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INTEGRATED REGULATORY REVIEW SERVICE (IRRS)

FOLLOW UP MISSION

TO

THE REPUBLIC OF ZIMBABWE

Harare, Zimbabwe

23 to 28 May 2022

DEPARTMENT OF NUCLEAR SAFETY AND SECURITY

Integrated Regulatory Review Service
IRRS

INTEGRATED REGULATORY REVIEW SERVICE (IRRS)
FOLLOW-UP REPORT
TO
REPUBLIC ZIMBABWE

Mission date:	*23 May to 28 May 2022*
Regulatory body:	*Radiation Protection Agency Zimbabwe (RPAZ)*
Location:	*Harare*
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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IAEA – May 2022

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 Zimbabwe, an international team of senior safety experts met with representatives of the Radiation Protection Authority of Zimbabwe (RPAZ) from 23 to 28 May 2022 to conduct an Integrated Regulatory Review Service (IRRS) follow-up mission. The purpose of the IRRS follow-up mission was to review Zimbabwe's progress in implementing the recommendations and suggestions identified in the initial IRRS mission, which was carried out from 9 to 18 November 2014. The follow-up mission took place at the headquarters of RPAZ in Harare. The scope of the IRRS follow-up mission was the same as the scope of the initial mission in 2014, namely the regulatory framework for all facilities and activities in Zimbabwe. The mission was also used as an opportunity to exchange information and experience between the IRRS review team and the RPAZ counterparts in the areas covered by the IRRS.

The IRRS team consisted of six senior regulatory experts from five IAEA Member States, and two IAEA staff members. The IRRS team carried out a review of the progress made on each recommendation and suggestion that was documented in the 2014 IRRS mission report. These recommendations and suggestions cover 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 and content of regulations and guides; emergency preparedness and response; control of medical exposure and occupational radiation protection.

At the request of RPAZ, the IRRS Follow-up mission included a policy issue discussion during which members of the IRRS team and senior staff of RPAZ shared views and regulatory experiences regarding topics related to "Diagnostic reference levels and patient protection".

Throughout the mission, the IRRS team was extended full cooperation in regulatory, technical and policy issues by all parties; in particular the staff of RPAZ provided the fullest practicable assistance and demonstrated extensive openness and transparency.

To assess progress, the IRRS team conducted a series of interviews and discussions with RPAZ staff and reviewed the advanced reference material provided by RPAZ. The IRRS team concluded that Zimbabwe has been responsive to each recommendation and suggestion made in 2014 and continues to place appropriate focus on implementing a framework that provides for effective radiation protection and safety for workers, patients, the public and the environment. Twenty out of 25 recommendations and six out of ten suggestions identified in 2014 have been closed. During the follow-up mission, the IRRS team formulated one new recommendation and two new suggestions.

The IRRS team noted that considerable improvement of the national legal and regulatory infrastructure for radiation safety has been made since the initial mission; in particular, the strengthening of the legal framework for radiation safety in the country. Significant achievements were also noted in other safety areas.

Since 2014, Zimbabwe has taken positive steps and has made a number of achievements in the following areas:

- A new Radiation Protection Bill and regulations that address the provisions of the international safety standards have been drafted and are near completion.
- Zimbabwe has ratified a significant number of international instruments related to nuclear safety and radiological protection.
- The new organizational structure of RPAZ ensures an effective separation of regulatory functions from the provision of technical services.
- A new radioactive waste management facility is under construction and commissioning and licensing is planned for the fourth quarter of 2022.
- The Management System of RPAZ has been improved by the development and implementation of a management system manual addressing a graded approach to regulatory functions.

- RPAZ has made significant progress in developing guidance documents that apply to the core functions of the regulatory body.
- RPAZ, in collaboration with the Department of Civil Protection and other relevant government agencies, has made significant enhancements to the status of emergency preparedness and response.

The IRRS team identified areas, including new findings, warranting attention or needing improvement.

The Government of Zimbabwe is encouraged to continue its efforts and take further action for:

- Developing a national policy and strategy for safety.
- Providing for building and maintaining the national arrangements for education and training in radiation protection and safety.
- Promulgating the draft Radiation Protection Bill 2022 and the draft National Nuclear and Radiological Emergency Plan.

RPAZ is encouraged to continue its efforts and take further action for developing:

- Specific guidance for the activities and facilities to be either exempted or authorized by notification.
- Regulations for transport and emergency preparedness and response
- MoUs with other authorities involved in the transport of radioactive materials.

The specific findings of the follow-up mission are summarized in Appendices IV and V.

A press release was issued by the IAEA at the end of the mission.

I. INTRODUCTION

At the request of the Government of Zimbabwe, an international team of senior safety experts met representatives of the Radiation Protection Authority of Zimbabwe (RPAZ) from 23 to 28 May 2022 to conduct an Integrated Regulatory Review Service (IRRS) follow-up mission. The mission tool place at headquarters of RPAZ in Harare. The purpose of this peer review was to review the Zimbabwe's progress against the recommendations and suggestions identified in the initial IRRS mission which was carried out from 9 to 18 November 2014.

The IRRS mission was formally requested by the Government of Zimbabwe in March 2020. A preparatory mission was conducted 7 to 8 March 2022 at RPAZ in Harare to discuss the purpose, objectives, and detailed preparations of the follow-up review in connection with regulated facilities, activities and exposure situations in Zimbabwe and their related safety aspects and to agree the scope of the IRRS follow-up mission.

The IRRS team consisted of 6 senior regulatory experts from 5 IAEA Member States, 1 IAEA staff members and 1 IAEA administrative assistant. The IRRS team carried out the review in the areas covered by the initial mission in November 2014.

In preparation for the IRRS follow-up mission, Zimbabwe conducted a self-evaluation of the status of recommendations and suggestions set out in the initial IRRS mission report and prepared a self-assessment follow-up report accordingly. This report and supporting documentation were provided to the IRRS team as advance reference material (ARM) for the mission. During the mission, the IRRS team performed a systematic review of all topics by reviewing the advance reference material, additional information provided, and by conducting interviews with management and staff of the RPAZ.

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

II. OBJECTIVE AND SCOPE

The purpose of this Integrated Regulatory Review Service (IRRS) follow-up mission was to conduct a review of the of the 25 recommendations and 10 suggestions that were given to Zimbabwe during the IRRS initial mission conducted and carried out from 9 to 18 November 2014 and to exchange information and experience in the areas covered by the IRRS.

The IRRS follow-up mission scope was the scope of the initial mission covering the following areas: responsibilities and functions of the government; responsibilities and functions of the regulatory body; the management system of the regulatory body; the activities of the regulatory body related to regulation of nuclear and radiation facilities and activities, including authorization, review and assessment, inspection, enforcement, the development and content of regulations and guides; emergency preparedness and response; occupational radiation protection; control of discharges; and environmental monitoring for public radiation protection.

The review was carried out by comparison of existing arrangements against the IAEA safety standards.

It is expected that the IRRS follow-up mission will facilitate regulatory improvements in Zimbabwe and other Member States from the knowledge gained and experiences shared between RPAZ Counterparts and IRRS reviewers, and through the evaluation of the effectiveness of Zimbabwe's regulatory framework for radiation safety.

III. BASIS FOR THE REVIEW

A) PREPARATORY WORK AND IRRS TEAM

At the request of the Government of Zimbabwe, a preparatory meeting for the Integrated Regulatory Review Service (IRRS) follow-up mission was conducted from 7 to 8 March 2022. The preparatory meeting was carried out by the appointed Team Leader Ms Patricia Holahan, and the IRRS IAEA Team Coordinator Mr Juan Tomas Zerquera and representative of RPAZ.

The IRRS follow-up mission preparatory team had discussions regarding regulatory programmes and policy issues with the senior management of RPAZ represented by Mr Justice Chipuru, Chief Executive Officer, and senior staff of RPAZ. The discussions resulted in agreement that the review will cover the areas covered by the initial mission conducted in November 2014.

- Radiation sources facilities and activities;
- Control of medical exposure;
- Occupational radiation protection;
- Selected policy issues.

Mr Justice Chipuru made presentations on the national context, the current status of RPAZ and the self-assessment results to date.

IAEA staff presented the IRRS principles, follow-up mission process and methodology. This was followed by a discussion on the tentative work plan for the implementation of the IRRS in Zimbabwe in May 2022.

The proposed composition of the IRRS team was discussed and tentatively confirmed. Logistics including meeting and workplaces, counterparts and Liaison Officer identification, proposed site visits, lodging and transportation arrangements were also addressed.

The Liaison Officer for the IRRS follow-up mission was Ms Rujeko Lynette Mpandanyama.

RPAZ provided IAEA with the advance reference material (ARM) for the review at the end of March 2022, in preparation for the mission, the IAEA review team members reviewed the Zimbabwe advance reference material and provided their initial impressions to the IAEA Team Coordinator prior to the commencement of the IRRS mission.

B) REFERENCES FOR THE REVIEW

The relevant IAEA safety standards and the Code of Conduct on the Safety and Security of Radioactive Sources were used as review criteria. The complete list of IAEA publications used as the references for this mission is provided in Appendix VII.

C) CONDUCT OF THE REVIEW

The initial IRRS Follow-up team meeting took place on Sunday, 22 May 2022 in Harare, directed by the IRRS Team Leader and the IAEA Team Coordinator. Discussions encompassed the general overview, the scope and specific issues of the mission, clarified the bases for the review and the background, context and objectives of the IRRS programme. The understanding of the methodology for review was reinforced. The agenda for the mission was presented to the team. As required by the IRRS Guidelines, the reviewers presented their initial impressions of the ARM and highlighted significant issues to be addressed during the mission.

The Liaison Officer Ms Rujeko Lynette Mpandanyama was present at the initial IRRS follow-up team meeting, in accordance with the IRRS Guidelines, and presented logistical arrangements planned for the mission.

The IRRS follow-up mission entrance meeting was held on Monday, 23 May 2022 with the participation of government officials and senior management and staff of RPAZ. Opening remarks

were made by Dr. A. N. Nyakabau Radiation Protection Authority Board Chairperson and Mr. A. T. Chikondo Secretary for Monitoring and Evaluation Office of the President and Cabinet and the Team Leader, Ms Patricia Holahan, gave a presentation on the expectations of the IRRS follow-up mission. Mr. Amos Muzongomerwa gave an overview of RPAZ activities and response to the 2014 intial mission findings.

During the mission, a review was conducted for all the mission scope areas with the objective of reviewing the Government and RPAZ's response to the recommendations and suggestons identified during the initial mission. The review was conducted through meetings, interviews and discussions regarding the national practices and activities.

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

The IRRS exit meeting was held on Saturday, 28 May 2022. The opening remarks at the exit meeting were presented by Dr. A. N. Nyakabau Radiation Protection Authority Board Chairperson and Mr. A. T. Chikondo Secretary for Monitoring and Evaluation Office of the President and Cabinet and were followed by the presentation of the results of the mission by the IRRS Team Leader Ms Patricia Holahan. Closing remarks were made by Mr Peter Johnston, Director of the Division of Radiation, Transport and Waste Safety, Department of Nuclear Safety and Security.

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

1. RESPONSIBILITIES AND FUNCTIONS OF THE GOVERNMENT

1.1. NATIONAL POLICY AND STRATEGY FOR SAFETY

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	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 and policy do not exist.
(1)	**BASIS: GSR Part 1 Req. 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 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 para 2.3 (a) states that** *"…In the national policy and strategy, account shall be taken of…The fundamental safety objective and the fundamental safety principles established in the Fundamental Safety Principles."*
R1	**Recommendation: The government should establish a national policy and strategy for safety to ensure that the Safety Fundamentals are explicitly adopted in a high-level document.**

Changes since the original IRRS mission

Recommendation R1: The government still has not developed a national policy and strategy for safety. However, the draft Radiation Protection Bill 2022 (Bill) that replaces the Act is currently near approval. Some aspects of the policy and strategy have been developed through government directives which are included in the new draft Bill. RPAZ does intend to initiate discussions with the Office of the President and Cabinet concerning development of a national policy and strategy. The government has developed a strategic plan covering all aspects of government, but none is specifically applicable to radiation safety. The law expresses the long-term commitment of the government for safety, the establishment of a regulatory body, and provisions of adequate financial resources.

Status of Recommendation 1

Recommendation (R1): remains open as the government still has not developed a national policy and strategy for safety.

1.2. ESTABLISHMENT OF A FRAMEWORK FOR SAFETY

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: Several elements for an effective governmental and legal framework for safety are missing from the existing law.

