****

**Atomic Energy Council**

**Regulatory Compliance Self-Assessment Tool**

**for facilities with X-ray generating equipment for medical applications**

**OVERVIEW**

This self-assessment tool has been designed to enable your facility to conduct a thorough evaluation of its compliance with the regulatory requirements and recommendations for use of X-ray generating equipment for medical applications e.g diagnostic X-ray machines (mobile, fixed, computed tomography, and dental X-rays) and interventional X-ray machines (C-Arm and flouroscopy). The primary purpose of this assessment is to ensure the safety, security, and regulatory compliance of your operations involving radiation sources. The self-assessment process is a proactive approach that empowers your facility to identify and resolve any issues before official inspections by the Atomic Energy Council take place. It allows you to take corrective actions, implement best practices, and ensure ongoing compliance with regulatory requirements, thus promoting the well-being of patients, staff, and the general public.

It is crucial to approach the self-assessment process with a commitment to accuracy and honesty. Provide responses that reflect the true state of your facility's practices, procedures, and systems. By doing so, you will gain valuable insights into areas where compliance may be lacking or improvements can be made. Identifying non-compliance or areas for improvement is not a cause for concern but an opportunity for growth. It is essential to take appropriate actions to address any gaps or deficiencies identified during the self-assessment process. These actions may include documenting new procedures and protocols, enhancing safety and security measures, providing additional training, or acquiring necessary resources.

**INSTRUCTIONS**

|  |
| --- |
| 1. Analyze and comprehend the specific regulatory requirement and the notes provided for each requirement or recommendation. The requirements derived from the Atomic Energy Act no. 24 of 2008 are denoted with AEA, and those from the Atomic Energy Regulations 2012 are denote with AER, 2012. 2. Assess your facility's current practices, procedures, and systems to determine if they align with each provision in the requirements or recommendations stated in the notes. 3. In the self-assessment part, indicate whether your facility meets the requirement or recommendation. Use "Yes" if your facility is compliant with **ALL** provisions in the notes, and "No" if there is any element that is lacking in compliance. 4. Use the comments section to provide any additional information, clarifications, or details related to your facility's compliance status. This section can also be used to explain any specific circumstances or actions taken that may affect compliance. 5. Use the Action(s) to be taken section to highlight the specific actions that your facility will undertake to address the gaps if there is non-compliance or room for improvement. 6. Once the self-assessment is complete, submit the filled and endorsed form to AEC for review. 7. After reviewing the self-assessment form, AEC may schedule an inspection or follow-up to verify the responses and assess the compliance of your facility. Be prepared to provide evidence or demonstrate your compliance during this inspection. |

**FACILITY CONTACT DETAILS**

|  |  |
| --- | --- |
| Facility Name |  |
| Postal Address |  |
| Location  (Plot number & District) |  |
| Telephone contact(s) |  |
| Email address(es) |  |
|  | |
| Name and job title of legal person |  |
| Qualifications |  |
| Years of experience |  |
| Telephone contact(s) |  |
| Email address(es) |  |
|  | |
| Name and job title of Radiation Safety Officer |  |
| Telephone contact(s) |  |
| Email address(es) |  |

**EQUIPMENT DETAILS**

|  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| **#** | **Equipment type**  e.g., Fixed plain X-ray | **Machine Model** | **Machine Serial No.** | **Manufacturer name** | **Tube Model** | **Tube Serial** | **Manufacturer** | **kV** | **mAs** |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |
|  |  |  |  |  |  |  |  |  |  |

