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INTEGRATED REGULATORY REVIEW SERVICE (IRRS)

MISSION

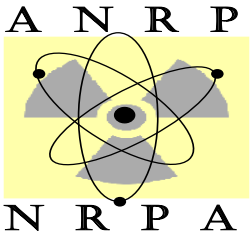
TO

THE REPUBLIC OF CAMEROON

Yaoundé, Cameroon

12 to 21 October 2014

DEPARTMENT OF NUCLEAR SAFETY AND SECURITY



Integrated
Regulatory
Review Service
IAEA IRRS

INTEGRATED REGULATORY REVIEW SERVICE (IRRS)
REPORT TO THE REPUBLIC OF
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Mission date:	*12 to 21 October 2014*
Regulatory body:	*National Radiation Protection Agency (NRPA)*
Location:	*Yaoundé, Cameroon*
Regulated facilities and activities:	*Radiation Sources in industrial and medical facilities, emergency preparedness and response, medical exposure, occupational exposure*
Organized by:	*International Atomic Energy Agency (IAEA)*

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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.

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EXECUTIVE SUMMARY

At the request of the Government of the Republic of Cameroon, an international team of senior safety experts met representatives of the National Radiation Protection Agency (NRPA) from 12 to 21 October 2014 to conduct an Integrated Regulatory Review Service (IRRS) mission. The mission took place at the headquarters of NRPA in Yaoundé. The purpose of the peer review was to review the national regulatory framework for radiation safety of Cameroon.

The review compared the Cameroon regulatory framework for radiation safety against the IAEA Safety Standards as the international benchmark for safety. The mission was also used as an opportunity to exchange information and experience between the IRRS review team and the NRPA counterparts in the areas covered by the IRRS.

The IRRS team consisted of six senior regulatory experts from six IAEA Member States, two IAEA staff members and one IAEA administrative assistant. The IRRS team carried out the review in the following areas: responsibilities and functions of the government; the global safety regime; responsibilities and functions of the regulatory body; the management system of the regulatory body; the activities of the regulatory body including authorization, review and assessment, inspection, enforcement, and the development, scope and content of regulations and guides; emergency preparedness and response; control of medical exposures; and occupational radiation protection.

The IRRS mission also included policy discussions on the topics of the independence of the regulatory body and on transparency and openness.

NRPA provided the IRRS team with advanced reference material and documentation including the results of self-assessment in all areas within the scope of the mission which also included an action plan. The mission included observations of regulatory activities and interviews and discussions with NRPA staff and the Ministry of Health. These activities also included observations of inspections at Yaoundé General Hospital, Yaoundé Central Hospital, General Hospital of Douala and an industrial facility, SODIP Limited Company, in Douala. The IRRS team members observed the working practices during inspections carried out by NRPA, including discussions with personnel and management of the licensee. The team was received by the Prime Minister and the Minister for Scientific Research and Innovation which all expressed their full support to the IRRS mission.

Throughout the mission, the IRRS Review Team received full cooperation from all parties in its review of the regulatory, technical and policy issues. The NRPA staff were very open in their discussions and provided the fullest practicable assistance.

The IRRS team made the following general observations:

- NRPA has gradually developed the implementation of its functions and its responsibilities, starting with a national inventory of sources; the authorization process; the inspection and enforcement programme; and co-operation with other ministries, especially the Ministry of Health. Good and important work was performed during the last few years and overall, NRPA is moving in the right direction in strengthening the regulatory processes and improving the oversight of radiation safety in the Republic of Cameroon.
- A legal and regulatory framework exists but important issues such as the prime responsibility for safety, involvement of interested parties, appeal against regulatory decision, use of graded approach in review and assessment, inspection and enforcement provisions, are not covered.

- The current Radiation Protection Law and Decree do not empower NRPA with the legal rights and authority to carry out all main regulatory functions of an independent regulatory body. Furthermore, it is not evident that sufficient resources for carrying out all regulatory responsibilities and activities of the regulatory body are allocated. It was established during the mission that NRPA finances some inspection activities by alternative resources.

The IRRS review team identified good practices, and made recommendations and suggestions where improvements are necessary to strengthen and enhance the regulatory functions in line with the IAEA Safety Standards.

Among the strengths and good practices identified by the IRRS Review team are the following:

- NRPA is using the latest version of RAIS 3.3 to integrate main safety related records, e.g. radiation sources and generators data, records of occupational doses and inspection reports. This enables NRPA to use a single integrated tool to maintain safety related records of facilities and activities which will enable efficient and effective record keeping.
- The guidance given by the regulatory body to the applicants of various radiation applications is a good practice that promotes the development of standardized emergency plans for different facilities.

The IRRS team identified issues warranting attention or in need of improvement and believes that consideration of these would enhance the overall performance of the regulatory system:

- The government should revise the legal and regulatory framework so that the provisions of the international safety standards are addressed in the laws and statutes.
- The government should revise the existing legislation in order to assign and authorize NRPA to carry out main regulatory functions of an independent safety authority such as establishing safety criteria, granting authorization, suspension or revoking authorization, review and assessment of safety matters, inspection and enforcement activities.
- The government should establish policy and strategy for the decommissioning of facilities, the safe management and disposal of radioactive waste and establish mechanisms to ensure the necessary financial provision for the decommissioning of facilities and management of radioactive waste, disused radioactive sources and radiation generators.
- The government should analyze the competence needs and the existing available national and international arrangements for education and training. Based on the results of this analysis the government should ensure that mechanisms are put in place to ensure sufficient national competence in relation to safety.
- NRPA should establish and implement an integrated management system.
- The regulatory body should apply a comprehensive approach to authorization, and ensure that the authorization system covers the entire lifetime of a facility and activity.

The IRRS team findings are summarized in Appendices V.

An IAEA press release was issued at the end of the mission.

I. INTRODUCTION

At the request of the Government of the Republic of Cameroon, an international team of senior safety experts met representatives of the National Radiation Protection Agency (NRPA) from 12 to 21 October 2014 to conduct an Integrated Regulatory Review Service (IRRS) mission. The purpose of the peer review was to review the Cameroon regulatory framework for radiation safety. The review mission was formally requested by the Government of Cameroon in June 2013. A preparatory meeting was conducted on 16 to 17 June 2014 at NRPA Headquarters in Yaoundé to discuss the purpose, objectives, scope and detailed preparations of the review in connection with the facilities regulated by NRPA and selected safety aspects.

The IRRS review team consisted of 6 senior regulatory experts from 6 IAEA Member States, 2 IAEA staff members and 1 IAEA administrative assistant. The IRRS review team carried out the review in the following areas: responsibilities and functions of the government; the global safety regime; responsibilities and functions of the regulatory body; the management system of the regulatory body; the activities of the regulatory body including authorization, review and assessment, inspection and enforcement processes; development and content of regulations and guides; emergency preparedness and response; occupational radiation protection, and patient protection.

NRPA conducted self-assessment in preparation for the mission and prepared a preliminary action plan. The results of the NRPA self-assessment and supporting documentation were provided to the team as advance reference material for the mission. During the mission the IRRS review team performed a systematic review of all topics by reviewing the advance reference material, conducting interviews with management and staff of NRPA and performed direct observation of NRPA working practices during inspections. Meetings with the Minister of Scientific Research and Innovation and Chairperson of the Board of NRPA and the Minister of Health were also organized. The team also made a courtesy visit to the Prime Minister's office.

All through the mission the IRRS team received excellent support and cooperation from NRPA.

II. OBJECTIVE AND SCOPE

The purpose of the IRRS mission was to conduct a review of the Cameroon radiation safety regulatory framework and activities, to review its effectiveness and to exchange information and experience in the areas covered by the IRRS. The IRRS review scope included all facilities regulated by NRPA. The review was carried out by comparison of existing arrangements against the IAEA safety standards.

It is expected that the IRRS mission will facilitate regulatory improvements in Cameroon and other Member States from the knowledge gained and experiences shared between NRPA and IRRS reviewers and through the evaluation of the effectiveness of the Cameroon regulatory framework for radiation safety and its good practices.

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

- Providing Cameroon and NRPA, through completion of the IRRS questionnaire, with an opportunity for self-assessment of its activities against IAEA safety standards;
- Providing Cameroon and NRPA with a review of its regulatory programme and policy issues relating to radiation safety, and emergency preparedness;
- Providing Cameroon and NRPA with an objective evaluation of its radiation safety, and emergency preparedness and response regulatory activities 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 NRPA staff with an opportunity to discuss their practices with reviewers who have experience with different practices in the same field;
- Providing Cameroon and NRPA with recommendations and suggestions for improvement; and
- Providing other 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 Cameroon, a preparatory meeting for the Integrated Regulatory Review Service (IRRS) was conducted from 16 to 17 June 2014. The preparatory meeting was carried out by the appointed Team Leader, Mr Ingemar Lund, and the IRRS IAEA team representatives, Mr Ahmad Al Khatibeh and Mr Teodros Hailu as Team Coordinator.

The IRRS mission preparatory team had discussions regarding regulatory programmes and policy issues with the senior management of NRPA represented by Dr Augustin Simo, the Director General, other senior management and staff. The discussions resulted in agreement that the regulatory functions covering the following facilities and activities were to be reviewed by the IRRS mission:

- Radiation sources facilities;
- Patient protection;
- Occupational radiation protection;

NRPA Director General and senior staff made presentations on the national context, the current status of NRPA and the self-assessment results todate.

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 Cameroon in October 2014.

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

The NRPA Liaison Officer for the preparatory meeting and the IRRS mission was Dr Maurice Moyo Ndontchueng, with Mr Richard Ndi Samba as his deputy.

NRPA provided IAEA (and the review team) with the advance reference material for the review in August 2014, including the self-assessment results. In preparation for the mission, the IAEA review team members conducted a review of the advance reference material and provided their initial review comments to the IAEA Team Coordinator prior to the commencement of the IRRS 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 VII.

C) CONDUCT OF THE REVIEW

An opening IRRS review team meeting was conducted on Sunday 12 October 2014 in Yaoundé by the IRRS Team Leader and the 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.

The Liaison Officer and his deputy were present at the opening IRRS review team meeting, in accordance with the IRRS guidelines, and presented logistical arrangements planned for the mission.

The reviewers also reported their first impressions of the advance reference material.

The IRRS entrance meeting was held on Monday 13 October 2014 with the participation of NRPA senior management and staff. Opening remarks were made by Dr Iroume Roger Noel, Inspector General of the Ministry of Scientific Research and Innovation on behalf of the Minister, and the IRRS Team Leader Mr Ingemar Lund. Dr Augustin Simo, the Director General of NRPA, gave an overview of the Cameroon regulatory framework and NRPA activities.

During the mission, a review was conducted for all the review areas with the objective of providing Cameroon and NRPA with recommendations and suggestions for improvement as well as identifying good practices. The review was conducted through meetings, interviews and discussions, visits to facilities and direct observations regarding the national practices and activities.

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

The IRRS exit meeting was held on Tuesday 21 October 2014. The opening remarks at the exit meeting were presented by Dr Augustin Simo, Director General of NRPA, and were followed by the presentation of the results of the mission by the IRRS Team Leader Mr Ingemar Lund. A message conveyed by Mr Denis Flory, IAEA Deputy Director General, was read by the IAEA team coordinator. Closing remarks were made by H.E. Ms Ebelle Etame Rebecca M, the General Secretary of the Ministry of Scientific Research and Innovation.

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

The Cameroon national safety policies to ensure the protection of people and the environment against the hazards of ionizing radiation is mainly addressed in the Radiation Protection Law No 95/08 dated 30 January 1995 and in the Framework Law related to the Environmental Management No 96/12 dated 5 August 1996.

The Cameroon safety policy and strategies for safety are mainly expressed through adherence to international legal instruments relating to radiation safety and legislative measures and assignments and instruction to the regulatory body. The fundamental safety principles expressed in these laws are that activities:

- shall not involve uncontrollable risks to the health and safety of persons;
- include measures and precautions to ensure optimum protection for persons, property and the environment in accordance with terms and conditions laid down by statutory instruments;
- be carried out by qualified persons who must ensure its supervision and assume professional responsibility using appropriate premises and installation.

The Radiation Protection Law incorporates provisions in the area of protection against harmful effects of ionizing radiation, such as penalties on activities without authorization; operators' responsibility for civil liability to cover the associated risks; and other enforcement actions. However, the IRRS team found that not all fundamental safety principles established in the IAEA Safety Fundamentals SF-1 are addressed in the present Cameroon's framework for safety; furthermore, the national policy and strategy is not documented as a statement formulating the government's intent.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Fundamental safety principles such as responsibility for safety, priority for safety, leadership and management for safety, and the protection of present and future generations are not covered by the existing safety legislation. A documented strategy for the implementation of the safety policy does not exist.
(1)	**BASIS: GSR Part 1 Requirement 1 states that: "***The government shall establish a national policy and strategy for safety, the implementation of which shall be subject to a graded approach in accordance with national circumstances and with the radiation risks associated with facilities and activities, to achieve the fundamental safety objective and to apply the fundamental safety principles established in the Safety Fundamentals"*
(2)	**BASIS: GSR Part 1 Requirement 1 para 2.3 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 national policy"*
(3)	**BASIS: GSR Part 1 Requirement 1 para 2.3 (a) states that: "**In *the national policy and strategy, account shall be taken of […[(a)The fundamental safety objective and the fundamental safety principles established in the Fundamental Safety Principles"*
R1	**Recommendation: The Government should ensure that all fundamental safety principles are incorporated in the Cameroon's national policy and that a documented strategy for the implementation of the safety principles is established.**

1.2. ESTABLISHMENT OF A FRAMEWORK FOR SAFETY

The Cameroon Acts are promulgated by a step-wise process involving the relevant Ministers and Authorities, the Prime Minister, the President of the Republic and the Parliament. Regarding legislation on radiation protection and safety issues, the Ministry in charge of Scientific Research and Innovation and the Ministry of Public Health have a central role but also other ministries such as those in charge of labour issues, environment, transport and mines and power are involved.

The Radiation Protection Law No 95/08 and the Framework Law related to the Environmental Management No 96/12 are the central acts in the area. The Ministry of Health has issued legally binding requirements, sometimes also applied outside of the area of medical exposure. Three of these are:

Arrêté No.1150/ A/ MINSANTE 11th of June 2013 covering conditions and marking of controlled and supervised areas and imposed rules in relation to such areas;

Arrêté No.1151/A/MINSANTE 11th of June 2013 containing procedures for medical and dosimetric monitoring of workers and patients exposed to ionising radiation;

Arrêté No.1152/A/MINSANTE 11th of June 2013 containing procedures for possession, use and handling of facilities emitting radiation in hospitals.

The present legislation does not cover and comply with all requirements of the international standards in the IAEA GSR Part 1. Examples of this are clear assignment of the prime responsibility for safety, provisions for the involvement of interested parties and for their input to decision making, provisions for exclusion and release from regulatory control, the use of a graded approach, appeal against regulatory decisions, sufficient provisions on inspection and enforcement.

The IRRS team recognizes that a new draft law on the general framework of radiation safety, nuclear safety and safeguards, and a decree for its implementation has been prepared and that these are presently subject to the national promulgation process. Other draft legal documents (Arrêté, decree) will establish procedures for radiation protection in connection with radioactive waste and its management.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: A legal and regulatory framework exists but important issues such as the prime responsibility for safety, involvement of interested parties, appeal against regulatory decision, use of graded approach in review and assessment, inspection and enforcement provisions, are not covered.
(1)	**BASIS: GSR Part 1 Requirement 2 states that: "***The government shall establish and maintain an appropriate governmental, legal and regulatory framework for safety within which responsibilities are clearly allocated."*
(2)	**BASIS: GSR Part 1 Requirement 2 para. 2.5 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: …(1) – (19)"*
R2	**Recommendation: The Government should revise the legal and regulatory framework so that all provisions of the international safety standards are addressed in the laws and statutes.**

1.3. ESTABLISHMENT OF A REGULATORY BODY AND ITS INDEPENDENCE

The Cameroon National Radiation Protection Agency (NRPA) was established under Decree No. 2002/250 of 31 October 2002. The decree sets up, organizes and regulates the functioning of the National Radiation Protection Board (NRPB). The Board of NRPA is comprised of the following twelve members:

(i) an official appointed by the decree of the President of the Republic as chair;

(ii) a representative of the Presidency of the Republic;

(iii) a representative of the Prime Minister's Office;

(iv) a representative of the ministry in charge of the scientific and technical research;

(v) a representative of the ministry in charge of finance;

(vi) a representative of the ministry in charge of labor;

(vii) a representative of the ministry in charge of public health;

(viii) a representative of the ministry in charge of territorial administration;

(ix) a representative of the ministry in charge of mines and power;

(x) a representative of the ministry in charge of the environment;

(xi) a representative of the ministry in charge of the transport; and

(xii) an elected representative of the staff.

The Director General of NRPA provides secretarial services at the board. The Board of Directors has full power to manage the NRPA, define and direct its general policy and assess its management within the framework of its objective. However, the Board may delegate some of its powers to the Director General. The Minister in charge of scientific research and the Minister in charge of finance are responsible, each in his own sphere, for the implementation of Decree No. 2002/250.

The present Radiation Protection Law and Decree do not empower NRPA to carry out and implement certain functions, such as:

- to develop and establish safety criteria;
- to require the performance of a safety assessment;
- to carry out inspections without prior assent;
- to enforce regulatory requirements, to suspend or revoke authorization.

The IRRS team finds that the present legislation does not assign sufficient authority and NRPA does not have sufficient resources to discharge these main regulatory functions.

