRs for non-NPP nuclear facilities and remains on schedule to complete this work by the end of 2018 (for the NPP this will be completed by 2019). This project is overseen by a five-person steering group who has the authority to approve the NVRs when they are completed. The steering group does not expect that the implementation of the plan will be delayed significantly since most of the documents have already been completed.

Recommendation 15: The IRRS team was advised that the government of The Netherlands has a policy which requires the regular review of all legislation, decrees and ministerial regulations at least every five years. This principle was adopted by ANVS when they developed their own internal review policy entitled "Beoordelen nationale regels 26003". Therefore, the approach taken by the ANVS for the frequency of the review is consistent with government policy.

The ANVS internal review policy governs the review of ANVS regulations, NVRs and international standards for continued applicability and suitability, where the ANVS is the sole authority for these documents. The same process also describes how the ANVS initiates or contributes to reviews of the higher level ministerial regulations, decrees and orders and the Act. For this part of the review process, ANVS functions in an advisory role to the government which controls the review and potential revision.

As noted, the main principle is the review of all regulations and documents within a five-year period. At this time, ANVS is concerned mainly with the final development of all the documentation required as a result of its formation. However, the review process, when fully utilized, will also ensure that regulatory needs are taken into account as necessary. For example, prior to the periodic safety evaluation of a nuclear facility, the documentation needed for that process must have been reviewed and accepted. Changes to documents can also occur on an *ad hoc* basis, depending on circumstances and as arising from events.

The review process requires the evaluation of the document in question and whether any changes or updates are required. The review process requires a documented conclusion to be drawn regarding each document and then the ANVS team leader reviews the recommendation as to whether to update the document or leave it as it is. The decision of the ANVS team leader is archived in the ANVS document management system, as per the policy.

ANVS is also working to complete the internal procedure used to guide the actual development of the updates to the regulations and standards.

Status of the finding in the initial mission

Suggestion 13 (S13) is closed based on progress made and confidence in the effective completion as the ANVS has made substantial progress in this area and has developed a comprehensive regulatory framework, including a scheduled plan for their completion.

Recommendation 15 (R15) is closed as the ANVS has developed the recommended procedure for ensuring that regulations and regulatory documents are reviewed and updated as necessary.

9.2. REGULATIONS AND GUIDES FOR NUCLEAR POWER PLANTS, RESEARCH REACTORS AND FUEL CYCLE FACILITIES

There were no findings in this area in the initial IRRS mission.

9.3. REGULATIONS AND GUIDES FOR WASTE MANAGEMENT FACILITIES

There were no findings in this area in the initial IRRS mission.

9.4. REGULATIONS AND GUIDES FOR RADIATION SOURCES FACILITES

There were no findings in this area in the initial IRRS mission.

9.5. REGULATIONS AND GUIDES FOR DECOMMISSIONING ACTIVITIES

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The current regulations do not require the development and submission of a safety assessment in support of initial decommissioning plans.	
(1)	**BASIS: GSR PART 6 in paragraph 7.4. states that** *"The licencee shall prepare and submit to the regulatory body an initial decommissioning plan together with the application for authorization to operate the facility. This initial decommissioning plan shall be required in order to identify decommissioning options, to demonstrate the feasibility of decommissioning, to ensure that sufficient financial resources will be available for decommissioning, and to identify categories and estimate quantities of waste that will be generated during decommissioning."*
(2)	**BASIS: GSR PART 6, Requirement 3 states that "***Assessment of safety for decommissioning Safety shall be assessed for all facilities for which decommissioning is planned and for all facilities undergoing decommissioning".*
R16	**Recommendation: The regulatory body should update the current regulation related to decommissioning to include, taking into account the graded approach, a requirement that safety of decommissioning is assessed for all facilities for which decommissioning is planned.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The current regulations do not include the requirements related to the end state of decommissioning and removal of regulatory control	
(1)	**BASIS: *GSR Part 6* Requirement 5** *Responsibilities of the regulatory body for decommissioning states* *The regulatory body shall regulate all aspects of decommissioning throughout all stages of the facility's lifetime, from initial planning for decommissioning during the siting and design of the facility, to the completion of decommissioning actions and the termination of authorization for decommissioning. The regulatory body shall establish the safety requirements for decommissioning, including requirements for management of the resulting radioactive waste, and shall adopt associated regulations and guides. The regulatory body shall also take actions to ensure that the regulatory requirements are met".*
R17	**Recommendation: The regulatory body should develop requirements on the end state of decommissioning, termination of the authorization for decommissioning and on the release of the facility and/or the site from regulatory control**.

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The regulatory body has the legal power to require financial provisions for decommissioning from licence holders of nuclear power plants, research reactors, HASS (high-activity sealed sources) and scrap metal facilities. However, there is no legal provision to require such provisions for others nuclear facilities, including fuel cycle facilities.	
(1)	**BASIS: GSR Part 6 requirement 9 states that** *"Responsibilities in respect of financial provisions for decommissioning shall be set out in national legislation. These provisions shall include establishing a mechanism to provide adequate financial resources and to ensure that they are available when necessary, for ensuring safe decommissioning."*
(2)	**GSR Part 6 paragraph 3.3 states that** *The responsibilities of the regulatory body shall include: …*

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Establishing requirements for the licencee's financial assurance for decommissioning and requirements for a mechanism to ensure that adequate resources will be available when necessary for safe decommissioning …
(3)	**GSR Part 6 paragraph 6.3 states that .** *If financial assurance for the decommissioning of an existing facility has not yet been obtained, adequate financial resources shall be put in place as soon as possible. Approval of a renewal or extension of the authorization for operation of the facility shall include provisions for financial assurance.*
R18	**Recommendation: The regulatory body should establish regulations related to the assurance of financial resources needed for timely and safe decommissioning of all regulated facilities, both nuclear and non-nuclear facilities.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The requirements of "Shutdown and Decommissioning Regulation" do not addressed necessity to take into account safety related aspects if deferred dismantling strategy has been selected	
(1)	**BASIS: GSR Part 6, paragraph 7.14 states that "***If deferred dismantling has been selected as a decommissioning strategy, the licencee shall demonstrate in the final decommissioning plan and supporting documents that such an option will be implemented safely. The availability of adequate financial resources to ensure that the facility is maintained in a safe condition during the deferral period and for subsequent decontamination and/or dismantling shall be demonstrated"*
(2)	**BASIS: GSR PART 6 paragraph 8.2 states** that In the case of deferred dismantling, the licencee shall ensure that the facility is maintained in a safe configuration so that subsequent decontamination and/or dismantling can be performed. An adequate programme for maintenance, monitoring and surveillance, which shall be subject to approval by the regulatory body, shall be developed to ensure safety throughout the period of deferral.
R19	**Recommendation: The regulatory body should ensure that the regulatory framework for decommissioning includes consideration of requirements related to safety aspects and financial resources if deferred dismantling has been selected.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The existing regulations do not specify the records, relevant for decommissioning, that are required to be kept during the lifetime of facility.	
(1)	**BASIS: GSR PART 6 paragraph 7.7 states that "***Appropriate records and reports that are relevant to decommissioning (e.g. records and reports of events) shall be retained by the licencee throughout the lifetime of the facility. The design of the facility, modifications to the facility and the facility's operating history shall be identified and shall be considered in preparing the decommissioning plans. If permanent shutdown takes place before a final decommissioning plan has been prepared, such a plan shall be prepared as soon as possible and adequate arrangements shall be made to ensure the safety of the facility until the approval of the final decommissioning plan."*
R20	**Recommendation: The regulatory body should develop guidance and update regulation taking into account requirement related to keeping records of information that will be relevant for decommissioning.**

Changes since the initial IRRS mission

Recommendation 16: ANVS informed the IRRS team that according to Article 3(1)(f) and (2) of the Shutdown and Decommissioning Regulation (Rboni), during operation of a nuclear facility, the preliminary decommissioning plan contains a general description of the measures necessary to ensure the safety of the facility and of the environment. The degree of detail of this description is expected to increase as the age of the facility increases. An application for a decommissioning licence must include a final decommissioning plan and must be supported by a safety report and risk analysis assessment (Article 10 (2)(a) of the Nuclear Facilities Fissionable Materials and Ores Decree (Bkse)).

Updated preliminary decommissioning plans that have been approved since 2014 (NPP Borssele, NPP Dodewaard and RR Delft; all 2016) are in accordance with this system and contain more detailed information about safety compared to the previous versions (2011). For the decommissioning licence of the Low Flux Reactor (LFR) in Petten (15 December 2014), the decommissioning of the reactor was included in the safety report of the plant (which contains not only the LFR, but also other facilities, like the hot labs (HCL) and waste storage facility (WSF)).

Currently, according to the new Decree on Basic safety standards for radiation protection (Bbs), some licence holders of non-nuclear facilities (to be mentioned in a separate regulation) are obliged to submit a decommissioning plan. In the Regulation on Basic safety standards for radiation protection (Rbs) these selected licence holders are listed with the selection based on the nature and size of the radiological risks involved, utilizing the graded approach.

In addition, the ANVS intends to issue regulations with regard to the quality and contents of this plan. Furthermore, a draft guideline on the contents of the decommissioning plan for these facilities was released in July 2017 by the ANVS, and is based on the IAEA guide WS-G-2.2 "Decommissioning of Medical, Industrial and Research Facilities". This ANVS-guideline, "Guide for drawing up a decommissioning plan for non-nuclear facilities", also provides further directives on the contents of the decommissioning plan, including the required safety consideration. ANVS informed the IRRS team that an inadequate decommissioning plan is one of the grounds for not granting a licence.