**REQUIREMENTS AND RECOMMENDATIONS**

|  |  |
| --- | --- |
| 1. **Authorization to possess and use radiation sources** | |
| AEA, 32 (1) | Subject to section 33, no person shall acquire, own, possess, operate, import, export, hire, loan, receive, use, install, commission, decommission, transport, store, sell, distribute, dispose of, transfer, modify, upgrade, process, manufacture or undertake any practice related to the application of atomic energy and regulated by this Act unless permitted by an authorization issued under this Act. |
| ***Note:*** *It is required that individuals or organizations engaging in activities involving radiation sources acquire a license or permit from the Council. This requirement ensures that you are legally authorized to possess and use radiation sources, promoting safety, security, and regulatory compliance. To confirm compliance, you should check that each radiation source has a valid license and that the details of all radiation sources match those specified on the license/permit.* | |
| Self-assessment | Do you possess the necessary authorization from the Council to undertake the practice(s) involving radiation sources? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Security measures against misuse or theft of radiation sources** | |
| AER, 21 (7) | An authorized person shall provide sufficient security measures against the misuse or theft of radiation sources under their possession. |
| ***Note:*** *It is required that you establish sufficient security measures to prevent the misuse or theft of radiation sources. These security measures are essential to safeguard the radiation sources from unauthorized access and potential theft or misuse. It is recommended to implement physical barriers such as lockable doors and security controls. Additionally, administrative controls at reception may be included to regulate access to radiation sources. The security measures should be comprehensive, taking into consideration the specific needs and risks associated with the storage and handling of radiation sources.* | |
| Self-assessment | Have you established sufficient security measures against the misuse or theft of radiation sources? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Equipment maintenance logbook** | |
| AER, 34(1)(l) | An authorized person shall keep records of the results of monitoring and verification of compliance, which shall include maintenance records of apparatus. |
| ***Note:*** *It is required that you establish a maintenance logbook for recording all maintenance activities conducted on the equipment used in radiation practices. It helps to track and document maintenance activities, including repairs, calibration, and routine checks, ensuring that the equipment remains in proper working conditions. The maintenance logbook should include relevant details such as the date of maintenance, description of the activity performed, and the name of the person who carried out the maintenance.* *By maintaining a comprehensive maintenance logbook, you can demonstrate the proper functioning of the equipment used in the radiation practices.* | |
| Self-assessment | Have you created a maintenance logbook for the equipment? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Trained and qualified radiation workers** | |
| AER, 29 (1) | An authorized person shall ensure that all personnel on whom protection and safety depend are appropriately trained and qualified, in order that they understand their responsibilities and perform their duties with appropriate judgment according to defined procedures, and are periodically retrained. |
| ***Note:*** *It is required that you employ radiation workers who are appropriately trained and qualified. To meet this requirement, each radiation worker, such as radiologists, imaging technologists, radiographers, and others involved in radiation practices, should possess relevant academic qualifications and training certificates in their respective fields or practices. These qualifications may include certifications from recognized educational institutions, such as UCE, UACE, diplomas, bachelor's degrees, or postgraduate studies, depending on the specific requirements of the role. By ensuring that your radiation workers have the necessary qualifications and training, you can enhance the safety and quality of radiation practices and mitigate potential risks of accidents.* | |
| Self-assessment | Do you ensure that you employ and use only radiation workers who are appropriately trained and qualified? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Documented obligations and responsibilities of radiation workers** | |
| AER, 35(5) | Authorized persons and employers shall ensure that workers are informed of their obligations and responsibilities for their own protection and the protection of others against radiation and for the safety and security of sources. |
| ***Note:*** *It is required that you have created distinct documents, specifically outlining the roles and responsibilities for different radiation workers or categories of radiation workers working in the radiology unit. This document should clearly define the expectations and duties related to radiation protection, safety practices, and security measures. Furthermore, copies of appointment letters containing the designated responsibilities for the Radiation Safety Officer (RSO), other radiation workers, and Radiation Safety Committee members should be provided to each individual. Additionally, copies of these appointment letters should be maintained on the Atomic Energy Council file for reference and verification purposes.* *By documenting and providing workers with their obligations and responsibilities, you establish a clear framework for radiation safety and security within your organization, promote a culture of awareness, accountability, and adherence to safety standards.* | |
| Self-assessment | Have you documented and provided workers with their obligations and responsibilities for protection, safety, and security? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Periodic training and retraining of radiation workers** | |
| AER, 55(2)(e) | Authorized persons shall be responsible, with respect to the sources under their charge for the establishment, implementation and maintenance of appropriate radiation safety training, and periodic retraining to the personnel having functions relevant to the protection of the public. |
| ***Note:*** *It is expected that have a documented and implemented training program, and that you provide adequate radiation safety training to all radiation workers, specifically tailored to radiation safety practices within your organization. This program should cover essential topics such as radiation protection principles, safe handling and use of radiation sources, emergency procedures, and regulatory compliance. The copies of training certificates should be available to confirm that each radiation worker has received the necessary training. The training materials should be periodically reviewed, at least every three years, to ensure they remain up to date and reflect current best practices in radiation safety. By providing appropriate training and periodic retraining, you ensure that radiation workers are well-informed about the potential risks associated with their work and are equipped to mitigate those risks effectively.* | |
| Self-assessment | Have you provided appropriate radiation safety training and periodic retraining to all radiation workers? |
| Comment(s) |  |
| Action(s) to be taken |  |
|  |  |