The IRRS team found that despite the fact that NRPA has grown quite rapidly during the last four years, the financial resources to carry out and fulfil all its statutory functions can be questioned. It was, for example, established that NRPA financed some of its inspection activities by resources from the Ministry of Health.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The Radiation Protection Act and the current decree do not empower NRPA with the legal rights and authority to carry out all main regulatory functions of an independent regulatory body. Furthermore, it is not evident that sufficient resources for carrying out the activities of the Regulatory Body are allocated. It was established that NRPA finances some inspection activities by alternative resources.
(1)	**BASIS: GSR Part 1 Requirement 4 states that:** *'The Government shall ensure that the regulatory Body is effectively independent in its safety related decision making and that it has functional separation from entities having responsibilities or interest that could unduly influence its decision making"*
R3	**Recommendation: The Government should revise the existing legislation in order to assign and authorize the NRPA to carry out main regulatory functions of an independent safety authority**

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	such as establishing safety criteria, granting authorization, suspension or revoking authorization, review and assessment of safety matters, inspection and enforcement activities.
(1)	**BASIS: GSR Part 1 Requirement 3 states that:** *"The government, through the legal system, shall establish and maintain a regulatory body, and shall confer on it the legal authority and provide it with the competence and the resources necessary to fulfil its statutory obligation for the regulatory control of facilities and activities"*
R4	**Recommendation: The Government should ensure that financial resources allocated to NRPA are sufficient to fulfil its statutory obligations in a timely and adequate fashion.**

1.4. COMPLIANCE WITH REGULATIONS AND RESPONSIBILITY FOR SAFETY

The existing legal and regulatory framework does not assign the prime responsibility for safety to operators and authorized parties. Neither is it clearly expressed that compliance with issued regulations, licence conditions etc. will not relieve the authorized party of the prime responsibility for safety.

From site visits and discussions conducted during the IRRS team's review, it was clear that the responsibilities and roles of the authorized party and the inspectors are discussed and challenged. The roles and responsibilities of different parties and accountability of each party are not clarified.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The existing legal framework does not include provisions on the prime responsibility for safety and compliance with stipulated regulatory requirements.
(1)	**BASIS: GSR Part 1 Requirement 5 states that** *"The government shall expressly assign the prime responsibility for safety to the person or organization responsible for a facility or an activity, and shall confer on the regulatory body the authority to require such persons or organizations to comply with stipulated regulatory requirements, as well as to demonstrate such compliance."*
(2)	**BASIS: GSR Part 1 requirement 6 states that** *"The government shall stipulate that compliance with regulations and requirements established or adopted by the regulatory body does not relieve the person or organization responsible for a facility or an activity of its prime responsibility for safety."*
R5	**Recommendation: The Government should include provisions on the prime responsibility for safety in the legal framework and that it should not be delegated. It should be ensured that compliance with regulations and stipulated requirements does not relieve the authorized party of its responsibility for safety.**

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

NRPA is the competent authority regarding radiation protection and safety in Cameroon with its responsibilities defined in the decree establishing the authority and the radiation protection law. All the ministries have the opportunity to provide comments on various legal proposals and before any legal documents are enacted. NRPA is empowered to cooperate with authorities having regulatory or other responsibilities for radiation safety and adjacent matters. Formal cooperation arrangments with relevant organizations, such as the Ministry of Health, are currently in place.

1.6 SYSTEM FOR PROTECTIVE ACTIONS TO REDUCE UNREGULATED RADIATION RISKS

A system for protective actions to reduce existing or unregulated radiation risks (unregulated sources, contamination from old practices) has not been envisaged or established. The IRRS team did not find any information on possibly contaminated land (of natural or artificial origin) but it could be established that events involving unauthorized as well as orphan sources have occurred. There are currently no organizations responsible for making the necessary arrangements and a mechanism to manage such situations has not been established. The regulatory body does not have any arrangements to provide the necessary input (advice, requirements and criteria) for such protective actions.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: A system to carry out protective actions to reduce undue radiation risks associated with unregulated sources and contamination from past activities or events does not exist.
(1)	**BASIS: GSR Part 1 Requirement 9 states that:** *"The government shall establish an effective system for protective actions to reduce undue radiation risks associated with unregulated sources (of natural or artificial origin) and contamination from past activities or events, consistent with the principles of justification and optimization."*
(2)	**BASIS: GSR Part 1 Requirement 9 para. 2.26 states that: "***The regulatory body shall provide any necessary inputs for the protective action, including advising the government or exercising regulatory control over protective actions. It shall establish the regulatory requirements and criteria for protective actions in cooperation with the other authorities involved, and in consultation with interested parties, as appropriate."*
R6	**Recommendation: The Government should designate responsible organizations and create a system to ensure that protective actions to reduce risks with unregulated sources and past contamination can be carried out.**

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

There are currently no arrangements for decommissioning of facilities and management of radioactive waste. The IRRS team recognized that a draft Arrêté is prepared to set procedures for some produced waste. At the moment waste and disused sources are stored at the facilities or where feasible since no central interim storage exists. A mechanism for financing these activities is also currently not established.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The decommissioning of facilities and the management of the radioactive waste from the facilities have not been addressed in the framework for safety.
(1)	**BASIS: GSR Part 1, Requirement 10, para. 2.28 states that** *"Decommissioning of facilities and the safe management and disposal of radioactive waste shall constitute essential elements of the governmental policy and the corresponding strategy over the lifetime of facilities and the duration of activities.[…]"*
(2)	**BASIS: GSR Part 1, Requirement 10, para. 2.33 states that "***Appropriate financial provision shall be made for:*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	(a) Decommissioning of facilities; *(b) Management of radioactive waste, including its storage and disposal;* *(c) Management of disused radioactive sources and radiation generators;* *(d) Management of spent fuel."*
R7	**Recommendation: The Government should establish policy and strategy for the decommissioning of facilities, the safe management and disposal of radioactive waste and establish mechanisms to ensure the necessary financial provision for the decommissioning of facilities and management of radioactive waste, disused radioactive sources and radiation generators.**

1.8. COMPETENCE FOR SAFETY

Some education and training events are performed by NRPA and the regulatory body has arranged national training courses to upgrade knowledge for radiation workers. Training for emergency service organizations was carried out in September 2011 and December 2012. A national seminar, involving NRPA staff, creating awareness on radiation protection was arranged in December 2010. In 2013, at Yaoundé, an awareness seminar on the implementation of radiation protection in hospitals using ionising radiation sources was held.

Among NRPA staff, six staff members graduated from IAEA Post Graduate Educational Courses (PGEC) in Morocco, South Africa and Algeria. Nine staff members have also gained one month regional training course on Authorization and Inspection of radiation sources.

Based on knowledge retrieved during the site visits, the IRRS team concluded that more training for technical staff of the NRPA would be needed. A review of the competence needs and the training and education opportunities have not been performed and actions have not been taken to build and maintain the necessary competence.

The team could not verify whether analysis has been made if available academic programmes, existing technical centres and various national or international arrangements for education and training are sufficient to build and maintain the competence needed by all Cameroon parties having responsibilities in relation to safety of facilities and activities.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The IRRS team could not verify that the government has analyzed if available academic programmes, existing technical centres and various national or international arrangements for education and training are sufficient to build and maintain the competence needed by all Cameroon parties having responsibilities in relation to safety of facilities and activities.
(1)	**BASIS: GSR Part 1 Requirement 11, states that: "***The government shall make provisions for building and maintaining the competence of all parties having responsibilities in relation to the safety of facilities and activities."*
R8	**Recommendation: The Government should analyze the competence needs and the existing available national and international arrangements for education and training. Based on the results of this analysis the government should ensure that mechanisms are put in place to ensure sufficient national competence in relation to safety.**

1.9. PROVISION OF TECHNICAL SERVICES

The NRPA is performing the tasks of providing dosimetric services, and is currently the only provider in the country. It was however observed that the individual monitoring service does not cover all radiation workers that need to be monitored. NRPA also records data relating to environmental radiation measurements. The IRRS team was not able to assess the sufficiency or the capacity of these arrangements. Currently there is no calibration facility in Cameroon.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The service for calibration of equipment is not yet operational and calibrations are not traceable.
(1)	**BASIS: GSR Part 1 Requirement 13 states that:** *"The government shall make provisions, where necessary, for technical services in relation to safety, such as for personal dosimetry, environmental monitoring and the calibration of equipment."*
R9	**Recommendation: The Government, with the technical support of NRPA, should ensure that, as appropriate, calibration of equipment as well as quality control and traceability to standards, is available.**

1.10. SUMMARY

After reviewing the responsibilities and functions of the government as compared with the IAEA safety standards the major issues are:

- The Radiation Protection Law No 95/08 does not address all key elements of the international standards. The IRRS team recognizes that a new draft law has been prepared but is not yet promulgated. To complete and enact necessary legislation is a high priority. A national policy for safety in line with the IAEA Safety Fundamentals and a strategy for its implementation is essential.
- The necessary national infrastructure to build and maintain Cameroon's human competence needs in the area of radiation safety is not yet established. Education and training capabilities should be based on an analysis of the national situation and be planned and used in a systematic way.
- The regulatory body is not given the necessary authority and the human and financial resources to carry out all main regulatory functions of an independent authority for safety, such as to establish safety criteria, issuing authorization, suspension or revoking of authorization, review and assessment of safety matters, and inspection and enforcement activities

2. GLOBAL NUCLEAR SAFETY REGIME

2.1. INTERNATIONAL OBLIGATIONS AND ARRANGEMENTS FOR INTERNATIONAL COOPERATION

The Republic of Cameroon has ratified the following conventions:

- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency signed in 1987 and ratified in 2006;
- Convention on Early Notification of a Nuclear Accident signed in 1987 and ratified in 2006;
- Bamako Convention on the Ban of the Import into Africa and the Control of Trans-boundary Movement and Management of Hazardous Wastes within Africa signed in 1991 and ratified in 1994;
- Joint protocol relating to the application of the Vienna Convention and the Paris convention signed in 1988 and ratified in 1991.

Cameroon has made a political commitment to the Code of Conduct on the Safety and Security of Radioactive Sources and to the guidance on the import and export of radioactive sources. However it is not a party to the Convention on Nuclear Safety and to the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

NRPA is also a member of the Forum of Nuclear Regulatory Bodies in Africa, which is a platform for the exchange of regulatory experiences and practices among the nuclear regulatory bodies in Africa. Cameroon is also a party to the Treaty on African nuclear weapon-free zone (Pelindaba Treaty) and the Treaty on the Non-Proliferation of nuclear weapons (NPT).

NRPA considers IAEA safety standards while developing regulatory requirements and guides. NRPA also participates in other relevant IAEA meetings and training courses.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The Republic of Cameroon is not a party to the Convention on Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.
(1)	**BASIS: GSR Part 1 Requirement 14 states that** *"The Government shall fulfill its respective international obligations, participate in the relevant international arrangements, including international peer reviews, and promote international cooperation to enhance safety globally"*
S1	**Suggestion: The Government should consider becoming a party to the relevant safety conventions.**

2.2. SHARING OF OPERATING EXPERIENCE AND REGULATORY EXPERIENCE

NRPA has made arrangements for receiving information on operating and regulatory experience through its international contacts. The operating and regulatory experience and lessons learned are shared during such contacts.

NRPA is an active member of the IAEA AFRA cooperation agreement. Through different arrangements with the IAEA, several expert missions to Cameroon for knowledge and experience sharing on various safety relevant areas have taken place and NRPA personnel visit other countries to get feedback and experience for improvement of the regulatory framework.

The IRRS team finds that there is no systematic evaluation of operational feed-back experience and it is not distributed to the relevant parties in a systematic way.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: NRPA gave examples of how actions are taken to ensure that operating experience is reflected in the authorities review, assessment and decisions. It is however not evident that the gained experience is analyzed and that relevant lessons learned are distributed to authorized parties in a 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 learned from operating 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"*.
S2	**Suggestion: NRPA should consider to systematically evaluate operational experience including from other States, and to establish a procedure for the dissemination of all significant operating experience to relevant authorized parties.**

2.3. SUMMARY

The Republic of Cameroon has ratified various international conventions and agreements related to radiation safety. However, the Repubic of Cameroon is not party to the Convention on Nuclear Safety and the Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management.

NRPA is a member of the Forum of Nuclear Regulatory Bodies in Africa, which is a platform for the exchange of regulatory experiences and practices among the nuclear and radiation regulatory bodies in Africa. NRPA participates in international meetings and conferences to exchanges operating and regulatory experience for enhancement of information on radiation safety and promotes international cooperation to enhance safety.

3. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY

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

The Radiation Protection Law No 95/08 of 30th of January 1995 and the Decree No 2002/250 of 31st of October 2002 establish the basis for organization and functioning of Cameroon's National Radiation Protection Agency (NRPA). The current legal framework does not give NRPA the leading role in establishing and adopting regulations and guides in the field of radiation safety and safety of radioactive sources.

About 156 radioactive sources had been identified and included in the source register which are in extensive use for beneficial purposes in medical, industrial, agricultural, and research applications. In addition to this, around 430 X-rays are used in the medical sector for diagnostic purposes. Medical facilities in Cameroon include two radiotherapy facilities (though only one is currently functional), a nuclear medicine facility, and facilities for computer tomography, as well as interventional, dental and diagnostic radiology.

Decree No 2002/250 puts NRPA under the Ministry in charge of Scientific Research and Innovation and its financial matters are handled by the Ministry of Finance. The Decree designates NRPA as the competent authority (the regulatory body) for radiation safety.

The NRPA is managed by a Board of Directors and a Director General. Members of the Board and the Director General are appointed by Decrees. The present Director General was appointed in January 2010. The members of the current Board were appointed in July 2014 and will serve for a period of 3 years. The members of the Board are drawn from the President's and the Prime Minister's Offices and the Ministries in charge of scientific and technical research, finance, labour, public health, territorial administration, mines and power, the environment, transport and representatives of NRPA staff. The Board defines and directs policy and oversees the management of NRPA.

The Director General supervises the daily activities of NRPA and reports to the Board. He prepares the budget, annual financial statements and progress reports, and manages the recruitment of staff and the deployment of the financial resources of NRPA. The organizational structure of NRPA is developed by the Director General but must be approved by the Board of Directors.

The annual draft budget is prepared by the Director General, adopted by the Board of Directors and submitted to the Ministry of Scientific Research and Innovation for consideration and transmission to the Ministry of Finance for approval before the beginning of the next financial year.

The allocation of resources to NRPA is not done entirely on a risk-informed basis. From NRPA's perspective, the funds allocated are not sufficient for it to fully discharge its mandate throughout the country. NRPA utilizes its resources on a risk informed assessment of the radiation safety.

The IRRS team recommends that the Government of the Republic of Cameroon should revise the legislation to make NRPA an effectively independent regulatory body and that it be allocated sufficient and timely resources. This issue has been addressed in Recommendation 4.

3.2. EFFECTIVE INDEPENDENCE IN THE PERFORMANCE OF REGULATORY ACTIVITIES

Currently, NRPA does not have the authority to intervene in connection with facilities and activities which present a significant safety risk without the approval from ministry level. NRPA has taken initiatives to intervene in such situations and they have been receiving approval and support by the NRPA Board and the Ministry of Scientific Research and Innovation.

The IRRS team could, however, not identify any procedures or any strategy to resolve possible conflicts of interests which could occur in the work of NRPA and with external interested parties. These matters include for example professionally performing the necessary functions in relation of safety regardless of personal views, recruitment of staff from authorized parties, underlining the regulatory aspects and the importance of safety in internal education and training, having a clear separation from the operators and authorized parties in communication and out-reach

activities, and not to hesitate to intervene in situations when a significant safety risk is identified, irrespective of costs to the authorized party.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There are currently no procedures or strategies to resolve or manage situations where conflicts of interests could occur in the work of NRPA and its interface with external parties.
(1)	**BASIS: GSR Part 1, Requirement 17, para. 4.7 states that** *"The regulatory body shall prevent or duly resolve any conflicts of interests or, where this is not possible, shall seek a resolution of conflicts within the governmental and legal framework."*
R10	**Recommendation: The regulatory body should develop a strategy and documented procedures to prevent or resolve any conflicts of interest in its work or in the interface with external parties.**

3.3. STAFFING AND COMPETENCE OF THE REGULATORY BODY

As of June 2014, the NRPA staff amounted to 50 persons with an average age of 35 years. About half of NRPA staff do technical work whilst the other half do administrative work. About 85% of the technical staff have a post graduate degree and 15% have undegraduate degree.

NRPA has grown rapidly during the last 3-4 years; only in 2013 the staffing level increased by 20 %. However, there is currently no plan in place or documented process for developing and maintaining the needed human resources.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: NRPA does not have a human resources plan or a documented process for developing and maintaining the needed human resources.
(1)	**BASIS: GSR Part 1, Requirement 17, para. 4.13 states that** *"A process shall be established to develop and maintain the necessary competence and skills of staff of the regulatory body, as an element of knowledge management. This process shall include the development of a specific training programme on the basis of an analysis of the necessary competence and skills. 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."*
R11	**Recommendation: NRPA should perform a human resources needs assessment and establish and implement a specific programme on the basis of the analysis in order to recruit sufficient staff, and develop and maintain necessary competence and skills.**

3.4. LIAISON WITH ADVISORY BODIES AND SUPPORT ORGANIZATIONS

NRPA have agreements and MOUs with other relevant organizations and different ministries. However, NRPA does not have any advisory body and there are no technical support organizations in Cameroon.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: NRPA does not have any advisory body and there is no technical support organization.
(1)	**BASIS: GSR Part 1 Requirement 20 states that** *"The regulatory body shall obtain technical or other expert professional advice as necessary in support of its regulatory functions, but this shall not relieve the regulatory body of its assigned responsibilities."*
S3	**Suggestion: NRPA should consider making arrangements to obtain technical or other expert professional advice as necessary in support of its regulatory functions.**

3.5. LIAISON BETWEEN THE REGULATORY BODY AND AUTHORIZED PARTIES

NRPA is required by law to ensure that the relationship with the operator is based on transparency. Meetings should be held as necessary to fully understand and discuss the arguments of each party on safety related issues.