Recommendation 17: The IRRS team noted that Article 30a of the Nuclear Facilities Fissionable Materials and Ores Decree (Bkse) states that the decommissioning of a nuclear facility ends with a so called "green field". Deviations from the green field requirement can be allowed, provided that they are specified in the decommissioning licence. Article 30d of the Bkse states that when applying for cancellation of the licence (therefore removal from regulatory control), the licence holder of the nuclear facility must prove that the decommissioning is completed according to Article 30a. In addition, it is possible that further specific requirements will be included in the decommissioning licence, as it was done in the recent decommissioning license for the Low Flux Reactor (LFR) in Petten (15 December 2014).

The next decommissioning of a nuclear facility is not expected before 2025, when the High Flux Reactor at Petten is expected to cease operation. The development by ANVS of general requirements for the end state of buildings and sites (both nuclear and non-nuclear) is expected to be finished by then.

The IRRS team was informed that specific regulations for the release of sites and buildings from the regulatory control have not yet been developed, although the Decree on Basic Safety Standards for Radiation Protection and in the underlying ANVS-Regulation on Basic Safety Standards for Radiation Protection (the implemented EU-Directive 2013/59/EURATOM Basic safety standards for protection against the dangers arising from exposure to ionizing radiation (EU-BSS)) can be used for requests on specific clearance of metals and building rubble. ANVS informed the IRRS team that further guidance is currently under development, and will be finalized during the next few years. The IRRS team was informed that an initial report on an international comparison on regulations and guidance on the clearance of sites has been finalized in May 2018 and additional research will start soon. The draft guideline "*Guide for drawing up a decommissioning plan for non-nuclear facilities*" provides further provisions on the contents of the decommissioning report that is required for licence holders after completion of decommissioning.

Recommendation 18: This recommendation is related to the information required for Recommendation 2 in Chapter 1. Further details may be found in the review of Recommendation 2 in Chapter 1.

Recommendation 19: The IRRS team noted that according to Dutch regulations (art 30, Decree on Nuclear Installations, Fissionable Materials and Ores, BKSE), decommissioning should start immediately after normal operations have ended, and should be carried out as soon as reasonably practicable. Use of a decommissioning strategy with deferred dismantling is no longer allowed as a strategy and therefore no general requirements are set in

the regulations. Only in special circumstances can the Minister permit the permanent shutdown and decommissioning of the facility to start at a later date.

In case of an accident, the liability of the licence holders for nuclear installations is covered by the Dutch Act on the Liability for Nuclear Accidents (Wet Aansprakelijkheid Kernongevallen, WAKO), which is the transposition in Dutch law of the Paris Convention and the Brussels Convention. Article 6 of the Nuclear Facilities, Fissionable Materials and Ores Decree (BKSE) stipulates that a licence application for a nuclear installation shall contain "a statement of the insurance or other financial security which the applicant will have and maintain in order to comply with the nuclear Accidents Liability Act". The Ministry responsible for the WAKO is the Ministry of Finance which takes provisions in consultation, inter alia, with the Ministry of Infrastructure and Water Management.The Ministry of Finance is also charged with inspection and enforcement. Regular consultations take place between the ministries.

There is one historical exception where deferred dismantling was authorized as a strategy, before the aforementioned Article (art 30, Bkse) came into effect, when the NPP Dodewaard applied for and was granted a licence in 2002, including a period of safe enclosure for 40 years. The company GKN has a licence for this shutdown facility, maintained in a safe enclosure. Within the framework of the Nuclear Energy Act the facility is considered as any other nuclear facility "in operation", even if the spent fuel has been removed and no nuclear energy may be released. The licence holder of the NPP Dodewaard is also obliged to provide financial security for the costs of final decommissioning, in accordance with Article 15f Nuclear Energy Act. However, the licence holder has not yet been able to provide an acceptable financial security to the Ministry of Infrastructure and Water Management and the Ministry of Finance, and legal proceedings are in progress.

Recommendation 20: The IRRS team was informed that Article 5 (1) of the Shutdown and Decommissioning Regulation (Rboni) states that the licence holder of a nuclear facility shall take measures to retain radiological knowledge and information on the facility that is relevant to the shutdown and decommissioning. As a minimum, these measures will include the maintenance of records of actions carried out involving fissionable materials and radioactive materials. Article 3 of the same regulation obliges licence holders to describe in their decommissioning plan which measures will be taken for the retention of the aforementioned knowledge and information. The IRRS team was informed also that this information is necessary for the licence holder to draft the preliminary decommissioning plan, which has to be updated at least every five years (Article 29 of the Nuclear Facilities, Fissionable Materials and Ores Decree). Therefore as a minimum, the relevant information will be collected and can be evaluated every five years. The practice has shown that licence holders have a good view of the relevant information and records that are necessary for the update of the decommissioning plans (and the decommissioning).

The IRRS team was informed that in addition, the licences of nuclear installations contain specific requirements on registration of radioactive materials and of the descriptions of (and changes in) the installation. Licence holders and the ANVS have clarity regarding the relevant records for decommissioning which must be kept and the current regulations offer a way to assess whether this is done correctly. In this respect the obligation to update the decommissioning plan at least every 5 years is particularly important, but more general obligations related to record-keeping play a significant role too.

The IRRS team was informed that for non nuclear facilities, a new guideline under development "Guide for drawing up a decommissioning plan for non-nuclear facilities" (see R16) gives general instructions to licence holders falling under the Nuclear Energy Act, Articles 29 and 34 (of facilities dealing with radioactive material excluding fissile materials or ores) regarding how to keep records that will be relevant for decommissioning. In particular, paragraphs 2.3, 2.6, 5.7 and 5.8 address this point. In paragraph 5.8 it is stated that the design and relevant modifications need to be archived, and furthermore, a non-limiting list of items to be archived is presented. Guidance for these specific items will however, be further developed. This guidance will be included in an updated version of the "Guide for drawing up a decommissioning plan for non-nuclear facilities".

Status of the finding in the initial mission

Recommendation 16 (R16) is closed as the ANVS has developed sufficient regulation and other documentation to describe how the graded approach is applied to decommissioning planning.

Recommendation 17 (R17) remains open as the ANVS has not completed development of the documents which describe release from regulatory control following the completion of decommissioning or clean-up of a site.

Recommendation 18 (R18) is closed on the basis of progress made and confidence in the effective completion as the Government and the ANVS have implemented a graded approach to the provision of financial resources for decommissioning of all facilities, relying on the Government as a means of last resort.

Recommendation 19 (R19) is closed as the regulatory requirements require prompt decommissioning and the deferred decommissioning option is no longer available, pursuant to the Dutch law.

Recommendation 20 (R20) is closed on the basis of progress made and confidence in the effective completion since the ANVS has developed some of the necessary documentation to describe the record-keeping requirements for most nuclear and non-nuclear facilities and intends to complete the remaining guideline within the next two years.

9.6. REGULATIONS AND GUIDES FOR TRANSPORT

There were no findings in this area in the initial IRRS mission.

10. EMERGENCY PREPAREDNESS AND RESPONSE

10.1. GENERAL EPR REGULATORY REQUIREMENTS

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: Although there are some requirements for emergency preparedness and response for non-nuclear facilities, RVO does not require the establishment of emergency preparedness and response arrangements as part of its licencing process.	
(1)	**BASIS: GS-R-2 paragraph 5.19** *states that "The operating organization [of a facility or practice in threat category I, II, III or IV] shall prepare an emergency plan that covers all activities under its responsibility, to be adhered to in the event of an emergency. This emergency plan shall be co-ordinated with those of all other bodies having responsibilities in an emergency, including public authorities, and shall be submitted to the regulatory body."*
(2)	**BASIS: GS-G-2.1 in paragraph 3.8 states that "***The regulatory body shall require that arrangements for preparedness and response be in place for the on-site area for any practice or source that could necessitate an emergency intervention…The regulatory body shall ensure that such emergency arrangements provide a reasonable assurance of an effective response, in compliance with these requirements, in the case of a nuclear or radiological emergency. The regulatory body shall require that the emergency arrangements "shall be tested in an exercise before the commencement of operation [of a new practice]. There shall thereafter at suitable intervals be exercises of the emergency [arrangements], some of which shall be witnessed by the regulatory body."*
(3)	**BASIS: GS-G-2.1 in paragraph 3.9 states that "***In fulfilling its statutory obligations, the regulatory body… shall establish, promote or adopt regulations and guides upon which its regulatory actions are based;… shall provide for issuing, amending, suspending or revoking authorizations, subject to any necessary conditions, that are clear and unambiguous and which shall specify (unless elsewhere specified):… the requirements for incident reporting;… and emergency preparedness arrangements."*
R21	**Recommendation: The regulatory body should make provisions for non-nuclear licensees to have in place clearly defined arrangements on emergency preparedness and response before issuing the licence.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The threat assessment established in the country considers Categories A and B objects based on the significance of the event (regional or national impact). This threat categorization is not consistent with GS-R-2 and does not provide an optimal basis for a graded approach to the development of emergency preparedness and response regulations	
(1)	**BASIS: GS-R-2 paragraph 3.15 states that** *"… The threat assessment shall be so conducted as to provide a basis for establishing detailed requirements for arrangements for preparedness and response by categorizing facilities and practices consistent with the five categories shown in table 1."*
S14	**Suggestion: The regulatory body should consider improving the requirements and criteria for the establishment of the threat categorization of facilities and activities in accordance with GS-R-2.**

Changes since the initial IRRS mission

Recommendation 21: Since the initial IRRS mission in 2014, and the establishment of the ANVS, the EU-BSS (2013/59/EURATOM) has been implemented into Dutch legislation. The new Decree on Basic Safety Standards for Radiation Protection was issued in February 2018 and provides for the establishment of a company emergency response plan by the organisation under whose responsibility the practice is implemented, for the risks identified

relating to foreseeable accidents and radiological emergencies, and those referred to in regional and national crisis plans. The Regulation on Basic Safety Standards for Radiation Protection which was issued in February 2018 also requires an analysis of radiation safety incidents, accidents and radiological emergencies. The Regulation requires that security and emergency response plans are established for practices where the use of radioative sources in categories 1, 2 and 3 for sources used in common practices as specified in the IAEA Safety Standards GSR Part 3 and RS-G-1.9. The Decree and the Regulation also require a description of the emergency procedures for high activity and industrial radiography sources. The IRRS team was informed that some of the non-nuclear emergency response plans have been submitted and reviewed by ANVS. A process for education and training of more staff of the ANVS to perform such reviews has been implemented.