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
(1)	**BASIS: GSR Part 1 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:* *(5) Provision for the involvement of interested parties and for their input to decision making;* *(6) Provision for assigning legal responsibility for safety to the persons or organizations responsible for the facilities and activities, and for ensuring the continuity of responsibility where activities are carried out by several persons or organizations successively;* *(11) Provision for appeals against decisions of the regulatory body;* *(12) Provision for preparedness for, and response to, a nuclear or radiological emergency;* *(17) The criteria for release from regulatory control."*
(2)	**BASIS: GS-R-2 para. 3.2 states that** *"The arrangements for emergency response actions both within and outside facilities, if applicable, or elsewhere under the control of the operator, are dealt with through the regulatory process…"*

R2	**Recommendation: The government should ensure that the proposed new law addresses the following issues in accordance with GSR Part 1:**
	• **Assigning prime responsibility for safety to the organised party;**
	• **Ensure that donations, bequests, grants or loans do not create a conflict of interest;**
	• **Explicitly mention regulating the licensees' emergency preparedness and response obligations and capabilities among the functions of the Radiation Protection Authority of Zimbabwe;**
	• **Use of a graded approach in all regulatory activities;**
	• **Involvement of interested parties and for their input to decision making;**
	• **A provision for use of advisory bodies or support organizations in the conduct of the regulatory activities;**
	• **A provision for management of disused and orphan sources and radioactive waste;**
	• **The following items, already identified by the Radiation Protection Authority of Zimbabwe, should be included:**
	  ○ **Regulatory control for ionising radiation;**
	  ○ **System for the administration of safeguards, coordination of nuclear security, control of import/export of radioactive sources and equipment;**
	  ○ **Regulatory control for transport of radioactive materials.**

Changes since the original IRRS mission

Recommendation R2: There is a draft Radiation Protection Bill 2022 that replaces the current Act that addresses the following:

- Clarifies the functions and powers of the Authority as the effectively independent authority for the regulatory control of activities and facilities involving ionising radiation and non-ionising radiation;
- Assigns prime responsibility for safety to the authorized party;
- Ensures that donations, bequests, grants or loans do not create a conflict of interest;
- Explicitly mentions regulating the licensees' emergency preparedness and response obligations and capabilities among the functions of the Radiation Protection Authority of Zimbabwe;
- Uses a graded approach in all regulatory activities;
- Involves interested parties and their input in decision making;

- Provides for use of advisory bodies or support organizations in the conduct of regulatory activities;
- Provides for management of disused and orphan sources and radioactive waste.

The following items, are also included:

- Regulatory control for ionising radiation;
- System for the administration of safeguards, coordination of nuclear security, control of import/export of radioactive sources and equipment;
- Regulatory control for transport of radioactive materials.

The new Bill has been drafted by the Attorney General and has been passed by the cabinet subcommittee and gone to the main Cabinet. Then it will have to be approved by the Parliament and President. It is expected that it will be ready for promulgation in 2023.

Status of Recommendation 2

Recommendation (R2): is closed on the basis of progress made and confidence in effective completion in due time as the Bill, which incorporates the recommended aspects, is nearing final approval and due for promulgation in 2023.

1.3. ESTABLISHMENT OF A REGULATORY BODY AND ITS INDEPENDENCE

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

1.4. COMPLIANCE WITH REGULATIONS AND RESPONSIBILITY FOR SAFETY

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

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

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: The government does not have formalised coordination with all government agencies with responsibilities for radiation safety.
(1)	**BASIS: GSR Part 1 para. 2.18 states that** *"The government shall ensure that there is appropriate coordination of and liaison between the various authorities concerned in areas such as: (1) safety of workers and the public; (2) protection of the environment; (3) applications of radiation in medicine, industry and research; (4) emergency preparedness and response…"*
S1	**Suggestion: The government should consider strengthening coordination between the national authorities having responsibilities for radiation safety.**

Changes since the original IRRS mission

Suggestion S1: Coordination has mainly been achieved through the National Nuclear Security Committee and other activities that require such coordination. Memoranda of Understanding (MoUs) have been signed with the Zimbabwe Revenue Authority, Chemistry on Soils Research Institute, Zimbabwe Republic Police and Environmental Management Agency. MoUs with Research Council of Zimbabwe and Medical Research Council of Zimbabwe are currently underway. None are required with Ministry of Health and Child Care and President's Department. However, no MoUs appear to have been initiated for the transport of dangerous goods with organizations such as the Civil Aviation Authority of Zimbabwe or the Ministry of Labour, Mining, and

Transport. The issues impacting security and safety issues for transport are addressed through the National Nuclear Security Committee. There is an intent in the future to develop MoUs with the other agencies involving transport of dangerous goods. The legal department has engaged regional institutions to develop cooperation agreements.

Status of Suggestion 1

Suggestion (S1): remains open as the remaining MoUs have not been developed for the transport of dangerous goods.

1.6 SYSTEM FOR PROTECTIVE ACTIONS TO REDUCE UNREGULATED RADIATION RISKS

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	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 para. 2.6 states that** *"Where several authorities are involved, the government shall specify clearly the responsibilities and functions of each authority within the governmental, legal and regulatory framework for safety."*
R3	**Recommendation: The government should designate a responsible organization and create a system to ensure that protective actions to reduce risks from unregulated sources and past contamination can be carried out.**

Changes since the original IRRS mission

Recommendation R3: The government through the new Bill designates RPAZ as the responsible organization. Specifically, clause 27 in the draft bill addresses orphan (unregulated) sources and scrap metal to ensure the radioactivity is controlled. However, the team noted there is nothing to specially address past contamination (for example, resulting from damaged sources or legacy sites) in the current Bill.

Status of Recommendation 3

Recommendation (R3): is closed on the basis of progress made and confidence in effective completion in due time as the draft Bill designates RPAZ as the responsible organization for ensuring protective actions to reduce risks from unregulated sources and past contamination.

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

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: The government has no national policy or strategy for radioactive waste management in place and decommissioning of facilities and activities has not been addressed adequately in the framework for safety. Financial aspects are neither addressed for decommissioning nor for waste remediation.
(1)	**BASIS: GSR Part 5, Requirement 1 states that** *"The government shall provide for an appropriate national legal and regulatory framework…"*

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
(2)	**BASIS: GSR Part 5, Requirement 2 states that** *"To ensure the effective management and control of radioactive waste, the government shall ensure that a national policy and a strategy…"*
(3)	**BASIS: GSR Part 1, Requirement 10 states that** *"Provision for the decommissioning of facilities and the management of radioactive waste and of spent fuel. The government shall make provision for the safe decommissioning of facilities, the safe management and disposal of radioactive waste arising from facilities and activities, and the safe management of spent fuel."*
(4)	**BASIS: GSR Part 1 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."*
(5)	**BASIS: GSR Part 1 para. 2.33 states that** *"Appropriate financial provision shall be made for:* *(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."*
R4	**Recommendation: The government should establish a national policy and strategy to include financial provisions for the decommissioning of facilities, the safe management and disposal of radioactive waste.**

Changes since the original IRRS mission

Recommendation R4: The draft Radiation Protection Bill, clause 39, appoints RPAZ to develop a national policy and strategy for radioactive waste management to include safe management and disposal. It also ensures appropriate funding arrangements are in place and to hold in trust for purposes of enabling repatriation, management, and storage or disposal of radioactive sources. Specifically, clause 38 of the draft Bill establishes the Waste Management Fund whose management and control shall be vested to the Board and clause 39 provides what RPAZ should include in the national policy to be approved by the Minister. However, RPAZ still has not taken the action to develop a national policy and strategy until the bill is finalized. Clause 32 of the draft Bill further establishes the obligations of the authority for decommissioning facilities.

Status of Recommendation 4

Recommendation (R4): is closed on the basis of progress made and confidence in effective completion in due time as provisions are made in the draft Bill. However, RPAZ still needs to take action to formally draft the national policy and strategy, and have it approved by the Minister.

1.8. COMPETENCE FOR SAFETY

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: Availability of academic programmes, existing technical centres and various national arrangements for education and training are not sufficient to build and maintain the competence needed by all Zimbabwe parties having responsibilities in relation to safety.
(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."*
(2)	**BASIS: GSR Part 1, 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*

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	programme on the basis of an analysis of the necessary competence and skills...”
R5	**Recommendation: The government should provide for building and maintaining the available national arrangements for education and training to address the competence needs of all parties in relation to safety of facilities and activities, based on proper analysis.**

Changes since the original IRRS mission

Recommendation R5: The government has not developed a provision to build and maintain the available national arrangements for education and training. Individual engagements by the Radiation Protection Authority of Zimbabwe (RPAZ) with research institutes and organizations have been developed through technical support but there is nothing at the national level to require those organizations to participate. RPAZ has developed a graduate training program to take students and train them on radiation related issues as well as the offer is made to students in the medical physics program to work at RPAZ for 1-3 months to give them regulatory experience so that they better understand the regulatory perspectives. The government could request the IAEA to send an Education and Training Advisory (EduTA) mission to the country to help the government establish provisions for education and training.

Status of Recommendation 5

Recommendation (R5): remains open as the government has not developed provisions for building and maintaining the national arrangements for education and training.

1.9. PROVISION OF TECHNICAL SERVICES

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

2. GLOBAL NUCLEAR SAFETY REGIME

2.1. INTERNATIONAL OBLIGATIONS AND ARRANGEMENTS FOR INTERNATIONAL COOPERATION

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: Zimbabwe has not ratified a number of international instruments related to nuclear safety and radiological protection or made a political commitment to the supplementary Guidance on Import and Export of Radioactive Sources.
(1)	**BASIS: GSR Part 1 Recommendation 14 states that** *"The government shall fulfil its respective international obligations, participate in the relevant international arrangements, including international peer reviews, and promote international cooperation to enhance safety globally."*
R6	**Recommendation: The government should ratify the international instruments related to nuclear safety and radiological protection and should demonstrate that respective international obligations are fulfilled by participation in its relevant international arrangements.**

Changes since the original IRRS mission

Recommendation R6: Since the initial mission in 2014, four international conventions and one agreement were concluded and deposited while ratification of six other conventions are underway. The Government of Zimbabwe has also made a political commitment to the supplementary Guidance on Import and Export of Radioactive Sources since the initial mission.

Deposited:

- Convention on the Physical Protection of Nuclear Materials;
- Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency;
- Convention on Early Notification of a Nuclear Accident;
- Joint Convention of Spent Fuel Management and on the Safety and Security of Radioactive Waste Management;
- Additional Protocol to the Comprehensive Safeguards Agreement.

Working on ratification

- Convention on Nuclear Safety;
- Vienna Convention on Civil Liability for Nuclear Damage;
- Joint Protocol Relating to the Application of the Vienna Convention and the Paris Convention;
- Protocol to Amend the Vienna Convention on Civil Liability for Nuclear Damage;
- International Convention for the Suppression of Terrorist Bombings (Terrorist Bombings Convention);
- International Convention for the Suppression of Acts of Nuclear Terrorism (Nuclear Terrorism Convention);

- IAEA Privileges and Immunities;
- Amendment to the Convention on the Physical Protection of Nuclear Material.

RPAZ has actively participated in the Joint Convention. The remaining eight conventions awaiting ratification are expected to be ratified by September 2022.

Status of Recommendation 6

Recommendation (R6): is closed on the basis of progress made and confidence in effective completion in due time as the remaining eight conventions are expected to be ratified by September 2022.

2.2. SHARING OF OPERATING EXPERIENCE AND REGULATORY EXPERIENCE

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: Zimbabwe has signed a Memorandum of Cooperative Arrangements (MCA) for Regulators of Nuclear and Radiation Safety in the Southern African Development Community (SADC).
(1)	**BASIS: GSR Part 1, Requirement 15, para 3.5 states that** *"To enhance the safety of facilities and activities globally, feedback shall be provided on measures that have been taken in response to information received via national and international knowledge and reporting networks."*
GP1	**Good Practice: Being a signatory to the MCA, where 15 nations share information amongst each other through establishment of the voluntary Southern African Development Community Nuclear Regulators Network.**
	Observation: RPAZ has not made arrangements to be actively involved in sharing operational and regulatory experience with authorised parties to enhance safety and improving the regulatory control.
(1)	**BASIS: GSR Part 1 Requirement 15, para. 3.4 states that** *"The regulatory body shall establish and maintain a means for receiving information …. and from authorized parties, as well as a means for making available to other lessons learned from operating experience and regulatory experience."*
S2	**Suggestion: RPAZ should consider establishing a formal process for identifying and sharing lessons learned from operating experience and regulatory experience.**

Changes since the original IRRS mission

Suggestion 2: Although the Southern African Development Community (SADC) Nuclear Regulator's Network platform has been enhanced to share experiences and lessons learned with other regulators, this does not address the need for a formal process to share operational and regulatory experience with authorized parties. Similarly, there is no formal process establishing what information will be shared with the Network Platform, how RPAZ analyses what should be shared, and what will be done with the information to further relate it to authorized parties. See also response to Recommendation R8.

Status of Suggestion 2

Suggestion (S2): remains open as there is no formal process for identifying and sharing lessons learned from operating and regulatory experience with authorized parties.

3. RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY

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

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ is providing personal dosimetry services for the radiation workers of the authorised parties within the inspection department.
(1)	**BASIS: GSR Part 1 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.*"
S3	**Suggestion: RPAZ should consider providing for a further operational separation between technical services and the regulatory function to minimize the potential for conflicts of interests.**
	Observation: The current policy and medical regulation state that authorisations are renewed annually.
(1)	**BASIS: GSR Part 1 Requirement 16 states that** *"The regulatory body shall structure its organization and manage its resources so as to discharge its responsibilities and perform its functions effectively; this shall be accomplished in a manner commensurate with the radiation risks associated with facilities and activities."*
(2)	**BASIS: GSR Part 1 Requirement 24 para. 4.33 states that** *"Prior to the granting of an authorization, the applicant shall be required to submit a safety assessment, which shall be reviewed and assessed by the regulatory body in accordance with clearly specified procedures. The extent of the regulatory control applied shall be commensurate with the radiation risks associated with facilities and activities, in accordance with a graded approach."*
	See Recommendation 11 in module 4.1.