|  |  |
| --- | --- |
| 1. **Appointment of a Radiation Safety Officer (RSO)** | |
| AER, 30(1) | An authorized person shall, after consultation with the Council, appoint a qualified person employed by him or her to be a Radiation Safety Officer in relation to his undertaking. |
| ***Note:*** *It is required that you appoint an individual who possesses the necessary qualifications, experience, and expertise in radiation safety as the RSO and issue an official appointment letter outlining their defined roles and responsibilities. The appointment letter should clearly specify the individual's authority and accountability for radiation safety matters. The RSO oversees and ensures compliance with radiation safety requirements within your organization. The RSO serves as a point of contact for radiation safety-related issues, provides guidance and expertise to radiation workers, and collaborates with the Council to ensure compliance with relevant regulatory requirements.* | |
| Self-assessment | Have you formally appointed a suitably qualified person as a Radiation Safety Officer (RSO)? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Establishment of Radiation Safety Committee (RSC)** | |
| AER, 31(1) & (2) | An authorized person shall, after consultation with the Council, constitute a Radiation Safety Committee for each premise, comprising of a representative of management; a qualified expert; a representative of workers; and the Radiation Safety Officer. The Radiation Safety Committee shall review local rules, radiation protection and safety programs; organize drills and exercises on emergency response for workers; and advise authorized persons on how to achieve safety and security of sources. |
| ***Note:*** *For facilities with more than two practices, significant workload (more than 25 patients a day), and high-risk machines, it is required that you appoint suitable members who will actively contribute to radiation safety efforts to a Radiation Safety Committee (RSC). The committee should consist of individuals representing various roles and responsibilities related to radiation safety, including but not limited to the Radiation Safety Officer (RSO), radiation workers, and management representatives. Appointment letters should be issued to the committee members, clearly outlining their roles, areas of responsibility, and expectations. The committee should hold regular meetings to discuss radiation safety matters, review procedures and protocols, and address any concerns or issues that may arise. Copies of the minutes from these meetings should be maintained as a record of discussions, decisions, and actions taken. The establishment of the RSC will enhance the effectiveness of your radiation safety program.* | |
| Self-assessment | Have you established a Radiation Safety Committee (RSC)? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Quality Control (QC) Program** | |
| AER, 49(3) | Quality assurance programs for medical exposures shall include measurements of the physical parameters of the radiation generators, imaging devices and irradiation installations at the time of commissioning and periodically thereafter; verification of the appropriate physical and clinical factors used in patient diagnosis or treatment; written records of relevant procedures and results; verification of the appropriate calibration and conditions of operation of dosimetry and monitoring equipment; and as far as possible, regular and independent quality audit reviews of the quality assurance program for radiotherapy procedures. |
| ***Note:*** *It is required that you establish and implement a comprehensive QC program for medical exposures in line with the AEC requirements. The QC program ensures the accuracy and reliability of radiation equipment and processes involved in medical imaging, specifically leading to improved image quality, accurate diagnoses, and enhanced patient safety. You are required to document a QC program that outlines the necessary tests, step-by-step procedures for carrying out each test, and the equipment required to perform these tests. The program should specify the frequency of the tests and identify the individuals responsible for performing the tests and their respective roles. Additionally, the QC program should define tolerance values for each test in line with the regulatory limits set by AEC. If any test results exceed the tolerance levels, the program should specify the actions to be taken, such as investigating the cause, initiating corrective measures, and documenting the actions taken. You should keep records of the results obtained from the QC checks and actions taken, if any, conducted as part of the program.* | |
| Self-assessment | Have you documented and implemented a comprehensive Quality Control (QC) program for the medical exposures at your facility? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Occupational radiation exposure monitoring** | |
| AER, 40(1), 40(4), 24(1), 34(1)(b), 40(6) | Authorized persons and employers shall arrange for the assessment of the occupational exposure of workers and shall ensure that adequate arrangements are made for the provision of such services by a dosimetry laboratory approved by the Council. The normal exposure of individuals shall be restricted, so that neither the total effective dose nor the total equivalent dose to relevant organs or tissues, caused by the possible combination of exposures from authorized practices, exceeds any relevant dose limits specified in Schedule 3 except in special circumstances considered under regulation 45. The nature, frequency and precision of individual monitoring shall be determined by consideration of the magnitude and possible fluctuations of exposure levels and the likelihood and magnitude of potential exposures. An authorized person shall keep records of the results of monitoring and verification of compliance, which shall include radiation dose records. Authorized persons and employers shall keep records of exposure which shall be made available to workers and the Council when required. |