Suggestion 14: The Decree on Basic Safety Standards for Radiation Protection stipulates that the authorised organization must provide a company emergency response plan for the risks it has identified of foreseeable accidents and radiological emergencies in accordance with a graded approach. The organisation must also consider foreseeable accidents and radiological emergencies of relevance to its undertaking identified in the local security region plan or national crisis agreements. Requirements will be issued by ANVS through regulations with regard to the form, content and quality of the company emergency response plan and its implementation depending on the nature and gravity of the risks concerned. The Nuclear Energy Act contains a categorization for objects in category A and category B which differ in expected national or regional/local impact. The Response Plan NCS (National Crisis Plan for Radiation Incidents) issued in 2017 contains updated information for the postulated accident scenarios for the categories of A and B objects defined in the plan. An overview of the differences between the IAEA categorization and the A and B objects in the Response Plan NCS (National Crisis Plan for Radiation Incidents) has been made by ANVS and summarised in a table. The IRRS team was informed that in the development and update of the Response Plan NCS (National Crisis Plan for Radiation Incidents) and Response Plans of the Safety Regions, the IAEA categorization will be included.

Status of the finding in the initial mission

Recommendation 21 (R21) is closed on the basis that implementing the EU-BSS (2013/59/EURATOM), the Government of The Netherlands established provisions for high risk non-nuclear practices to establish an emergency response plan, and the review of these plans as part of the licensing process.

Suggestion 14 (S14) is closed as the requirements and Response Plan NCS (National Crisis Plan for Radiation Incidents have been updated, and a comparison with IAEA emergency preparedness categories has been completed and proposed for inclusion in the national framework.

10.2. FUNCTIONAL REGULATORY REQUIREMENTS

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: Some of the response time objectives for identification, notification and activation at facility, local and national level are established for the Borssele NPP but are not consistent with GS-G-2.1, and such objectives are not explicitly required and not implemented by other facilities and activities.	
(1)	**BASIS: GS-G-2.1 in paragraph 6.5 states that "***The arrangements for facilities in threat categories I, II and III should be established with the goal of meeting the time objectives given in Appendix VI."*
(2)	**BASIS: GS-G-2.1 Appendix VI states that** *"Response time objectives are suggested time objectives for selected critical response functions or tasks for facilities in threat categories I, II and III. They should, once established, be part of the performance objectives for a response capability and should be used as part of the evaluation criteria for exercises"*
S15	**Suggestion: The Regulatory Body should consider clearly defining criteria for response time objectives for all relevant threat categories and evaluating compliance with response time criteria during emergency exercises.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The current values established in the national system as action levels, intervention levels and guidance values for emergency workers are not in line with the values established in IAEA safety standards.	
(1)	**BASIS: GS-R-2 paragraph 4.45 states that** *"Optimized [national] intervention levels [for taking urgent protective actions] shall be [established that are in accordance with international standards], modified to take account of local and national conditions …"*
(2)	**BASIS: GS-R-2 paragraph 4.71 states that** *"… arrangements shall be made for promptly assessing the results of environmental monitoring and monitoring for contamination on people in order to decide on or to adapt urgent protective actions to protect workers and the public, including the application of operational intervention levels (OILs) with arrangements to revise the OILs as appropriate to take into account the conditions prevailing during the emergency."*
(4)	**BASIS: GS-R-2 paragraph 4.60 states that** *"National guidance that is in accordance with international standards shall be adopted for managing, controlling and recording the doses received by emergency workers..."*
S16	**Suggestion: The Regulatory Body should consider aligning action levels, intervention levels, and guidance values for emergency workers with IAEA standards.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: Requirements and arrangements for recovery operations are not defined in the national regulatory system.	
(1)	**BASIS: GS-R-2 paragraph 4.99 states that** "*Arrangements shall be established for the transition from emergency phase operations to routine long term recovery operations. This process shall include: the definition of the roles and functions of organizations; methods of transferring information; methods of assessing radiological and non-radiological consequences; and methods of modifying the actions taken to mitigate the radiological and non- radiological consequences of the nuclear or radiological emergency."*
R22	**Recommendation: The Regulatory Body should ensure that requirements and arrangements are established for recovery operations in line with international standards.**

Changes since the initial IRRS mission

Suggestion 15: An analysis was conducted by ANVS of the current response time objectives that are available in the emergency preparedness and response framework in The Netherlands. The analysis report lists all the response time objectives described in different documents such as licences, crisis and emergency plans and manuals for the categories considered in the Response Plan NCS (National Crisis Plan for Radiation Incidents). The table of response times objectives established in the IAEA GS-G-2.1 has been used in the analysis report as a basis for a comparison with existing times included in the abovementioned documents. For most of the tasks at the facility level, there are no specific response time objectives defined and enforced by legislation or licences. For the local and national level, response times objectives are part of the legislation, manuals or arrangements. The IRRS team was informed that a decision will be taken by ANVS in consultation with other stakeholders on the best way to align the response time objectives with IAEA guidance, and the formalisation thereof through updating of the Response Plan NCS (National Crisis Plan for Radiation Incidents) or by means of regulation under the Decree on Basic Safety Standards for Radiation Protection. Following this decision, an Action Plan will be developed specifying activities to ensure that the criteria are formalised and implemented at all levels.

Suggestion 16: The Decree on Basic Safety Standards for Radiation Protection specifies that in the case of occupational exposure in radiological emergencies, the dose limits stipulated in the Decree shall apply as far as possible to workers acting as emergency response personnel. It also contains requirements for the information,

training, reference levels and recording of doses for emergency workers. The Decree includes reference levels for workers acting as emergency response personnel, to salvage extremely important material interests, for life-saving work and prevention of serious health effects. The reference levels for emergency occupational exposures are consistent with the IAEA Safety Standards GSR Part 3, GSR Part 7 and also with the European Council Directive 2013/59/EURATOM.

Recommendation 22: The updated Response Plan NCS (National Crisis Plan for Radiation Incidents) makes provision for scaling down and the transition to aftercare and restoration in case of a nuclear or radiological emergency associated with category A and B objects. It further states that during the emergency a detailed aftercare plan should be drawn up, based on the specific situation and in line with national policy on aftercare and restoration or remediation. Reference levels to be established for the exposure of members of the public in the transition from a radiological emergency to an existing exposure situation, in particular when terminating long-term protective measures such as relocation elsewhere are contained in the Decree on Basic Safety Standards for Radiation Protection. In addition, the Appendix of the Decree requires that for transition from an emergency exposure situation to an existing exposure situation, recovery and remediation must be included in an emergency response system. The ANVS has developed a draft Action Plan to facilitate the inclusion of arrangements for the transition from an emergency exposure situation for category A and B objects in the national framework for emergency preparedness and response. The IRRS team was informed that the Response Plan NCS (National Crisis Plan for Radiation Incidents) is envisaged to be updated with more details on transition and recovery arrangements, taking consideration of IAEA Safety Standard GSG-11. All relevant emergency preparedness and response stakeholders will be consulted during the review and implementation of the proposed Action Plan.

Status of the finding in the initial mission

Suggestion 15 (S15) is closed on the basis of progress made and confidence in the effective completion. Good progress is being made by ANVS in the development and adoption of response time objectives as well as the planned consultation with other stakeholders.

Suggestion 16 (S16) is closed as the reference levels for emergency workers have been aligned with the IAEA Safety Standards.

Recommendation 22 (R22) is closed on the basis of progress made and confidence in the effective completion. Requirements have been established for recovery and transition from an emergency exposure situation, and the implementation of the proposed Action Plan provides confidence that current arrangements are to be expanded and implemented.

10.3. REGULATORY REQUIREMENTS FOR INFRASTRUCTURE

There were no findings in this area in the initial IRRS mission.

10.4. ROLE OF REGULATORY BODY DURING RESPONSE

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The actions to be performed by KFD during the response to a nuclear and radiological emergency for all Threat Categories, namely to monitor the situation, to independently determine the source term and to provide advice to the Government via the National Nuclear Assessment Team are not proceduralized.	
(1)	**BASIS: GS-R-2 paragraph 5.21 states that** *"The operating and response organizations shall develop the necessary procedures, analytical tools and computer programmes in order to be able to perform the functions specified to meet the requirements for emergency response established in Section 4.*
S17	**Suggestion: The Regulatory Body should consider finalizing its procedures for responding to a nuclear and radiological emergency.**

Changes since the initial IRRS mission

Suggestion 17: ANVS has in terms of the amended Nuclear Energy Act, responsibilities for emergency preparedness

and response which are reflected in the updated Response Plan NCS (National Crisis Plan for Radiation Incidents). Amongst others ANVS has the authority for the functioning of the Crisis Expert Team (CETsn) which provides the national knowledge and consultation network for radiation incidents, and is also The Netherlands' contact point for radiation accidents and incidents. The ANVS is also represented on the Interdepartmental Committee on Crisis Management (ICCb). The ANVS has an advisory role on the basis of its professional expertise, which contributes to the decision making during a crisis.