Changes since the original IRRS mission

Suggestion 3: The revised organizational structure of RPAZ shows a clear operational separation of regulatory services and technical services to minimize the potential for conflicts of interest. This is further supported by Section 8 of the RPAZ Strategic Plan 2021-2025, which was approved by the Board in November 2021. For example, the Department of Regulatory Services is responsible, in part, for development of regulations, authorization, inspection, enforcement, managing emergency preparedness and response, physical protection of facilities, whereas the Department of Technical Services is responsible, in part, for radiochemistry laboratory, food and materials monitoring, non-ionizing radiation, dosimetry/personnel monitoring, radioactive waste management, consultancy and training.

Status of Suggestion 3

Suggestion (S3): is closed as a clear separation of regulatory services and technical services has been established to minimize the potential for conflicts of interest.

3.2. EFFECTIVE INDEPENDENCE IN THE PERFORMANCE OF REGULATORY ACTIVITIES

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

3.3. STAFFING AND COMPETENCE OF THE REGULATORY BODY

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ does not have a formalised training program for regulatory staff.
(1)	**BASIS: GSR Part 1 Recommendation 18 states that** *"The regulatory body shall employ a sufficient number of qualified and competent staff, commensurate with the nature and the number of facilities and activities to be regulated, to perform its functions and to discharge its responsibilities."*
(2)	**BASIS: GS-R-3 para. 4.3 states that** *"The Senior management shall determine the competence requirements for individuals at all levels and shall provide training or take other actions to achieve the required level of competence. An evaluation of the effectiveness of the actions taken shall be conducted. Suitable proficiency shall be achieved and maintained."*
(3)	**BASIS: GS-R-3 para 4.4 states that** *"Senior management shall ensure that individuals are competent to perform their assigned work and that they understand the consequences for safety of their activities. Individuals shall have received appropriate education and training, and shall have acquired suitable skills, knowledge and experience to ensure their competence. Training shall ensure that individuals are aware of the relevance and importance of their activities and of how their activities contribute to safety in the achievement of the organization's objectives."*
R7	**Recommendation: RPAZ should develop a formal program and competence requirements for training of regulatory staff with essential knowledge and skills.**

Changes since the original IRRS mission

Recommendation 7: A number of programs have been launched and are in use in RPAZ to enhance and maintain regulatory staff knowledge and skills:

- Graduate Traineeship program, designed for new employees (to include new graduates), covers training for all regulatory and support activities before the employee is deployed to work in specific departments.
- Internal Training Program is a refresher course for regulatory staff already in the system.

The Graduate Trainee program does address all aspects of regulatory and support activities to include the management system but does not address safety culture. However, safety culture is covered under the section for inspector training under the QA system. A competency profile was developed in 2021 to assess the competencies of all regulatory staff to enable identification of competency gaps and come up with strategies to address them. The competency profile has not been in effect long enough to assess its effectiveness. RPAZ evaluated the training every six months to see if any changes are necessary. They also assign mentors to work with incoming staff. This could also be supplemented if the government requests the IAEA to send an Education and Training Advisory (EduTA) mission to the country.

Status of Recommendation 7

Recommendation (R7): is closed on the basis of progress made and confidence in effective completion in due time as the training programs are in place and the competency profiles were developed. However, there is insufficient evaluation of the effectiveness of the programs.

3.4. LIAISON WITH ADVISORY BODIES AND SUPPORT ORGANIZATIONS

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

3.5. LIAISON BETWEEN THE REGULATORY BODY AND AUTHORIZED PARTIES

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: There is no formal mechanism to communicate to authorised parties on safety related issues, including justification and explanation of regulatory decisions to all authorised parties.
(1)	**BASIS: GSR Part 1 Requirement 21 states that** *"The regulatory body shall establish formal and informal mechanisms of communication with authorized parties on all safety related issues, conducting a professional and constructive liaison."*
R8	**Recommendation: RPAZ should develop a formal mechanism to communicate with authorised parties on all safety related issues.**

Changes since the original IRRS mission

Recommendation 8: The Radiation Protection Authority of Zimbabwe has a Client Charter and Communication Strategy to guide communication with stakeholders. The Authority also makes use of social media platforms such as Twitter, Facebook, WhatsApp, Linkedin as well as an interactive website. Trainings and webinars are also offered as a platform to Radiation Safety Officers', Enhanced Radiation Safety Officers', and individual facilities to communicate with authorized parties on all safety related issues. Also, meetings on specific topics with certain groups of authorized parties. They occasionally put out information in written form as to the basis for regulatory decisions, primarily when they are conducting changes to their regulations. This is a significant improvement because informal communication occurs however there is still no formal mechanism to share lessons learned regarding safety related issues with all authorized parties. A formal process is not addressed in the management system manual.

Status of Recommendation 8

Recommendation (R8): remains open as there is no formal mechanism for communicating safety related issues with licensees.

3.6. STABILITY AND CONSISTENCY OF REGULATORY CONTROL

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ does not have a formal process articulated through specific policies, principles, and associated criteria to ensure that the regulatory control is consistent throughout the Authority that may result in the appearance of subjectivity.
(1)	**BASIS: GSR Part 1 Requirement 19 states that** *"The regulatory body shall ensure that regulatory control is stable and consistent."*
(2)	**BASIS: GS-R-3 para. 3.5 states that** *"Senior management shall ensure that it is clear when, how and by whom decisions are to be made within the management system."*
R9	**Recommendation: RPAZ should ensure that decision making is applied and documented to ensure that regulatory control is consistent throughout the Authority.**

Changes since the original IRRS mission

Recommendation 9: Decision making has been primarily achieved through development of procedures and checklists for authorization and inspection functions. The procedures, checklists and related guides are continually reviewed. However, not all procedures address who is responsible for the actual decision making and who can take action. For example, who is responsible to review an inspection report to make the final decision as to its accuracy and determine if there are any actions to be taken. One way to address this is to have a single document that outlines the consistency for decision-making process to describe the delegation of authority. This could describe who makes the actual decision for certain actions: Minister, Board, CEO, Department Head or below.

Status of Recommendation 9

Recommendation (R9): remains open as not all procedures address who is responsible for the actual decision making and who can take action.

3.7. SAFETY RELATED RECORDS

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

3.8. COMMUNICATION AND CONSULTATION WITH INTERESTED PARTIES

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: The organizational structure of RPAZ includes a Corporate Communications Officer, reporting directly to the CEO, whose primary responsibility is communications with all interested parties including the media.
(1)	**BASIS: GSR Part 1 Requirement 36 states that** *"The regulatory body shall promote the establishment of appropriate means of informing and consulting interested parties and the public about the possible radiation risks associated with facilities and activities, and about the processes and decisions of the regulatory body."*
GP3	**Good Practice: RPAZ has a Corporate Communications Officer whose primary responsibility is communicating with all interested parties.**

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

4. MANAGEMENT SYSTEM OF THE REGULATORY BODY

4.1. IMPLEMENTATION AND DOCUMENTATION OF THE MANAGEMENT SYSTEM

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: The management system is described in a variety of documents. There is a gap between the manual and other documents. The vision, mission and values are not stated in the manual and the priority to safety is not given an overarching position in the MS.
(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 2.1 states that** *"A management system shall be established, implemented, assessed and continually improved. It shall be aligned with the goals of the organization and shall contribute to their achievement. The main aim of the management system shall be to achieve and enhance safety by:* • *Bringing together in a coherent manner all the requirements for managing the organization;* • *Describing the planned and systematic actions necessary to provide adequate confidence that all these requirements are satisfied;* • *Ensuring that health, environmental, security, quality and economic requirements are not considered separately from safety requirements, to help preclude their possible negative impact on safety."*
(3)	**BASIS: GS-R-3 para 2.2** ***states that*** *"Safety shall be paramount within the management system, overriding all other demands."*
S4	**Suggestion: RPAZ should consider continuing to establish the management system in a consistent, coherent manner.**
	Observation: Internal safety culture issues are currently addressed in the concept of radiation protection. The concept of internal safety culture is not treated explicitly and addressed and communicated to staff in a more comprehensive manner.
(1)	**BASIS: GS-R-3 para. 2.5 states that** *"The management system be used to promote and support a strong safety culture by:* • *Ensuring a common understanding of the key aspects of safety culture within the organization;* • *Providing the means by which the organization supports individuals and team in carrying out their task safely and successfully, taking into account the interaction between individuals, technology and the organization;* • *Reinforcing a learning and questioning attitude at all levels of the organization;* • *Providing the means by which the organization continually seek to develop improve its safety culture."*
R10	**Recommendation: RPAZ' senior management should promote an awareness of internal safety culture by ensuring that it is in their training programme and is appropriately reflected within its management system.**
	Observation: The MS addresses a graded approach to the regulatory decision making but the approach is not fully implemented.
(1)	**BASIS: GSR 3 Requirement 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:*

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	• *The significance and complexity of each product or activity;* • *The hazards and the magnitude of the potential impact (risks) associated with the safety, health, environmental, security, quality and economic elements of each product or activity;* • *The possible consequences if a product fails or an activity is carried out incorrectly."*
(2)	**BASIS: GSR 3 Requirement 2.7 states that** "*Grading of the application of management system requirements shall be applied to the products and activities of each process."*
R11	**Recommendation: RPAZ should implement a graded approach in all activities and processes.**

Changes since the original IRRS mission

Suggestion 4: The management system manual is currently under review to ensure consistency with other policy documents issued by RPAZ. The IRRS team noted that since the initial IRRS mission, progress has been made through including vision, mission, and values in the manual. However, the Radiation Protection Act is in a late state of revision into a new Bill for radiation protection. The mandate for RPAZ is stated in the new Bill and the language is currently not reflected in the manual, including the strategic plan, as well as the vision and mission statements. The vision stated in the manual differs from the one stated in the strategic plan.

Status of Suggestion

Recommendation (S4): is closed on the basis of progress made and confidence in effective completion in due time as progress has been made in the development of management system and incorporation on the new Bill.

Changes since the original IRRS mission

Recommendation 10: Since the initial mission safety culture is further developed in the management system manual. The manual points out several of areas in which RPAZ ensures that a high level of safety culture is maintained.

Safety culture is addressed in the inspector training program. However, it is not clear that under the section of QA system safety culture is included. The IRRS team noted the language of Quality Assurance is used instead of the current language of Management System. The graduate trainee program does not explicitly address safety culture.

Although the Safety Health and Environment (SHE) policy addresses safety it does not clearly state the concept of safety culture.

In addition, no evidence was found that all staff were involved in recurrent safety culture training program in fostering and sustaining a strong safety culture including all its aspects.

Status of Recommendation 10

Recommendation (R10): is closed on the basis of progress made and confidence in effective completion in due time as safety culture has been partially included in the training program and is appropriately addressed in the management system manual.

Changes since the original IRRS mission

Recommendation 11: The draft Bill addresses the implementation of a graded approach in the organization's activities. A description of a graded approach is included in the management system manual. RPAZ has made progress in the implementation of a graded approach in its processes such as, authorization, review and assessment, inspection and enforcement. RPAZ is practising multi-staged authorization for

complex and high-risk facilities and developing and implementing practice specific checklists in review and assessment for diagnostic and interventional radiography, gauges, nuclear medicine, radiotherapy and dental radiography activities. It is also noted that inspection frequencies are using a risk based and compliance level approach.

However, graded approach has not been adopted in the frequency of authorization. All facilities and activities that undergo authorization by registration and licensing are authorized for one year, regardless of their associated risks. This was to comply with the existing law, but the new Bill provides more flexibility to allow the RPAZ to use a graded approach by not restricting them to only one year authorization.

Status of Recommendation 11

Recommendation (R11): is closed on the basis of progress made and confidence in effective completion in due time in implementing a graded approach and incorporation of the new Bill.

4.2. MANAGEMENT RESPONSIBILITY

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

4.3. RESOURCE MANAGEMENT

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

4.4. PROCESS IMPLEMENTATION

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: The MS is largely procedure based. There is an overall description in the MS of process management but there is no further procedure that describes the concept of process orientation. RPAZ has no procedure for organizational change.
(1)	**BASIS: GS-R-3, para. 5.1 to para. 5.29 states that** *"The processes of the management system that are needed to achieve the goals, provide the means to meet all requirements….. communicated, monitored, tracked and recorded to ensure that safety is not compromised."*
R12	**Recommendation: RPAZ should identify, analyse and implement relevant processes and procedures including process owners, education and training on the management system and communication to the staff.**

Changes since the original IRRS mission

Recommendation 12: The IRRS team noted that progress has been made in identifying processes and in appointing process owners including their responsibility. However, the process approach is not clear and does not include the descriptions of the processes. The process for communication is missing and under process owners' responsibilities the item of on communication and training is missing.

Status of Recommendation 12

Recommendation (R12): is closed on the basis of progress made and confidence in effective completion in due time in identifying processes and in appointing process owners.