NRPA's formal mechanisms for communication with authorized parties include:

- Letters requesting additional information from license applicants;

- Inspection reports and covering letters requiring action and response to inspection findings;

- Requests for comments on draft regulations and guides;

- Minutes of meetings between NRPA staff and license holders and applicants;

NRPA's regulatory decisions are formally communicated in writing to the authorized party in accordance with NRPA's procedures.

Informal communication is conducted through meetings, phone calls, seminars, etc. NRPA had organized workshops open to applicants and licence holders to discuss its regulatory processes.

3.6. STABILITY AND CONSISTENCY OF REGULATORY CONTROL

The established legal system has not changed for quite some time but an update of the law is forthcoming. Regulations and guides also need to be developed and updated. Recommendations to keep regulations and guides complete and updated, and to inform applicants on the relevant regulations is provided in Section 9.

NRPA does not yet have a management system (This issue has been addressed in Recommendation 14) but has developed procedures, guidelines and instructions and checklists in several areas, e.g. for inspection of medical facilities and other industries, interventions in case of radiation incidents, for emergency preparedness, etc. Some procedures are however missing, such as procedures for enforcement and resolving of conflicts.

While regulations are missing or vague, some guidance documents are good and in the area of emergency preparedness and response in Section 10, a *Good Practice* has been identified on guidance to the applicants of various radiation techniques.

3.7. SAFETY RELATED RECORDS

Since 2009, data collection for radiation sources is continuously being implemented nationwide and registered in the Regulatory Authority Information System (RAIS). About 430 X-ray machines, 156 radioactive sources and 700 ionizing radiation workers had been identified and included in a database. Presently, NRPA is compiling data on occupational doses to create a central national dose register. Furthermore, inspection reports and other safety records are also stored in RAIS. The IRRS team found that the use of a single tool for record keeping greatly increases the efficiency and effectiveness in record keeping. It also allows NRPA to easily retrieve records and data from the information system.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The IRRS team found that NRPA is using the new tool RAIS 3.3 as management tool, national dose register, inventories of sources and threat analysis within emergency preparedness.
(1)	**BASIS: GSR Part 1, Requirement 35 Safety Related Records, states that:** *"The regulatory body shall make provision for establishing, maintaining and retrieving adequate records relating to the safety of facilities and activities."*
GP1	**Good Practice: NRPA is using the latest version of RAIS 3.3 to integrate main safety related records, e.g. radiation sources and generators data, records of occupational doses and inspection reports. This enables NRPA to use a single integrated tool to maintain safety related records of facilities and activities which will enable efficient and effective record keeping.**

3.8. COMMUNICATION AND CONSULTATION WITH INTERESTED PARTIES

The contacts with the public and means of disseminating information to the public are restricted to the use of the NRPA web page and information is also given to licences and professionals in the field. However the current communication activities to the general public are not developed and arrangements have not been made to establish systematic processes to inform and present the regulatory work, collect views on its functions, processes and regulations.

The NRPA does not require that the authorized parties inform the public about the possible radiation risks associated with the operation of a facility or the conduct of an activity.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The team found little evidence for sufficient information having been given to the public about the authority's work, radiation risks associated with facilities and activities, and the requirements for the protection of the people and the environment. The information dissemination is not open and inclusive and is restricted to selected parties. There are also no requirements from NRPA that oblige the authorized parties to carry out such communication.
(1)	**BASIS: GSR Part 1, Requirement 36, para 4.67 states that** *"The regulatory body, in its public informational activities and consultation, shall set up appropriate means of informing interested parties, the public and the news media about the radiation risks associated with facilities and activities, the requirements for protection of people and the environment, and the processes of the regulatory body. In particular, there shall be consultation by means of an open and inclusive process with interested parties residing in the vicinity of authorized facilities and activities."*
R12	**Recommendation: NRPA should establish appropriate means of informing interested parties, the public and the news media about its activities and radiation risks associated with facilities and activities.**
(1)	**BASIS: GSR Part 1, Requirement 36, para 4.68 states that** *"The authorized party has an obligation to inform the public about the possible radiation risks associated with the operation of a facility or the conduct of an activity, and this obligation shall be specified in the regulations promulgated by the regulatory body, in the authorization or by other legal means.*"
R13	**Recommendation: NRPA should ensure that the authorized party informs the public about the possible radiation risks associated with the operation of a facility or the conduct of an activity and that this obligation is specified in the regulations issued by the regulatory body.**

3.9. SUMMARY

NRPA has not yet established:

- a formal programme for training and human resources needs;
- procedures and a strategy to resolve conflicts of interests in its work and in external contacts;
- a strategy for, and procedures on, the communication to the public about its mission and tasks; and
- a stipulation that authorized parties are obliged to communicate with the public on risks associated with the operation of a facility or in conducting an activity involving ionizing radiation.

The IRRS team identified a good practice in the use of a single system for keeping all safety related records of the NRPA, including the national dose register.

4. MANAGEMENT SYSTEM OF THE REGULATORY BODY

4.1. IMPLEMENTATION AND DOCUMENTATION OF THE MANAGEMENT SYSTEM

NRPA does not have a management system but there are plans to develop a management system document based on the GR-R-3 requirements and to provide guidance to the work of NRPA.

As an initial step, NRPA has started to draft mission, vision and core values. Professionalism, fairness and transparency have been identified as core values. The continual improvement of the management system would need to be reflected in the use of policies and strategies, plans and feedback information, in performing internal audits, self-assessments and management reviews of the management system.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: NRPA does not currently have a management system consistent with the latest internationally established standards.
(1)	**BASIS: GSR part 1, Requirement 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 para 2.5 states that** *"The management system shall be used to promote and support a strong safety culture by […]"*
(3)	**BASIS: GS-R-3 para 2.6 states that** *"The application of management system requirements shall be graded so as to deploy appropriate resources, on the basis of the consideration of..."*
(4)	**BASIS: GS-R-3 para 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*.
(5)	**BASIS: GS-R-3 para 3.1 states that** *"Management at all levels shall demonstrate its commitment to the establishment, implementation, assessment and continual improvement of the management system and shall allocate adequate resources to carry out these activities."*
(6)	**BASIS: GS-R-3 para 3.7 states that** *"Senior management shall develop the policies of the organization. The policies shall be appropriate to the activities and facilities of the organization.*"
(7)	**BASIS: GS-R-3 para 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."*
(8)	**BASIS: GS-R-3 para 5.1 states that** *"The processes of the management system that are needed to achieve the goals, provide the means to meet all requirements and deliver the products of the organization shall be identified, and their development shall be planned, implemented, assessed and*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	continually improved.
(9)	**BASIS: GS-R-3 para 6.1 states that** *"The effectiveness of the management system shall be monitored and measured to confirm the ability of the processes to achieve the intended results and to identify opportunities for improvement."*
(10)	**BASIS: GS-R-3 para 6.2 states that** *"Senior management and management at all other levels in the organization shall carry out self-assessment to evaluate the performance of work and the improvement of the safety culture."*
R14	**Recommendation: NRPA should establish and implement an integrated management system. The management system should include and address the following elements:** ▪ **The mission of NRPA, its vision and core values, policy statements, goals and strategies;** ▪ **Responsibilities, accountabilities, levels of authority and interactions among those managing, performing and assessing work;** ▪ **Management commitment to safety;** ▪ **Safety culture;** ▪ **Resources management;** ▪ **Training programme;** ▪ **A graded approach in the regulatory work;** ▪ **Core and support processes to achieve the mission and goals of NRPA;** ▪ **Monitoring and evaluation of the effectiveness of the management processes;** ▪ **Self-assessment, independent assessment, external audit and improvements.**

4.2. MANAGEMENT RESPONSIBILITY

The responsibilities of the general management of NRPA and the board of directors are described in Decree No. 2002/250.

The team was informed that NRPA Management at all levels demonstrate its commitment to the establishment and implementation of the management system, and allocate adequate resources to carry out these activities. Senior management developed individual values and behavioural expectations for the organization to support the establishment of the management system, and acts as role model in the promotion of the core values and expectations. NRPA arranges meetings with interested parties on need basis; however, NRPA does not have any mechanism to collect and address the expectations of interested parties with the aim of enhancing the satisfaction of interested parties while at the same time ensuring that safety is not compromised.

The operational policies of the organization have not been developed so far. The goals, strategies and plans are also not established in an integrated manner. NRPA develops annual plans to conduct activities within its responsibilities and the performance is monitored on annual bases. The Director General oversees the development of the organizational chart, the statutes and the rules that are approved by the Board of Directors. Head of Services in NRPA oversees the development of action plans for the implementation of the organizational chart. These action plans are approved by the NRPA Board. NRPA has decided to develop a short term strategic plan of three years with strategies and activities to achieve the goals.

4.3. RESOURCE MANAGEMENT

The Director General determines the resources required to carry out the activities of the organization and submits to the Board for approval every year. The resources' include personnel, infrastructure, the working environment, information and knowledge, and suppliers, as well as material and financial resources. NRPA deploys the resources according to the importance and prioritizing on its different regulatory activities.

NRPA management determines the competence requirements for individuals to perform their assigned work and arrange trainings to achieve suitable skills, knowledge and experience to ensure their competence. However, NRPA does not evaluate the effectiveness of trainings to see if the required objectives have been achieved and maintained. NRPA management also determines the infrastructure and the working environment necessary. However, due to limited resources, NRPA is not able to provide and maintain it at optimum level. The issues related to resources have been addressed in Recommendation 4.

4.4. PROCESS IMPLEMENTATION

NRPA has started to develop its processes that are needed to achieve the goals of the organization.

NRPA has maintained the communication system within the organization, and externally with the licensees and other interested parties. Information relevant to safety, health, environment, security, quality and goals are communicated to individuals in the organization and, where necessary, to other relevant parties. At the beginning of each week, the Director General together with the Heads of Service assess the implementation and effectiveness of the functions of the regulatory body.

NRPA has a web site to disseminate information to all stakeholders and to get feedback for its functions and has established intranet, with limited access only on RAIS and SARIS databases.

The organizational changes if necessary are proposed by the Director General to the Board and the Board has the authority to approve or reject the changes. Each proposed amendment in the organization is evaluated and accompanied by a justification statement for the need for the proposed amendments, and consideration of this explanatory memorandum is subject to the discretion of the Board of Directors.

Document and records control

NRPA has not established generic procedure for the control of documents and records. The Director General's Secretariat is however, responsible for maintaining all formal incoming and outgoing communications and safety related documents.

The archiving of documents and records is not satisfactorily meeting the requirements of GS-R-3; the retention times of documents and records should be established to be consistent with statutory requirements. The environment for storing documents and records does not meet the adequate standards for security and fire protection.

While preparing, revising, reviewing or approving the documents such as policies, procedures, instructions, process, checklists, training materials, etc, NRPA should assign the tasks to the individuals having specific relevant competence.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There is no process, to control documents including the preparation and revision to assure preservation of the information and retention, in place, which presents a potential vulnerability of information related to the regulatory basis for licensing and related basis for decision.
(1)	**BASIS: GS-R-3 para. 5.11 states that** *"[…] generic processes shall be developed in the management system such as […]' control of documents' and 'control of records'."*
(2)	**BASIS: GS-R-3 para. 5.21 states that "***Records shall be specified in the process documentation*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	and shall be controlled. All records shall be readable, complete, identifiable and easily retrievable".
S4	**Suggestion: The regulatory body should consider establishing control of documents and control of records to assure preservation of information and records.**

4.5. MEASUREMENT, ASSESSMENT AND IMPROVEMENT

NRPA has conducted self assessment using IAEA Self Assessment Methodology and Tools before the conduct of the IRRS mission. The IRRS team was informed that NRPA does not peform internal as well as external audit of its activities to monitor their effectiveness.

4.6. SUMMARY

NRPA has some procedures, guidance, instructions and templates to conduct its core activities but has not yet developed the mission, vision, core values, policy statement, goals, and strategies. NRPA has not developed its integrated management system in accordance with the requirements of GS-R-3 which should include function, responsibilities, accountabilities, levels of authority and interactions among those managing, performing and assessing work; management commitment to safety, safety culture, resources management, training programme, and graded approach in the regulatory work. NPRA has also not developed a system to monitor and evaluate the effectiveness of the management processes.

5. AUTHORIZATION

5.1. GENERIC ISSUES

The major applications of ionizing radiation in Cameroon are in the medical and industrial sector, and include the following facilities:

- external radiotherapy (2 facilities) and brachytherapy (2 facilities)
- nuclear medicine (1 facility)
- medical radiology (432 X-ray devices)
- industrial radiography (44 radiation sources, 5 X-ray devices)
- well logging (5 facilities)
- nuclear gauges (5 facilities)
- research applications (5 facilities)

The authorization system currently in place in Cameroon is included in the following regulatory framework:

- Law No 95/08 of January 30th, 1995 on radiation protection;
- Decree No 2002/250 of October 31st, 2002 on creation, organization and functioning of the National Radiation Protection Agency;
- Arrêté No 1152/A/MINSANTE of June 11, 2013 (covering only X-ray emitting devices in the medical field).

Authorizations are required by Law 95/08 on radiation protection for the following domains: *exploration and extraction of uranium ore and thorium, the acquisition, handling, production, transfer, processing, use, stocking, conveyance, importation of radioactive substances and radioactive sources as well as the installation of nuclear devices and equipment.*

Eventhough the basis for its creation dates from 2002, NRPA became operational in 2007 by the appointment of a Director General. Regulatory activities have been initiated since 2008. Since its becoming operational, the regulatory body worked on establishing an inventory of radiation sources, by contacting the facilities likely to use radiation sources.

However, neither the law nor the decree clearly gives the NRPA the responsibility to issue, amend, suspend or revoke authorizations. In this context, the current legislation do not define the conditions for obtaining, modifying, cancellation of an authorization or approval.

As a consequence of this lack in legislation and regulation, there are still many facilities operating under an old authorization regime (licences were formerly issued by the Ministry of Industry) or not having an authorization at all. According to the information provided to the team, a decree has been drafted to legally address the requirements needed for the authorization regime, that also includes radiation source classification corresponding to the IAEA categorization. This decree was prepared in 2012 but is yet to be issued and has still not been implemented.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Neither the law, nor the decree, clearly give the NRPA the responsibility to issue, amend, suspend or revoke authorizations. As a consequence there are facilities being operated without an authorization.
(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."*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R15	**Recommendation: The Government should empower the regulatory body to authorize facilities, and the regulatory body should develop an action plan to have all facilities and activities covered by an authorization.**

5.2. AUTHORIZATION OF RADIATION SOURCES FACILITIES

The practice of issuing licenses is currently nevertheless applied through an informal system of authorization. In this context the following types of licenses are issued:

- authorization of opening of a service using radiation sources;
- authorization of importation and exportation of radioactive sources;
- authorization of use of radiation sources;
- authorization of transport, temporary storage authorization, and approval of workers under ionizing radiation.

The system is based on IAEA safety standards and TECDOC 1525 and takes into account:

- the graded approach for the regulatory control, taking into account the categorization of sources and the different practices in the country;
- the period for renewal of authorization;
- the demonstration of safety to be submitted by applicants.

With this informal procedure for authorization, the categorization of the sources is based on the IAEA categorization scheme, and the approach towards authorization requirements is closely related to IAEA guidelines and procedures.

However, as this system currently does not have a legal basis, there are facilities not willing to comply and are hence running unauthorized. It was observed during a site visit by the IRRS team with NRPA inspectors that mainly medical facilities are in this situation of not having an authorization. Due to the absence of a legal basis, it was observed that the medical facility visited is not willing to comply and is working without an operation license and still importing sources for its nuclear medicine applications.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There is no hierarchy and continuity in the licensing system. Import licenses are issued even though the applicant does not have an operation license.
(1)	**BASIS: GSR Part 1, requirement 24, para. 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). This includes, as appropriate, the management of radioactive waste and the management of spent fuel, and the remediation of contaminated areas. For radioactive sources and radiation generators, the regulatory process shall continue over their entire lifetime."*
(2)	**BASIS: GSR Part 3 para. 3.5 states that** "*No person or organization shall adopt, introduce, conduct, discontinue or cease a practice, or shall, as applicable, mine, extract, process, design, manufacture, construct, assemble, install, acquire, import, export, supply, provide, distribute, loan, hire, receive, site, locate, commission, possess, use, operate, maintain, repair, transfer,*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	decommission, disassemble, transport, store or dispose of a source within a practice other than in accordance with the requirements of these Standards."
R16	**Recommendation: The regulatory body should apply a comprehensive approach to authorization, and ensure that the authorization system covers the entire lifetime of a facility and activity.**

The NRPA's requirement for documents to be submitted with the application for a license include a safety assessment report. However, as there is no competence or service in the country for making safety assessment outside the regulatory body, the applicant often asks the NRPA for getting help on making the safety assessment. This ends up in the regulatory body carrying out the safety assessment for the applicant, and afterwards validating their own assessment. This relates to unclear definition of responsibilities adressed in section 1.4.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The safety assessment report to be submitted by an authorization applicant is not done independently, but with the help of the regulatory body.
(1)	**BASIS: GSR Part 4, Requirement 21 states that** *"The operating organization shall carry out an independent verification of the safety assessment before it is used by the operating organization or submitted to the regulatory body."*
(2)	**BASIS: GSR Part 3 Requirement 13 states that** *"The regulatory body shall establish and enforce requirements for safety assessment and the person or organization responsible for a facility or activity that gives rise to radiation risks shall conduct an appropriate safety assessment of this facility or activity."*
(3)	**BASIS: GSR Part 4 Requirement 3 states that** *"The responsibility for carrying out the safety assessment shall rest with the responsible legal person; that is, the person or organization responsible for the facility or activity."*
R17	**Recommendation: The regulatory body should review its system of providing safety assessments for applicants for authorization and should encourage the applicants to have an independent verification of the safety assessment realized through different mechanisms.**

The requirements for submittals (content, level of detail, quality) for application of authorizations reflect the use of a graded approach. NRPA requires that modifications of a practice, which might have an impact on safety, need to be notified to the NRPA, which then decides on an amendment or a renewal of the authorization.