A Crisis Expert Team Manual for the CETsn has been developed by ANVS detailing the functions to be performed by ANVS and CETsn during the preparedness and response to a nuclear and radiological emergency. The manual describes the methods and procedures as well as national and international arrangements necessary to produce appropriate, reliable and timely advice in the event of radiation accidents. Specific functional roles have been identified and defined in the manual, and are being complemented by working instructions for each role.

Status of the finding in the initial mission

Suggestion 17 (S17) is closed on the basis of progress made and confidence in the effective completion. Good progress has been made with the development of a manual designed to fullfill the functions of the ANVS and CETsn during a nuclear or radiological emergency.

11. ADDITIONAL AREAS

11.1. CONTROL OF MEDICAL EXPOSURES

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: Guidelines used for the protection of the patient are prepared by the Scientific and Professional Societies and are widely used by authorised parties as well as for inspections, but they are not formally endorsed by the regulatory body.	
(1)	**BASIS: GSR PART 3 Requirement 3 states** *"The regulatory body shall establish or adopt regulations and guides for protection and safety and shall establish a system to ensure their implementation."*
R23	**Recommendation: The regulatory body should establish or adopt regulatory guides for the protection and safety of patients.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: Provisions for establishing DRLs, for placing signs in waiting areas for pregnant or breastfeeding female patients, for the establishment of dose constraints for carers and comforters (and the issue of guidance) and for calibration of sources giving rise to medical exposure, exist but not as clear regulatory requirements.	
(1)	**BASIS: GSR Part 3 Requirement 34 states** *"The government shall ensure that … diagnostic reference levels, …, are established"*
(2)	**BASIS: GSR Part 3 paragraph 3.148 states** *"The government shall ensure that, as a result of consultation between the health authority, relevant professional bodies and the regulatory body, the following are established: …(a) dose constraints, ….. for exposures of carers and comforters……"*
(3)	**BASIS: GSR PART 3 paragraph 3.172 states that** *"Registrants and licensees shall ensure that relevant dose constraints are used in the optimisation of protection and safety in any procedure in which an individual acts as a carer or comforter"*
(4)	**BASIS: GSR PART 3 paragraph 3.174 states** *"Registrants and licensees shall ensure that signs in appropriate languages are in place in public places, waiting rooms for patients, cubicles and other appropriate places and that …."*
(5)	**BASIS: GSR PART 3 paragraph 3.166 states** *"In accordance with paragraph 3.153(d) and (e), the medical physicist shall ensure that:* *(a) All sources giving rise to medical exposure are calibrated in terms of appropriate quantities using internationally accepted or nationally accepted protocols;* *(b) Calibrations are carried out at the time of commissioning a unit prior to clinical use, after any maintenance procedure that could affect the dosimetry and at intervals approved by the regulatory body;* *(c) Calibrations of radiotherapy units are subject to independent verification prior to clinical use;* *(d) Calibration of all dosimeters used for dosimetry of patients and for the calibration of sources is traceable to a standards dosimetry laboratory.*
S18	**Suggestion: The regulatory body should consider strengthening the requirements for:** • **the establishment, the use and the systematic revision of the diagnostic reference levels, at national and local level,** • **the establishment of dose constraints for carers and comforters and the issue of the respective guidelines for their use,** • **the registrants and licensees that signs in appropriate languages are placed to request female patients undergoing a radiological procedure to notify, in case of pregnancy or**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	breast feeding (for nuclear medicine), • **ensuring the calibration of sources giving rise to medical exposure.**

Changes since the initial IRRS mission

Recommendation 23: In February 2018, The Netherlands transposed the Council Directive 2013/59/EURATOM of 5 December 2013, laying down basic safety standards for protection against the dangers arising from exposure to ionising radiation, which is very much in line with IAEA GSR Part 3. This is done through the Decree on Basic Safety Standards for Radiation Protection and its explanatory memorandum.

Within the Decree on Basic Safety Standards for Radiation Protection there are provisions for the Minister of Health, Welfare and Sport to establish regulations and to ensure the issuing of guidelines related to the protection and safety of patients. These provisions concern the setting, regular review and use of Diagnostic Reference Levels (DRL) (in Article 8.3 paragraph 3) and the setting of referral criteria for justification on medical imaging (explanation to 2.4 paragraph 2 and 3 and to Article 8.2). Article 8.6b provides for the Minister of Health, Welfare and Sport to establish regulations and the Scientific Societies to issue guidelines for the justification of medical-radiological procedures in asymptomatic persons.

The IRRS team was informed that: (a) representatives from the Ministry of Health, Welfare and Sport usually participate in the drafting of the guidelines issued by Professional and Scientific Societies; (b) ANVS includes provisions of guidelines as licence conditions in the respective documents when authorizing nuclear medicine facilities and activities; (c) the guidelines issued by the Inspectorate of Health Care on the inspections of medical facilities and activities provide for the use of the respective guidelines issued by Professional and Scientific Societies to verify compliance.

Although a lot has been done by the Ministry of Health, Welfare and Sport with regard to the establishment of regulatory guidelines, not all guidelines used for the control of medical exposure are adopted by the Ministry as regulatory documents (such as staffing requirements and quality assurance programmes).

Suggestion 18: Within the Decree on Basic Safety Standards for Radiation Protection:

- there are provisions for the Minister of Health, Welfare and Sport to issue regulations for the setting, regular review and use of Diagnostic Reference Levels (DRL) (Article 8.3, paragraph 4). Values for national DRLs have been determined.
- there are provisions (Article 8.7, parargaph 3a) that the Minister of Health, Welfare and Sport may set dose constraints and further rules for exposures of carers and comforters.
- Article 8.11 paragraph 4 provides that the licensees take measures that help raise awareness among women, concerning medical exposure. However, proposed measures (such as signs in appropriate languages) are not specified in any regulatory document. The choice of the appropriate measures is left to the licensees.
- the requirement for the calibration of sources giving rise to medical exposure is implicitly expressed in the Decree on Basic Safety Standards for Radiation Protection through the provisions of the the programmes for quality assurance and the responsibilities of medical physicists. Calibration of sources is explicitly mentioned in the guidelines and protocols issued by the Dutch Society of Medical Physicists and used by the licensees.

Status of the finding in the initial mission

Recommendation 23 (R23) is closed, on the basis of progress made and confidence in effective completion. Good progress is being made by the Ministry of Health, Welfare and Sport regarding the establishment of regulatory guidelines for DRLs, dose constraints and referral criteria. There is confidence that further progress will be made towards the formal adoption of other guidelines used for the regulatory control of medical exposure.

Suggestion 18 (S18) is closed, on the basis of progress made and confidence in effective completion. Good progress is being made by the Ministry of Health, Welfare and Sport in strengthening the requirements for DRLs, for

dose constraints for carers and conforters as well as for the calibration of radiation sources. There is confidence that further progress will be made for explicitly addressing the requirements regarding information signs.

11.2. CONTROL OF DISCHARGES, MATERIALS FOR CLEARANCE, AND CHRONIC EXPOSURES; ENVIRONMENTAL MONITORING FOR PUBLIC RADIATION PROTECTION

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: There is currently no national policy related to management of existing exposure situations and remediation thereof. Additionally there is currently no defined reference level related to protection of the public from radon indoors. However, studies have suggested that indoor radon is not a major health concern in The Netherlands	
(1)	**BASIS: GSR PART 3 paragraph 5.20 states "***Where activity concentrations of radon that are of concern for public health are identified on the basis of the information gathered ..., the government shall ensure that an action plan is established comprising coordinated actions to reduce activity concentrations of radon in existing buildings and in future buildings, which includes:* *(a) Establishing an appropriate reference level for 222Rn for dwellings and other buildings with high occupancy factors for members of the public, with account taken of the prevailing social and economic circumstances, that in general will not exceed an annual average activity concentration due to 222Rn of 300 Bq/m3".*
(2)	**BASIS: GSR PART 3 paragraph 5.3 states** *"The government shall include in the legal and regulatory framework for protection and safety (see Section 2) provision for the management of existing exposure situations. The government, in the legal and regulatory framework, as appropriate:* *(a) Shall specify the exposure situations that are included in the scope of existing exposure situations;* *(b) Shall specify the general principles underlying the protection strategies developed to reduce exposure when remedial actions and protective actions have been determined to be justified;* *(c) Shall assign responsibilities for the establishment and implementation of protection strategies to the regulatory body and to other relevant authorities and, as appropriate, to registrants, licensees and other parties involved in the implementation of remedial actions and protective actions;* *(d) Shall provide for the involvement of interested parties in decisions regarding the development and implementation of protection strategies, as appropriate.*
R24	**Recommendation: The Government should establish provisions for the management of existing exposure situations and the remediation thereof. These provisions should include a national reference level for protection against indoor radon.**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The regulatory body in The Netherlands does not undertake an independent verification of environmental radioactivity reported by the regulated entities.	
(1)	**BASIS: GSR PART 3 Requirement 32 states** *"The regulatory body and relevant parties shall ensure that programmes for source monitoring and environmental monitoring are in place and that the results from the monitoring are recorded and are made available".*
(2)	**BASIS: GSR PART 3 paragraph 3.135. states** *"The regulatory body shall be responsible, as appropriate, for:* *(c) Making provision for an independent monitoring programme.* *(d) Assessment of the total public exposure due to authorized sources and practices in the State on the basis of monitoring data provided by registrants and licensees and with the use of data from independent monitoring and assessments."*
R25	**Recommendation: The Regulatory body should undertake independent verification of the**

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	environmental monitoring reported by regulated facilities.

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: The established clearance levels require updating to address identified deficiencies.	
(1)	**BASIS: GSR Part 3 Requirement 8: Exemption and clearance states:** *"The government or the regulatory body shall determine which practices or sources within practices are to be exempted from some or all of the requirements of these Standards. The regulatory body shall approve which sources, including materials and objects, within notified practices or authorized practices may be cleared from regulatory control".*
R26	**Recommendation: The regulatory body should update the established clearance levels to include the release of bulk quantities of material, the conditional clearance of materials and materials representing mixtures of artificial and natural nuclides**.