4.5. MEASUREMENT, ASSESSMENT AND IMPROVEMENT

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

5. AUTHORIZATION

5.1. GENERIC ISSUES

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

5.2. AUTHORIATION OF RADIATION SOURCES AND FACILITIES

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ does not have specific guidance for the activities and facilities to be either authorised by notification or exempted.
(1)	**BASIS: GSR Part 3 Requirement 8, para 3.10 states that** *"The government or the regulatory body shall determine which practices or sources within practices are to be exempted from some or all of the requirements of these Standards, including the requirements for notification, registration or licensing, using as the basis for this determination the criteria for exemption specified in Schedule I or any exemption levels specified by the regulatory body on the basis of these criteria."*
(2)	**BASIS: GSR Part 3 Requirement 7, para 3.7 states that** *"Any person or organization intending to carry out any of the actions specified in para. 3.5 shall submit a notification to the regulatory body of such an intention18. Notification alone is sufficient provided that the exposures expected to be associated with the practice or action are unlikely to exceed a small fraction, as specified by the regulatory body, of the relevant limits, and that the likelihood and magnitude of potential exposures and any other potential detrimental consequences are negligible."*
S5	**Suggestion: RPAZ should consider developing guidance on the facilities and activities to be authorized by notification or exempted from its regulatory control.**
	Observation: RPAZ does not implement a multi-stage authorisation system.
(1)	**BASIS: GSR Part 1 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)…"*
R13	**Recommendation: RPAZ should implement a multi-staged authorisation system for facilities and activities as appropriate.**
	Observation: RPAZ does not use a graded approach in their authorisation system for facilities and activities.
(1)	**BASIS: GSR Part 1, para 4.33 states that** *"Prior to the granting of an authorization, the applicant shall be required to submit a safety assessment [8], which shall be reviewed and assessed by the regulatory body in accordance with clearly specified procedures. The extent of the regulatory control applied shall be commensurate with the radiation risks associated with facilities and activities, in accordance with a graded approach."*
	See Recommendation 11 in module 4.1.

Changes since the original IRRS mission

Suggestion 5: The IRRS team was informed that the revised authorization policy of 2014 is awaiting approval by the Board in June 2022. The policy requires RPAZ to develop systems for exemption and clearance from regulatory control, and authorization through notification, registration and licensing. RPAZ is now exempting sources where radiation risks are sufficiently low not to warrant regulatory control and also issuing authorization through registration and licensing, based on risk

associated with the sources. However, RPAZ has not developed any guidance to assist in the identification of sources or activities that fall under exemption or are to be authorized through notification.

The IRRS team noted that RPAZ has developed criteria to be used in NORM practices. The criteria state the levels to be used for exemption and for conditional exemption, and authorization through licensing.

Status of Suggestion 5

Suggestion (S5): remains open as RPAZ has not developed any guidance documents to assist with the identification of activities that qualify for exemption and authorization through notification.

Changes since the original IRRS mission

Recommendation 13: RPAZ is practising multi staged licensing for activities they consider complex and of high-risk, that is, diagnostic and interventional radiography, radiotherapy, nuclear medicine and radioactive waste management facilities. However, there is need of a guidance document to ensure consistency in multi-staged authorization process. The provision for multi-staged authorization is also captured in the draft Radiation Protection Bill 2022.

Status of Recommendation 13

Recommendation (R13): is closed as RPAZ is issuing multi-staged authorization to complex and high-risk facilities and activities.

5.3. AUTHORIZATION OF RADIOACTIVE WASTE MANAGEMENT FACILITIES

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ has custody of an interim storage facility which is not licensed.
(1)	**BASIS: GSR Part 1 Requirement 23 states that** *"Authorization by the regulatory body, including specification of the conditions necessary for safety, shall be a prerequisite for all those facilities and activities that are not either explicitly exempted or approved by means of a notification process."*
(2)	**BASIS: GSR Part 5 Requirement 3 states that** *"The regulatory body shall establish the requirements for the development of radioactive waste management facilities and activities and shall set out procedures for meeting the requirements for the various stages of the licensing process. The regulatory body shall review and assess the safety case and the environmental impact assessment for radioactive waste management facilities and activities, as prepared by the operator both prior to authorization and periodically during operation."*
R14	**Recommendation:** RPAZ should license the interim waste storage facility to a unit within its organisation that is not tasked with authorisation or inspection until such time that custody can be transferred to a proper utility outside RPAZ.

Changes since the original IRRS mission

Recommendation 14: The interim waste storage facility has not been issued with an authorization by RPAZ. However, in March 2019, RPAZ issued a memorandum approving its design and use as a temporary storage facility for radioactive waste.

In 2018, the Government embarked on a new project of constructing a radioactive waste management facility, which the IRRS team was informed that the construction is 95% complete. RPAZ issued authorization approving designs for construction of the facility 30th October 2018. The IRRS team was informed that

completion is expected in September 2022 and once operationalized in October 2022, all the waste at the interim waste storage facility will be transferred to the new facility. The IRRS team was informed that plans are underway to licence the new facility once construction is complete.

Status of Recommendation 14

Recommendation (R14): is closed as the new radioactive waste management facility will be commissioned to be operational before the end of 2022.

6. REVIEW AND ASSESSMENT

6.1. GENERIC ISSUES

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

6.2. REVIEW AND ASSESSMENT OF RADIATION SOURCES, FACILITIES AND ACTIVITIES

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ does not apply a graded approach to review and assessment of facilities and activities.
(1)	**BASIS: GSR Part 1 Requirement 25 states that** *"Review and assessment of a facility or an activity shall be commensurate with the radiation risks associated with the facility or activity, in accordance with a graded approach.*"
	See Recommendation 11 in module 4.1.

6.3 REVIEW AND ASSESSMENT FOR WASTE MANAGEMENT FACILITIES

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

7. INSPECTION

7.1. GENERIC ISSUES

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

7.2. INSPECTION OF RADIATION SOURCES FACILITIES

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: Even though it is stated in the Inspection Policy document that the inspection programme is based on risk ranking, there is no explicit evidence that this provision is implemented.
(1)	**BASIS: GSR Part 1 Requirement 29 states that** *"Inspections of facilities and activities shall be commensurate with the radiation risks associated with the facility or activity, in accordance with a graded approach."*
	See Recommendation 11 in module 4.1.

7.3. INSPECTION OF WASTE MANAGEMENT FACILITIES

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

8. ENFORCEMENT

8.1. ENFORCEMENT POLICY AND PROCESSES

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

8.2. ENFORCEMENT IMPLEMENTATION

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ has no written procedures and guidelines for enforcement
(1)	**BASIS: GS-G- 1.5 para. 3.85 states that** *"The regulatory body should adopt clear administrative procedures governing the taking of enforcement actions. All inspectors and other staff of the regulatory body should be trained in, and knowledgeable about, the procedures. The procedures should specify the policy of the regulatory body with regard to the use of regulatory actions and enforcement measures, and the associated delegated authority given to inspectors and to other staff of the regulatory body."*
S6	**Suggestion: RPAZ should consider developing written procedures and guidelines for enforcement and provide training for its use in collaboration with relevant government agencies.**

Changes since the original IRRS mission

Suggestion 6: RPAZ has documented procedures and guidelines for taking enforcement actions against any identified non-compliance cases. The enforcement actions listed include both administrative and litigation:

- Recorded verbal notifications
- Written notifications
- Written warning
- Orders/ directives
- Increased regulatory scrutiny
- Imposition of additional regulatory requirements and conditions
- Revocation of authorization
- Prosecution

In the MoU between RPAZ and the Zimbabwe Republic Police, there is an agreement for cooperation on matters related to enforcement and training of police. Formal charges under the Radiation Protection Act can only be initiated by Police, under recommendation by RPAZ. The IRRS team was informed that the Police have requested training and enforcement will be one of the elements that will be covered.

Suggestion (S6): is closed as the procedures and training have been developed.

9. REGULATIONS AND GUIDES

9.1. GENERIC ISSUES

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ does not have guidance for all types of activities being regulated.
(1)	**BASIS: GSR Part 1 req. 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."*
R15	**Recommendation:** RPAZ should develop guides for all regulated activities.

Changes since the original IRRS mission

Recommendation 15: RPAZ has developed guidance documents for applying authorizations in the following practices: Diagnostic and interventional radiography, dental radiography, veterinary practice, industrial radiography, nuclear gauges, radioactive waste management, import/export of radiation sources, and safety guide for NORM. The IRRS team was informed that RPAZ would be developing additional guides to include transport.

Status of Recommendation 15

Recommendation (R15): is closed based on progress made and confidence in effective completion in due time as RPAZ has developed guides for most of the activities and will complete development of missing guides.

9.2. REGULATIONS AND GUIDES FOR WASTE MANAGEMENT FACILITIES

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

10. EMERGENCY PREPAREDNESS AND RESPONSE

10.1. GENERAL EPR REGULATORY REQUIREMENTS

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: There are no regulatory requirements and no guidance for the licensees to develop threat assessment as 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."*
R16	**Recommendation: RPAZ should develop regulatory and guidance documents for the licensees to perform threat assessment on which their EPR arrangements will be based.**
	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: RPAZ should consider extending its threat assessment beyond the threat categorization of sources registered in RAIS, to cover all possible radiation emergency scenarios.**

Changes since the original IRRS mission

Recommendation 16: RPAZ developed *Guidance Document on Emergency Preparedness and Response for Nuclear and Radiological Emergencies*, in line with the Radiation Protection Act (Chapter 15:15), and the Protection (Safety and Security of Radiation Sources) Regulations, 2011. The Plan provides guidance on emergency preparedness and response (EPR) for nuclear and radiological emergencies.

The Plan covers and addresses the aspect of hazard assessment in Clause 6.2. The identified hazards and potential consequences provide basis for establishing EPR arrangements for a nuclear or radiological emergency.

The Guidance further mentions that results of the hazard analysis should be used to implement a graded approach to emergency preparedness arrangements to commensurate with the potential magnitude and nature of the hazard. Hazard analysis also provide for appropriate emergency preparedness categories.

The IRRS team noted that RPAZ has aligned the Guidance with the GSR Part 7*, in use of the term *'Hazard Assessment'* as opposed to '*Threat Assessment'*, which was previously used in GS-R-2 publication.

NOTE:
**The IAEA safety publication GS-R-2 referred to in the Module, was reviewed and updated to GSR Part 7 in 2015.*

Status of Recommendation 16

Recommendation (R16): is closed as RPAZ has developed the guidance documents, which fully covers the threat assessment on which EPR arrangements will be based.

Changes since the original IRRS mission

Suggestion 7: The developed *Guidance Document on Emergency Preparedness and Response for Nuclear and Radiological Emergencies*, covers events to be included in the hazard assessment beyond the threat categorization of sources registered in RAIS. For example, it considers events:

- that could affect the facility or activity, including very low probability and those not considered in the design;
- involving a combination of a nuclear or radiological emergency with a conventional emergency such as an earthquake, volcanic eruption, tropical cyclone, severe weather, tsunami, aircraft crash or civil disturbances that may affect wide areas and/or impair capabilities to provide support in the emergency response;
- that could affect several facilities and activities concurrently and the interactions among the facilities and activities affected;
- facilities or activities in other States that would have an impact on Zimbabwe.

Specifically, Zimbabwe has made arrangements for preparedness and response for communities near Limpopo boundary, in case of a severe nuclear power reactor accident in South Africa.

Status of Suggestion 7

Suggestion (S7): is closed as RPAZ has developed guidance documents, which includes possible radiation emergency scenarios that go beyond the threat categorization of sources registered in RAIS.

10.2. FUNCTIONAL REGULATORY REQUIREMENTS

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: Arrangements have not been made for the implementation of a command and control system for the response to a nuclear or radiological emergency.
(1)	**BASIS: GS-R-2 para. 4.10 states that** *"Arrangements shall be made for the implementation of a command and control system for the response to a nuclear or radiological emergency. This shall include arrangements for co-ordinating activities, for developing strategies and for resolving disputes between the response organizations15 concerning functions, responsibilities, authorities, the allocation of resources and priorities. In addition, arrangements shall be made for obtaining and assessing the information necessary in order to allocate resources for all response organizations."*
R17	**Recommendation: RPAZ should develop, in cooperation with the emergency response coordinating authority, an incident command and control system.**

Changes since the original IRRS mission

Recommendation 17: Zimbabwe has drafted National Nuclear and Radiological Emergency Plan (NNREP) in an agreement between the RPAZ, Department of Civil Protection (DCP), and other key organizations. The Plan aims at providing emergency response to radiological emergencies in a coordinated and timely manner, while mitigating consequences of radiological accidents, and protecting public and environment.

The Plan was still in draft form during the initial mission. The IRRS team was informed that the Plan underwent significant progress to enrich it from the initial draft. RPAZ informed the IRRS team that the Plan is now at the final stage of discussion, and all supporting organizations are aware. It is awaiting signatures from support organizations, and approval by the Minister in charge of Local Government.

Roles and responsibilities for support organizations for radiological emergency have been defined. DCP, under the Ministry of Local Government, is the main coordinator and custodian, while RPAZ is the lead technical

agency with a responsibility for offering technical support. Organizational structure for emergency response has been provided.

The cost for each support government agency is an individual agency responsibility. For example, RPAZ has a budget for emergency preparedness and response.

Status of Recommendation 17

Recommendation (R17): is closed on the basis of progress made and confidence in effective completion in due time as the NNREP is prepared and ready for approval.