| ***Note:*** *It is required that you have implemented appropriate arrangements for assessing the occupational exposure of workers to radiation by providing them with personal dosimeters. These arrangements are essential to monitor and measure the radiation doses received by individual workers during their work activities. Regular monitoring and assessment of individual dose results are necessary to ensure that the radiation exposure of workers remains within the relevant dose limits specified by the Atomic Energy Council (AEC). The individual dose results provide information about the level of radiation exposure and help in identifying any potential overexposure or dose exceeding situations. The dosimeters should be read at least once in three (03) months and the records of the individual dose results provided to each radiation worker, and a copy maintained on file. Workers in interventional radiology are typically required to have two dosimeters to accurately measure their occupational exposure. One dosimeter is worn under the lead apron, positioned between the waist and the chest, while the second dosimeter is worn outside the lead apron at the collar level.* | |
| Self-assessment | Have you established arrangements for the assessment of occupational exposure of the radiation workers? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Patient Exposure Records** | |
| AER, 54(1) | An authorized person shall keep and make available, as required, records of equipment calibration, clinical dosimetry, and quality assurance, as well as any other necessary information to allow retrospective assessments of the doses received by patients. |
| ***Note:*** *It is required that you maintain a comprehensive file or book for patient exposure records. The file can be in the form of physical records or digital files/records stored in a computer system, accessible for inspection by the Council. The specific parameters to be included in the records depend on the type of radiology practice. For plain radiology, ensure the records contain patient name, date of examination, kV, FFD, mA/mAs, DAP (where possible), and type of examination. In CT scans, document kV, mA, s (or mAs), pitch, CTDIvol, DLP, and type of examination, considering the mode used. For dental radiology, record patient name, tooth exposed, kV, mA, s, DAP (where possible), and other relevant details. In the case of interventional radiology, include patient name, screening time, ESD, DAP, kV, mA, type of examination/procedure, beam width, and patient volume. Ensure bone densitometry records include patient name, kV, mA, s, and DAP (where possible), while mammography records should contain patient name, kV, mAs, patient details, and glandular dose (GD) (where possible). These records should be well-maintained and readily available for inspection to demonstrate compliance with regulatory standards.* | |
| Self-assessment | Have you created a file or book for patient exposure records? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Personal Protective Equipment for Radiation Safety** | |
| AER, 39(2)(c) | The authorized person or employer shall ensure that workers and employees are provided with suitable and adequate personal protective equipment, including as appropriate protective aprons and gloves and organ shields. |
| ***Note:*** *It is required that you acquire and provide appropriate personal protective equipment (PPE) for radiation safety to ensure the protection of radiation workers, patients, and patient helpers. The required PPE varies depending on the specific radiology practice. For plain radiology, CT, dental radiology, and mammography, it is necessary to have lead aprons of different sizes (adult, child, and infant) with a lead equivalent of at least 0.25mmPb. Thyroid shields with a lead equivalent of 0.25mmPb or higher are also required for these practices. In CT, bismuth eye shields, thin bismuth breast shields, and lead gonad shields are recommended. Lead goggles with a lead equivalent of 0.5mmPb should be provided for portable X-ray machines. Interventional radiology requires lead aprons with closed-back designs, thyroid shields, lead gonad shields of different sizes, protective accessories, pairs of lead gloves, and lead glass spectacles or eye protection. For bone densitometry, a thyroid shield and a lead apron are necessary. The radiation workers must wear appropriate protective clothing and use the necessary equipment during work, and also provide protective equipment to patients* (*where necessary) and patient helpers.* | |
| Self-assessment | Have you acquired and provided suitable and adequate personal protective equipment for radiation safety? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Periodic Verification of Integrity Personal Protective Equipment** | |
| AER, 39(3) | The authorized person or employer shall arrange for regular testing and maintenance to be carried out on all personal protective equipment, including, as required, special equipment for use in the event of accidents and interventions. |
| ***Note:*** *It is required that there are established arrangements for the periodic verification and maintenance of all personal protective equipment (PPE) used for radiation safety. This ensures that the PPE remains in good condition and provides the necessary protection. Documented procedures should be in place for testing the integrity of the PPE, including inspections, functionality checks, and any other relevant tests. Test results and exposed films should be properly documented and maintained for reference. If any issues or deficiencies are identified during the verification process, reports should be generated to initiate corrective actions and ensure timely resolution. Regular verification of PPE integrity helps to uphold the effectiveness and reliability of the protective equipment in protecting radiation workers.* | |
| Self-assessment | Have you made arrangements to periodically verify the integrity and maintain all personal protective equipment (PPE)? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Storage of Personal Protective Equipment (PPE)** | |
| ***Note:*** *It is important to store personal protective equipment (PPE) appropriately to ensure its effectiveness and longevity. PPE, such as lead aprons, thyroid shields, and goggles, should be stored in straight positions to maintain their shape and protective properties. Straight storage prevents unnecessary bending, creasing, or damage to the PPE, ensuring its optimal performance when needed.* | |