2014 RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
Observation: There are presently limited, very generic, requirements related to the control of consumer products.	
(1)	**BASIS: GSR Part 3 paragraph 3.139 states:** *"Upon receipt of a request for authorization to provide consumer products to the public, the regulatory body:* *(a) Shall require the provider of the consumer product to provide documents to demonstrate compliance with the requirements in paragraphs 3.138-3.144;* (b) *Shall verify the assessments and the selection of parameters presented in the request for authorization;* (c) *Shall determine whether the end use of the consumer product can be exempted;* (d) *Shall authorize the provision to the public of the consumer product, where appropriate, subject to specific conditions of authorization ".*
S19	**Suggestion: The regulatory body should consider establishing more specific requirements related to consumer products, consistent with the recommendation in IAEA documents GSR Part 3.**

Changes since the initial IRRS mission

Recommendation 24: In implementing the EU-BSS (2013/59/EURATOM), the Government of The Netherlands established provisions for existing exposure situations in The Netherlands' legal and regulatory framework. The Decree on Basic Safety Standards for Radiation Protection contains provisions for existing exposure situations, radon and building materials (Article 6.2 with Articles 6.15 - 6.21) as well as reference levels (Article 9.10). The Regulation on Basic Safety Standards for Radiation Protection and the ANVS-Regulation on Basic Safety Standards for Radiation Protection developed further the provisions for existing exposure situations.

Article 6.15 of the Decree requires the Government to establish an inventory of existing exposure situations in The Netherlands. If an existing exposure situation might be of concern from a radiation protection point of view, Articles 6.16 and 6.17 of the Decree describe how to assess this situation. If indeed an assessment indicates that an existing exposure situation may constitute a real safety concern, a strategy must be developed (Article 6.18) that has to be implemented (Article 6.19). Currently RIVM has created the inventory on request of the ANVS. Two existing exposure situations were found in need of special attention, namely, radon and building materials. In the Decree a reference level of 100 Bq/m3 has been set for radon, and the IRRS team was informed that a national action programme will be developed in 2018 (Article 6.20). To regulate the exposure from building materials Article 6.21

specifies the reference level of 1 mSv/year. More details on what has to be regulated according to the directive (list of building materials, methods to assess the materials) can be found in the Regulation and ANVS-Regulation.

Recommendation 25: Besides the practical work, in implementing the EU-Directive/2013/59, the requirements for performing an independent environmental monitoring programme are captured in the Decree on Basic Safety Standards for Radiation Protection (BBS) and in the underlying ANVS-Regulation on Basic Safety Standards for Radiation Protection. In Article 6.24 of the BBS it is required for the Minister of Infrastructure and Water Management to make provisions for the implementation of a suitable environmental monitoring programme. The IRRS team noted that the Minister of Infrastructure and Water Management assigns institutions and/or laboratories to perform (part of) this independent verification programme. In Article 6.2. of the ANVS-regulation provisions for the environmental monitoring programme are established.

The IRRS team was informed that yearly independent verification of environmental monitoring in The Netherlands is performed by the National Institute for Public Health and the Environment (RIVM), on behalf of ANVS. In addition to this independent verification, which already was performed for many years, in 2017 special attention was devoted to the independent verification of the environmental monitoring of EPZ (Operator of NPP Borssele) and COVRA (Dutch central organization for interim storage of nuclear waste).

In 2018, the independent verification of the environmental monitoring of EPZ was incorporated in the yearly plan of RIVM. By the end of 2018 the first results will be available for the ANVS.

The IRRS team was informed that RIVM is conducting an independent monitoring programme of environmental radioactivity, within water, food and air, in The Netherlands and that the RIVM reports the results of the environmental monitoring programme to the public. Part of this report are the results of the environmental monitoring performed by the nuclear power plant Borssele. The IRRS team also was informed that in the 2018 plan of RIVM, the independent verification of the environmental monitoring programme of NPP Borssele and COVRA are incorporated. The IRRS team was also informed that the environmental monitoring results of NPP Dodewaard (in safe enclosure) and the research reactor of the Delft Technical University (HOR) are planned to be verified in the future, if necessary. The IRRS team was informed that further improvements planned by ANVS include assessment regarding if the NRG Petten (operator of the research reactor HFR in Petten) and Urenco Almelo (enrichment facility) require to have an environmental monitoring programme and independent verification. ANVS also plans to consider whether such a programme and independent verification are required for certain non-nuclear facilities.

Recommendation 26: The IRRS team noted that the implementation of the Council Directive 2013/59/EURATOM Basic safety standard in the Dutch radiation protection regulatory framework (in particular the Decree on Basic Safety Standards for Radiation Protection (Besluit Basisveiligheidsnormen Stralingsbescherming (BBS)) and accompanying regulations updated the concepts of exemption as “the exemption of radioactive sources from the regulatory control” and the clearance as “release of radioactive materials from regulated practices”.

The IRRS team noted that exemption and clearance levels have been established. The method of dealing with mixtures of different radionuclides was also established.

An important addition to the regulatory framework is that it currently allows the Regulatory Body to establish, on its own behalf, upon request by the operator, conditional clearance levels.

Suggestion 19: The IRRS team noted that The Netherlands has transposed the Council Directive 2013/59/EURATOM, laying down basic safety standards for protection against the dangers arising from exposure to radiation, in its national legal and regulatory framework. On 6 February 2018 the Decree on Basic Safety Standards for Radiation Protection and its underlying regulations Regulation on Basic Safety Standards for Radiation Protection and ANVS-Regulation on Basic Safety Standards for Radiation Protection have come into force.

The IRRS team also noted that the transposition of the Council Directive 2013/59/EURATOM includes the implementation of the regulations on the justification and the regulatory oversight of practices and the use of consumer products. The implementation includes among others considerations on how certain categories of consumer products will remain prohibited, the definition of consumer product, provisions for practices involving consumer products and the Annex IV on the justification of new classes or types of practices involving consumer products as referred to in the Council Directive 2013/59/EURATOM.

Status of the finding in the initial mission

Recommendation 24 (R24) is closed based on the basis that in implementing the EU-BSS (2013/59/EURATOM), the Government of The Netherlands established provisions on existing exposure situations which are laid down in The Netherlands legal and regulatory framework.

Recommendation 25 (R25) is closed on the basis that implementing the EU-Directive/2013/59, the requirements for performing independent environmental monitoring are captured in the Decree on Basic Safety Standards for Radiation Protection and in the underlying ANVS-Regulation on Basic Safety Standards for Radiation Protection. In addition RIVM is extending an independent radiological environmental monitoring programme and is reporting the results of this monitoring programme to the public.

Recommendation 26 (R26) is closed on the basis that with the implementation of the EU-Directive 2013/59/ in particular by issuing the Decree on Basic Safety Standards for Radiation Protection and accompanying regulations, ANVS has updated the concepts of exemption and clearance and corresponding exemption and clearance levels.

Suggestion 19 (S19) is closed on the basis that with the implementation of the EU-Directive 2013/59/, ANVS has developed and incuded in the regulations the justification and the regulatory oversight of practices and the use of consumer products.

11.3. TRANSPORT OF RADIOACTIVE MATERIAL – SPECIAL ARRANGEMENTS

There were no specific findings regarding transport during the 2014 IRRS mission to The Netherlands, although transport arrangements were addressed within relevent chapters.

Following questions in the Dutch Parliament in 2016 regarding potential safety concerns in connection with the use of Special Arrangements for transport of radioactive materials, ANVS requested that the IAEA to perform a peer review of this practice during the IRRS follow-up mission in 2018.

The Advance Reference Material (ARM) contained a self-assessement of this practice together with examples of licences issued for transport under special arrangements. During the interviews with the counterpart the IRRS team identified that two administrative “shall” requirements in IAEA SSR 6 paragraph 836 (a and g) were missing in the Dutch Special Arrangements, although they noted these omissions have no impact on overall safety. ANVS immediately made a formal decision to include the missing items in all future licences of this type and amended the licence format to include the missing items.

Regarding the implementation of transport under special arrangements in The Netherlands, the IRRS team concluded the following:

1. The IAEA Regulation SSR-6 (2012) is implemented through the modal transport regulations (ADR, ADN, IMDG Code, etc.). They are legally binding in The Netherlands.
2. Transport under special arrangements, as indicated in SSR6, are standard internationally accepted procedures to handle certain types of radioactive transports if they fulfil the IAEA and relevant national legal requirements. In such cases transport under special arrangements is justified.
3. Based on the Dutch NEA the transport under special arrangement requires a licence, instead of a certificate as is required by the SSR-6. All provisions related to the certificate are covered by the licence. The licence procedure is more stringent and includes publication and the possibility for objection by stakeholders.
4. ANVS provided the IRRS team with four examples of different approvals regarding transport under special arrangements including both nuclear materials (irradiated Low Enriched Uranium) and Naturally Occuring Radioactive Materials. The approvals included different requirements, such as escort by radiation protection experts or Radiation Protection Officer with adequate measurement and emergency equipment and communication devices, restrictions regarding weather conditions and approved routing applied. The approval for fissile materials includes an extra layer of safety of physical protection measures. The overall safety requirements implemented in these examples were deemed to be good.