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: A contact (notification) point has been established which is responsible for receiving emergency notifications 24 hrs/day and 7 days/week. However, it is a person with a mobile phone who may or may not be available. This is not sufficient to function as a National Warning Point.
(1)	**BASIS: GS-R-2 para. 4.16 states that** *"Notification points shall be established that are responsible for receiving emergency notifications of an actual or potential nuclear or radiological emergency. The notification points shall be continuously available to receive any notification or request for assistance and to respond promptly or to initiate an off-site response."*
R18	**Recommendation: The government should establish a permanent contact point for notification of a radiation emergency, both for domestic emergency notification and also to function as a National Warning Point.**

Changes since the original IRRS mission

Recommendation 18 The IRRS team was informed that RPAZ is available to receive emergency notifications on a 24/7 basis through calls or emails. The call is through the Point of Contact (PoC) personal mobile phone, same as earlier identified during initial mission. It was added that an arrangement is in place, to have an alternate (from the Southern Zimbabwe Region) to receive calls in case the primary contact is not available. RPAZ informed the IRRS team that an arrangement is in place for licensees and support organizations to communicate with RPAZ in case of an emergency, and both PoCs phone contacts have been shared with them.

When RPAZ PoC is notified of an emergency, he may contact the DCP, depending on the nature of the response. The DCP is the designated national emergency response agency and has an appointed PoC for the matters of radiological emergencies. However, the DCP contacts have not been shared with the licensees.

Zimbabwe has ratified the Convention on Early Notification of a Nuclear Accident, and Assistance in the Case of Nuclear Accident or Radiological Emergencies. RPAZ has also established international contact point with the IAEA Incident and Emergency Centre. Memoranda of understanding between RPAZ and the Zimbabwe Republic Police, as well as with the Environmental Management Agency have been established.

Status of Recommendation 18

Recommendation (R18): is closed as arrangements are in place to receive and send information on a 24/7 basis, through modes of communication, such as emails and mobile phones.

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: There are no generic and operational intervention and action levels available in Zimbabwe.
(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*

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	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."*
R19	**Recommendation: RPAZ should develop generic and operational intervention and action levels, in accordance with the international standards.**

Changes since the original IRRS mission

Recommendation 19 The hazard assessment mentioned in the guidance document, provides for identification of facilities, sources, practices, on-site areas, off-site areas or locations for which radiation emergencies could warrant:

- precautionary urgent protective actions to prevent deterministic health effects
- urgent protective action to prevent stochastic health effects

The draft NNREP provides for the use of protective actions when national intervention levels are exceeded. Appendix 4 covers total effective dose guidance for emergency workers, operational intervention levels (OILs) based on the dose rate measurements and action levels.

Status of Recommendation 19

Recommendation (R19): is closed on basis of progress made and confidence in effective completion in due time as national intervention levels are included in the NNREP which is prepared and ready for approval.

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: Although arrangements have been made for taking measures to provide protection for workers involved in emergency response operations, the term "emergency worker" is not defined in Zimbabwe. Consequently, the requirements on protection for these emergency workers are not defined.
(1)	**BASIS: GS-R-2 para. 4.57 states that** *"Arrangements shall be made to designate as emergency workers those who may undertake an intervention…"*
(2)	**BASIS: GS-R-2 para. 4.60 states that** *"National guidance that is in accordance with international standards shall be adopted for managing, controlling and recording the doses received by emergency workers. 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 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."*
R20	**Recommendation: RPAZ should initiate the process, in cooperation with other government agencies, needed for officially defining the term "emergency workers" and developing the regulatory provisions for their protection.**

Changes since the original IRRS mission

Recommendation 20: The draft NNREP has defined 'emergency worker', while the guidance document for EPR for radiological and nuclear emergencies has both defined and included 'emergency worker' and 'helper' in the Plan, which is in line with the GSR Part 7.

The guidance document provides for identification of hazardous conditions that may harm emergency workers and helpers, ensures protection, implements health surveillance, and establishes a radiation protection programme to be implemented during emergencies.

Different pathways that may contribute dose exposures to radiation workers has been provided in the guidance document. Total effective dose guidance for emergency workers has been provided in life saving, averting serious injuries, short- and long-term recovery operations.

Status of Recommendation 20

Recommendation (R20): is closed as the process has been completed to define and cover emergency worker and helper, in the developed documents.

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: There are no national intervention levels and action levels for agricultural countermeasures, countermeasures against ingestion and longer term protective actions established in Zimbabwe.
(1)	**BASIS: GS-R-2 para. 4.88 states that** *"Optimized [national] intervention levels and action levels for agricultural countermeasures, countermeasures against ingestion and longer term protective actions shall be established that are in accordance with international standards, modified to take account of local and national conditions…"*
R21	**Recommendation: The government should adopt, based on proposals and regulatory requirements developed by RPAZ, the optimized intervention levels and action levels for agricultural countermeasures, countermeasures against ingestion and longer term protective actions.**
	Observation: RPAZ has regulatory responsibility in the recovery operations (e.g. transition threshold, workers protection, response criteria etc.) but the relevant regulations have 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. "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…."*
R22	**Recommendation: RPAZ should develop the necessary requirements regulating the recovery operation and facilitating the smooth transition to normal social and economic conditions.**

Changes since the original IRRS mission

Recommendation 21: The draft NNERP provides for national intervention levels in Appendix 4 (see Recommendation 19 above), which specifies the levels for urgent protective actions during sheltering, evacuation and administering iodine prophylaxis salt.

The guidance document on EPR for Nuclear and Radiological Emergencies provides for optimized intervention levels and action levels for agricultural countermeasures, countermeasure against ingestion and longer-term protective actions.

Status of Recommendation 21

Recommendation (R21): is closed based on progress made and confidence in effective completion in due time as the NNREP is prepared and ready for approval.

Changes since the original IRRS mission

Recommendation 22: Arrangements have been made for recovery in the NNREP, which takes place after the initiating conditions of the emergency have been established and immediate actions to protect the public and safety and property has been accomplished.

The DCP – main coordinator, and RPAZ – technical coordinator, leads the national, local and regional agencies involved in decontaminating the affected area and controlling radioactive materials. However, RPAZ has not developed regulations to regulate recovery of operations. The RPAZ is in the process of drafting the necessary requirements for social and economic recovery to be included in the national recovery plan.

Status of Recommendation 22

Recommendation (R22): remains open as RPAZ has not developed EPR Regulations to regulate recovery operations.

10.3. REGULATORY REQUIREMENTS FOR INFRASTRUCTURE

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ has an important role in developing the national radiation emergency response plan. This plan is in draft form, its finalization would be a major step in strengthening the national emergency response capabilities.
(1)	**BASIS: GS-R-2 para. 5.13 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: RPAZ should consider finalizing the draft national radiation emergency plan and forward it to the relevant national authorities for review and approval.**
	Observation: The regulations requiring the applicants of licenses to establish emergency preparedness capabilities exist, the emergency planning is clearly requested but there is no guidance given to the applicants/licensees on how to prepare the plan. In addition, there are no clear acceptance criteria for the emergency plans.
(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…"*
R23	**Recommendation: RPAZ should develop guidance for the applicants/licensees on the preparation of emergency plans for facilities and activities. This should also serve as acceptance criteria for the evaluation of the emergency plans during the authorization process.**

Changes since the original IRRS mission

Suggestion 8: The RPAZ, in conjunction with DCP and other key government agencies, drafted the NNREP (see Recommendation R17 above).

The NNREP provides arrangements in case of the following types of radiological emergencies:

- Accidents with radiation sources or radioactive materials
- Transport accidents involving radioactive materials
- Transboundary accident
- Re-entry of a satellite carrying nuclear materials
- Nuclear accidents

The Plan also provides for a joint information system to coordinate various actions, such as responding to rumours that may create public concern.

Status of Suggestion 8

Suggestion (S8): is closed based on progress made and confidence in effective completion in due time as the NNREP is prepared and ready for approval.

Changes since the original IRRS mission

Recommendation 23: RPAZ has established guidance for licensees to use when preparing emergency preparedness and response plans (see Recommendation 16 above). One of the objectives of the Guidance Document on EPR for Nuclear and Radiological Emergencies is to provide guidance to applicable licensees and other stakeholders on how to prepare their own EPR plans.

Status of Recommendation 23

Recommendation (R23): is closed as the RPAZ has developed a guidance document that guides licensees on how to prepare their own EPR plans.

10.4. ROLE OF REGULATORY BODY DURING RESPONSE

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: Although RPAZ is considered to be part of the national radiation emergency response system, the Lead Technical Agency and the advisor of the government, it does not have an organizational emergency response plan.
(1)	**BASIS: GS-R-2 para. 5.14 states that** *"Each response organization "shall prepare a general plan or plans for coordinating and [performing their assigned functions as specified in Section 4]. This includes situations involving such sources of exposure as sources illegally brought into the country, falling satellites equipped with sources or radioactive materials released in accidents beyond national borders." ... "Emergency plans shall be prepared which specify how the responsibilities for the management of interventions will be discharged on the site, off the site and across national [borders], as appropriate, in separate but interconnecting plans."*
R24	**Recommendation: RPAZ should develop its own radiation emergency response plan.**

Changes since the original IRRS mission

Recommendation 24: RPAZ has developed an Emergency Preparedness and Response Plan for Radiological and Nuclear Emergencies that was approved in December 2019. The Plan provides requirements and guidance on emergency preparedness and response for radiological and nuclear emergencies. It applies to RPAZ staff, authorized parties and all response teams. The Plan defines the roles and responsibilities of RPAZ, outlines organizational structure, capabilities and training requirements for first responders.

The Plan is subject for review on an annual basis, or when necessary.

Status of Recommendation 24

Recommendation (R24): is closed as the RPAZ has developed its own emergency radiation protection plan.

11. ADDITIONAL AREAS

11.1. CONTROL OF MEDICAL EXPOSURES

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ is not represented in the national Ethics Committees on screening programmes and on biomedical research housed in the Medical Research Council.
(1)	**BASIS: GSR part 3 Para. 3.151 states that** *"Registrants and licensees shall ensure that no individual incurs a medical exposure as part of a programme of biomedical research unless the exposure has been approved by an ethics committee (or other institutional body that has been assigned similar functions by the relevant authority) …"*
(2)	**BASIS: GSR part 3 Para. 3.160 states that** *"The medical exposure of volunteers as part of a programme of biomedical research is deemed to be not justified unless:* *(b) It is subject to approval by an ethics committee (or other institutional body that has been assigned similar functions by the relevant authority), subject to any dose constraints that may be specified (as required in paras 3.148(a)(ii) and 3.173), and subject to applicable national regulations and local regulations."*
S9	**Suggestion: The government should consider having representatives from RPAZ on the Ethics Committee on screening programmes and on the Ethics Committee on biomedical research.**

Changes since the original IRRS mission

Suggestion 9: The draft MoU between RPAZ and the Medical Research Council of Zimbabwe (MRCZ) is prepared. The draft states that the MRCZ shall include nominated representatives from RPAZ on the Ethics Committee on screening programmes/research where radiation applications are involved.

Status of Suggestion 9

Suggestion (S9): is closed on the basis of progress made and confidence in the effective completion in due time as the MoU is prepared and ready for signature.

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: The current status of the regulations on radiation protection in Zimbabwe is not fully compliant with the requirements of GSR part3.
(1)	**BASIS: GSR Part 3 Para. 3.156 states that** *"The justification of medical exposure for an individual patient shall be carried out through consultation between the radiological medical practitioner and the referring medical practitioner, as appropriate, with account taken, in particular for patients who are pregnant or breast-feeding or paediatric, of:* *(a) The appropriateness of the request;* *(b) The urgency of the procedure;* *I The characteristics of the medical exposure;* *(d) The characteristics of the individual patient;* *I Relevant information from the patient's previous radiological procedures."*
(2)	**BASIS: GSR Part 3 Para. 3.157 states that** *"Relevant national or international referral guidelines shall be taken into account for the justification of the medical exposure of an individual patient in a radiological procedure."*
(3)	**BASIS: GSR Part 3 Para. 3.160 states that** *"The medical exposure of volunteers as part of a programme of biomedical research is deemed to be not justified unless:* *(a) It is in accordance with the provisions of the Helsinki Declaration [20] and takes into account the guidelines published by the Council for International Organizations of Medical Sciences [21], together with the recommendations of the ICRP [22];*