The entire authorization process as well as the documents required are described in the internal *Authorization and Notification System* document, to ensure neutrality of treatment and consistency for every application. Forms developed to guide the applicants through the process ensure that the procedures to be followed are transparent and are publicly available (through the NRPA's website).

The NRPA is the only regulatory body implied in the authorization process. For medical facilities, an authorization for X-ray equipment is also required from the Ministry of Health according to Arrêté No. 1152/A/MINSANTE. No other interested parties, such as local communes, rescue services, worker protection authorities or the public are consulted or informed as necessary about the issuing of authorizations to facilities.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The NRPA is the only authority involved in the authorization procedure. No stakeholder, other than the licensee and the NRPA, are involved in the process, neither through consultation nor through provision of information.
(1)	**BASIS: GSR Part 3 para. 2.30 states that** *"The regulatory body shall establish a regulatory system for protection and safety that includes (...)* *(f) Provision of information to, and consultation with, parties affected by its decisions and, as appropriate, the public and other interested parties."*
R18	**Recommendation: The regulatory body should involve relevant interested parties in the authorization process, through information or consultation, in accordance with a graded approach.**

A national register of radioactive sources is maintained by the NRPA using the RAIS 3.3 software from the IAEA to manage the control of radioactive sources. The *Computer Documentation and Archiving Unit* of NRPA is in charge of managing the database, including its access and its updating process.

The applicants for a license are requested to provide a contract agreement for the return of disused radioactive sources to the supplier. This was, however, not the case before the current authorization practices. As a result, many disused sources cannot be sent back to the supplier, and are currently being temporarily stored in the licensee's premises.

Furthermore, in the case of a bankruptcy or disappearance of licensee, the property of the source might become unclear and there is no arrangement foreseen for the resulting orphan source.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The NRPA is confronted with disused sources for which no agreement has been made to send them back to the supplier, and there is no waste management facility in Cameroon.
(1)	**BASIS: GSR Part 3 para. 2.29 states that** *"The government shall ensure that arrangements are in place for the safe decommissioning of facilities, the safe management of radioactive waste and the safe management of spent fuel."*
R19	**Recommendation: The Government and regulatory body should ensure that a safe storage of disused sources is guaranteed, and find arrangements for their final disposal, including also orphan sources.**

5.3 SUMMARY

Eventhough the basis for its creation dates from 2002, the NRPA became operational in 2007 by the appointment of a Director General. Regulatory activities have been initiated since 2008. To date, an inventory of radioactive sources was established, and an authorization system was implemented. The work that has been done in this time can be considered as a significant achievement.

The applied authorization system is widely based on IAEA standards and guides, although the different authorization modalities are currently not covered in a binding legislative framework. According to the NRPA, these legal issues are to be addressed in a draft decree, submitted to the Government in 2012 but not yet issued.

An important legal aspect that needs to be addressed remains to ensure the revision and promulgation of the law to clearly give the NRPA the responsibility and mandate to issue, amend, suspend or revoke authorizations.

6. REVIEW AND ASSESSMENT

6.1. MANAGEMENT OF REVIEW AND ASSESSMENT

During the authorization process, NRPA conducts review and assessment of the information provided by the applicant in accordance with the documentation requirements checklist that is part of the forms for authorization application. The documentation requirements vary according to the level of radiological risk of the practice.

For a facility or activity using radiation sources, the assessment is focused on the conformity of the facility with regards to the equipment that will be installed, the qualification of the workers, the available radiation protection program for the practice, the emergency preparedness and response plan, the occupational exposure monitoring program and the quality control of the equipment.

There is no documented internal guidance for review and assessment and the regulatory body's review and assessment plan including prioritization of various submissions in accordance with a graded approach is not available. A monitoring (tracking) of the review and assessment process and document control system is in place. The documentation of review process and bases (justification) for regulatory decisions, including use of feedback from previous review and assessment needs improvement.

A pre-authorization inspection is conducted, as part of the review and assessment process, in accordance with the graded approach. During the life time of the facilities, the NRPA assesses compliance with safety requirements through inspections.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There are no documented review and assessment policies and procedures.
(1)	**BASIS: GSR Part 1 Requirement 22 states that** *"The regulatory body shall ensure that regulatory control is stable and consistent."*
(2)	**BASIS: GSR Part 1 Paragraph 4.26 states that** *"The regulatory process shall be a formal process that is based on specified policies, principles and associated criteria, and that follows specified procedures as established in the management system. The process shall ensure the stability and consistency of regulatory control and shall prevent subjectivity in decision making by the individual staff members of the regulatory body. The regulatory body shall be able to justify its decisions if they are challenged. In connection with its reviews and assessments and its inspections, the regulatory body shall inform applicants of the objectives, principles and associated criteria for safety on which its requirements, judgements and decisions are based."*
R20	**Recommendation: The regulatory body should develop and implement procedures for the review and assessment that it conducts.**

6.2. ORGANIZATION AND TECHNICAL RESOURCES FOR REVIEW AND ASSESSMENT

The Authorization Section of NRPA has the responsibility of carrying out the review and assessment process. The section comprises of only three members of staff who have been trained through training programmes organized by the IAEA for regulators, including training on authorization and review and assessment. However, the responsibilities of the staff in the review and assessment have not been clearly delineated.

There are no external independent resources for review and assessment, neither are there Technical Service Organizations in Cameroon to provide services of safety assessment to licensees. There is no mechanism or arrangement for building of competence for all parties with responsibilities for the safety of facilities and activities,

including authorized parties and organizations providing services or expert advice on matters relating to safety, with the exception of the regulatory body.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There is insufficient resources to carry out necessary review and assessment activities within the regulatory body, and the majority of licensees do not have capacity to carry out safety assessments neither do they have access to technical services for safety assessment.
(1)	**BASIS: GSR Part 1 Requirement 11, paragraph 2.35 states that** *"The building of competence shall be required for all parties with responsibilities for the safety of facilities and activities, including authorized parties, the regulatory body and organizations providing services or expert advice on matters relating to safety.*
R21	**Recommendation: The Government should make arrangements to ensure the availability of the necessary professional training programs for maintaining competence and availability of a sufficient number of suitably qualified staff for all parties with responsibilities for the safety of facilities and activities.** **The regulatory body should develop a training programmes to enhance the capacity of its staff in review and assessment.**

6.3. BASES FOR REVIEW AND ASSESSMENT

There are no regulations that address review and assessment and there are also no relevant regulations for safety assessment to be performed by the licensees. However, some guidelines are available in the *Authorization and Notification System* document which covers this topic under section X on *examination/evaluation of the requests for authorization*.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There are no relevant regulations for review and assessment, as well as regulations and guidance for safety assessment by the licencees.
(1)	**BASIS: GSR Part 1 Requirement 25 states that** *"[…] review and assessment of information shall be performed prior to authorization and again over the lifetime of the facility or the duration of the activity, as specified in regulations promulgated by the regulatory body or in the authorization."*
(2)	**BASIS: GSR Part 1 Paragraph 4.26 states that** *"The regulatory process shall be a formal process that is based on specified policies, principles and associated criteria, and that follows specified procedures as established in the management system. The process shall ensure the stability and consistency of regulatory control and shall prevent subjectivity in decision making by the individual staff members of the regulatory body. The regulatory body shall be able to justify its decisions if they are challenged. In connection with its reviews and assessments and its inspections, the regulatory body shall inform applicants of the objectives, principles and associated criteria for safety on which its requirements, judgements and decisions are based."*
(3)	***BASIS: GSR Part 3 Requirement 13 states that*** *"The regulatory body shall establish and enforce requirements for safety assessment and the person or organization responsible for a facility or activity that gives rise to radiation risks shall conduct an appropriate safety assessment of this facility or activity."*
R22	**Recommendation: The regulatory body should develop relevant regulations and/or guidance**

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	for review and assessement and for safety assessment by the licensees.

6.4. SUMMARY

The review and assessment system is less developed and has to be improved upon and be well documented. Regulations/guidance for licensees in safety review and assessment are needed and supportive infrastructure and services that facilitate to carry out safety assessments including the independent verification of the safety assessments by the licensees have to be developed.

7. INSPECTION

7.1 GENERIC ISSUES

7.1.1. INSPECTION APPROACHES, METHODS AND PLANS

NRPA has developed and implemented a schedule of inspection of facilities and activities to confirm compliance with regulatory requirements, including conditions of licence. Since the creation of NRPA, about 200 regulatory inspections have been carried out which includes 2 radiotherapy centres, 170 diagnostic radiology centres and 28 in industrial applications combined with pre-authorization inspections. The inspection frequencies foresee inspections once to twice per year for category I and II sources and once or twice per two years for category III and IV sources. All inspections are carried out only by NRPA.

The regulatory body has established a process and a range of inspection procedures and instructions. Preliminary reports are written after each inspection and are presented to the licensee for response and endorsement of the inspection finding, before the final report is sent. The reports are managed within NRPA's Regulatory Authority Information System (RAIS) and are used for future inspections and can also be referenced in future authorizations as well as review and assessment.

NRPA is preparing its inspection plan for building construction of radiation facilities to be implemented following a decision and request for a construction licence and is seeking to obtain the resources required for a comprehensive building construction inspection activity.

7.1.2. INSPECTION PROCESSES AND PRACTICES

Decree No. 2002/250, Article 4, requires NRPA to set up a planned and systematic inspection programme. NRPA establishes its programme and plans for inspections through its '*Inspection Procedure and Generic Inspection Guidance',* which includes development of the inspection plan, methods of inspection, monitoring and direct observation approaches for each type of facility, interviews, examination of records, procedures and documentation, tests and measurements, and methods for selection of inspection samples.

7.1.3 INSPECTORS

NRPA has established a process, procedures and instructions to govern its inspection programme but has not yet a formal inspector training programme and qualification criteria and procedures. The role for the team of inspectors is not yet properly established by the regulation. Hence, the inspectors are not formally appointed, and do not have the authority to access facilities and carry out inspections and to take immediate enforcement actions as necessary. Their only way to address non-compliances is by suggesting the licensee to take actions on the issues identified during inspection.

The NRPA currently relies on a pool of 20 technical inspectors, of which however only 13 have been trained through the different IAEA coordinated training programmes. The inspectors are composed of personnel from the NRPA, which also have other responsibilities within the regulatory body, hence the inspections are only a small part of their actual work. This results in the 20 inspectors carrying out approximately 60 inspections per year. An inspection is usually conducted by two inspectors and takes one day for preparation, one day for carrying out the inspection and one day for reporting.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The inspectors from the NRPA currently are not officially appointed and do not have the formal authority to access facilities and carry out inspections. The inspectors only carry out a few inspections per year.
(1)	**BASIS: GSR Part 1, Requirement 29, Para 4.52 states that** *"Regulatory inspections shall cover all areas of responsibility of the regulatory body, and the regulatory body shall have the authority to carry out independent inspections. Provision shall be made for free access by regulatory inspectors*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	to any facility or activity at any time, within the constraints of ensuring operational safety at all times and other constraints associated with the potential for harmful consequences […].”
R23	**Recommendation: The regulatory body should make arrangements to ensure that all inspectors undergo training, and are officially appointed to carry out their duties. The inspectors should also be organized in a way that they make inspections regularly in order to benefit from continuous experience.**

7.2. INSPECTION OF RADIATION SOURCES FACILITIES

NRPA’s inspection plan for regulated sources and licensees focuses on users of Category I, II and III sources, followed by a focus on hospitals. The priorities in future inspection plans are reviewed in light of the outcomes of the previous plan. Currently the NRPA has planned and executed routine inspections for the last three years.

Currently the inspection guidelines are in draft form. There is at this moment no formal inspection procedure, ensuring that inspections are carried out to the same standards.

The NRPA ‘*Draft Inspection Guidance*’ includes ‘*routine*’, ‘*special*’, ‘*team*’ and ‘*reactive*’ inspections, both announced and unannounced. However, at present NRPA does not conduct unannounced inspections. Furthermore the programme of an inspection is elaborated for each category of facility taking into account the associated risks and in accordance with a graded approach. Inspection checklists are used for the different practices and include all the items to be inspected.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The NRPA currently has a draft inspection guidance. It is however not finalized, and does not include clear procedures for common standards. There is a checklist covering the aspects to be addressed during an inspection, but no clear criteria is included on operational actions to be taken for non-compliances.
(1)	**BASIS: GSR Part 1 Paragraph 4.26 states that** *“The regulatory process shall be a formal process that is based on specified policies, principles and associated criteria, and that follows specified procedures […]”*
R24	**Recommendation: The regulatory body should finalize and approve the inspection guidelines and include criteria as a guidance to ensure that all the inspections are carried out according to common standards.**

During a site visit, it was noticed that the currently used measurement devices for radiation detection and inspection are not calibrated. There is no quality assurance programme in place for the instruments used .

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The currently used measurement devices by the regulatory body are not calibrated and are not clearly marked.
(1)	**BASIS: Code of Conduct para 9 states that** *“Every State should ensure that appropriate facilities and services for radiation protection, safety and security are available to, and used by, the persons who are authorized to manage radioactive sources. Such facilities and services should include, but are not limited to, those needed for: […]*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	(d) the calibration of radiation monitoring equipment."
R25	**Recommendation: The regulatory body should make arrangements for periodic calibration of their measurement equipment, including the marking of the calibration validity.**

7.3. SUMMARY

The NRPA carries out approximatively 60 inspections per year. The inspections take into account the graded approach and are focused on users of Category I, II and III sources, followed by a focus on hospitals. The inspections are guided through a draft inspection guidance, which includes checklists of the items to be addressed but doee not include criteria of operational actions to be taken in case of non-compliances.

Not all inspectors of the regulatory body are trained in a systematic way, and they are not officially appointed. Hence, their only way to address non-compliances is by suggesting to the licensee to take actions on the issues identified.

8. ENFORCEMENT

8.1. ENFORCEMENT POLICY AND PROCESSES

Section 7 and 8 of Law No. 95/08 of 30 January 1995 on Radiation Protection provides the penalties that are imposed for causing exposure to ionizing radiation or a nuclear accident through imprudence or negligence and for carrying out regulated activities without prior authorization. Section 14 of the same law further provides provisions for the court, dealing with a matter involving the violation of the provisions of the same Law, to order the closure and/or sealing of the facility as well as the confiscation of the equipment. The competent authority, as an interim measure prior to the court making its decision, can also enforce a temporary cessation of the activity in question according to Section 14(2). The procedure for carrying out this interim measure is expected to be laid down in regulations. However, regulations detailing this procedure have not been developed and thus this provision for interim measure has not been implemented todate.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The regulatory body has not initiated a process to have regulations for enfocement in place, in accordance with the existing law.
(1)	**BASIS: GSR Part 1 Requirement 30 states that** *"The regulatory body shall establish and implement an enforcement policy within the legal framework for responding to non-compliance by authorized parties with regulatory requirements or with any conditions specified in the authorization."*
(2)	**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."*
S5	**Suggestion: The regulatory body should consider taking the necessary steps to establish an enforcement regulation as provided for under section 14 of Law No. 95/08.**

The present enforcement provisions in the legislation only deal with penalties that are imposed by a court. The regulatory body has no other enforcement tools that might include recorded verbal notification, written notification, and imposition of additional regulatory requirements and conditions, written warnings, penalties and, ultimately, revocation of the authorization at its disposal and does not apply a graded approach in enforcement. Further, there are no provisions for the regulatory body to require the authorized parties to take corrective action in the event that risks are identified including risks unforeseen in the authorization process.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The regulatory body is requesting authorized parties to take corrective actions when risks are identified. However, the licensees are reluctant to carry out the corrective actions citing that the regulatory body has no such powers.
(1)	**BASIS: GSR Part 1 Requirement 31 states that** *"In the event that risks are identified, including risks unforeseen in the authorization process, the regulatory body shall require corrective actions to be taken by authorized parties."*
R26	**Recommendation: The government should provide necessary provisions in the legislation for the regulatory body to require for corrective actions when necessary. The regulatory body should establish criteria for taking such corrective actions.**

8.2. ENFORCEMENT IMPLEMENTATION

The present enforcement provisions in the legislation are not comprehensive, and there is currently no enforcement system established by the regulatory body based on the available enforcement provisions in the law, such as the provision for penalizing the carrying out of regulated activities without prior authorization.

The regulatory body should also develop an enforcement policy and procedures to streamline its enforcement processes and train its staff on carrying out enforcement actions.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The existing enforcement provisions in the law are not comprehensive and the regulatory body is not using the existing enforcement provisions to enforce its regulatory decisions. Hence, a number of facilities continue to operate without prior authorization or do not follow decisions of the regulatory body.
(1)	**BASIS: GSR Part 1 Requirement 30 states that** *"The regulatory body shall establish and implement an enforcement policy within the legal framework for responding to non-compliance by authorized parties with regulatory requirements or with any conditions specified in the authorization."*
R27	**Recommendation: The Government should revise the legislation and provide the regulatory body with comprehensive enforcement tools in the legal framework. The regulatory body should establish and implement an enforcement policy within the existing legal framework and revise it accordingly when the legislation is revised.**

8.3. SUMMARY

The enforecement system is not clearly spelt and is not comprehensive. The regulatory body is also not currently utilizing any available enforcement provisions in the current legislation.

9. REGULATIONS AND GUIDES

9.1. EXISTING REGULATIONS AND GUIDES

Three Arrêtés are in place; Arrêté No.1150, Arrêté No.1151: Dosimetry Monitoring and Arrêté No.1152: Licencing and Practice Modalities for X-ray facilities.