| Self-assessment | Have you made arrangements for the proper storage of PPE in accordance with regulations? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Arrangements for Pregnant Radiation Workers** | |
| AER, 36 (2)-(5) | Female workers shall be advised by the authorized person or employer that it is desirable to notify the employer of pregnancy. Where a female worker has notified the employer that she is pregnant, the employer shall adapt the working conditions in respect of occupational exposure to ensure that the embryo or fetus is accorded the same broad level of protection, which is required for members of the public, as specified in Schedule 3. The notification of pregnancy shall not be considered a reason to exclude female workers from work. Employers shall make every reasonable effort to provide workers with suitable alternative workplace or employment in circumstances where it has been determined, either by the Council or in the framework of the health surveillance program required by the Regulations, that the workers, for health reasons, may no longer continue in employment involving occupational exposure. |
| ***Note:*** *It is required that you have documented administrative arrangements in place to address the specific needs and considerations of pregnant radiation workers. These arrangements may be included as part of the local rules or separate guidelines. If a radiation worker declares pregnancy, it is important to establish measures to ensure the safety and well-being of both the worker and the developing fetus. These arrangements may include modified work schedules, assignment to lower radiation dose activities or provision of additional protective measures. The objective is to minimize the radiation dose to the pregnant worker while still allowing her to continue working, considering the nature of her tasks and the associated risks.* | |
| Self-assessment | Have you established and documented arrangements for female radiation workers who could become pregnant? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Local Rules and Procedures for the Practice** | |
| AER, 38(1) (a) | An authorized person and employers shall, in consultation with workers, through their representatives where appropriate establish in writing, in a language comprehensible to the workers and others, such local rules and procedures as are necessary to ensure adequate levels of protection and safety for workers and other persons and for the security of sources |
| ***Note:*** *It is required that you have specific, documented, and approved local rules and procedures in place for each practice to ensure the safe and compliant operation of radiation-related activities. They serve as a comprehensive guide for radiation protection, addressing areas such as radiation protection measures, the do’s and don’ts for operating and handling radiation sources, equipment maintenance, and other relevant aspects.* | |
| Self-assessment | Have you documented local rules and procedures for the/each practice at your facility? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Emergency Preparedness and Response Plan and Procedures** | |
| AER, 67(1) | Where an authorized practice or source within a practice has a potential for accidents which may provoke unplanned exposure of any person, the authorized person shall ensure that an emergency plan appropriate for the source and its associated risks is prepared and drilled. |
| ***Note:*** *It is required that you establish and document emergency preparedness and response plans and procedure to address the potential accidents that could lead to unplanned exposure of any person. The emergency plan and procedures should be tailored to the specific radiation source and its associated risks. It should identify the potential incidents with radiation-related consequences, outline the necessary steps to be taken in the event of each of the identified emergency situation, including immediate actions, communication protocols, and coordination with relevant authorities.* | |
| Self-assessment | Have you established and documented an appropriate emergency plan tailored to the (each) specific radiation source? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Medical Practitioner Approval for Medical Exposures** | |
| AER, 46(1) (a) | An authorized person shall ensure that no patient is administered a diagnostic or therapeutic medical exposure unless the exposure is prescribed by a medical practitioner. |
| ***Note:*** *It is required that you have a system in place to ensure that all medical exposures, such as diagnostic imaging procedures, are requested by a qualified medical practitioner. This can be achieved using referral or medical request forms that are signed by a doctor in the case of manual systems. In facilities that utilize online systems or software for request submissions, the online requests should include the necessary approval by a medical practitioner. The availability of signed referral or medical request forms, or verified online requests ensures that medical procedures involving radiation are performed based on appropriate medical justifications and under the supervision of trained healthcare providers.* | |
| Self-assessment | Do you have to arrangements to ensure that all medical exposures are requested by a medical practitioner? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Operational Manuals for Radiation Generating Equipment** | |
| AER, 64 (1)(d) | Authorized persons, in co-operation with suppliers, shall ensure that performance specifications, operating and maintenance instructions, including protection and safety instructions, are provided in English and in compliance with the relevant IEC and ISO standards with regard to accompanying documents. |
| ***Note:*** *It is required that you have operational manuals for each radiation source or equipment used in your facility. The manuals should be in English to ensure clear understanding and accessibility for personnel involved in handling the radiation sources. The operational manuals should cover all relevant aspects, including installation, operation, maintenance, troubleshooting, and safety precautions specific to each radiation source or equipment. The manuals provide detailed instructions and technical information necessary for the safe and proper operation of the equipment by radiation workers, enabling them to follow proper procedures, address any issues that may arise, and ensure the safe and effective use of the equipment. During inspections, it is important to demonstrate the availability of operational manuals for each radiation source. These manuals should be easily accessible to radiation workers and kept up to date to reflect any changes or updates in equipment operation or safety guidelines.* | |