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	(b) It is subject to approval by an ethics committee (or other institutional body that has been assigned similar functions by the relevant authority), subject to any dose constraints that may be specified (as required in paras 3.148(a)(ii) and 3.173), and subject to applicable national regulations and local regulations."
(4)	**BASIS: GSR Part 3 Para. 3.163 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 consistent with delivery of the prescribed dose to the planning target volume within the required tolerances."*
(5)	**BASIS: GSR Part 3 Para. 3.146 states that** *"The government, in accordance with paras 2.13–2.28, shall ensure with regard to medical exposures that, as a result of consultation between the health authority, relevant professional bodies and the regulatory body, the relevant parties identified in paras 2.40 and 2.41 are authorized to assume their roles and responsibilities, and shall ensure that they are notified of their duties in relation to protection and safety for individuals undergoing medical exposures."*
(6)	**BASIS: GSR Part 3 Para. 3.147 states that** *"The government shall ensure, as part of the responsibilities specified in para. 2.15, that as a result of consultation between the health authority, relevant professional bodies and the regulatory body, a set of diagnostic reference levels is established for medical exposures incurred in medical imaging, including image guided interventional procedures. In setting such diagnostic reference levels, account shall be taken of the need for adequate image quality, to enable the requirements of para. 3.168 to be fulfilled. Such diagnostic reference levels shall be based, as far as possible, on wide scale surveys or on published values that are appropriate for the local circumstances."*
(7)	**BASIS: GSR Part 3 Para. 3.148 states that** *"The government shall ensure that, as a result of consultation between the health authority, relevant professional bodies and the regulatory body, the following are established:* *(a) Dose constraints, to enable the requirements of paras 3.172 and 3.173 respectively to be fulfilled for:* *(i) Exposures of carers and comforters;* *(ii) Exposures due to diagnostic investigations of volunteers participating in a programme of biomedical research;* *(b) Criteria and guidelines for the release of patients who have undergone therapeutic procedures using unsealed sources or patients who still retain implanted sealed sources."*
(8)	**BASIS: GSR Part 3 Para. 3.165 states that** *"Registrants and licensees shall ensure that the particular aspects of medical exposures are considered in the optimization process for:* *(a) Paediatric patients subject to medical exposure;* *(b) Individuals subject to medical exposure as part of a health screening programme;* *I Volunteers subject to medical exposure as part of a programme of biomedical research;* *(d) Relatively high doses43 to the patient;* *I Exposure of the embryo or foetus, in particular for radiological procedures in which the abdomen or pelvis of the pregnant woman is exposed to the useful radiation beam or could otherwise receive a significant dose;* *(f) Exposure of a breast-fed infant as a result of a female patient undergoing a radiological procedure with radiopharmaceuticals."*
(9)	**BASIS: GSR Part 3 Para. 3.166 states that** *"The medical physicist shall ensure that:* *I Calibrations of radiotherapy units are subject to independent verification prior to clinical use;* *(d) Calibration of all dosimeters used for dosimetry of patients and for the calibration of sources is traceable to a standards dosimetry laboratory."*
(10)	**BASIS: GSR Part 3 Para. 3.168 states that** *"Registrants and licensees shall ensure that:*

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	(a) Local assessments, on the basis of the measurements required in para. 3.167, are made at approved intervals for those radiological procedures for which diagnostic reference levels have been established (para. 3.147); *(b) A review is conducted to determine whether the optimization of protection and safety for patients is adequate, or whether corrective action is required if, for a given radiological procedure:* *(i) typical doses or activities exceed the relevant diagnostic reference level; or* *(ii) typical doses or activities fall substantially below the relevant diagnostic reference level and the exposures do not provide useful diagnostic information or do not yield the expected medical benefit to the patient."*
(11)	**BASIS: GSR Part 3 Para. 3.169 states that** *"Registrants and licensees, in applying the requirements of these Standards in respect of management systems, shall establish a comprehensive programme of quality assurance for medical exposures with the active participation of medical physicists, radiological medical practitioners, medical radiation technologists and, for complex nuclear medicine facilities, radiopharmacists and radiochemists, and in conjunction with other health professionals as appropriate. Principles established by the World Health Organization, the Pan American Health Organization and relevant professional bodies shall be taken into account."*
(12)	**BASIS: GSR Part 3 Para. 3.170 states that** "*Registrants and licensees shall ensure that programmes of quality assurance for medical exposure include, as appropriate to the medical radiation facility:* *(a) Measurements of the physical parameters of medical radiological equipment made by, or under the supervision of, a medical physicist:…"*
(13)	**BASIS: GSR Part 3 Para. 3.171 states that** *"Registrants and licensees shall ensure that regular and independent audits are made of the programme of quality assurance for medical exposures, and that their frequency is in accordance with the complexity of the radiological procedures being performed and the associated risks."*
(14)	**BASIS: GSR Part 3 Req. 39 states that** *"Registrants and licensees shall ensure that there are arrangements in place for appropriate radiation protection in cases where a woman is or might be pregnant or is breast-feeding."*
(15)	**BASIS: GSR Part 3 Req. 36 states that** *"Registrants and licensees shall ensure that no person incurs a medical exposure unless there has been an appropriate referral, responsibility has been assumed for ensuring protection and safety, and the person subject to exposure has been informed as appropriate of the expected benefits and risks."*
(16)	**BASIS: GSR Part 3 Para. 3.182 states that** *"Registrants and licensees shall maintain for a period as specified by the regulatory body and shall make available, as required, the following personnel records:* *(a) Records of any delegation of responsibilities by principal parties…"*
(17)	**BASIS: GSR Part 3 Para. 3.183 states that** *"Registrants and licensees shall maintain for a period as specified by the regulatory body and shall make available, as required, the following records of calibration, dosimetry and quality assurance:…* *(c) Records of local assessments and reviews made with regard to diagnostic reference levels …"*
(18)	**BASIS: GSR Part 3 Para. 3.184 states that** *"Registrants and licensees shall maintain for a period as specified by the regulatory body and shall make available, as required, the following records for medical exposure:…* *(e) Exposure records for volunteers subject to medical exposure as part of a programme of biomedical research;…"*
(19)	**BASIS: GSR Part 3 Para. 3.178 states that** *"Registrants and licensees … shall ensure that all practicable measures are taken to minimize the likelihood of unintended or accidental medical*

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	exposures arising from flaws in design and operational failures of medical radiological equipment, from failures of and errors in software, or as a result of human error.
R25	**Recommendation: RPAZ should revise the current legal and regulatory framework to bring it in line with the requirements of GSR Part 3.**

Changes since the original IRRS mission

Recommendation 25: Since the initial mission in 2014, RPAZ has prepared the draft Bill and the Draft Radiation Protection Regulations (Amendment - 2022 to replace the radiation protection regulation SI 62 - 2011). The IRRS team was informed that these two drafts are in their final stages. See Recommendation R2 regarding the status of the draft Bill. The Draft Regulation will go through its approval process after the publication of the Bill in the Gazette.

The draft radiation protection regulation (Amendment, 2022) has addressed all but two issues of the above listed bases relevant to the control of medical exposure for recommendation R25.

Status of Recommendation 25

Recommendation (R25): is closed, as all but two issues of the listed bases within recommendation R25 are addressed in the draft regulations. Two new suggestions have been provided below to address the remaining two issues.

New observation(s) from the follow-up mission

Although the draft regulations (Amendment, 2022) have included the requirement that relevant national or international referral guidelines shall be considered for the justification of the medical exposure of an individual patient in a radiological procedure. The authority has not developed a national referral guideline nor adopted an international referral guideline. The IRRS team was informed that the facilities are using their own referral guidelines adopted from international references. However, these guidelines are not endorsed or approved by the competent authorities.

FOLLOW UP MISSION RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ has not developed a national referral guideline nor adopted an international referral guideline that shall be taken into account for the justification of the medical exposure of an individual patient in a radiological procedure.
(1)	**BASIS: GSR Part 3 Para. 3.158 states that** *"Relevant national or international referral guidelines shall be taken into account for the justification of the medical exposure of an individual patient in a radiological procedure."*
SF1	**Suggestion: RPAZ, in consultation with the health authority and relevant professional bodies, should consider developing a national referral guideline or adopt an international referral guideline that shall be taken into account for the justification of the medical exposure of an individual patient in a radiological procedure.**

New observation(s) from the follow-up mission

The draft regulation (Amendment, 2022) requires the establishment of dose constraints for the purpose of optimization of protection for medical exposure for carers and comforters, and for volunteers participating in medical or biomedical research. However, these constraints have not been established.

This draft also requires licensees to take necessary measure to ensure appropriate radiation protection for members of the public and for family members before a patient is released following radionuclide therapy. These arrangements include the activity of radionuclides in the patient is such that doses that could be received by members of the public and family members would follow the requirements set by the authority. However,

there is no requirement set by the authority on the maximum activity in the patient's body before being released from the hospital.

FOLLOW UP MISSION RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ has not developed dose constraints for the exposures of carers and comforters and for volunteers participating in a programme of biomedical research, nor established the requirement on maximum activity for the release of patients who have undergone therapeutic radiological procedures using unsealed sources.
(1)	**BASIS: GSR Part 3 Para. 3.149 states that** *"The government shall ensure that, as a result of consultation between the health authority, relevant professional bodies and the regulatory body, the following are established:* *(a) Dose constraints to be fulfilled for:* *(i) Exposures of carers and comforters;* *(ii) Exposures due to diagnostic investigations of volunteers participating in a programme of biomedical research.* *(b) Criteria and guidelines for the release of patients who have undergone therapeutic radiological procedures using unsealed sources or patients who still retain implanted sealed sources."*
SF2	**Suggestion: RPAZ, in consultation with the health authority and relevant professional bodies, should consider developing dose constraints for the exposures of carers and comforters and for volunteers participating in a programme of biomedical research, and also consider establishing requirements on the criteria for the release of patients who have undergone therapeutic radiological procedures using unsealed sources.**

11.2. OCCUPATIONAL RADIATION PROTECTION

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: The current status of the regulations on radiation protection in Zimbabwe is not fully compliant with the requirements of GSR part3.
(1)	**BASIS: GSR Part 3 Para. 4.12 states that** *"The government shall establish a programme for managing, controlling and recording the doses received in an emergency by emergency workers, which shall be implemented by response organizations and employers."*
(2)	**BASIS: GSR Part 3 Schedule III-1 states that** *"For occupational exposure of workers over the age of 18 years, the dose limits are:* *(b) An equivalent dose to the lens of the eye of 20 mSv per year averaged over 5 consecutive years (100 mSv in 5 years) and of 50 mSv in any single year."*
(3)	**BASIS: GSR Part 3 Schedule III-2 states that** *"For occupational exposure of apprentices of 16 to 18 years of age who are being trained for employment involving radiation and for exposure of students of age 16 to 18 who use sources in the course of their studies, the dose limits are: …* *(b) An equivalent dose to the lens of the eye of 20 mSv in a year;"*
(4)	**BASIS: GSR Part 3 Schedule III-1.c states that** *"The equivalent dose limits for the skin apply to the average dose over 1 cm² of the most highly irradiated area of the skin."*
(5)	**BASIS: GSR Part 3 Requirement 20 states that** *"The regulatory body shall establish and enforce requirements for the monitoring and recording of occupational exposures in planned exposure situations."*
(6)	**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."*

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
(7)	**BASIS: GSR Part 3 Para. 3.78 states that** *"Employers, registrants and licensees shall ensure that workers exposed to radiation from sources within a practice that are not required by or directly related to their work have the same level of protection against such exposure as members of the public."*
(8)	**BASIS: GSR Part 3 Para. 3.85 states that** *"If workers are engaged in work that involves or that could involve a source that is not under the control of their employer, the registrant or licensee responsible for the source and the employer shall cooperate to the extent necessary for compliance by both parties with the requirements of these Standards."*
(9)	**BASIS: GSR Part 3 Requirement 25 states that** *"Employers, registrants and licensees shall be responsible for making arrangements for assessment and recording of the occupational exposure and for workers' health surveillance."*
(10)	**BASIS: GSR Part 3 Requirement 22 states that** *"Workers shall fulfil their obligations and carry out their duties for protection and safety."*
(11)	**BASIS: GSR Part 3 Requirement 24 states that** *"Employers, registrants and licensees shall establish and maintain organizational, procedural and technical arrangements for the designation of controlled areas and supervised areas, for local rules and for monitoring of the workplace, in a radiation protection programme for occupational exposure."*
(12)	**BASIS: GSR Part 3 Para. 3.93 states that** *"Employers, registrants 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 following hierarchy of preventive measures:* *(1) Engineered controls;* *(2) Administrative controls;* *(3) Personal protective equipment."*
	Refer to Recommendation 25 of module 11.1.

The draft radiation protection regulation (Amendment, 2022) has addressed all but one issue of the above listed bases relevant to the control of occupational radiation protection. Only one point remains open about the requirements on the workers to fulfil their obligations and to carry out their duties for protection and safety.

Status of Recommendation 25

Recommendation (R25): is closed, as all but one issue of the listed bases is addressed in the draft regulations. One new recommendation has been provided below to address the remaining one issue in relation to occupational radiation protection.

New observation(s) from the follow-up mission

The IRRS team noted that there are no requirements for workers to fulfill their obligation in the draft radiation protection regulations (Amendment – 2022).

FOLLOW UP MISSION RECOMMENDATIONS AND SUGGESTIONS	
	Observation: RPAZ has not developed requirements on the workers to fulfill their obligation and carry out their duties for protection and safety.
(1)	**BASIS: GSR Part 3 Requirement 22 states that** *"Workers shall fulfil their obligations and carry out their duties for protection and safety."*
(2)	**BASIS: GSR Part 3 Para. 3.83 states that** *"Workers:* *(a) Shall follow any applicable rules and procedures for protection and safety as specified by the employer, registrant or licensee;* *(b) Shall use properly the monitoring equipment and personal protective equipment provided;*

FOLLOW UP MISSION RECOMMENDATIONS AND SUGGESTIONS	
	(c) Shall cooperate with the employer, registrant or licensee with regard to protection and safety, and programmes for workers' health surveillance and programmes for dose assessment; *(d) Shall provide to the employer, registrant or licensee such information on their past and present work that is relevant for ensuring effective and comprehensive protection and safety for themselves and others;* *(e) Shall abstain from any wilful action that could put themselves or others in situations that would not be in accordance with the requirements of these Standards;* *(f) Shall accept such information, instruction and training in protection and safety as will enable them to conduct their work in accordance with the requirements of these Standards.:*
RF1	**Recommendation: RPAZ should include requirements on the workers to fulfil their obligation and carry out their duties for protection and safety.**

11.4. TRANSPORT OF RADIOACTIVE MATERIAL

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

11.4.1. GENERAL ISSUES

2014 Original mission RECOMMENDATIONS AND SUGGESTIONS	
	Observation: Effective regulatory control of transport of radioactive material and sources is not in place yet.
(1)	**BASIS: GS-G-1.5 para. 5.6 states that "***The role of the regulatory body in relation to transport will normally include requirements relating to the approval of package designs, the approval of transport and, as determined by national legislation, the tracking of sources. National infrastructures for transport safety, in general, can be very complex. The regulatory body's role for the safe transport of radioactive material may need to be shared with other governmental agencies having competences and responsibilities for the safe transport of other dangerous goods."*
S10	**Suggestion: RPAZ should consider strengthening its regulatory activities to control the transport of radioactive material and sources within the country and in transit.**

Changes since the original IRRS mission

Suggestion 10: The IRRS team noted that RPAZ has a general guidance document on Minimum Requirements for Authorization to Transport Radioactive Material Within or Outside Zimbabwe and to Transit Through Zimbabwe. This document explains the minimum requirements for the approval of a transport action and includes the need to comply with the requirements of SSR-6. However, there is no documented evidence that, either the user or RPAZ, is following this document in regard to compliance with SSR-6. It is also noted that there are no specific regulations related to the intent of the general guidance.