The current regulations/Arrêtés do not cover all regulatory aspects for all facilities and activities. The regulatory body has not been following a graded approach in the development of regulations and guides. The practices that pose more significant and higher risk, such as for instance non-destructive testing and radiotherapy, do not have any regulations yet. The regulatory body has however initiated a regulation/Arrêté for X-ray facilities, a practice with lower risk which had been approved by the government.

Guides are available in the form of the *Authorization and Notification System* document and application forms. Additional guides as well as practice specific guides would need to be developed covering all the different practices in the country.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: A number of practices do not have regulations and guides that specify the principles, requirements and associated criteria for safety upon which the regulatory judgements, decisions and actions are based.
(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."*
R28	**Recommendation: The regulatory body should establish or adopt regulations and guides to cover all aspects for all facilities and activities.**

9.2. PROCESSES FOR DEVELOPING REGULATIONS AND GUIDES

The regulatory body does not have clear procedures for the development of regulations and guides. Though there are set requirements by the government for the development of regulations, the regulatory body is yet to integrate these requirements and any other processes the regulatory body has to carry out prior to sending draft regulations to the government. Stakeholder involvement and participation has not been streamlined into the process of developing regulations and guides.

The regulatory body does not have a policy and procedures on the review and revision of regulations and guides. Regulations and guides have not yet been 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, and also to to align them with the IAEA safety standard *Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards General Safety Requirements GSR Part 3*.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Regulations and guides are not being reviewed and revised to keep them up to date.
(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."*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R29	**Recommendation: The regulatory body should review and revise regulations and guides as necessary to keep them up to date.**

The regulatory body carries out some activities to promote its regulations and guides. It uses its website and newsletter. However, the current efforts do not sufficiently reach out to all interested parties as the IRRS Team observed during the site visits that some licensees showed lack of knowledge of the existing regulations and guides.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Regulations and guides are not being sufficiently promoted to interested parties.
(1)	**BASIS: GSR Part 1 Requirement 34 states that** *"The regulatory body shall notify interested parties and the public of the principles and associated criteria for safety established in its regulations and guides, and shall make its regulations and guides available."*
R30	**Recommendation: The regulatory body should actively promote its regulations and guides to all interested parties and make the regulations available.**

9.3. SUMMARY

The regulatory body has not yet issued regulations and guides that cover all aspects of practices available in the country. A procedure for the development and review and revision of regulations and guides is not in place. Regulations and guides are yet to be reviewed and revised as necessary to keep them up to date. The regulatory body would need to promote its regulations and guides.

10. EMERGENCY PREPAREDNESS AND RESPONSE

10.1. GENERAL EPR REGULATORY REQUIREMENTS

Basic responsibilities

NRPA, being the sole regulatory body in Cameroon, is mandated to cover also all regulatory matters related to emergency preparedness and response (EPR) in the country. Stemming from its obligations under Decree 2002/250 the regulatory body is responsible, among others, for

- Regulating the licensees in matters of EPR;
- Being one of the response organizations of the national EPR infrastructure;
- Developing the national radiation emergency plan (NREP).

There is some ambiguity regarding the primary responsibility for EPR in licensed facilities. Both the regulator and the operators of the licensed facilities understand so that the licensee is fully responsible for its on-site EPR arrangements, this responsibility is not clearly defined in the relevant legal documents. In practice, NRPA requires from the licensee 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. Emergency plan is a condition of authorization. In addition, pursuant to Article 4 of Decree No. 2002/250, NRPA proposes models of emergency plans adapted to different existing practices in Cameroon. These models incorporate the roles of other intervening organizations. It also includes training activities and plans to organize emergency exercises.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Although it seems to be a common understanding of the regulator and the applicants/licensees of radiological practices that the prime responsibility for on-site EPR arrangements are with the licensee, this requirement is not explicitly expressed in a regulatory document.
(1)	**BASIS: GS-R-2 para. 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.[…]"*
R31	**Recommendation: The regulatory body should develop regulations that clearly define the licensee's responsibility to establish emergency preparedness and response capabilities commensurate with the hazards of the given practice.**

According to decree 2002/250, NRPA is considered to be the national radiological expert organization and adviser to the government in respect of nuclear and radiation safety. NRPA is a member of National Risks Observatory according to the Order No. 037/PM and, according to the recently drafted national radiation emergency plan, is the Coordinator of the Operations in the national radiation emergency management scheme. Decree No. 98/31 on organization of emergency plans for disasters or major risks, defines the roles and responsibilities of the National Crisis Committee (NCC), which is the main decision making body, and lists the government agencies and Non-Governmental Organizations that are involved in the NCC. This decree, however, does not take into consideration the role of NRPA as radiological expert organization.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Decree No. 98/31 is the basic legal document regulating planning for management of national emergencies, which lists all the national agencies that are members of the National Crisis Committee. NRPA, as the regulatory body in nuclear and radiological matters, is not mentioned in this decree.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(1)	**BASIS: GS-R-2 para. 3.10 states that** *"In planning for, and in the event of [a nuclear or radiological emergency], the regulatory body shall act as an adviser to the government and [response organizations] in respect of nuclear safety and radiation protection."*
S6	**Suggestion: The regulatory body should consider initiating the amendment of Decree 98/31, to include NRPA in the list of the National Crisis Committee members, as the main government organization responsible for radiation emergency preparedness and response.**

Assessment of threats

In Cameroon there are no regulatory requirements and no guidance for the licensee to develop a threat assessment to be the basis of its EPR planning.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There are no regulatory requirements and no guidance for the licensees to develop threat assessment, to be the basis of their EPR planning.
(1)	**BASIS: GS-R-2 para. 3.15 states that** *"The nature and extent of emergency arrangements [for preparedness and response] shall be commensurate with the potential magnitude and nature of the [threat]… associated with the facility or activity." (Ref. [10], para. 6.4.) The full range of postulated events shall be considered in the threat assessment. In the threat assessment, emergencies involving a combination of a nuclear or radiological emergency and a conventional emergency such as an earthquake shall be considered […]"*
R32	**Recommendation: The regulatory body should develop regulatory and guidance documents for the applicants/licensees to perform threat assessment, on which their EPR arrangements will be based.**

The inventory of ionizing radiation sources is registered in RAIS, with over 156 radioactive sources. It contains the threats categorization for these sources, according to GS-R-2 and following the methodology of EPR - METHOD 2003, and it shows that the highest emergency planning (threat) categories in Cameroon are catergory III and IV. This threat assessment is updated by NRPA every year. However, this should be extended beyond the RAIS to scenarios that would warrant radiation emergency response (e.g. satellite re-entry, illicit trafficking of radioactive material, nuclear emergency abroad, radioactive dispersion device etc).

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The assessment of radiation emergency hazard on the national level is limited to assigning the threat categories defined in GS-R-2 to the radiation sources registered in RAIS, but it does not cover many other scenarios that would warrant emergency response.
(1)	**BASIS: GS-R-2 para. 3.15 states that** *"The full range of postulated events shall be considered in the threat assessment. In the threat assessment, emergencies involving a combination of a nuclear or radiological emergency and a conventional emergency such as an earthquake shall be considered. Any threat associated with nuclear facilities in other States shall also be considered […]"*
S7	**Suggestion: The regulatory body should extend its threat assessment beyond the threat categorization of sources registered in RAIS, to cover all possible radiation emergency**

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	scenarios.

10.2. FUNCTIONAL REGULATORY REQUIREMENTS

Establishing emergency management and operations

There are no regulatory requirements on the licensee's emergency management structure. These are not yet established, although NRPA indicated that the demonstration of these capabilities is required during inspections and exercises.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There are no regulatory requirements and no guidance for the licensees to establish emergency management and operations.
(1)	**BASIS: GS-R-2 para. 4.2 states that** *"The on-site emergency response shall be promptly executed and managed without impairing the performance of the continuing operational safety functions."*
(2)	**BASIS: GS-R-2 para. 4.3 states that** *"The off-site emergency response shall be effectively managed and co-ordinated with the on-site response."*
(3)	**BASIS: GS-R-2 para. 4.4 states that** *"The emergency response shall be co-ordinated between all responding organizations."*
(4)	**BASIS: GS-R-2 para. 4.5 states that** *"Information necessary for making decisions on the allocation of resources shall be appraised throughout the emergency."*
R33	**Recommendation: The regulatory body should develop regulatory and guidance documents for the applicants/licensees to establish appropriate emergency management and operations.**

Identifying, notifying and activating

Regulatory requirements have not been developed for identifying a situation that warrants emergency response and the classification system of GS-R-2 is not in use in Cameroon.

The draft plan requires that the licensee immediately notify the regulatory body of any radiation emergency but there is no time objective attached to this requirement (and the plan is only a draft and not yet in effect).

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There are no regulatory requirements and no guidance for the licensees to identify a situation that warrants emergency response and the emergency classification is not consistent with GS-R-2, paragraph 4.19.
(1)	**BASIS: GS-R-2 para. 4.19 states that** *"The operator of a facility or practice in threat category I, II, III or IV shall make arrangements for the prompt identification of an actual or potential nuclear or radiological emergency and determination of the appropriate level of response. This shall include a system for classifying all potential nuclear and radiological emergencies that warrant an emergency intervention to protect workers and thepublic, in accordance with international standards[…]"*
R34	**Recommendation: The regulatory body should develop regulatory and guidance documents for the applicants/licensees to classify the emergency in consistency with GS-R-2, and to notify the regulatory body within a well-defined time period.**

Taking mitigatory actions
There are no specific regulations regarding the provision of emergency services at the licensed facilities, but NRPA requires the establishment of operating procedures and guidelines for operator response to severe emergencies.

External emergency services are part of the licensee's plan to take mitigatory actions, e.g. police, medical and firefighting services. They are available round the clock.

Taking urgent protective action
Since in Cameroon the most severe threat that the national EPR must be prepared for is category III, the issue of public protection has limited relevance. Nevertheless, the regulatory body has a role in establishing regulations or levels for the protection of the public during an emergency. According to the decree 2002/250, NRPA is responsible to develop regulations in radiation protection, and this process is ongoing.

No generic and operational intervention and action levels are currently available.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There are no generic and operational intervention and action levels available in Cameroon.
(1)	**BASIS: GS-R-2 para. 4.45 states that** *"Optimized [national] intervention levels [for taking urgent protective actions] shall be [established that are in accordance with international standards[…]"*
(2)	**BASIS: GS-R-2 para. 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."*
R35	**Recommendation: The regulatory body should develop generic and operational intervention and action levels, in accordance with the international standards.**

Providing information and issuing instructions
The regulatory body is not responsible for regulations regarding the role of licensees in instructing the public. It is the Ministry of Territorial Administration which has this responsibility.

Protecting emergency workers
According to Article 4 of the decree 2002/250, NRPA must develop the regulations regarding the protection of on-site emergency workers. According to the same article, NRPA must develop regulations concerning the protection of off-site emergency workers involved in the on-site support to the licensee. These regulations are not yet in place.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation*:* Although Article 4 of Decree 2002/250 obliges NRPA to develop regulations regarding the protection of emergency workers (both on-site and off-site), these regulations are not yet available.
(1)	**BASIS: GS-R-2 para. 4.56 states that** *"Arrangements shall be made to protect emergency workers, in accordance with international standards"*
(2)	**BASIS: GS-R-2 para. 4.60 states that** *"National guidance that is in accordance with international standards55 shall be adopted for managing, controlling and recording the doses received by emergency workers. This guidance shall include default operational levels of dose for emergency workers for different types of response activities, which are set in quantities that can be directly*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	monitored during the performance of these activities (such as the integrated dose from external penetrating radiation). In setting the default operational levels of dose for emergency workers the contribution to doses via all exposure pathways shall be taken into account."
R36	**Recommendation: The regulatory body should develop regulations for the protection of emergency workers (both on-site and off-site), in accordance with the international standards.**

Assessing the initial phase
The regulatory body has no regulation on the need to promptly assess abnormal conditions at the facility or practice, including potential or actual radioactive releases, as well as characterization of abnormal exposures and the extent and significance of contamination. This issues however is somewhat not currently relevant since there is no catergory I and II in Cameroon.

Managing the medical response
The regulatory body does not have any role in regulating medical response management by the licensees.

Other activities in emergency preparedness
The regulatory body does not have any role in defining the criteria for agricultural countermeasures, countermeasures against ingestion and longer-term protective actions, neither in dealing with non-radiological impacts on the public and the emergency workers.

However, the regulatory body has regulatory responsibilities in regulating the recovery activities, including for example transitions threshold, workers protection, response criteria, but it has not yet been developed.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The regualtory body has regulatory responsibility in the recovery operations (e.g. transition threshold, workers protection, response criteria etc.) but has not yet been developed.
(1)	**BASIS: GS-R-2 para. 4.100 states that** *"Decisions to cancel restrictions and other arrangements imposed in response to a nuclear or radiological emergency shall be made by a formal process that is in accordance with international guidance [15]. "The regulatory body shall provide any necessary input to the intervention process. Such input may be advice to the government or regulatory control of intervention activities. […]"*
R37	**Recommendation: The regulatory body should develop the necessary requirement regulating the recovery operation and facilitating the smooth transition to normal social and economic conditions.**

10.3. REGULATORY REQUIREMENTS FOR INFRASTRUCTURE

Authority, organization and coordination of emergency response
As it was mentioned in section 10.1 the regualtory body is responsible, among others, for a) regulating the licensees in matters of EPR, b) being one of the response organizations of the national EPR infrastructure and c) developing the national radiation emergency plan (NREP). The NREP is to clarify the roles and responsibilities of other governmental and non-governmental organizations.

In the proposed emergency plan account is given of responsibilities for all parties involved in emergency response. In this plan, as well as in other documents (e.g. "Modèle PUI synthèse CND") appropriate positions and duties are defined for EPR staffing of the licensees. Arrêté No. 1150 also gives details of the requirement for staffing.

Plans and procedures
There are regulatory requirements regarding plans and procedures for licensees (although it is somewhat vague, embedded in the regulation for authorization). Regulatory requirements regarding plans and procedures for licensees are mentioned in the authorization and inspection checklist of NRPA. The emergency plan of the responsible party is designed in collaboration with the NRPA.

While regulations are missing or vague, there is good guidance given by the regulatory body to the licensees regarding preparing their emergency plans. NRPA developed six specific emergency plan templates covering all possible related risks

The regulatory body approves the licensee's emergency plans. When designing the emergency plan, the responsible party is requested to submit the emergency plan to the NRPA for review and approval. The regulatory control of adequate implementation of the emergency plans is an ongoing task, addressed partly through inspection, workshops etc.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The regulatory body has developed model emergency plans to serve as a guidance for six different applications of radiological practices.
(1)	**BASIS: GS-R-2 para. 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…"*
GP2	**Good practice: The guidance given by the regulatory body to the applicants of various radiation applications is a good practice that promotes the development of standardized emergency plans for different facilities.**

Logistical support and facilities
The six models of radiological emergency plans provided by NRPA indicated all adequate tools, instruments, supplies, etc. that are needed to be available for prompt response. Licensees are required to make these tools available. The availability of these tools and facilities are supposed to be checked during inspections and exercises but this verification activity should be strengthened.

Training, drills and exercises
The model emergency plans proposed to the licensees contain requirements for training and simulation exercises. Facility emergency exercises are held with certain regularity (typically yearly), with the possibility of the regulatory body to observe. Submission of training and exercise reports on this should be requested and followed up. This is another task for the regulatory body to strengthen regulatory control of the licensees EPR capabilities.

No national exercises have been organized yet but it is planned.

Quality assurance programme
The regulatory body does not have regulations regarding quality assurance in EPR.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The regulatory body does not have regulations regarding quality assurance in EPR
(1)	**BASIS: GS-R-2 para. 5.37 states that** *"The operator of a facility, practice or source in threat category I, II, III or IV and the off-site response organizations shall establish a quality assurance programme, in accordance with international standards, to ensure a high degree of availability and reliability of all the supplies, equipment, communication systems and facilities necessary to perform the functions specified in Section 4 in an emergency (see para. 5.25)…"*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
(2)	**BASIS: GS-R-2 para. 5.39 states that** *"The operator of a facility, practice or source in threat category I, II, III or IV and the off-site response organizations shall make arrangements to review and evaluate responses in emergencies and in drills and exercises, to record the areas in which improvements are necessary and to ensure that the necessary improvements are made."*
R38	**Recommendation: The regulatory body should develop regulatory requirements for EPR quality assurance programme to be established and maintained by the licensees.**

10.4. ROLE OF REGULATORY BODY DURING RESPONSE

Article 4 of Decree No. 2002/250 assigns responsibility to NRPA in responding to participate in responding to a radiological emergency. NRPA is considered to be the national radiological expert organization and adviser to the government. NRPA is a member of National Risks Observatory (Order No.037/PM). According to Article 29.of the draft nuclear law "the regulatory body prepares a national radiological emergency plan in collaboration with competent administrations".

NRPA has its own plans and procedures for EPR ("Procedure d'intervention ANRP"). Coordination with other organizations is as per the NREP ("Plan d'urgence Radiologique Camerounais"), which is in draft form, still to be finalized and approved.

The regulatory body does not have an independent EPR training, drill and exercise programme. Its staff members participate in different training activities (courses, workshops) organized by the IAEA, and the dissemination of training material and experience from IAEA courses is a regular practice.

There are limited means, equipment and facilities available to measure radiation and radioactivity (gamma spectrometer, hand-held dose rate meters and radiation/contamination monitoring devices).