| Self-assessment | Do you have operational manuals for all radiation equipment? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Technique Chart Display for Scan Protocols** | |
| AER, 51 (1) | Authorized persons shall ensure that guidance levels for medical exposure, as specified in Schedule 5, are revised as technology improves and are used as guidance by medical practitioners. |
| ***Note:*** *It is required that you develop and display a technique chart in your facility for machines without Automatic Exposure Controls or where parameters cannot be selected digitally. This technique chart serves as a reference guide for radiation workers, providing recommended scan protocols for both pediatric and adult patients. The technique chart should include a comprehensive list of scanning parameters such as kilovoltage (kV), milliampere-seconds (mAs), focal spot size, and any additional relevant settings for various types of examinations. The protocols for pediatric patients should be clearly distinguished from those for adults, considering their unique anatomical and physiological characteristics. The displayed technique chart helps ensure consistency and accuracy in setting the appropriate radiation exposure parameters for each patient. It assists radiation workers in selecting optimal scan settings, minimizing unnecessary radiation dose while maintaining diagnostic image quality.* | |
| Self-assessment | Have you developed and displayed a technique chart showing both pediatric and adult scan protocols? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Display of Warning Symbols and Notices in Imaging Rooms** | |
| AER, 37 (1)(b)(iv) | There shall be controlled areas where an authorized person shall display a warning symbol, recommended by the International Organization for Standardization (ISO) and appropriate instructions at access points and other appropriate locations within controlled areas |
| ***Note:*** *It is required that you display warning symbols and notices around the imaging rooms. These visual indicators serve to alert individuals to the potential radiation hazards present within these areas. The warning symbols should be clearly visible and easily recognizable. Additionally, it is important to translate the notices into local languages understood by the natives and the local community to enhance comprehension and promote safety awareness.* | |
| Self-assessment | Have you displayed warning symbols and notices at entrance doors to all imaging rooms and appropriate locations within the supervised area? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Adequate Shielding of the Radiation Premises** | |
| AER, 57 (1) (c) & 63 (1) (b) | Authorized persons shall ensure that, if a source of external irradiation can cause exposure to the public, shielding and other protective measures that are optimized in accordance with the requirements of these Regulations and measures are provided as appropriate for restricting public exposure to the satisfaction of the Council.  Authorized persons shall ensure that the following requirements with regard to storage of radiation sources are complied with, the place of storage shall be adequately shielded such that at the outside surface of its walls or containment, the radiation dose shall not exceed 0.01 mSv per hour. |
| ***Note:*** *It is required that radiation premises are adequately shielded to prevent radiation leakage exceeding 10µSv/h outside the imaging area. It is essential to conduct regular measurements and assessments to verify that radiation levels in all imaging rooms, including at the doors, windows, viewing glasses, or any wall, remain below this limit. Adequate shielding materials and techniques should be implemented to minimize radiation exposure to personnel, patients, and the public. It is particularly recommended to design an overlap on each side of the entrance door opening by at least 100mm. This design feature helps to minimize radiation leakage from the imaging room.* | |
| Self-assessment | Have you ensured that the radiation premises are adequately shielded, with radiation leakage levels maintained below 10µSv/h outside the imaging area? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Copies of the Atomic Energy Act (2008) and the Regulations** | |
| ***Note:*** *It is essential that radiation workers have access to the relevant regulatory documents governing radiation safety, namely the Atomic Energy Act no. 24 of 2008 and the Atomic Energy Regulations, 2012. These documents outline the legal and safety requirements, standards, and guidelines for radiation-related activities. By providing radiation workers with copies of these documents in either hard or soft form, you enable them to familiarize themselves with the regulations, understand their responsibilities, and adhere to the prescribed safety measures.* | |
| Self-assessment | Have you acquired copies of the Atomic Energy Act (AEA), 2008 and the Atomic Energy Regulations (AER), 2012, and made them available to all radiation workers? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Procedures for Verification of Pregnancy of Female Patients** | |
| ***Note:*** *It is important to have procedures in place to verify the pregnancy status of female patients before performing medical X-ray examinations. These procedures ensure that appropriate precautions are taken to protect the developing fetus from unnecessary radiation exposure. The documented interview process or procedure should be followed to inquire about the patient's pregnancy status and confirm whether they are pregnant or not. In the case of medical X-ray forms or online requests, it is important to incorporate a parameter specifically addressing pregnancy.* | |
| Self-assessment | Have you established procedures for the verification of pregnancy for female patients? |
| Comment(s) |  |
| Action(s) to be taken. |  |