RPAZ has not yet developed or issued transport regulations. The IRRS team was informed that RPAZ currently relies on SSR-6 as their transport regulations. However, SSR-6 only covers packaging and labelling and does not cover licensing requirements for transport.

The IRRS team noted that RPAZ has not yet established any formal MoU with other government regulators involved with the transport of dangerous goods. This is discussed above in Suggestion S1.

Status of Suggestion 10

Suggestion (10) remains open as to strengthen its regulatory activities RPAZ needs to further develop the national transport regulations.

Policy Discussion about the importance of Diagnostic Reference Levels for Patient Protection

This policy discussion was organized by the RPAZ and attended by their relevant staff and concerned participants from the Ministry of Health and Child Care, users, medical physicists, and radiation protection officers. RPAZ presented their challenge about the need to convince the MoHCC and all stakeholders with the importance of establishing diagnostic reference levels (DRLs) and their role in the optimization process. The meeting discussed the critical use of DRL in medical imaging to indicate whether the dose to the patient or the activities of radiopharmaceuticals administered in a specified radiological procedure for medical imaging is unusually high or unusually low for that procedure.

The IRRS team elaborated their views in this regard based on the experiences in their own countries. The views varied between:

- simple step by step manual collection of data;
- centralized patient dose management systems which are very helpful software tools linked to all radiology modalities for monitoring patient exposure, optimisation, compliance with DRLs and quality assurance;
- establishing dynamic DRLs such as with the American College of Radiology –National Radiology Data Registry where it allows facilities to compare their CT dose indices with regional or national values.

A good international practice is to require submission of dose values (once the Bill and the radiation protection regulations are promogulated) from hospitals at regular time intervals, instead of on a voluntary basis.

The IRRS team emphasized the importance of DRLs as can be used to:

- Improve national distributions of observed doses by reducing the frequency of unjustified high or low dose values;
- Promote an optimum range of doses for specified imaging protocols;
- Provide a common dose metric for comparison between facilities, protocols and modalities;
- Indicate compliance with regulatory requirements.

Finally, the participants in this policy discussion were introduced to an online training course on Diagnostic Reference Levels in Medical Imaging https://www.iaea.org/online-learning/courses/628/diagnostic-reference-levels-in-medical-imaging. This e-learning programme is designed to provide continuing education to medical imaging professionals, regulators and others who are interested in establishment and use of diagnostic reference levels. Participants were encouraged to use this free course to train all people involved in the project for the establishment of DRL as a first step to harmonize knowledge and provide good guidance to establish the national DRLs.

Representatives of MoHCC explained that there is an ongoing plan for starting the process for the introduction of DRLs in the near future.

APPENDIX I – LIST OF PARTICIPANTS

INTERNATIONAL EXPERTS			
1.	HOLAHAN Patricia Karen	U.S. Nuclear Regulatory Commission (USNRC) WASHINGTON, DC UNITED STATES OF AMERICA	patricia.holahan@nrc.gov
2.	FRANZÉN Anna Katarina	Swedish Radiation Safety Authority (SSM) Solna Strandväg 96 171 16 STOCKHOLM SWEDEN	anna.franzen@ssm.se
3.	HINRICHSEN Paul John	National Nuclear Regulator (NNR) 0046 CENTURION SOUTH AFRICA	phinrich@nnr.co.za
4.	KABORO Beth Mwihaki	Radiation Protection Board Hospital Road NAIROBI 1984100202 KENYA	kaborobeth@gmail.com
5.	KHARITA Mohammad Hassan	Hamad Medical Corporation DOHA, QATAR	MKharita@hamad.qa
6.	MUNDIA Isaac Waweru	Kenya Nuclear Regulatory Authority P.O. Box 19841 00202 NAIROBI KENYA	rpbkenya@nbnet.co.ke
IAEA STAFF MEMBERS			
1.	TOMAS ZERQUERA Juan	Division of Radiation, Transport and Waste Safety	T.Hailu@iaea.org
2.	SWOBODA Zumi	Division of Radiation, Transport and Waste Safety	Z.Swoboda@iaea.org
LIAISON OFFICERS			
1.	MPANDANYAMA Rujeko	Liaison Officer	rmpandanyama@rpaz.co.zw

GROUP PHOTO

APPENDIX II – MISSION PROGRAM

IRRS FOLLOW-UP MISSION TO ZIMBABWE

22 – 28 May 2022

Sunday 22 May		
10:00 - 13:00	**IRRS Initial Team Meeting** • Opening remarks by the IRRS Team Leader • Introduction by IAEA • Self-introduction of all attendees • IRRS Process and report writing (IAEA) • Schedule (TL, IAEA) • First impressions from team members arising from the Advanced Reference Material (ARM) • Administrative arrangements (Liaison Officer, IAEA): Detailed Mission Programme	Location: Hotel Participants: IRRS Team, Liaison Officer
13:00 – 14:00	Lunch	
14:00 -17:00	• Reviewers prepare for interviews; • TL presentation for the Entrance Meeting (as necessary)	Participants: IRRS Team
Monday 23 May		
09:00 – 11.00	**IRRS Entrance Meeting** • Arrival, registration • Welcoming address • Self-introduction of Liaison Officer and counterparts of each module • Opening remarks by IRRS Team Leader. Expectations for the Mission • Self-introduction of IAEA mission members • RPAZ presentation – Overview of national regulatory infrastructure and RPAZ: progress since 2014 • Photo session	Location: RPAZ Participants: Govt Officials, RPAZ senior management, Liaison Officer and staff, IRRS Team
11:00 – 12:00	Beginning of interviews and discussions with counterparts (parallel discussions)	Location: RPAZ Participants: IRRS Team and national counterparts
12:00 – 13:00	Lunch	
13:00 – 17:00	Interviews and discussions with counterparts (parallel discussions)	Location: RPAZ Participants: IRRS Team and national counterparts
17:00 - 18:00	Daily IRRS Review Team meeting	Location: Hotel Participants: IRRS Team + LO

20:00 –	Team writes report	IRRS Team
Tuesday 24 May		
09:00 – 12:00	Interviews and discussions with counterparts (parallel discussions)	Location: RPAZ Participants: IRRS Team and national counterparts
12:00 – 13:00	Lunch	
13:00 – 15:00	Policy issue discussions	Location: RPAZ Participants: IRRS Team and RPAZ designated staff
15:00 – 17:00	Interviews and discussions with counterparts (parallel discussions)	Location: RPAZ Participants: IRRS Team and national counterparts
17:00 – 18:00	Daily IRRS Review Team meeting/ Discussion of the preliminary findings (conclusions)	Location: Hotel Participants: IRRS Team + the LO
20:00 – 24:00	Report drafting: • Team writes report • Secretariat edits report	IRRS Team
Wednesday 25 May		
Daily Discussions / Interviews		
09:00 – 12:00	• Follow-up Interviews as needed • Finalization of draft text and deliver to TL • TL and TC review introductory part	Location: RPAZ Participants: IRRS Team and national counterparts (as needed)
12:00 – 13:00	Lunch	
13:00 – 14:00	Written preliminary (conclusions) delivered to the Team Leader copied to IAEA Coordinator	Location: RPAZ IRRS Team
14:00 – 16:00	Report preparation and cross reading	Location: RPAZ IRRS Team
16:00 – 17:00	Preliminary Draft Report Ready	IRRS Team
17:00 – 18:00	Daily IRRS Review Team Meeting: conclusions discussions	Location: Hotel Participants: IRRS Team + the LO
20:00 – 24:00	Report reading	IRRS Team
Thursday 26 May		
09:00 – 12:00	Report finalization	Location: RPAZ Participants: IRRS Team
12:00 – 13:00	Lunch	
13:00 – 14:00	Submission of draft report to RPAZ	Location: RPAZ Participants: IRRS Team
14:00 – 16:00	• TL finalizes presentation • TC coordinates press release with RPAZ and OPIC	TL TC and AA RPAZ
16:00 – 18:00	Discussion of Executive Summary	Location: RPAZ Participants: Govt Officials, Senior management RPAZ,

		Liaison Officer and staff, IRRS Team RPAZ
20:00 – 24:00	Report revision as needed	IRRS Team
Friday 27 May		
10:00 – 12:00	Reception of comments from the Host	Location: RPAZ Participants: RPAZ, IRRS Team
12:00 – 13:00	Lunch	
13:00 – 16:00	Discussion on the comments from the Host and finalization of the final draft report	Location: RPAZ Participants: TL
16:00 – 18:00	Presentation of the final draft report to the Host	Location: RPAZ Participants: IRRS Team, RPAZ representatives
Saturday 28 May		
09:00 – 12:00	• Exit Meeting • Press release • Farewell	Location: RPAZ Participants: Government Officials, RPAZ senior management, Liaison Officer and staff, IRRS Team
12:00 –	Departure of IRRS Team Members	IRRS Team

APPENDIX III – LIST OF COUNTERPARTS

	IRRS EXPERTS	Lead Counterpart
1.	**LEGISLATIVE AND GOVERNMENTAL RESPONSIBILITIES**	
	Patricia HOLAHAN Isaac MUNDIA	V. Mavurayi-Mutanga I. Mayida
2.	**GLOBAL NUCLEAR SAFETY REGIME**	
	Patricia HOLAHAN Isaac MUNDIA	V. Mavurayi-Mutanga I. Mayida
3.	**RESPONSIBILITIES AND FUNCTIONS OF THE REGULATORY BODY**	
	Patricia HOLAHAN Isaac MUNDIA	V. Mavurayi-Mutanga I. Mayida
4.	**MANAGEMENT SYSTEM OF THE REGULATORY BODY**	
	Anna FRANZÉN	R.L. Mpandanyama A. Muzongomerwa
5.	**AUTHORIZATION**	
	Isaac MUNDIA	N. Manjeru
6.	**REVIEW AND ASSESSMENT**	
	Isaac MUNDIA	M. Masoka
7.	**INSPECTION**	
	Isaac MUNDIA	N. Ncube
8.	**ENFORCEMENT**	
	Isaac MUNDIA	P. Zvenyika
9.	**REGULATIONS AND GUIDES**	
	Isaac MUNDIA	P. Zvenyika

	IRRS EXPERTS	Lead Counterpart
10.	**EMERGENCY PREPAREDNESS AND RESPONSE**	
	Beth Mwihaki KABORO	N. Manjeru S. Mangena
11.	**ADDITIONAL AREAS**	
	Hassan KHARITA	A . Muzongomerwa P. Sithole E. Makoni
	Paul John HINRICHSEN	

APPENDIX IV - RECOMMENDATIONS (R) AND SUGGESTIONS (S) FROM THE PREVIOUS IRRS MISSION THAT REMAIN OPEN

Module	Section	R/S	Recommendations/Suggestions
1	1.1	R1	Recommendation: The government should establish a national policy and strategy for safety to ensure that the Safety Fundamentals are explicitly adopted in a high level document.
1	1.5	S1	Suggestion: The government should consider strengthening coordination between the national authorities having responsibilities for radiation safety.
1	1.8	R5	Recommendation: The government should provide for building and maintaining the available national arrangements for education and training to address the competence needs of all parties in relation to safety of facilities and activities, based on proper analysis.
2	2.2	S2	Suggestion: RPAZ should consider establishing a formal process for identifying and sharing lessons learned from operating experience and regulatory experience.
3	3.5	R8	Recommendation: RPAZ should develop a formal mechanism to communicate with authorised parties on all safety related issues.
3	3.6	R9	Recommendation: RPAZ should ensure that decision making is applied and documented to ensure that regulatory control is consistent throughout the Authority.
5	5.2	S5	Suggestion: RPAZ should consider developing guidance on the facilities and activities to be authorized by notification or exempted from its regulatory control.
10	10.2	R22	Recommendation: RPAZ should develop the necessary requirements regulating the recovery operation and facilitating the smooth transition to normal social and economic conditions.
11	11.4.1	S10	Suggestion: RPAZ should consider strengthening its regulatory activities to control the transport of radioactive material and sources within the country and in transit.