Exercises are planned to test effectiveness of the regulatory body's EPR arrangements.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Proper response to a radiation emergency response on the national level requires planning and coordination. NRPA has an important role in this planning process. The national radiation emergency plan is in draft form, which is incomplete and is not yet in effect.
(1)	**BASIS: GS-R-2 para. 3.13 states that** *"Plans or other arrangements shall be made for co-ordinating the national response to the range of potential nuclear and radiological emergencies. These arrangements for a co-ordinated national response shall specify the organization responsible for the development and maintenance of the arrangements; shall describe the responsibilities of the operators and other response organizations; and shall describe the co-ordination effected between these arrangements and the arrangements for response to a conventional emergency. The arrangements should include provisions that can be used to formulate in detail a response to situations such as: a serious exposure or contamination resulting from contact with a source by a member of the public; the notification of a potential transboundary release of radioactive material; the discovery of a shipment containing a dangerous source that is not under control; the notification of the potential re-entry of a satellite; public concern or rumours about a threat; and other unanticipated situations warranting a response."*
S8	**Suggestion: The regulatory body should consider finalizing the draft national radiation emergency plan and forward it to the relevant national authorities for review and approval.**

10.5. SUMMARY

The main conclusions regarding regulating emergency preparedness and response in Cameroon are as follows:

- NRPA is the sole regulator in Cameroon regarding emergency preparedness and response;

- The primary responsibility of the licensees in establishing emergency response capabilities and performing emergency response in their facilities is not spelled out explicitly in the legal and regulatory documents. This needs development of legal and regulatory framework that clearly define the licensee's responsibility.

- There are no regulatory requirements for several functions of EPR (e.g. threat assessment, establishment of emergency management and operations, identification and classification of situations warranting emergency response, intervention and action levels, protection of emergency workers, recovery operations etc.). The regulatory body would need to develop these regulations, together with the relevant guidance documents that will help the licensees (and applicants of future practices) to establish proper on-site EPR arrangements.

- The guidance given by the regulatory body to the applicants of various radiation techniques is a good practice that promotes the development of standardized emergency plans for different facilities.

11. ADDITIONAL AREAS

11.1. CONTROL OF MEDICAL EXPOSURES

Medical facilities in Cameroon include two external radiotherapy facilities and two brachytherapy facilities, one nuclear medicine facility, 21 CT, 20 interventional radiology units, 36 mammography units as well as 265 diagnostic radiology and 90 dental radiology units.

The legal and regulatory framework for the medical exposure area consist of:

- Law No 95/08 on Radiation Protection, which establishes the general legal framework for radiation protection;
- Decree 2002/250 that establishes, in particular, NRPA as the competent body including to carryout quality control of medical radiation devices;
- Arrêté 1151/A/MINSANTE laying down, in particular, the methods of dosimetric monitoring of patients;
- Arrêté 1152/MINSANTE laying down conditions for the detention, and use of X-ray emitting devices in hospitals.

The IRRS team noted that since 2007, even if no comprehensive regulation relevant to patient protection has been issued, NRPA adopted two Arrêtés related to patient protection and developed significantly its quality control activities; so far 200 medical devices have been controlled.

The IRRS team was also informed that NRPA has drafted several documents relevant to patient protection:

- internal guidelines on how to conduct the different quality control operations, including criteria to determine compliance or non-compliance;
- draft Arrêté laying down the requirements concerning medical physics organization and determining the conditions for training and work of medical physicists;
- draft law and decree on nuclear safety, making provisions for some aspects of patient protection.

There is a partnership agreement with the Ministry of Health (MoH). As a result of this agreement, three Arrêtés have been signed by the MoH in 2013. During a meeting the IRRS team had in the Ministry of Health, it was indicated that this partnership is valued by both parties and is effective.

- Responsibilities of the government

Arrêté 1152 for X-ray emitting devices in the medical field makes provisions for the holders to be authorized by the competent authorities. However, the Arrêté does not define clearly who the competent authorities are and neither the law, nor the decree, clearly gives the NRPA the responsibility to issue, amend, suspend or revoke authorizations. Many facilities still do not have the necessary authorization. This issue is addressed in more details in secition 5 and Recommendation 15.

No diagnostic reference levels have been defined yet. However, maximal skin entry doses for some exams in diagnostic radiology have been defined in the Arrêté. As dose limits do not apply to medical exposure, those values could have been considered as diagnostic reference levels. However, their status should be clarified, as well as the way they should be used as optimization tools.

There are currently no dose constraints for carers and comforters, no criteria for the release of patients have been defined yet, and there are no related guidelined developed.

Consultation of professionals and communication about the radiation protection regulations/Arrêtés/ enacted in 2013 seem to have been very limited. Professionals encountered during the team visits demonstrated not to have sufficient knowledge of the existing relevant regulations. This issue is addressed in more details in section 9 and Recommendation 30.

- Responsibilities of the regulatory body

Although it was explained to IRRS team that specialization of the physicians in the appropriate area, as well as education of the radiation technologists and radiation protection training are checked during the licensing process, the requirements regarding the education, training and competence requirements for staff with duties in relation to the radiation protection of patients are not defined. Besides, there are no requirements regarding periodic refresher training.

In accordance with the decree 2002/250, NRPA has been organizing radiation protection training. Training programmes have been organized in the early years when NRPA was establised in order to upgrade the radiation protection knowledge of workers, including lectures on quality control for medical devices and radiation protection in medicine. The present frequency of those programmes is, however, not defined and these trainings take place on an ad-hoc basis, upon request for the licensees. This issue is addressed in general in section 11.2 and Suggestion 11.

- Responsibilities of registrants and licensees

Responsibilities of licensees regarding radiation protection of patients are currently not defined in regulations. In particular, there is no requirement regarding the sufficiency of medical and paramedical personnel. Availability of medical physicists is very limited, and it has been indicated that there may also be a shortage of radiation technologists in the coming years as the progamme of educating radiation technologists at the diploma level had not been implemented from 1995 to 2009.

However, the professionals encountered during the inspection of the radiology facility at *the Central Hospital* of Yaoundé demonstrated a good knowledge of patient radiation protection principles and implemented actions aimed at applying the principles of justification and optimization.

- Justification of medical exposure

Although Arrêté 1151 requires “elements of justification” to be provided in the report developed after any medical procedure involving ionizing radiation is performed, justification of medical exposure by weighing the expected benefits against the radiation detriment is currently not a regulatory requirement in Cameroon.

At present there is no referral guide offering guidance for generic justification.

- Pregnant women and breast feeding women

There is currently no regulatory requirement with regard to pregnant and breast feeding women.

However, during a site visit the staff of the radiology facility of the Central Hospital of Yaoundé explained that they give special attention to the justification of a procedure if the patient is pregnant.

- Patient release

There is currently no crieria and guidelines established regarding release of patients.

- Unintended and accidental medical exposures

Minimizing the likelihood of unintended or accidental exposure, investigating such exposures, reporting them to NRPA and, if appropriate, implementing corrective actions is currently not a regulatory requirement.
No incident has been officially reported so far to NRPA.

- Reviews and records

There is currently no regulatory requirement to conduct radiological reviews.

Some records are required to be maintained by the regulations/Arrêtés such as:

- quality control reports
- information necessary for the retrospective assessment of doses delivered to patients.

There is no requirement regarding all other records required in GSR Part 3.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The regulatory framework regarding patient protection is incomplete since areas such as justification, optimization, responsibilities of licensees, criteria regarding the sufficiency of medical and paramedical personnel, training, calibration, reporting of unintended exposures are not addressed.
(1)	**BASIS:** *GSR Part 3 para. 3.145 to 3.185 define the requirements for patient protection in medical exposure.*
R39	**Recommendation: NRPA should complete the regulatory requirements on medical exposure, making sure that they are compliant with GSR Part 3. Some of this framework should be developed in consultation with the Ministry of Health and relevant professional bodies.**
	Observation: Maximal skin entry doses have been defined in the Arrêté 1152. How those values should be used is not explained in the current regulation, and NRPA has not yet started applying this requirement.
(1)	**BASIS: GSR Part 3, Requirement 34** states that *"The government shall ensure that […] diagnostic reference levels […]are established".*
(2)	**GSR Part 3, Requirement 38, Para 3.169** states that *"[…]licencees shall ensure[…]whether the optimization of protection and safety for patients is adequate[…]"*
R40	**Recommendation: The Government should revise Arrêté 1152 and replace the maximal skin entry doses with diagnostic reference levels. NRPA should also define how to use these values as optimization tools and control the implementation of this requirement.**

- Optimization of medical exposure

Arrêté 1152 defines some requirements for the design of medical facilities and equipments.

Law No 95/08 makes a general provision for "ensuring optimum protection for persons". However, the application of the optimization principle, i.e. delivering to the patient the minimum dose necessary to fulfil the clinical purpose of the radiological procedure, is currently not a regulatory requirement for medical exposures in Cameroon. As there are only one medical physicist in Douala General Hospital and one in Yaoundé General Hospital, optimization of doses delivered to patients, either during interventional image guided procedures or in diagnostic radiology, is not ensured. In the radiotherapy facility, it was declared during the site visit that the physicist does not have access to a treatment planning system and is not able to ensure that for each patient the exposure other than to the target volume is kept as low as reasonably achievable.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Treatment Planning System (TPS) is not available during the preparation of radiotherapy treatments. Therefore, the exposure of volumes other than the planning target volume is not optimized.
(1)	**BASIS: GSR Part 3 para. 2.29 states that** *"The regulatory body shall establish requirements for the application of the principles of radiation protection specified in paras 2.8–2.12 for all exposure situations and shall establish or adopt regulations and guides for protection and safety"*
(2)	**BASIS: GSR Part 3 para. 3.164 states that** *"For therapeutic radiological procedures, the radiological medical practitioner, in cooperation with the medical physicist and the medical radiation technologist, shall ensure that for each patient the exposure of volumes other than the planning target volume is kept as low as reasonably achievable consistentwith delivery of the prescribed dose to the*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	planning target volume within the required tolerances."
R41	**Recommendation: NRPA should formalize the requirements for optimization of doses delivered to radiotherapy patients and enforce them.**

There is no calibration service available in Cameroon, and no requirement for the calibration of sources used for medical exposure.

There is currently no requirement to determine typical doses to patients or to make assessments of those doses against diagnostic reference levels defined in the regulation.

According to Arrêté 1152, the licensee is responsible for establishing a quality assurance program.

Presently the frequencies of quality controls are not in accordance with a graded approach but it was explained that a draft regulation addressing this issue has been elaborated.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Quality Control requirements are currently not determined using a graded approach in accordance to the risks associated with the different activities.
(1)	**BASIS: GSR Part 3 para. 3.172 states that** *"Registranst and licensees shall ensure that […] quality assurance […] frequency is in accordance with the complexity of the radiological procedures being performed and the associated risks."*
S9	**Suggestion: NRPA should consider ensuring that graded frequencies are applied for quality control, in accordance with the complexity of the radiological procedures being performed and the associated risks.**

No company is available to perform quality controls of medical radiation equipments in Cameroon, and at present this task is only peformed by NRPA.

The criteria of compliance for the quality controls have not yet been formalized in a validated document although an internal guide has been drafted. The IRRS team was informed that on average, only 20% of the equipment controlled by NRPA comply with the performance criteria defined in this draft and 40% do not comply but still remain acceptable. For the remaining 40%, NRPA issues a recommendation not to use the equipment but so far, such recommendations have not been enforced. Enforcement issue is also addressed in more details in section 8 and Recommendation 27.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Acceptance criteria for quality control have been elaborated, but not been validated or published yet. On the basis of the draft criteria, nearly half of the X-ray devices controlled by NRPA do not comply, and a third of them do not comply but still remain acceptable. The enforcement policy to address this issue is not defined.
(1)	**BASIS: GSR Part 3 Para. 3.171 states that** *"Registrants and licensees shall ensure that programmes of quality assurance for medical exposure include as appropriate[…](b) implementation of corrective actions if performed if measured values of the physical parameters […] are outside established tolerance limits."*

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
R42	**Recommendation: NRPA should formalize its acceptance criteria for quality control results and define and implement an enforcement policy for devices that are outside tolerance limits.**

11.2. OCCUPATIONAL RADIATION PROTECTION

- Legal and regulatory framework

The legal and regulatory framework in the area of occupational exposure consists of:

- Law No 95/08 on Radiation Protection, which establishes the general legal framework for radiation protection;
- Decree 2002/250 that establishes, in particular, NRPA as the competent body to record individual monitoring data;
- Arrêté 1150/A/MINSANTE laying down the methodology for defining controlled or supervised areas. This Arrêté applies for all activities.
- Arrêté 1151/A/MINSANTE laying down, in particular, the methods of medical and dosimetric monitoring of workers. This Arrêté applies only to institutions using ionizing radiation in the medical field.
- Arrêté 1152/MINSANTE laying down conditions for the detention, and use of X-ray emitting devices in hospitals, and containing some provisions about occupationally exposed workers in hospitals.

There is currently no requirement regarding:

- workers undertaking remedial actions in existing exposure situations;
- emergency workers (also adressed in Section 10);
- occupational radiation protection related to exposure due to ^{222}Rn in workplaces, including the establishment of an appropriate reference level for ^{222}Rn, despite the existence of a survey indicating that there may be high concentrations of radon in some areas of Cameroon; (a survey of radon in houses has been performed in Cameroon and for one region, the mean concentration is 1280 Bq /$m^{3)}$;
- exposure of air crew due to cosmic radiation.

The IRRS team noted that since 2007, NRPA has adopted three Arrêté s related to occupational exposure and set up a dosimetry service. Currently, about 250 workers are monitored. Furthermore, the IRRS team was informed that NRPA has drafted several documents relevant to occupational exposure such as:

- internal guide on individual monitoring;
- external guide on how to use the dosimeters (this guide is intended, once in effect, to be sent to the licensees with the dosimeters);
- the draft law and decree on nuclear safety, making provisions for some aspects of occupational exposure.

Except for the dose limit to the lens which needs to be updated, dose limits established by the current regulations/ Arrêtés are consistent with dose limits established in GSR Part 3.

- General responsibilities of registrants, licensees and employers

Responsibilities of registrants and licensees are defined in the three Arrêtés. Except for defining controlled and supervised areas as well as access rules to those areas, all the requirements are defined only for medical workers. Licences issued place the general requirement to protect the workers on the licensee.

The following responsibilities, established by GSR Part 3, are not (or not fully) addressed in the current regulation[1]:

- optimization of protection and safety: apart from a very general statement in law 95/08, the current regulation does not mention this requirement ;
- recording of decisions with regard to measures for protection and safety (except for the method that allowed the definition of controlled and supervised areas) ;
- requirement to establish policies, procedures and organizational arrangements for protection and safety for implementing the relevant requirements of GSR Part 3, with priority given to design measures and technical measures for controlling occupational exposure ;
- requirement to provide suitable and adequate facilities, equipment and services for protection and safety, the type and extent of which are commensurate with the expected likelihood and magnitude of occupational exposure;
- requirement for calibration of the monitoring equipment;
- requirements regarding maintenance of records;
- consultation of and cooperation with workers, through their representatives where appropriate;
- provision of necessary conditions for promoting safety culture.

The regulation/Arrêté is not explicit about periodic re-training, and guidance on the contents of the training are also not available.

The other elements of of GSR Part 3 requirement 21 are not addressed in the regulation/Arrêté, except for the involvement of workers representatives through access to the delimitation of controlled and supervised areas.

Requirements regarding cooperation between employers and licensees are only very briefly addressed in Arrêté 1150 for maintenance activities.

Dose limits for female workers and for pregnant women are defined, as well as requirements to notify the employer once pregnant. There is however no requirement regarding the specific information of female workers or to adapt the working conditions of a pregnant or breast-feeding woman as requiredd in Requirement 28 of GSR Part 3.

The age limit for young workers is not clear; the regulation mentions that it is 21 (which is not consistent with the specific dose limits defined for workers between 16 and 18), unless the young worker is a student in which case no age limit is provided.

The current regulations/Arrêtés establish some responsibilities of employers and licensees. However, not all the responsibilities mentioned in GSR Part 3 are covered.

- General Responsibilites of workers

It was not established that responsibilities of workers are addressed in the regulations.

- Requirements for radiation protection programmes

Controlled areas

Arrêté 1150 establishes the requirements for the designation of controlled areas. Anticipated accident conditions are not required to be taken into account by this Arrêté. Most of the requirements regarding controlled areas are met by this Arrêté or Arrêtés 1151 and 1152, except for :

- displaying instructions at access points and other appropriate locations within controlled areas, for which there is no clear requirement;
- providing equipment for workplace monitoring;
- providing suitable storage for contaminated personal protective equipment;
- periodically reviewing conditions to assess whether there is any need to modify the measures for protection and safety or the boundaries of controlled areas;

- _____

[1] The requirements that exist but only for medical workers are not mentioned in this list.

- providing appropriate information, instruction and training for persons working in controlled areas.

Supervised areas

Arrêté 1150 also establishes the requirements for the designation of supervised areas. No requirement exists regarding periodically reviewing conditions to assess whether there is any need for further measures for protection and safety or any need for changes to the boundaries of supervised areas.

Local rules, prcoedures and personal protective equipment

There is no requirement that employers, registrants and licensees shall minimize the need to rely on administrative controls and personal protective equipment for protection and safety by providing well engineered controls and satisfactory working conditions in accordance with the hierarchy of preventive measures mentioned in GSR Part 3.
As for local rules, procedures and protective equipment:

- Access rules to controlled and supervised areas are not defined, and areas requiring protective equipment have not been identified;
- the regulation does not make clear provisions for making the local rules and procedures known to those workers to whom they apply or who may be affected by them;
- designation of a RPO that will supervise work is required only for medical activities;
- Arrêté 1150 mentions that when protective equipment is needed, areas requiring them to be used should be identified. It also requires to ensure that protective equipment is used and checked, and if necessary, repaired before being used again. Arrêté 1152 defines specific requirements regarding protecting equipments for radiation technologists in the medical field but does not mention thyroid shields.

Monitoring of the workplace

NRPA has not established regulatory requirement regarding workplace monitoring except an indication, in Arrêté 1150, of the employer being required to perform periodic measures.