APPENDIX I – LIST OF PARTICIPANTS

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STRITAR Andrej	Slovenian Nuclear Safety Administration	andrej.stritar@gov.si
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LIAISON OFFICERS		
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APPENDIX II – FOLLOW-UP MISSION PROGRAMME

Time	MON 19 Nov	TUE 20 Nov	WED 21 Nov	THU 22 Nov	FRI 23 Nov	SAT 24 Nov	SUN 25 Nov	MON 26 Nov	Time
09:00		Entrance Meeting	Interviews	TM write Report TL and DTL review introductory part	Discussion Counterpart/Expert Finalisation	**Preparation for Exit Meeting presentation and Final Executive Summary (TL, DTL, TC, DTC)** -At Novotel-	Preparation Press Release and Press Conference (TL, DTL, TC, DTC, Press officer) -At Novotel-	Exit Meeting & Press Conference	09:00
09:30									09:30
10:00									10:00
10:30									10:30
11:00		Interviews		**Draft text to TL**				Farewell	11:00
11:30									11:30
12:00			Lunch		Lunch and **Presentation on OPEX for Regulatory Body**	Lunch	Lunch		12:00
12:30		Lunch		Lunch					12:30
13:00			Policy discussion **On ANVS Independence**		Presentation on Vessel Retention	Free Time Activity TBD	Social event	Departure of Team Members	13:00
13:30		Interviews		Secretariat edits the report / Cross-reading	Discussions on R2 and R18 IRRS Team + ANVS Counterparts				13:30
14:00	Initial Team Meeting (Attended by the LO): ▪ Admin and logistical issues (LO) ▪ IRRS objectives, process ▪ Report writing ▪ Schedule ▪ First observations -At Novotel-								14:00
14:30									14:30
15:00			Interviews/ TM Write findings						15:00
15:30									15:30
16:00				Preliminary Draft Report Ready					16:00
16:30			**Written preliminary findings delivered**		Commented Report received from Counterparts				16:30
17:00		Daily team Meeting -At ANVS-	Daily team Meeting Discussion of findings -At ANVS-	Daily team Meeting -At ANVS-	Daily team Meeting **Finalization of the report** -At ANVS-				17:00
17:30									17:30
18:00	Dinner	Dinner	Dinner	Dinner	Presentation of Final Results to ANVS' Counterparts (if required)				18:00
19:00							Official Dinner		19:00
19:30			TM Writing of the report -At Novotel-	TM write Report Secretariat edits Report -At Novotel-	Dinner w/ANVS staff				19:30
20:00									20:00
20:30									20:30
21:00									21:00

APPENDIX III – LIST OF COUNTERPARTS

	IRRS Experts	Lead Counterpart	Support Staff
1.	**LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES**		
	STRITAR Andrej FUNDAREK Peter	LEIJENDEKKER Rita	HEKKER Arthur VAN VUREN Johannes SMIT Martin VAN ROIJEN Job SORMANI Patricia BANUS Sander GODTHELP Barbara JANSSEN John
2.	**GLOBAL NUCLEAR SAFETY REGIME**		
	STRITAR Andrej FUNDAREK Peter	VERWEIJ Bert	BOOM Jurrian
3.	**RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY**		
	MEDAKOVIĆ Saša ALM-LYTZ Kirsi SANTINI Miguel	DE BEL Jupp	JANSSEN John DE JONGH Benno KOCK Romy BOOM Jurrian VAN LONKHUYZEN Wouter KELLER Bernd
4.	**MANAGEMENT SYSTEM OF THE REGULATORY BODY**		
	MEDAKOVIĆ Saša ALM-LYTZ Kirsi SANTINI Miguel	DE BEL Jupp	CHRISTIAANSE Corina
5.	**AUTHORIZATION**		
	POLITI Adriana DONALD John FUNDAREK Peter SHADAD Ibrahim JOVA SED Luis	DE KOFF Sigrid	JANSEN Rob SORMANI Patricia STAAL Yvette

	IRRS Experts	Lead Counterpart	Support Staff
6.	**REVIEW AND ASSESSMENT**		
	POLITI Adriana DONALD John FUNDAREK Peter SHADAD Ibrahim JOVA SED Luis	DE KOFF Sigrid	JANSEN Rob STAAL Yvette
7.	**INSPECTION**		
	POLITI Adriana DONALD John FUNDAREK Peter SHADAD Ibrahim JOVA SED Luis	DE KOFF Sigrid VERWEIJ Bert	KELLER Bernd
8.	**ENFORCEMENT**		
	POLITI Adriana DONALD John FUNDAREK Peter SHADAD Ibrahim JOVA SED Luis	DE KOFF Sigrid VERWEIJ Bert	KELLER Bernd
9.	**REGULATIONS AND GUIDES**		
	POLITI Adriana DONALD John FUNDAREK Peter SHADAD Ibrahim JOVA SED Luis	DELFINI Ginevra	ARENDS Patrick GÖRTS Peter JANSEN Rob VAN ROIJEN Job VERMEULEN Ton TEN WOLDE Annika
10.	**EMERGENCY PREPAREDNESS AND RESPONSE**		
	MULLER Alan	KLOMBERG Theo	VAN GALEN Tom GROOT Marjolein
11.	**ADDITIONAL AREAS**		

	IRRS Experts	Lead Counterpart	Support Staff
	ZIKA Helmuth KAMENOPOULOU Vasiliki SHADAD Ibrahim	VERMEULEN Ton TER MORSHUIZEN Mathieu	GOPAL-KALI Mithra GÖRTS Peter GODTHELP Barbara TIJSMANS Miriam VAN ROIJEN Job VAN DE PUT Frans VAN GALEN Tom KEULEMANS Laurine ARENDS Patrick

APPENDIX IV – RECOMMENDATIONS (R), SUGGESTIONS (S) AND GOOD PRACTICES (GP)

AREA	R: Recommendations S: Suggestions GP: Good Practices	Recommendations, Suggestions or Good Practices
9. REGULATIONS AND GUIDES	**R17**	**Recommendation: The regulatory body should develop requirements on the end state of decommissioning, termination of the authorization for decommissioning and on the release of the facility and/or the site from regulatory control.**

APPENDIX V – COUNTERPART'S REFERENCE MATERIAL USED FOR THE REVIEW

#	#ARM	R/S	Name ARM	ARM is also used with R/S	Translated	Uploaded
Module 1: Legislative and governmental responisbilities						
1	**01R1001**	**R1**	Outlines of the Dutch policy for nuclear safety and radiation protection 2018		**y**	
2	01R2001	**R2**	Letter to parliament (High Level Working Group)	R18	y	
3	01R2002		Appendix to letter to parliament (High Level Working Group (in Dutch: Hoog Ambtelijke Werkgroep – HAW)	R18	y	
4	**01R2003**		Decree on Basic Safety Standards for Radiation Protection - 4 parts	S1, R5, R16, R17, R18, R21, S16, R23, S18, R24, R25, R26, S19	**y**	
5	01R2004		National programme for the management of radioactive waste and spent fuel (2016)	R18	y	
6	01R2005		Draft Guide for drawing up a decommissioning plan for non-nuclear facilities	R16, R17, R18, R20	y	
7	01R3001	**R3**	Decision of the Minister of Infrastructure and Environment of 17 December 2014, Official Gazette, no. 37291	R4	y	
8	01R3002		Royal Decision of 10 April 2015, Official Gazette, no. 11080		y	
9	01R3003		Amendment of the Nuclear Energy Act with regard of the establishment of the ANVS, Official Journal 2016, 180	R7, R9, S5	y	
10	01R3004		Amendment of Several Decrees on the basis of the Nuclear Energy Act with regard of the establishment of the ANVS, Official Journal 2017, 233		y	
11	01R3005		Amendment of Several Ministerial Regulations on the basis of the Nuclear Energy Act with regard of the establishment of the ANVS, Official Gazette 2017, no. 27098		y	
12	01R3006		Royal Decision of 6 July 2017, Official Journal 2017, 312		y	
13	01S1001	**S1**	Ministerial Nuclear Safety Regulation for nuclear installations	R10, R20	y	
14	01S1002		Nuclear Energy Act		y	
15	**01R2003**		Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, R5, R16, R17, R18, R21, S16, R23, S18,	**y**	

				R24, R25, R26, S19		
16	01R3001	**R4**	Decision of the Minister of Infrastructure and Environment of 17 December 2014, Official Gazette, no. 37291	R3	y	
17	01R4001		2017 Cooperation Agreement for Radiation Protection, Official Gazette, no. 59132	R5	y	
18	01R4002		Covenant on cooperation customs		y	
19	01R4003		Annex to the Covenant on cooperation customs		y	
20	01R5001	**R5**	Organization decision 2014/2016	R7, S5	y	
21	01R5002		Berenschot Report	R9	y	
22	01S1001		Ministerial Nuclear Safety Regulation for nuclear installations	R4	y	
23	**01R2003**		Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R16, R17, R18, R21, S16, R23, S18, R24, R25, R26, S19	**y**	
24	01R5003		Regulation on Basic Safety Standards for Radiation Protection	R16, R21, R24, R26, S19	y	
25	01R5004		ANVS-Regulation on Basic Safety Standards for Radiation Protection - articles	R17, R24, R25, R26, S19	y	
26	01R5005		ANVS-Regulation on Basic Safety Standards for Radiation Protection - annexes	R17, R24, R25, R26, S19	y	
27	01R5006		ANVS-Regulation on Basic Safety Standards for Radiation Protection - explanation	R17, R24, R25, R26, S19	y	
28	**01R5007**		Technopolis Group report 'Nucleaire kennisinfrastructuur in Netherland' (2016) - 2 documents		**y**	
Module 2: Global nuclear safety regime						
29	02R6001	**R6**	GRS OEF workshop Nov 08, 2017 - part 1		y	
30	02R6002		GRS OEF workshop Nov 08, 2017 - part 2		y	
31	-		OEF and REF procedure		n	n
32	-		OEF analysis report		n	n
Module 3: Responsibilities and functions of the regulatory body						
33	03R7001	**R7**	I&E Vision for Regulation ANVS		y	
34	03R7002		Parliamentary paper of the House of Representatives, Session year 2016-2017, 25268 no. 138		y	
35	01R5001		Organization decision 2014/2016	R5, S5	y	