|  |  |
| --- | --- |
| 1. **Installation of Radiation Warning Lights** | |
| ***Note:*** *It is necessary to have functional radiation warning lights installed above the entrance door to each controlled room where radiation activities take place. These lights serve as visual indicators to warn individuals about potential radiation hazards and remind them to exercise caution. The lights are typically colored red and green, with the red light indicating the presence of radiation and the green light indicating a safe condition. Ideally, the radiation warning lights should be synchronized with the exposure switch to ensure that the lights activate simultaneously with the initiation of radiation exposure.* | |
| Self-assessment | Have you installed radiation warning lights at the entrance door to the controlled room, preferably synchronized with the exposure switch? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Provision of Safe Methods for Observing Patients during Exposures** | |
| ***Note:*** *It is essential to ensure the safety of radiation workers while maintaining their ability to closely observe patients during exposures. One way to achieve this is by providing a shielded viewing window that allows radiation workers to monitor patients without direct exposure to radiation. The dose rates behind the viewing window should be maintained below 10µSv/h to ensure a safe working environment. In the case of fluoroscopic procedures, an image intensifier coupled with a television chain, or a flat panel detector system should be utilized. This enables radiation workers to view real-time images of the patient on a monitor, allowing them to observe the procedure without being in the immediate vicinity of the radiation source.* | |
| Self-assessment | Have you provided a safe and continuous method for radiation workers to observe patients during exposures? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Correct Identification of Patients and Medical X-ray Procedures by Radiation Workers** | |
| ***Note:*** *It is expected that there are accurate patient identification and appropriate selection of medical X-ray procedures, several measures should be in place. This includes the use of comprehensive medical request forms that capture essential patient information, such as name, gender, date of birth, and unique patient number, among others. Additionally, radiation workers should diligently check patient identification documents, such as IDs or medical cards, to verify the patient's identity before proceeding with the X-ray procedure. It is crucial to establish a documented procedure that outlines the steps to be followed in confirming patient identity and selecting the correct medical X-ray procedure based on the medical request form and patient information.* | |
| Self-assessment | Is there an established and documented procedure to ensure radiation workers correctly identify the patient and the respective medical X-ray procedure to perform? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Display of licenses** | |
| ***Note:*** *It is necessary to prominently display the license(s) for each radiation source within the radiology unit/department or other visible location, such as the reception area or a designated noticeboard. This display area should be accessible to staff, patients, and the AEC inspectors. The license(s) serve as a legal authorization for the operation of the radiation sources and provide important information regarding the specific sources and their authorized use.* | |
| Self-assessment | Is the license for each radiation source posted at the reception area or anywhere in the radiology unit/department? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Documented Procedures for Medical Examinations** | |
| ***Note:*** *It is essential to have documented procedures in place for each medical examination conducted within the facility. These procedures provide a standardized and systematic approach to ensure consistency, accuracy, and safety in performing the examinations. These include step-by-step guidelines, technical parameters, patient positioning instructions, and any additional considerations relevant to each examination. By adhering to these documented procedures, the facility promotes quality assurance, reduces the likelihood of errors or variations in practice, and ensures the delivery of reliable and safe medical imaging services to patients.* | |