Assessment of occupational exposure

Requirements regarding individual monitoring are defined for medical workers only; passive dosimetry (including, if necessary, extremity dosimetry) in supervised and controlled areas, active dosimetry "in particular in controlled area", and internal dosimetry if the worker operates in a zone where a risk of contamination exists. However, extremity dosimetry and internal dosimetry are currently not available in Cameroon. The case of self-employed persons is not mentioned in the regulation.

Records of occupational exposure

Record keeping is a requirement only for licensees in the medical field. The data to be associated with each individual monitoring do not contain all the elements mentioned in GSR Part 3 paragraph 3.105.

The employer transmits, at least annually, the individual monitoring results to the worker and is required to present, at any requisition from NRPA, the results of operational dosimetry. He preserves the confidentiality of the information collected. No provision is made regarding facilitating the data transmission to a possible new employer.

Conditions of service

There are currently no specific requirements regarding the conditions of service of workers being independent of whether they are or could be subject to occupational exposure. The regulations do not make clear that special compensatory arrangements, or preferential consideration with respect to salary, special insurance coverage, working hours, length of vacation, additional holidays or retirement benefits, shall neither be granted nor be used as substitutes for measures for protection and safety in accordance with the requirements of the GSR Part 3.

It is mentioned in Arrêté 1152 that a worker that has exceeded the dose limit should not be exposed anymore, but there is no clear provision about employers making all reasonable efforts to provide workers with suitable alternative employment in circumstances for which it has been determined, either by the regulatory body or in the framework of the programme for workers' health surveillance in accordance with the requirements of GSR Part 3,

that workers, for health reasons, may no longer continue in employment in which they are or could be subject to occupational exposure.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The regulatory framework for occupational radiation protection is not complete and contains inconsistencies. In particular, many requirements apply only to workers in medical radiation applications while these requirements would as well be relevant to workers in other aeas.
(1)	**BASIS: GSR Part 3, Requirement 19 states that** *"The government or the regulatory body shall establish and enforce requirements to ensure that protection and safety is optimized, and the regulatory body shall enforce compliance with dose limits for occupational exposure."*
R43	**Recommendation: NRPA should revise the regulatory framework for occupational exposure for consistency and completeness with respect to GSR Part 3, in particular making it consistent in the medical and non-medical fields so that all workers are entitled to the same level of protection. The dose limit to the lens of the eye should be updated accordingly.**
	Observation: A survey of radon in houses has been performed in Cameroon. For one region, the mean concentration is 1280 Bq /m^3. There may be a radon exposure for workers in this region, but this has not been investigated.
(1)	**BASIS: GSR Part 3 Para 3.68 to 3.116** *define the requirements for occupational exposure.*
(2)	**GSR Part 3 Para 5.27 states that** "*The regulatory body or other relevant authority shall establish a strategy for protection against exposure due to 222Rn in workplaces[…]*"
S10	**Suggestion: NRPA should consider performing further studies to determine radon concentrations, especially in workplaces.**

Workers' health surveillance

Provisions for workers' health surveillance are made only in the medical field. The IRRS team was also informed that the regulation in this respect is not applicable in practice to public hospitals as civil servants in Cameroon do not benefit from any occupational health service.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Although Arrêté 1151 requires that health surveillance be perfomed every year for medical workers, it was explained that it is not applicable to workers in the public hopitals.
(1)	**BASIS: GSR Part 3 para 3.76 states that "***The government or the regulatory body shall establish and enforce requirements to ensure that protection and safety is optimized for occupational exposure."*
(2)	**BASIS: GSR Part 3 para 3.76 states that "***Employers, registrants and licensees shall ensure, for all workers engaged in activities in which they are or could be subject to occupational exposure, that […](f)Necessary workers' health surveillance and health services for workers are provided.*"
R44	**Recommendation: The Government should make the necessary arrangements so that necessary health surveillance is provided to all occupationally exposed workers.**

Information, instruction and training

Decree 2002/250 mentions that NRPA is in charge for organizing radiation protection training. Arrêté 1152 mentions that the radiation technologists must have received the required radiation protection training, but the contents of this training and who is able to deliver it is not mentioned. A very brief mention of the licensee being required to inform workers of "the risk liked to X-ray exposure" is made in Arrêté 1152. It is also mentioned that the Radiation Protection Officer (RPO) is in charge of participation in safety training of the workers. Licences issued indicate that the licensee is in charge of the radiation protection training of the workers.

NRPA has delivered some radiation protection training for workers in the past, such as a course in 2011 for RPOs, but there doesn't seem to be any clearly defined frequency currently for these trainings. Overall, the requirements on this aspect are insufficiently addressed by the current regulation/Arrêté and the training capabilities are low.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: There is no periodic specialized training course available for radiation protection officers in Cameroon. NRPA has given a RPO course once in 2011. Re-training by the RPO is not explicitly included in the radiation protection regulatory framework, and no information of the contents of the radiation protection training to be delivered is available.
(1)	**BASIS: GSR Part 3 para. 2.22 states that** *"The government shall ensure that arrangements are in place for the provision of the education and training services required for building and maintaining the competence of persons and organizations that have responsibilities relating to protection and safety"*
(2)	**BASIS: RS-G-1.4 Part 3 para. 2.6 states that** "*The regulatory body should provide guidance on qualification requirements for each category of job found in particular practices or intervention situations. This guidance should address the minimum educational level, minimum training and retraining requirements and minimum experience for each job category. In addition, the regulatory body should enforce regulations concerning the recognition of qualifications or authorization processes relating to certain duties and/or responsibilities, such as those of radiation protection officers. Alternatively, the regulatory body should review and approve, if appropriate, proposals regarding training requirements made by employers, registrants and licensees"*
(3)	**BASIS: RS-G-1.4 para. 3.37 states that:** "*Training of workers in protection and safety should be a well established part of the overall programme on radiation protection. The training should be tailored to the particular radiation application and the type of work performed and should be designed so that a worker develops the necessary skills to work safely. The training programme should ensure that all workers receive adequate and up to date information on the health risks associated with their occupational exposure […]. It should also include local rules, safety and warning systems, and emergency procedures […]*"
(4)	**BASIS: RS-G-1.1 para. 5.100 states that:** "*[…]Periodic retraining should be provided to ensure that workers have the most up to date knowledge relevant to their work, and that they do not become complacent about workplace hazards. Retraining should also be undertaken when there are significant changes in policy or procedures. Training should be updated at regular intervals"*
S11	**Suggestion: NRPA should consider, in consultation with the relevant training course providers and possibly at the international level, establishing arrangements to support the availability of authorized radiation protection training courses for Radiation Protection Officers.** **The radiation protection framework should also include more clear provisions for the re-training of occupationally exposed workers by the Radiation Protection Officers. NRPA should consider providing guidance on the contents of this training.**

- Monitoring programmes and technical services

NRPA through monitoring workers has been able to evaluate the compliance with the dose limits for those workers. Several occurrences of individual dose exceeding dose limits have already been reported. In such cases, NRPA sends a letter to the licensee indicating that the worker in question is no longer to be exposed, and sends a team of inspectors to investigate (this procedure is not however yet documented).

It was explained to the IRRS team that the licence requirements do not systematically include the review of the programmes for monitoring of the workers. On the contrary, NRPA refuses to provide dosimeters to workers in facilities that are not licensed yet. As a result, many occupationally exposed workers are currently not monitored.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: It was explained that a licence can be issued even though individual monitoring service is not available to the radiation workers. On the contrary, it is required to have a licence to obtain individual dosimeters from NRPA.
(1)	**BASIS: GSR Part 3 Para 3.72 states that** "*Before authorization of a new or modified practice, the regulatory body shall require, as appropriate, and review supporting documents from the responsible parties that state (b)[…] programmes for monitoring of workers for occupational exposure in all operational states and in accident conditions.*"
(2)	**BASIS: GSR Part 3 Para 3.73 states that** "*The regulatory body shall be responsible, as appropriate, for (a) establishment and enforcement of requirements for the monitoring, recording and control of occupational exposures in planned exposure situations in accordance with the requirements of these Standards."*
R45	**Recommendation: NRPA should review supporting documents from the responsible parties describing programmes for monitoring of workers before granting authorizations and make sure that requirements for the monitoring of occupational exposures are applied in all facilities.**

The regulatory framework establishes the requirements for monitoring of occupational exposure, but only in the medical field. It is mentioned in the regulation/Arrêté that NRPA is responsible for recording the data. "Approved dosimetry institutions" are mentioned but how those service providers are approved is not described in the regulation/Arrêté, nor how the dosimetric results are sent to the national record, in case the service provider is not based in Cameroon.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: Some licensees choose to contract with foreign dosimetry service providers. The regulations do not define the approval process of such services and how the dosimetric results should then be forwarded to NRPA, which is in charge of keeping.dose records.
(1)	**BASIS: GSR Part 3 para 3.73 states that** "*The regulatory body shall be responsible, as appropriate, for […] (c) authorization or approval of service providers for individual monitoring and calibration services; […] (e) provision for maintaining exposure records[…]"*
R46	**Recommendation: NRPA should define the process for approval of dosimetry service providers as well as the requirements regarding transmission of dosimetry results to the national record.**

NRPA provides individual monitoring service and the frequency of dosimeter exchange is one month for all facilities, except for two facilities for which the frequency is three months and one of which is an industrial facility from another country.

RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES	
	Observation: The frequency of dosimeter exchange is not consistently related to the risks associated with the activities performed.
(1)	**BASIS: RS-G-1.3 para. 3.16 states that "**[…]*The frequency of dosimeter exchange should be established by the dosimetry service depending on the type of work being performed and the anticipated exposure associated with the work, and the characteristics of the dosimeters and the overall limit of detection of the dosimetry system. […]Exchange frequencies can range from daily, in special operations, to every six months, if the exposure is expected to be very low, but exchange periods of one to three months are typical.[…]"*
S12	**Suggestion: NRPA should consider defining and applying precise rules and procedures regarding the frequency of dosimeter exchange, for each type of activity.**

11.3. SUMMARY

Publication of the three Arrêtés has allowed the regulatory framework for medical and occupational exposure to progress in a significant way. NRPA has set up a dosimetry service and performs quality control of medical radiation equipment. However, the currently available regulations do not fully comply with GSR Part 3 requirements regarding medical and occupational exposure and will have to be revised and completed.

In particular, the current regulations do not ensure that workers from the medical and non medical fields are entitled to the same level of protection and broad access to individual monitoring, even to workers employed in facilities that are not currently having an authorization.

With regard to medical exposure, priority would need to be given to defining practical measures allowing to increase patient protection, such as optimization of doses delivered to volumes other than the target volumes in radiotherapy, defining requirements on the sufficiency of medical and paramedical personnel, validating criteria for quality control compliance, and enforce requirements.

APPENDIX I LIST OF PARTICIPANTS

INTERNATIONAL EXPERTS			
1.	**LUND** Ingemar	Swedish Radiation Safety Authority (SSM)	Ingemar.Lund@ssm.se
2	**ARSHAD** Naeem	Pakistan Nuclear Regulatory Authority	naeem.arshad@pnra.org
3.	**RUEL** Delphine	ASN (Nuclear Safety Authority)	Delphine.RUEL@asn.fr
4.	**THIRY** Jean-Claude	Ministry of Health, Department of Radiation Protection	Jean-claude.thiry@ms.etat.lu
5.	**SEVERA** Reward	Radiation Protection Authority of Zimbabwe	rsevera@rpaz.co.zw
6.	**ZOMBORI** Peter	Senior Expert, Hungary	Petezombori@gmail.com
IAEA STAFF MEMBERS			
1.	**HAILU** Teodros	Division of Radiation, Transport and Waste Safety	T.Hailu@iaea.org
2.	**KHARITA** Mohammad Hassan	Division of Radiation, Transport and Waste Safety	H.Kharita@iaea.org
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LIAISON OFFICER			
1.	**NDONTCHUENG** Moyo	Liaison Officer	ndomomau@yahoo.fr
2.	**SAMBA** Richard NDI	Deputy Liaison Officer	samba_ndi@yahoo.co.uk

APPENDIX II MISSION PROGRAMME

IRRS MISSION PROGRAMME	
Sunday, 12 October 2014	
IRRS Initial IRRS Review Team Meeting	
13:30 - 18:30	Opening remarks by the IRRS Team Leader (Mr Ingemar Lund) Introduction by IAEA Self-introduction of all attendees IRRS Process (IAEA) Report writing (IAEA) Schedule (TL, IAEA) First impression from experts arising from the Advanced Reference Material (ARM) (All Experts) Administrative arrangements (NRPA IRRS Liaison Officer, IAEA): Detailed Mission Programme
Monday, 13 October 2014	
IRRS Entrance Meeting	
09:00 – 12.00	09:00 Arrival, registration, 09:30 Welcoming Address 09:45 IAEA Team Coordinator – The IRRS programme 10:00 IRRS Team Leader – Expectations for the Mission and introduction of the IRRS Team 10:30 Coffee 11:00 NRPA presentation – Regulatory Overview, SARIS results (strength, challenges, action plan) 11:45 Questions
12:00 – 13:30	Lunch
13:30 – 17:00	Interviews and Discussions with Counterparts NRPA (parallel discussions)
17:00 - 18:00	Daily IRRS Review Team meeting
Tuesday, 14 October 2014	
Daily Discussions / Interviews	
09:00 – 17:00	Interviews and discussions with counterparts NRPA (parallel discussions)
09:00 – 12:00	Interviews and discussions with counterparts NRPA (parallel discussions)
12:00 – 13:30	Lunch
15:00 - 19;30	Site visit to Douala; travel
17:00 – 18:00	Daily IRRS Review Team meeting
Wednesday, 15 October 2014	
Daily Discussions / Interviews	
09:00 – 17:00	Follow-up interviews and discussions with counterparts NRPA for all modules
12:00 – 13:00	Meetings with Minister of Scientific Research and Innovations and Chair Person of the NRPA (TL, TC, NA)
13:00 – 14:00	Lunch
14:00 – 15:00	Meeting with the Secretary General of the Prime Minister (TL, TC, NA)
Site Visits	
08:30 – 13:30	Visit to medical facility (Nuclear Medicine-General Hospital Yaoundé, Diagnostic Radiology- Central Hospital Yaoundé).
08:00 – 17:00	Visit to Industrial facility (Industrial Radiography-SODIP) and Radiotherapy-(General Hospital Douala) and travel back
12:00 – 13:30	Lunch

IRRS MISSION PROGRAMME	
13:30 – 17:00	Report preparation
17:00 – 18:30	Daily IRRS Review Team meeting
Thursday, 16 October2014	
Daily Discussions / Interviews	
09:00 – 17:00	Follow-up Interviews and discussions with counterparts NRPA (parallel discussions)
12:00 – 12:30	Lunch
13:30 – 16:00	Policy issue discussion:
16:00 – 18:00	Daily IRRS Review Team Meeting: observations, basis, recommendations, suggestions and good practices
Friday, 17 October 2014	
09:00 – 18:00	Report preparation
Saturday, 18 October 2014	
Daily Discussions/ Interviews (if needed)	
09:00 – 10:30	Cross reading
10:30 – 12:30	Finalizing draft to be sent to NRPA by mid-day.
Sunday, 19 October 2014	
09:00 –	NRPA review the draft
Monday, 20 October 2014	
Daily Discussions/Report Review	
08:00 – 10:00	NRPA submit comments
10:00 – 12:00	Meeting with the Secretary General of the Presidency of the Republic (TL, TC, NA)
12:00 – 15:00	Report finalization by the team and handover the report to NRPA
Tuesday, 21 October 2014	
Exit Meeting	
09:00 – 11:00	IRRS Exit meeting, opening remarks by DG of NRPA
	Main findings of the IRRS mission (Team Leader)
	Closing Remarks by Cameroon and response to the Mission findings.
11:00 – 12:00	Press Conference

APPENDIX III SITE VISITS

Facilities visited

Nuclear Medicine - General Hospital Yaoundé

Diagnostic Radiology – Central Hospital Yaoundé

Industrial Radiography (SODIP), Douala and

Radiotherapy – General Hospital Douala

APPENDIX IV LIST OF COUNTERPARTS

IRRS EXPERTS	COUNTERPART
RESPONSIBILITIES AND FUNCTIONS OF THE GOVERNMENT, GLOBAL SAFETY REGIME	
Ingemar Lund Naeem Arshad	Pulcherie Chakam Jean Mbida Ehongo Evina
RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY	
Ingemar Lund Naeem Arshad	Pulcherie Chakam Jean Mbida Ehongo Evina
MANAGEMENT SYSTEM	
Ingemar Lund Naeem Arshad	Pulcherie Julie Tagheu Chakam Jean Mbida Joseph Marie Ehongo Evina
AUTHORIZATION	
Jean-Claude Thiry Reward Severa	Jean Felix Ateba Beyala Blaise Yimele Etienne Mapel
REVIEW AND ASSESSMENT	
Jean-Claude Thiry Reward Severa	Jean Felix Ateba Beyala Blaise Yimele Etienne Mapel
INSPECTION	
Jean-Claude Thiry Reward Severa	Ateba Beyala Blaise Yimele Etienne Mapel
ENFORCEMENT	
Jean-Claude Thiry Reward Severa	Jean Felix Ateba Beyala Blaise Yimele Etienne Mapel

IRRS EXPERTS	COUNTERPART
REGULATIONS AND GUIDES	
Jean-Claude Thiry Reward Severa	Jean Felix Ateba Beyala Blaise Yimele Etienne Mapel
EMERGENCY PREPAREDESS AND RESPONSE	
Peter Zombori	Lydie Rose Marie Stanislas Mvondo Jean Faustin Sabouang
ADDITIONAL AREAS - MEDICAL EXPOSURE	
Delphine Ruel	Richard Ndi Samba Haieta Calvin Didier Njiki
ADDITIONAL AREAS - OCCUPATIONAL EXPOSURE	
Delphine Ruel	Richard Ndi Samba Haieta Calvin Didie Njiki

APPENDIX V RECOMMENDATIONS, SUGGESTIONS AND GOOD PRACTICES

AREA		R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
1.	**RESPONSIBILITIES AND FUNCTIONS OF THE GOVERNMENT**	R1	The Government should ensure that all fundamental safety principles are incorporated in the Cameroon's national policy and that a documented strategy for the implementation of the safety principles is established.
		R2	The Government should revise the legal and regulatory framework so that all provisions of the international safety standards are addressed in the laws and statutes.
		R3	The Government should revise the existing legislation in order to assign and authorize the NRPA to carry out main regulatory functions of an independent safety authority such as establishing safety criteria, granting authorization, suspension or revoking authorization, review and assessment of safety matters, inspection and enforcement activities.
		R4	The Government should ensure that financial resources allocated to NRPA are sufficient to fulfil its statutory obligations in a timely and adequate fashion**.**
		R5	The Government should include provisions on the prime responsibility for safety in the legal framework and that it should not be delegated. It should be ensured that compliance with regulations and stipulated requirements does not relieve the authorized party of its responsibility for safety.
		R6	The Government should designate responsible organizations and create a system to ensure that protective actions to reduce risks with unregulated sources and past contamination can be carried out.