36	01R3003		Amendment of the Nuclear Energy Act with regard of the establishment of the ANVS, Official Journal (in Dutch: Staatsblad) 2016, 180	R3, R9, S5	y	
37	03R8001	**R8**	ANVS Safety Culture		y	
38	03R8002		ANVS Vision Document		y	
39	01R5002	**R9**	Berenschot Report	R5	y	
40	**03R9001**		Brief van de Minister IenM aan de voorzitter 2e Kamer, Tweede Kamer, vergaderjaar 2016–2017, 25 422, nr. 187		**y**	
41	03R9002		Nuclear Energy Act (Remunerations) Decree		y	
42	01R3003		Amendment of the Nuclear Energy Act with regard of the establishment of the ANVS, Official Journal (in Dutch: Staatsblad) 2016, 180	R3, R7, S5	y	
43	01S1001	**R10**	Ministerial Nuclear Safety Regulation for nuclear installations	S1, R20	y	
44	03R10001		Training profile policy		n	
45	03R10002		Training profile authorization_licensing		n	
46	03R10003		Training profile legal		n	
47	03R10004		Training profile inspection		n	
48	03R10005		Training profile management		n	
49	03R10006		Courses followed in 2015-2017		n	
50	03R10007		Introduction course for new employees		n	
51	-		Training requirements picket services		n	n
52	03S2001	**S2**	Decision Establishing an ANVS Advisory Body (published 12 April 2018 Official Gazette (in Dutch: Staatscourant), no. 21957)		y	
53	03S2002		Decision Appointing Members of the ANVS Advisory Body (published 17 April 2018 Official Gazette (in Dutch: Staatscourant), no. 21953)		y	
54	03S3001	**S3**	Framework agreement KFD-GRS 15/9/1992		y	
55	**03S3002**		Framework Agreement Government Clients - RIVM - 2 documents		**y**	
56	03S3003		Framework agreement ANVS-RTD Lot 2		y	
57	03S3004		Framework agreement ANVS-SCK		y	
58	03S3005		Framework agreement ANVS-NRG Lot 1		y	
59	03S3006		Framework agreement ANVS-NRG Lot 2		y	
60	03S3007		Framework agreement ANVS-NRG Lot 3		y	
61	03R11001	**R11**	Project Start Architecture for the ZAPP System	S10	y	
62	03R11002		General Architecture Framework ZAPP Project	S10	y	
63	03R11003		Project Initiation Document (PID) VIZA-1	S4, S10	y	

64	03R11004		Project Initiation Document (PID) VIZA-1, Annex 1	S4, S10	y	
65	03R11005		Project Initiation Document (PID) VIZA-1, Annex 2	S4, S10	y	
66	03R11006		Project Initiation Document (PID) VIZA-1, Annex 3	S4, S10	y	
67	03R11007		Project Initiation Document (PID) VIZA-1, Annex 4	S4, S10	y	
68	-		Project Initiation Document (PID) VIZA-2	S10	n	n
69	-		Demo of ZAPP	S10	n	n
70	03S4001	**S4**	Dutch presentation at IAEA meeting on national source registers		y	
71	03R11003		Project Initiation Document (PID) VIZA-1	R11, S10	y	
72	03R11004		Project Initiation Document (PID) VIZA-1, Annex 1	R11, S10	y	
73	03R11005		Project Initiation Document (PID) VIZA-1, Annex 2	R11, S10	y	
74	03R11006		Project Initiation Document (PID) VIZA-1, Annex 3	R11, S10	y	
75	03R11007		Project Initiation Document (PID) VIZA-1, Annex 4	R11, S10	y	
Module 4: Management system of the regulatory body						
76	04R12001	**R12**	ANVS Integral Management System (AIM)		y	
77	-		Demo of MAVIM		n	n
78	04S5001	**S5**	Budget cycle and group management I&E		y	
79	01R3003		Amendment of the Nuclear Energy Act with regard of the establishment of the ANVS, Official Journal (in Dutch: Staatsblad) 2016, 180	R3, R7, R9	y	
80	01R5001		Organization decision 2014/2016	R5, R7	y	
Module 5: Authorization						
81	05R13001	**R13**	NVR Planning and progress overview document		y	
81	-		NVRs		n	n
83	-	**S6**	NA		-	-
Module 6: Review and assessment						
84	06S7001	**S7**	Licensing Policy ANVS		y	
85	-	**S8**	NA		-	-
Module 7: Inspection						
86	07R14001	**R14**	ANVS inspection and enforcement strategy	S9, S11	y	
87	07R14002		Inspection Plan Medical and Industrial		n	
88	07R14003		Inspection Plan Medical and Industrial - Example Scrap Metal		n	
89	07R14004		Inspection Plan Transport		n	

90	07R14005		Inspection Plan Nuclear Installations		n	
91	07R14001	**S9**	ANVS inspection and enforcement strategy	R14, S11	y	
92	03R11001	**S10**	Project Start Architecture for the ZAPP System	R11	y	
93	03R11002		General Architecture Framework ZAPP Project	R11	y	
94	03R11003		Project Initiation Document (PID) VIZA-1	S4, R11	y	
95	03R11004		Project Initiation Document (PID) VIZA-1, Annex 1	S4, R11	y	
96	03R11005		Project Initiation Document (PID) VIZA-1, Annex 2	S4, R11	y	
97	03R11006		Project Initiation Document (PID) VIZA-1, Annex 3	S4, R11	y	
98	03R11007		Project Initiation Document (PID) VIZA-1, Annex 4	S4, R11	y	
99	-		Project Initiation Document (PID) VIZA-2	R11	n	n
100	-		Demo of ZAPP	R11	n	n
Module 8: Enforcement						
101	07R14001	**S11**	ANVS inspection and enforcement strategy	R14, S9	y	
102	-	**S12**	NA		-	-
Module 9: Regulations and guides						
103	05R13001	**S13**	NVR Planning and progress overview document		y	
104	-		Instruction to evaluate the content of an IAEA standard		n	n
105	-		(Draft) NVRs		n	n
106	-	**R15**	Draft procedure update regulations		n	n
107	**01R2003**	**R16**	Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R17, R18, R21, S16, R23, S18, R24, R25, R26, S19	**y**	
108	01R5003		Regulation on Basic safety standards for radiation protection	R5, R21, R24, R26, S19	y	
109	01R2005		Draft Guide for drawing up a decommissioning plan for non-nuclear facilities	R2, R17, R18, R20	y	
110	09R17001	**R17**	"Guideline for the clearance of buildings during the decommissioning of a nuclear facility", KIN2010/0066, Hamburg 30 juni 2012		y	
111	09R17002		"Guideline for the clearance of sites during the decommissioning of a nuclear facility", KIN2010/0066, Hamburg 30 juni 2012, by TÜV NORD for the ministry of Economic Affairs, as attached to the license for the decommissioning of the LFR		y	

112	**01R2003**		Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R16, R18, R21, S16, R23, S18, R24, R25, R26, S19	**y**	
113	01R5004		ANVS-Regulation on Basic Safety Standards for Radiation Protection - articles	R5, R24, R25, R26, S19	y	
114	01R5005		ANVS-Regulation on Basic Safety Standards for Radiation Protection - annexes	R5, R24, R25, R26, S19	y	
115	01R5006		ANVS-Regulation on Basic Safety Standards for Radiation Protection - explanation	R5, R24, R25, R26, S19	y	
116	01R2005		Draft Guide for drawing up a decommissioning plan for non-nuclear facilities	R2, R16, R18, R20	y	
117	-		Tussenrapportage vrijgave terreinen, Martijn van der Schaaf-RIVM, 11-05-2018		n	n
118	01R2001	**R18**	Letter to parliament	R2	y	
119	01R2002		Appendix to letter to parliament (High Level Working Group (in Dutch: Hoog Ambtelijke Werkgroep – HAW)	R2	y	
120	**01R2003**		Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R16, R17, R21, S16, R23, S18, R24, R25, R26, S19	**y**	
121	01R2005		Draft Guide for drawing up a decommissioning plan for non-nuclear facilities	R2, R16, R17, R20	y	
122	01R2004		National programme for the management of radioactive waste and spent fuel (2016)	R2	y	
123	-	**R19**	NA		-	-
124	01R2005	**R20**	Draft Guide for drawing up a decommissioning plan for non-nuclear facilities	R2, R16, R17, R18	y	
125	01S1001		Ministerial Nuclear Safety Regulation for nuclear installations	S1, R10	y	
Module 10: Emergency preparedness and response						
126	**01R2003**	**R21**	Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R16, R17, R18, S16, R23, S18, R24, R25, R26, S19	**y**	
127	01R5003		Regulation on Basic Safety Standards for Radiation Protection	R5, R16, R24, R26, S19	y	
128	10S14001	**S14**	Response Plan NCS	S17	y	
129	**10S14002**		GRIP-Regulation (see also X009)		**y**	