APPENDIX V- RECOMMENDATIONS (RF), SUGGESTIONS (SF) AND GOOD PRACTICES (GPF) FROM THE 2022 IRRS FOLLOW UP MISSION

Module	Section	RF/SF/GPF	Recommendation, Suggestion or Good Practice
11	11.1	SF1	Suggestion: RPAZ, in consultation with the health authority and relevant professional bodies, should consider developing a national referral guideline or adopt an international referral guideline that shall be taken into account for the justification of the medical exposure of an individual patient in a radiological procedure.
11	11.1	SF2	Suggestion: RPAZ should consider developing, in consultation with the health authority and relevant professional bodies, dose constraints for the exposures of carers and comforters and for volunteers participating in a programme of biomedical research. RPAZ should consider also establishing requirements on the criteria for the release of patients who have undergone therapeutic radiological procedures using unsealed sources.
11	11.2	RF1	Recommendation: RPAZ should include requirements on the workers to fulfil their obligation and carry out their duties for protection and safety.

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

1.	ARMS report IRRS Follow-up Mission Zimbabwe.docx
2.	Draft National EPR Plan.pdf
3.	Draft Radiation Protection Bill 2022.pdf
4.	Draft Regulations for Radiation Safety in Nuclear Medicine ZW.pdf
5.	Draft Regulations for Radiation Safety in Radiotherapy ZW.pdf
6.	IRRS Follow-up Mission Zimbabwe 2022 report template .docx
7.	National stakeholder workshop for development of National Nuclear and radiological emergency plan.pdf
8.	RPAZ Authorization Policy_2021.pdf
9.	RPAZ Clients Charter.pdf
10.	RPAZ Communications Manual.pdf
11.	RPAZ Dental Checklist.pdf
12.	RPAZ Draft Communication Strategy.pdf
13.	RPAZ Draft MOU with Medical Research Council of Zimbabwe.pdf
14.	RPAZ Draft Policy Development Procedure 2022.pdf
15.	RPAZ Draft SHE Policy 2021 .pdf
16.	RPAZ Enforcement Policy_ 2021.pdf
17.	RPAZ Enforcement Procedure.pdf
18.	RPAZ EPR Requirements for Radiological and Nuclear Installations.pdf
19.	RPAZ Graduate Training Program.pdf
20.	RPAZ Guidance Document on EPR for Nuclear and Radiological Emergencies.pdf
21.	RPAZ Guidance for radioactive waste management.pdf
22.	RPAZ Guide for completing Application for Gauging and Detection Devices.pdf
23.	RPAZ Guide for completing Application for Import and Export.pdf
24.	RPAZ Guide for completing Application for X-Ray Facilities.pdf
25.	RPAZ Guide to Reading RPAZ License.pdf
26.	RPAZ Industrial Checklist.pdf
27.	RPAZ Inspections Procedures_2020.pdf
28.	RPAZ Inspector Training Program.pdf
29.	RPAZ List of IRRS Module Counterparts.pdf
30.	RPAZ Medical Facilities Inspection Checklist_2021.pdf
31.	RPAZ MOU with Ministry of Agriculture for soil, environment and food quality monitoring and management.pdf
32.	RPAZ MOU with Research Council of Zimbabwe -draft 3.pdf

33.	RPAZ MOU with Zimbabwe Republic Police.pdf
34.	RPAZ MOU with Zimbabwe Revenue Authority.pdf
35.	RPAZ Nuclear Medicine Checklist.pdf
36.	RPAZ Nuclear Medicine Checklist Staff Complement.pdf
37.	RPAZ Organizational Organogram.pdf
38.	RPAZ Radiation Safety Training Calender_2022 and Catalogue.pdf
39.	RPAZ Radiotherapy Facility Check list (Equipment Procedures).pdf
40.	RPAZ Radiotherapy Facility Check list (Human Resource & Equipment Inventory).pdf
41.	RPAZ Radiotherapy Facility Check list for approval.pdf
42.	RPAZ Radiotherapy Facility Checklist (Patient Protocols).pdf
43.	RPAZ Radiotherapy Facility Checklist (Radiation Protection and Safety).pdf
44.	RPAZ Records Manual.pdf
45.	RPAZ Requirements radioactive waste management.pdf
46.	RPAZ RPP Guide.pdf

APPENDIX VII – IAEA REFERENCE MATERIAL USED FOR THE REVIEW

1.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Fundamental Safety Principles, No SF-1, IAEA, Vienna (2006)
2.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Governmental, Legal and Regulatory Framework for Safety, General Safety Requirements Part 1, No. GSR Part 1 (Rev. 1), IAEA, Vienna (2016)
3.	**INTERNATIONAL ATOMIC ENERGY AGENCY –** Leadership and Management for Safety, General Safety Requirements Part 2, No. GSR Part 2, IAEA, Vienna (2016)
4.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Radiation Protection and Safety of Radiation Sources: International Basic Safety Standards, General Safety Requirements Part 3, No. GSR Part 3, IAEA, Vienna (2014).
5.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety assessment for facilities and activities, General Safety Requirements Part 4, No. GSR Part 4 (Rev. 1), IAEA, Vienna (2016)
6.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Predisposal Management of Radioactive Waste, General Safety Requirement Series Part 5, No. GSR Part 5, IAEA, Vienna (2009)
7.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Decommissioning of Facilities, General Safety Requirement Series No. GSR Part 6, IAEA, Vienna (2014)
8.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Preparedness and Response for Nuclear or Radiological Emergency, General Safety Requirement Series No. GSR Part 7, IAEA, Vienna (2015)
9.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Site Evaluation for Nuclear Installations, Specific Safety Requirement Series No. SSR-1, IAEA, Vienna (2003)
10.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety of Nuclear Power Plants: Design, Specific Safety Requirements Series No. SSR-2/1 (Rev. 1), IAEA, Vienna (2016)
11.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety of Nuclear Power Plants: Commissioning and Operation, Specific Safety Requirements Series No. SSR-2/2 (Rev. 1), IAEA, Vienna (2016)
12.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety of Research Reactors, Specific Safety Requirements Series No. SSR-3, IAEA, Vienna (2016)
13.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety of Nuclear Fuel Cycle Facilities, Specific Safety Requirements Series No. SSR-4, IAEA, Vienna (2017)
14.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Disposal of Radioactive Waste, Specific Safety Requirements Series No. SSR-5, IAEA, Vienna (2011)
15.	**INTERNATIONAL ATOMIC ENERGY AGENCY** – Regulations for the Safe Transport of Radioactive Material, Specific Safety Requirements Series No. SSR-6, IAEA, Vienna (2012)
16.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Regulations for the Safe Transport of Radioactive Material, 2018 Edition, Specific Safety Requirements Series No. SSR-6 (Rev. 1), IAEA, Vienna (2018)
17.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Classification of Radioactive Waste, General Safety Guide No. GSG-1, IAEA, Vienna (2009)
18.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Criteria for Use in Preparedness and Response for a Nuclear or Radiological Emergency, Safety Guide Series No GSG-2, IAEA, Vienna (2012)
19.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Communication and Consultation with Interested Parties by the Regulatory Body, General Safety Guide Series No. GSG-6, IAEA, Vienna (2017).
20.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Occupational Radiation Protection, Safety Guide Series No. GSG-7 , IAEA, Vienna (2018)
21.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Regulatory Control of Radioactive Discharges to the Environment, Safety Guide Series No GSG-9, IAEA, Vienna (2018)
22.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Organization, Management and Staffing of the Regulatory Body for Safety, General Safety Guide Series No. GSG-12, IAEA, Vienna (2018).
23.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Functions and Processes of the Regulatory Body for Safety, General Safety Guide Series No. GSG-13, IAEA, Vienna (2018).

24.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Arrangements for Preparedness for a Nuclear or Radiological Emergency, Safety Guide Series No. GS-G-2.1, IAEA, Vienna (2007)
25.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - The Management System for the Disposal of Radioactive Waste, Safety Guide Series No GS-G-3.4, IAEA, Vienna (2008)
26.	**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)
27.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - A System for the Feedback of Experience from Events in Nuclear Installations, Safety Guide Series No. NS-G-2.11, IAEA, Vienna (2006)
28.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Modifications to Nuclear Power Plants, Safety Guide Series No NS-G-2.3, IAEA, Vienna (2001)
29.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Recruitment, Qualification and Training of Personnel for Nuclear Power Plants, Safety Guide Series No NS-G-2.8, IAEA, Vienna (2002)
30.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Environmental and Source Monitoring for Purposes of Radiation Protection, Safety Guide Series No. RS-G-1.8, IAEA, Vienna (2005)
31.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Safety of Radiation Generators and Sealed Radioactive Sources, Safety Guide Series No. RS-G-1.10, IAEA, Vienna (2008)
32.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Borehole Disposal Facilities for Radioactive Waste, Safety Guide Series No SSG-1, IAEA, Vienna (2009)
33.	**INTERNATIONAL ATOMIC ENERGY AGENCY -** Deterministic Safety Analysis for Nuclear Power Plants, Specific Safety Guides Series No. SSG-2, IAEA, Vienna (2010)
34.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Development and Application of Level 1 Probabilistic Safety Assessment for Nuclear Power Plants, Specific Safety Guide Series No. SSG-3, IAEA, Vienna (2010)
35.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Development and Application of Level 2 Probabilistic Safety Assessment for Nuclear Power Plants, Specific Safety Guide Series No. SSG-4, IAEA, Vienna (2010)
36.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety of Conversion Facilities and Uranium Enrichment Facilities, Specific Safety Guide Series No. SSG-5, IAEA, Vienna (2010)
37.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety of Uranium Fuel Fabrication Facilities Specific Safety Guide Series No. SSG-6, IAEA, Vienna (2010)
38.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Safety of Uranium and Plutonium Mixed Oxide Fuel Fabrication Facilities, Specific Safety Guide Series No. SSG-7, IAEA, Vienna (2010)
39.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Licensing Process for Nuclear Installations, Specific Safety Guide Series No. SSG-12, IAEA, Vienna (2010)
40.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Geological Disposal Facilities for Radioactive Waste Specific Safety Guide Series No. SSG-14, IAEA, Vienna (2011)
41.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Storage of Spent Nuclear Fuel, Safety Guide Series No SSG-15 (Rev. 1), IAEA, Vienna (2020)
42.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Periodic Safety Review for Nuclear Power Plants, Safety Guide Series No SSG-25, IAEA, Vienna (2013)
43.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Advisory Material for the IAEA Regulations for the Safe Transport of Radioactive Material, Specific Safety Guide No SSG-26, IAEA, Vienna, (2014)
44.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Commissioning for Nuclear Power Plants, Safety Guide Series No. SSG-28, IAEA, Vienna (2014)
45.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Predisposal Management of Radioactive Waste from Nuclear Power Plants and Research Reactors, Safety Guide Series No SSG-40, IAEA, Vienna (2016)
46.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Predisposal Management of Radioactive Waste from Nuclear Fuel Cycle Facilities, Safety Guide Series No SSG-41, IAEA, Vienna (2016)
47.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Management of Waste from the Use of Radioactive Material in Medicine, Industry, Agriculture, Research and Education, Safety Guide Series No SSG-45, IAEA, Vienna (2019)

48.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Radiation Protection and Safety in Medical Uses of Ionizing Radiation, Safety Guide Series No SSG-46, IAEA, Vienna (2018)
49.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Decommissioning of Nuclear Power Plants, Research Reactors and Other Nuclear Fuel Cycle Facilities, Safety Guide Series No SSG-47, IAEA, Vienna (2018)
50.	**INTERNATIONAL ATOMIC ENERGY AGENCY** – Ageing Management and Development of a Programme for Long Term Operation of Nuclear Power Plants, Safety Guide Series No SSG-48, IAEA, Vienna (2018)
51.	**INTERNATIONAL ATOMIC ENERGY AGENCY** –Decommissioning of Medical, Industrial and Research Facilities, Safety Guide Series No SSG-49, IAEA, Vienna (2019)
52.	**INTERNATIONAL ATOMIC ENERGY AGENCY** – Operating Experience Feedback for Nuclear Installations, Safety Guide Series No SSG-50, IAEA, Vienna (2019)
53.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Accident Management Programmes for Nuclear Power Plants, Safety Guide Series No SSG-54, IAEA, Vienna (2019)
54.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Planning and Preparing for Emergency Response to Transport Accidents Involving Radioactive Material, Safety Guide No TS-G-1.2 (2002)
55.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Radiation Protection Programmes for the Transport of Radioactive Material, Safety Guide No TS-G-1.3, IAEA, Vienna, (2007)
56.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - The Management System for the Safe Transport of Radioactive Material Safety Guide No TS-G-1.4, IAEA, Vienna, (2008)
57.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Compliance Assurance for the Safe Transport of Radioactive Material, Safety Guide No TS-G-1.5, IAEA, Vienna, (2009)
58.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Schedules of Provisions of the IAEA Regulations for the Safe Transport of Radioactive Material (2009 Edition), Safety Guide No TS-G-1.6 (Rev.1), IAEA, Vienna, (2014)
59.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Storage of Radioactive Waste, Safety Guide Series No WS-G-6.1, IAEA, Vienna (2006)
60.	**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)
61.	**INTERNATIONAL ATOMIC ENERGY AGENCY** - Storage of Radioactive Waste, Safety Guide Series No. WS-G-6.1, IAEA, Vienna (2006)

APPENDIX VIII – ORGANIZATIONAL CHART

ORGANASITIONAL STRUCTURE: 2021-2025