AREA		R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
		R7	The Government should establish policy and strategy for the decommissioning of facilities, the safe management and disposal of radioactive waste and establish mechanisms to ensure the necessary financial provision for the decommissioning of facilities and management of radioactive waste, disused radioactive sources and radiation generators.
		R8	The Government should analyze the competence needs and the existing available national and international arrangements for education and training. Based on the results of this analysis the government should ensure that mechanisms are put in place to ensure sufficient national competence in relation to safety.
		R9	The Government, with the technical support of NRPA, should ensure that, as appropriate, calibration of equipment as well as quality control and traceability to standards, is available.
2.	**GLOBAL NUCLEAR SAFETY REGIME**	S1	The Government should consider becoming a party to the relevant safety conventions.
		S2	NRPA should consider to systematically evaluate operational experience including from other States, and to establish a procedure for the dissemination of all significant operating experience to relevant authorized parties.
3.	**RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY**	R10	The regulatory body should develop a strategy and documented procedures to prevent or resolve any conflicts of interest in its work or in the interface with external parties.
		R11	NRPA should perform a human resources needs assessment and establish and implement a specific programme on the basis of the analysis in order to recruit sufficient staff, and develop and maintain necessary competence and skills.
		S3	NRPA should consider making arrangements to obtain technical or other

AREA		R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
			expert professional advice as necessary in support of its regulatory functions
		GP1	NRPA is using the latest version of RAIS 3.3 to integrate main safety related records, e.g. radiation sources and generators data, records of occupational doses and inspection reports. This enables NRPA to use a single integrated tool to maintain safety related records of facilities and activities which will enable efficient and effective record keeping.
		R12	NRPA should establish appropriate means of informing interested parties, the public and the news media about its activities and radiation risks associated with facilities and activities.
		R13	NRPA should ensure that the authorized party informs the public about the possible radiation risks associated with the operation of a facility or the conduct of an activity and that this obligation is specified in the regulations issued by the regulatory body.
4.	**MANAGEMENT SYSTEM OF THE REGULATORY BODY**	R14	NRPA should establish and implement an integrated management system. The management system should include and address the following elements: ▪ The mission of NRPA, its vision and core values, policy statements, goals and strategies; ▪ Responsibilities, accountabilities, levels of authority and interactions among those managing, performing and assessing work; ▪ Management commitment to safety; ▪ Safety culture; ▪ Resources management; ▪ Training programme; ▪ A graded approach in the regulatory work; ▪ Core and support processes to achieve the mission and goals of NRPA; ▪ Monitoring and evaluation of the effectiveness of the management processes;

AREA		R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
			▪ Self-assessment, independent assessment, external audit and improvements.
		S4	The regulatory body should consider establishing control of documents and control of records to assure preservation of information and records.
5.	**AUTHORIZATION**	R15	The Government should empower the regulatory body to authorize facilities, and the regulatory body should develop an action plan to have all facilities and activities, covered by an authorization.
		R16	The regulatory body should apply a comprehensive approach to authorization, and ensure that the authorization system covers the entire lifetime of a facility and activity.
		R17	The regulatory body should review its system of providing safety assessments for applicants for authorization and should encourage the applicants to have an independent verification of the safety assessment realized through different mechanisms.
		R18	The regulatory body should involve relevant interested parties in the authorization process, through information or consultation, in accordance with a graded approach.
		R19	The Government and regulatory body should ensure that a safe storage of the disused sources is guaranteed, and find arrangements for their final disposal, including also orphan sources.
6.	**REVIEW AND ASSESSMENT**	R20	The regulatory body should develop and implement procedures for the review and assessment that it conducts.
		R21	The Government should make arrangements to ensure the availability of the necessary professional training programs for maintaining competence and availability of a sufficient number of suitably qualified staff for all parties with responsibilities for the safety of facilities and activities. The regulatory body should develop a training programme to enhance the

AREA		R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
			capacity of its staff in review and assessment.
		R22	The regulatory body should develop relevant regulations and/or guidance for review and assessement and for safety assessment by the licensees.
7.	**INSPECTION**	R23	The regulatory body should make arrangements to ensure that all inspectors undergo training, and are officially appointed to carry out their duties. The inspectors should also be organized in a way that they make inspections regularly in order to benefit from continuous experience.
		R24	The regulatory body should finalize and approve the inspection guidelines and include criteria as a guidance to ensure that all the inspections are carried out according to common standards.
		R25	The regulatory body should make arrangements for periodic calibration of their measurement equipment, including the marking of the calibration validity.
8.	**ENFORCEMENT**	S5	The regulatory body should consider taking the necessary steps to establish an enforcement regulation as provided for under section 14 of Law No. 95/08.
		R26	The Government should provide necessary provisions in the legislation for the regulatory body to require for corrective actions when necessary. The regulatory body should establish criteria for taking such corrective actions.
		R27	The Government should revise the legislation and provide the regulatory body with comprehensive enforcement tools in the legal framework. The regulatory body should establish and implement an enforcement policy within the existing legal framework and revise it accordingly when the legislation is revised.
9.	**REGULATION AND GUIDES**	R28	The regulatory body should establish or adopt regulations and guides to cover all aspects for all facilities and activities.

AREA		R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
		R29	The regulatory body should review and revise regulations and guides as necessary to keep them up to date.
		R30	The regulatory body should actively promote its regulations and guides to all interested parties and make the regulations available.
10.	**EMERGENCY PREPAREDNESS AND RESPONSE**	R31	The regulatory body should develop regulations that clearly define the licensee's responsibility to establish emergency preparedness and response capabilities commensurate with the hazards of the given practice.
		S6	The regulatory body should consider initiating the amendment of Decree 98/31, to include NRPA in the list of the National Crisis Committee members, as the main government organization responsible for radiation emergency preparedness and response.
		R32	The regulatory body should develop regulatory and guidance documents for the applicants/licensees to perform threat assessment, on which their EPR arrangements will be based.
		S7	The regulatory body should extend its threat assessment beyond the threat categorization of sources registered in RAIS, to cover all possible radiation emergency scenarios.
		R33	The regulatory body should develop regulatory and guidance documents for the applicants/licensees to establish appropriate emergency management and operations.
		R34	The regulatory body should develop regulatory and guidance documents for the applicants/licensees to classify the emergency in consistency with GS-R-2 and to notify the regulatory body within a well-defined time period.
		R35	The regulatory body should develop generic and operational intervention and action levels, in accordance with the international standards.

AREA		R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
		R36	The regulatory body should develop regulations for the protection of emergency workers (both on-site and off-site), in accordance with the international standards.
		R37	The regulatory body should develop the necessary requirement regulating the recovery operation and facilitating the smooth transition to normal social and economic conditions.
		GP2	The guidance given by the regulatory body to the applicants of various radiation applications is a good practice that promotes the development of standardized emergency plans for different facilities.
		R38	The regulatory body should develop regulatory requirements for EPR quality assurance programme to be established and maintained by the licensees.
		S8	The regulatory body should consider finalizing the draft national radiation emergency plan and forward it to the relevant national authorities for review and approval.
11.	**CONTROL OF MEDICAL EXPOSURES**	R39	NRPA should complete the regulatory requirements on medical exposure, making sure that they are compliant with GSR Part 3. Some of this framework should be developed in consultation with the Ministry of Health and relevant professional bodies.
		R40	The Government should revise Arrêté 1152 and replace the maximal skin entry doses with diagnostic reference levels. NRPA should also define how to use these values as optimization tools and control the implementation of this requirement.
		R41	NRPA should formalize the requirements for optimization of doses delivered to radiotherapy patients and enforce them.

AREA		R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
		S9	NRPA should consider ensuring that graded frequencies are applied for Quality Control, in accordance with the complexity of the radiological procedures being performed and the associated risks.
		R42	NRPA should formalize its acceptance criteria for quality control results and define and implement an enforcement policy for devices that are outside tolerance limits.
11.	**OCCUPTIONAL RADIATION PROTECTION**	R43	NRPA should revise the regulatory framework for occupational exposure for consistency and completeness with respect to GSR Part 3, in particular making it consistent in the medical and non-medical fields so that all workers are entitled to the same level of protection. The dose limit to the lens of the eye should be updated accordingly.
		S10	NRPA should consider performing further studies to determine radon concentrations, especially in workplaces.
		R44	The Government should make the necessary arrangements so that necessary health surveillance is provided toall occupationally exposed workers
		S11	NRPA should consider, in consultation with the relevant training course providers, and possibly at the international level, establishing arrangements to support the availability of authorized radiation protection training courses for RPOs. The radiation protection framework should also include more clear provisions for the re-training of occupationally exposed workers by the RPO. NRPA should consider providing guidance on the contents of this training.
		R45	NRPA should review supporting documents from the responsible parties describing programmes for monitoring of workers before granting authorizations and make sure that requirements for the monitoring of occupational exposures are applied in all facilities.

AREA		R: Recommendations S: Suggestions G: Good Practices	Recommendations, Suggestions or Good Practices
		R46	NRPA should define the process for approval of dosimetry service providers as well as the requirements regarding transmission of dosimetry results to the national record.
		S12	NRPA should consider defining and applying precise rules and procedures regarding the frequency of dosimeter exchange, for each type of activity.

APPENDIX VI REFERENCE MATERIAL USED FOR THE REVIEW

Advance Reference Material provided by Cameroon

1. 03 industrial Inspection Reports
2. 04 Medical Inspection Reports
3. 06 Inspection Checklists
4. 2013 NRPA activities report;
5. Accord MINSANTE-ANRP (MoU)
6. African nuclear weapon-free zone, treaty pelindaba, signed in 1996 and ratified in 2010;
7. African regional co-operative agreement for research, development and training related to nuclear science and technology, party in 2010;
8. Agreement on the privileges and immunities of the IAEA, party in 1988
9. Annual report 2013 of NRPA
10. Arrêté N°037/PM of 19 March 2003
11. Arrêté set procedure for radioactive waste management (draft)
12. Bamako Convention on the Ban of the Import into Africa and the Control of Transboundary Movement and Management of Hazardous Wastes within Africa signed in 1991 and ratified in 1994
13. Board resolution no 00012/CA/ANRP of 28th July 2010
14. Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency signed in 1987 and ratified in 2006
15. Convention on Early Notification of a Nuclear Accident signed in 1987 and ratified in 2006
16. Convention on the physical protection of nuclear material, party in 2004
17. Decree No. 2010/024 of 28 January 2010 appointing the Director-General of the National Radioprotection Agency
18. Decree No. 2014/225 of 14 July 2014 appointing the members of the Board of the National Radioprotection Agency
19. Decree on the establishment, organization and functioning of the National Radiation Protection Agency (N°2002/250, 31 October 2002)
20. Decree on the protection of people and the environment against the harmful effects of ionizing radiation from natural and contaminated scrap from sensitive facilities for orphan radioactive sources (draft)
21. Draft law on the general framework of radiation safety, nuclear safety and safeguards implementation and its implementing decree
22. Draft law on the general framework of radiation safety, nuclear safety and safeguards implementation and its implementing decree
23. Draft of decree setting out procedures for management of radioactive waste;
24. Draft of Decree setting out procedures for monitoring high-activity of sealed sources ;
25. Draft of decree setting out the conditions for obtaining an approval of laboratory measurements of radioactivity in the environment;
26. Draft of dosimetric monitoring guide ;
27. Draft of guide on the use of dosimeters ;
28. Draft of inspection guide for interventional radiology for medical purposes ;
29. Draft of national strategy for radioactive waste management;
30. Draft of NRPA intervention procedures;
31. Draft of orphan sources research guide ;
32. Draft of procedural guide on dosimetry;
33. Draft of procedural guide on Internal quality control;
34. Draft of procedural guides on regulatory and technical requirements of radiation protection for diagnostic x-ray applications ;
35. Draft of sealed sources guides ;
36. Emergency plan model for well-logging;

37. Emergency plan model for industrial radiography;
38. Emergency plan model for Nuclear Gauge;
39. Emergency plan model for nuclear medicine;
40. Emergency plan model for radiotherapy;
41. Emergency plan model for X-Ray generator;
42. FNRBA Agreement;
43. Framework Law related to the Environmental Management (n°96/12, 5 August 1996);
44. Import-export guide;
45. Inspection checklist of NRPA;
46. Joint protocol relating to the application of the Vienna Convention and the Paris convention signed in 1988 and ratified in 1991
47. Law N° 96/03 january 1996 in the field of health
48. Law N° 98/015 of 14 june 1998 relating to establishments classified as dangerous, unhealthy or obnoxious
49. Law No 95/08 of 30 January 1995 on Radiation Protection
50. List of inspections (numbers by practices type) carried out 2013
51. NRPA Authorization system
52. NRPA Draft Inspection of Regulated Activities procedure
53. NRPA Draft Procedures and guidance governing inspection
54. NRPA Draft Procedures and guidance governing inspection
55. NRPA Enforcement Policy (draft)
56. NRPA Guide on Quality Control of X Ray Machines and Draft Guidance material relating to Diagnostic Reference Levels for patient protection
57. NRPA Inspection Checklists
58. NRPA Procedure for response
59. NRPA SELF ASSESSMENT SUMMARY
60. Arrêté N° 1150/A/MINSANTE of 11th June 2013 on conditions for delimitation and signalisations of zones and safety,
61. Arrêté N° 1151/A/MINSANTE of 11th June 2013 on monitoring of workers and patients,
62. Arrêté N° 1152/A/MINSANTE of 11th June 2013 on authorization for opening and utilisation of X-ray applications and applications involves used of radioactive sources,
63. Organizational chart of NRPA
64. Planned inspection programme for 2013
65. Planned inspection programme for 2014
66. Quality control guide for X-Rays;
67. Radiation Protection Law (N°95/08)
68. Revised supplementary agreement concerning the provision of technical assistance by the IAEA signed in 1981;
69. Safety and security of radioactive sources guide;
70. SARIS 2014 Report
71. System of notification and authorization system of NRPA.
72. The decree of creation of the National Radiation Protection Agency
73. The law on radiation protection
74. Threats categorization in Cameroon
75. Vienna convention on civil liability for nuclear damage, party in 1977

APPENDIX VII IAEA REFERENCE MATERIAL USED FOR THE REVIEW

1. INTERNATIONAL ATOMIC ENERGY AGENCY - No. SF-1 - Fundamental Safety Principles
2. INTERNATIONAL ATOMIC ENERGY AGENCY - Governmental, Legal and Regulatory Framework for Safety General Safety Requirement Part 1 (Vienna2010)
3. INTERNATIONAL ATOMIC ENERGY AGENCY - Preparedness and Response for a Nuclear and Radiological Emergency Safety Requirement Series No. GS-R-2 IAEA Vienna (2002)
4. INTERNATIONAL ATOMIC ENERGY AGENCY The Management System for Facilities and Activities. Safety Requirement Series No. GS-R-3 IAEA, Vienna (2006)
5. INTERNATIONAL ATOMIC ENERGY AGENCY – Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, General Safety Requirements Part 3, 2014 edition
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 Using Radioactive Material Safety, Safety Requirement Series No. WS-R-5, IAEA, Vienna (2006)
9. 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)
10. 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)
11. 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)
12. INTERNATIONAL ATOMIC ENERGY AGENCY - Documentation for Use in Regulatory Nuclear Facilities, Safety Guide Series No. GS-G-1.4, IAEA, Vienna (2002)
13. INTERNATIONAL ATOMIC ENERGY AGENCY- - Arrangements for Preparedness for a Nuclear or Radiological Emergency, Safety Guide Series No. GS-G-2.1, IAEA, Vienna (2007)
14. 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)
15. INTERNATIONAL ATOMIC ENERGY AGENCY– Assessment of Occupational Exposure Due to Intake of Radionuclides Safety Guide Series No. RS-G-1.2, IAEA, Vienna (1999)
16. 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)
17. INTERNATIONAL ATOMIC ENERGY AGENCY - Building Competence in Radiation Protection and the Safe Use of Radiation Sources, Safety Guide Series No. RS-G-1.4, IAEA, Vienna (2001)
18. INTERNATIONAL ATOMIC ENERGY AGENCY – Classification of Radioactive Waste, General Safety Guide No. GSG-1, IAEA, Vienna (2009)
19. INTERNATIONAL ATOMIC ENERGY AGENCY – Regulatory Control of Radioactive Discharge to the Environment, Safety Guide Series No. WS-G-2.3, IAEA, Vienna (2000)
20. 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)
21. INTERNATIONAL ATOMIC ENERGY AGENCY - Convention on Early Notification of a Nuclear Accident (1986) and Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (1987), Legal Series No. 14, Vienna (1987).

APPENDIX VIII ORGANIZATIONAL CHART