



**Republic of Madagascar**

**National Report**  
**Convention on the Nuclear Safety**  
**8<sup>th</sup> and 9<sup>th</sup> Review Meeting of the Contracting Parties**  
**March 2023**

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## **SECTION I: SUMMARY**

Madagascar has progressively developed the use of ionizing radiation sources in different socio-economic sectors, such as medicine, agriculture, medicine, industry, mining, research and education. Meanwhile, Madagascar has continuously upgraded its nuclear legislative and regulatory framework in compliance with the international obligations and standards.

In this framework, Madagascar signed and ratified most of the international conventions and instruments related to safety, security and safeguards regulating a global regime (see Art 7 (1b)). The development of the application of nuclear technologies in different social and economic fields, gave rise to awareness with regard to nuclear safety and security, training and education, knowledge management, expertise and national, regional and international cooperation. Madagascar does not have any “nuclear installation” as defined by the Convention on Nuclear Safety CNS. To be fully in compliance with its international obligations,

Madagascar has drafted a new and comprehensive Law addressing safety, security and safeguards and creating a new regulatory body. Pending the promulgation of the new Law, Madagascar is still working with the old Law N° 97-041 on safety and radiation protection aspects.

Madagascar prepared this national report with the purpose of communicating on the progress made in safety of nuclear applications aspects and of sharing its experience in developing nuclear techniques in a safe, secure and sustainable manner. Madagascar hosted an IAEA Integrated Regulatory Review Service (IRRS) mission in 2008 and an Advisory mission in 2016. Being involved in regional and international cooperation, Madagascar has developed collaboration network at multilateral and bilateral levels, mainly with the IAEA, the African Regional Cooperative Agreement for Research, Development and Training related to Nuclear Science and Technology ‘AFRA’, the Global Nuclear Safety and Security Network ‘GNSSN’, the Forum of Nuclear Regulatory Bodies in Africa ‘FNRBA’ and the SADC Nuclear Regulatory Network ‘NRN’.

## **SECTION II: INTRODUCTION**

Nuclear applications are used in Madagascar in different socio-economic sectors such as medicine, industry, agriculture, mining, research, and education. Indeed, Madagascar, joined the International Atomic Energy Agency (IAEA) in 1965, became a party of the Treaty of Non-Proliferation of Nuclear Weapons (NTP) in 1970, and ratified five nuclear and radiological instruments under the IAEA's auspices. The Convention on Nuclear Safety (CNS) was ratified in April 2017, by which the country expressed its commitment to nuclear safety and its willingness to actively participate in the development of a safety culture among the contracting parties. Furthermore, the National Institute for Nuclear Sciences and Techniques (INSTN-Madagascar) is created in 1992 in order to develop and promote nuclear and radiological applications.

Ratification of the CNS was prepared by INSTN-Madagascar in cooperation with all stakeholders (Office of the Prime Minister, Ministry of Foreign Affairs, Ministry of Justice, Ministry of Higher Education and Scientific Research, Ministry of Mines, Ministry of Interior). Government of Madagascar does not organized national meeting on the communication on the CNS yet. INSTN-Madagascar has prepared the first National Report to be submitted to the next contracting parties meeting review in March 2020. In this context, the report gives an overview of the national policy on nuclear activities and the nuclear safety legal and regulatory framework. The report is a stand-alone document, structured in conformity with the “Guidelines regarding National Reports under the Convention on Nuclear Safety” (INFCIRC/572/Rev.6).

## **SECTION III: IMPLEMENTATION OF THE CONVENTION**

### **Article 7: Legislative and Regulatory Framework**

Art 7 (1a): Overview of the current legislative framework Law N° 97-041 on 2<sup>nd</sup> January 1998, “Radiological Safety and Radioactive Waste Management”. The Law N° 97-041 defines the processes of authorization, notification, control and inspection of all activities using ionizing radiation sources and provides enforcement provisions and penalties in case of violation of its provisions. It also addresses the aspects related to the radioactive waste management, transport

of radioactive materials. Additionally, Law N° 97-041 established «l’Autorité Nationale de Sûreté et de Protection Radiologique (ANPSR) » as an independent regulatory body in charge of radiation safety and radioactive waste management. The Decree N° 2002-1199 on 07 October 2002 sets the general principles of protection against hazards resulting from the use of ionizing radiation. It provides the radiation protection principles including 1. The principle of justification; 2. The principle of optimization (ALARA).

The Decree N° 2002-1274 on 16 October 2002 sets the general principles of the radioactive waste management. It describes the supporting documents required to obtain an authorization for 1. Discharging of liquid and gas effluents to the environment; 2. Commissioning; 3. Operation; 4. Final shutdown and decommissioning. This decree states that the license holder remains the primary responsible for nuclear safety in its facility.