| Self-assessment | Are there documented procedures for carrying out each examination? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Consent for Examinations/Procedures Involving High Doses** | |
| ***Note:*** *It is crucial to obtain informed consent from patients before conducting any examination or procedure that involves high doses of radiation, such as CT scans or interventional procedures. The facility should have consent forms in place that clearly outline the nature of the examination/procedure, associated risks (even if they are rare), and the potential benefits. These consent forms should provide comprehensive information to patients, enabling them to make an informed decision regarding their participation in the procedure.* | |
| Self-assessment | Is consent sought from a patient undertaking an examination/procedure involving high doses, such as CT or interventional procedures? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Design requirements for imaging rooms** | |
| ***Note:*** *It is important to adhere to specific spatial requirements for imaging rooms. For plain radiography, the minimum ground area should be 16m2, while for CT, Cath lab, and fixed Fluoroscopy, it should be 25m2. Dental radiography requires a minimum ground area of 12m2, and mammography should have at least 9m2 of ground area. Additionally, each imaging room should have a minimum ceiling height of 2.5m to allow for equipment installation and comfortable movement. To prevent direct radiation exposure, any windows present in the X-ray room should be positioned at least 2m above the ground level outside. The spatial requirements can minimize the impact of scatter radiation and prevent radiation leakage, ensuring the well-being of both patients and radiation workers.* | |
| Self-assessment | Does the imaging room meet the minimum requirements for room size and window and ceiling heights? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Decongestion of imaging rooms** | |
| ***Note:*** *It is important to decongest the imaging room, ensuring that it is free from unnecessary items clutter and obstructions.* *By reducing the number of items, objects, and surfaces within the room, there are fewer opportunities for radiation to bounce off and scatter in unintended directions. This helps to maintain a more controlled and focused radiation field during imaging procedures, improving the accuracy and quality of the diagnostic results. The overall radiation dose to both patients and radiation workers can also be effectively managed.* | |
| Self-assessment | Are all the items not important to the imaging procedure not kept in the imaging room? |
| Comment(s) |  |
| Action(s) to be taken |  |

|  |  |
| --- | --- |
| 1. **Arrangements for Disposal of radiation generating equipment** | |
| ***Note:*** *It is important to establish and document procedures and arrangements for the proper disposal of obsolete radiation generating equipment. This includes equipment that is no longer in use or has reached the end of its operational life. The disposal procedures should adhere to relevant regulatory guidelines including notifying and ensure the safe handling, and disposal of electronic waste, or unauthorized use by another person. It is important to consider environmentally responsible methods of disposal, such as recycling or appropriate disposal facilities, to minimize any impact on the environment.* | |
| Self-assessment | Have you established procedures and arrangements for the disposal of obsolete radiation generating equipment in accordance with regulatory guidelines and environmentally responsible practices? |
| Comment(s) |  |
| Action(s) to be taken |  |

I, …………………………., certify that the information provided is correct and true to the best of my knowledge.

Title: ………………………………………………………………………………………….

Signature: …………………………………………………………………………………….

Date: ………………………………………………………………………………………….