130	-	**S15**	An overview of the response time objectives		n	n
131	**01R2003**	**S16**	Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R16, R17, R18, R21, R23, S18, R24, R25, R26, S19	**y**	
132	-		Action plan - action and intervention levels		n	n
133	-	**R22**	Action plan		n	n
134	10S14001	**S17**	Response Plan NCS	S14	y	
135	-		CETsn Handbook		n	n
Module 11: Additional areas						
136	**01R2003**	**R23**	Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R16, R17, R18, R21, S16, S18, R24, R25, R26, S19	**y**	
137	**01R2003**	**S18**	Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R16, R17, R18, R21, S16, R23, R24, R25, R26, S19	**y**	
138	**01R2003**	**R24**	Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R16, R17, R18, R21, S16, R23, S18, R25, R26, S19	**y**	
139	01R5003		Regulation on Basic Safety Standards for Radiation Protection	R5, R16, R21, R26, S19	y	
140	01R5004		ANVS-Regulation on Basic Safety Standards for Radiation Protection - articles	R5, R17, R25, R26, S19	y	
141	01R5005		ANVS-Regulation on Basic Safety Standards for Radiation Protection - annexes	R5, R17, R25, R26, S19	y	
142	01R5006		ANVS-Regulation on Basic Safety Standards for Radiation Protection - explanation	R5, R17, R25, R26, S19	y	
143	11R25001	**R25**	Yearly Plan 2018 Contra Expertise on measurements by the nuclear facilities		n	
144	**01R2003**		Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R16, R17, R18, R21, S16, R23, S18, R24, R26, S19	**y**	
145	01R5004		ANVS-Regulation on Basic Safety Standards for Radiation Protection - articles	R5, R17, R24, R26, S19	y	
146	01R5005		ANVS-Regulation on Basic Safety Standards for Radiation Protection - annexes	R5, R17, R24, R26, S19	y	

147	01R5006		ANVS-Regulation on Basic Safety Standards for Radiation Protection - explanation	R5, R17, R24, R26, S19	y	
148	**01R2003**	**R26**	Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R16, R17, R18, R21, S16, R23, S18, R24, R25, S19	**y**	
149	01R5003		Regulation on Basic Safety Standards for Radiation Protection	R5, R16, R21, R24, S19	y	
150	01R5004		ANVS-Regulation on Basic Safety Standards for Radiation Protection - articles	R5, R17, R24, R25, S19	y	
151	01R5005		ANVS-Regulation on Basic Safety Standards for Radiation Protection - annexes	R5, R17, R24, R25, S19	y	
152	01R5006		ANVS-Regulation on Basic Safety Standards for Radiation Protection - explanation	R5, R17, R24, R25, S19	y	
153	**01R2003**	**S19**	Decree on Basic Safety Standards for Radiation Protection - 4 parts	R2, S1, R5, R16, R17, R18, R21, S16, R23, S18, R24, R25, R26	**y**	
154	01R5003		Regulation on Basic Safety Standard for Radiation Protection	R5, R16, R21, R24, R26	y	
155	01R5004		ANVS-Regulation on Basic Safety Standards for Radiation Protection - articles	R5, R17, R24, R25, R26	y	
156	01R5005		ANVS-Regulation on Basic Safety Standards for Radiation Protection - annexes	R5, R17, R24, R25, R26	y	
157	01R5006		ANVS-Regulation on Basic Safety Standards for Radiation Protection - explanation	R5, R17, R24, R25, R26	y	
ARM not related to an R/S						
Special arrangments transport						
158	X001	-	Transport licence - 30 januari 2017 COVRA - special arrangement - removal HFR-LEU	-	y	
159	X002	-	Transport licence - 13 januari 2017 Centrica Production Nederland - special arrangement	-	y	
160	X003	-	Transport licence - 25 april 2017 COVRA - special arrangement - HOR elements	-	y	
161	X004	-	Transport licence - 25 april 2017 Jewometaal Stainless Processing - special arrangement	-	y	
162	**X013**	-	Results questionnaire EACA Special Arrangements (Europe)	-	**y**	

Miscellaneous						
163	X005	-	COUNCIL DIRECTIVE 2013-59-EURATOM Basic safety standards of 5 December 2013 (EU-BSS)	-	y	
164	X006	-	2nd Update of the National Action Plan for the follow-up of post-Fukushima Dai-ichi related activities	-	y	
165	**X007**	-	Update of the national implementation of the IAEA action plan	-	**y**	
166	X008	-	The application of the independence principle to the regulatory body in The Netherlands - Arthur Hekker	-	y	
167	X009	-	GRIP-regulation (Dutch) (see also 10S14002)	-	n	
168	X010	-	Decree on Basic Safety Standards for Radiation Protection (in Dutch, Bbs)	-	n	
169	X011	-	Regulation on Radiation Protection for Occupational Exposure (in Dutch, part of Bbs)	-	n	
170	X012	-	Regulation on Radiation Protection for Medical Exposure (in Dutch, part of Bbs)	-	n	
171	**X014**	-	2nd Update of the National Action Plan for the follow-up of post-Fukushima Dai-ichi related activities - part 2 - update of the Post Fukushima Measures status NL 2018	-	**y**	

APPENDIX VI – IAEA REFERENCE MATERIAL USED FOR THE REVIEW

1.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Fundamental Safety Principles, No SF-1, IAEA, Vienna (2006)
2.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Governmental, Legal and Regulatory Framework for Safety, General Safety Requirements Part 1, No. GSR Part 1, IAEA, Vienna (2010).
3.	**INTERNATIONAL ATOMIC ENERGY AGENCY** – The Management System for Facilities and Activities. Safety Requirement Series No. GS-R-3, IAEA, Vienna (2006).
4.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Preparedness and Response for Nuclear and Radiological Emergencies, Safety Requirement Series No. GS-R-2, IAEA, Vienna (2002).
5.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, General Safety Requirements Part 3, No. GSR Part 3, IAEA, Vienna (2014).
6.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety assessment for facilities and activities, General Safety Requirements Part 4, No. GSR Part 4, IAEA, Vienna (2009)
7.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Predisposal Management of Radioactive Waste, General Safety Requirement Part 5, No. GSR Part 5, IAEA, Vienna (2009).
8.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Decommissioning of Facilities, Safety Requirement Series No. GSR Part 6, IAEA, Vienna (2014).
9.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety of Nuclear Power Plants: Design, Specific Safety Requirements No. SSR-2/1, IAEA, Vienna (2012).
10.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety of Nuclear Power Plants: Commissioning and Operation, Specific Safety Requirements Series No. SSR-2/2, IAEA, Vienna (2011).
11.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Site Evaluation for Nuclear Installations, Safety Requirement Series No. NS-R-3, IAEA, Vienna (2003).
12.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety of Research Reactors, Safety Requirement Series No. NS-R-4, IAEA, Vienna (2005).
13.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety of Nuclear Fuel Cycle Facilities, Safety Requirement Series No. NS-R-5, IAEA, Vienna (2014)
14.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Disposal of Radioactive Waste, Specific Safety Requirements No. SSR-5, IAEA, Vienna (2011)
15.	**INTERNATIONAL ATOMIC ENERGY AGENCY** – Regulations for the Safe Transport of Radioactive Material, Specific Safety Requirements No. SSR-6, IAEA, Vienna (2012)

16.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Organization and Staffing of the Regulatory Body for Nuclear Facilities, Safety Guide Series No. GS-G-1.1, IAEA, Vienna (2002).
17.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Review and Assessment of Nuclear Facilities by the Regulatory Body, Safety Guide Series No. GS-G-1.2, IAEA, Vienna (2002).
18.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Regulatory Inspection of Nuclear Facilities and Enforcement by the Regulatory Body, Safety Guide Series No. GS-G-1.3, IAEA, Vienna (2002).
19.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Documentation Used in Regulating Nuclear Facilities, Safety Guide Series No. GS-G-1.4, IAEA, Vienna (2002).
20.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Arrangements for Preparedness for a Nuclear or Radiological Emergency, Safety Guide Series No. GS-G-2.1, IAEA, Vienna (2007)
21.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Criteria for use in Preparedness and Response for a Nuclear or Radiological Emergency, General Safety Guide Series No. GSG-2, IAEA, Vienna 2011)
22.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Commissioning for Nuclear Power Plants, Safety Guide Series No. SSG-28, IAEA, Vienna (2014)
23.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Periodic Safety Review of Nuclear Power Plants, Safety Guide Series No. SSG-25, IAEA, Vienna (2013)
24.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - A System for the Feedback of Experience from Events in Nuclear Installations, Safety Guide Series No. NS-G-2.11, IAEA, Vienna (2006)
25.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Occupational Radiation Protection, Safety Guide Series No. RS-G-1.1, IAEA, Vienna (1999)
26.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Assessment of Occupational Exposure Due to Intakes of Radionuclides, Safety Guide Series No. RS-G-1.2, IAEA, Vienna (1999)
27.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Assessment of Occupational Exposure Due to External Sources of Radiation, Safety Guide Series No. RS-G-1.3, IAEA, Vienna (1999)
28.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Radiological Protection for Medical Exposure to Ionizing Radiation, Safety Guide Series No. RS-G-1.5, IAEA, Vienna (2002)
29.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Environmental and Source Monitoring for Purposes of Radiation Protection, Safety Guide Series No. RS-G-1.8, IAEA, Vienna (2005)
30.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety of Radiation Generators and Sealed Radioactive Sources, Safety Guide Series No. RS-G-1.10, IAEA, Vienna (2006)

31.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Deterministic Safety Analysis for Nuclear Power Plants, Specific Safety Guides Series No. SSG-2, IAEA, Vienna (2010)
32.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants, Specific Safety Guide Series No. SSG-3, IAEA, Vienna (2010)
33.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants, Specific Safety Guide Series No. SSG-4, IAEA, Vienna (2010)
34.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety of Conversion Facilities and Uranium Enrichment Facilities, Specific Safety Guide Series No. SSG-5, IAEA, Vienna (2010)
35.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety of Uranium Fuel Fabrication Facilities Specific Safety Guide Series No. SSG-6, IAEA, Vienna (2010)
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39.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Storage of Spent Nuclear Fuel Specific Safety Guide Series No. SSG-15, IAEA, Vienna (2012)
40.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material, Specific Safety Guide No SSG-26, IAEA, Vienna, (2014)
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56.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety Assessment for the Decommissioning of Facilities Using Radioactive Material, Safety Guide Series No.WS-G-5.2, IAEA, Vienna (2009)
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APPENDIX VII – ORGANIZATIONAL CHART