The Decree N°2002-1161 on 2 October 2002 dealing the possession and use of ionising radiation sources in the medical field.

Decree n°2012-1112 on 4<sup>th</sup> December 2012 dealing the reorganization of the " Autorité Nationale de Protection et de Sûreté Radiologique (ANPSR)".

Art 7 (1b): International Conventions and agreements. Madagascar has committed to the following legally binding instruments. 1. Convention on the Physical Protection of Nuclear Material (CPPNM) (entered into force in 2003); 2. Amendment to the Convention on the Physical Protection of Nuclear Material (entered into force on 03 March 2017); 3. Convention on Early Notification of a Nuclear Accident (entered into force on 02 April 2017); 4. Vienna Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency (entered into force on 02 April 2017); 5. Convention on Nuclear Safety (entered into force in 01 June 2017); 6. Joint Convention on the Safety of Spent Fuel Management and on the Safety of Radioactive Waste Management (entered into force on 01 June 2017); 7. Treaty on the Non-Proliferation of Nuclear Weapons (entered into force on November 27, 1970); 8. Application of safeguards in the context of the Treaty on the Non-Proliferation of Nuclear Weapons (entered in force on 08 October 1970), 9. Additional Protocol entered in force on 18 Sept. 2003. In addition to that, Madagascar has adhered to the IAEA Code of Conduct on the Safety and Security of Radioactive Sources and its Guidance.

Art 7 (2) (i): National safety requirements and regulations, Madagascar has set, the objective to upgrade the national regulatory framework. As a result, so far, five decrees were revised and drafted for consultation with relevant stakeholders. These regulations concern the following areas: 1. Licensing and Registration System of facilities and Ionizing Radiation Sources activities; 2. Population, Workers and Environment Protection against the risks of Ionizing Radiation; 3. Use of Ionizing Radiation for Medical, Dental and Veterinary Purposes; 4. Security of Radioactive Sources in use, storage and transportation; 5. Radioactive Waste Management; these regulations will be completed by orders, guides, procedures, technical prescriptions, etc. Art 7 (2) (i) c: Overview of the process for establishing and revising regulatory requirements. As it was highlighted in Art 7 (2) (i), Madagascar has adopted a participatory approach to establish the national regulations of radiological safety and security. For this purpose, a national committee for upgrading the regulatory framework will be created. The process is depicted in short as follows:

1. Within INSTN, the Radiological Safety and Nuclear Security Directorate (DSRSN) drafts a regulation, which is submitted for review to technical department to ensure that all relevant safety and security issues have been taken into account in compliance with other regulations and requirements. The modified draft is then discussed with and reviewed by experts from IAEA. After refining the draft, a new version is issued and is discussed later within the relevant stakeholders.
2. The final draft is submitted to the Government for approval. In fact, the general Government submits this draft to all governmental departments and agencies concerned to collect their questions, comments and suggestions, which will be answered and discussed with DSRSN. The final version is then promulgated and published by the Government.

Art 7 (2) (ii): System of licensing current status according to the Law N° 97-041, radiological facilities and activities are authorized by the administration. The following activities are subject to the authorization by decree: 1. Construction of a radiological facility; 2. Discharge of liquid or gaseous radioactive effluents from the facility; 3. Closure, dismantling and decommissioning of the facility; 4. Storage and disposal of radioactive waste; 5. Import and export of radioactive sources; 7. Transport of radioactive materials; and 8. Transfer of ionizing radiations. As stated in the Law N° 97-041, the applicant for an authorization shall include a safety analysis report of the facility including a report of the site selection and evaluation, an environmental impact study of the facility, an internal emergency plan, updated at the different stages of the authorization process.

## **Article 8: Regulatory Body**

Art 8 (1): Establishment of the Regulatory Body ‘ANPSR’ Mission: According to article 3 of the Law N° 97-041, ANPSR is a public institution, with legal personality and financial autonomy placed under the umbrella of the Prime Minister, committed to ensure compliance of the radiological safety and all activities and facilities involving Ionizing Radiation Sources with Madagascar’s regulatory framework and international commitments. However, ANPSR is not created by the law, which constitute a serious non-compliance with IAEA safety standards (GSR Part 1 rev 1).

The Decree N°2012-1112 on 04 December 2012 on the reorganization of ANPSR creates the "Radiological Safety and Nuclear security Directorate" (DSRSN) within the " Institut National des Sciences et Techniques Nucléaires " (INSTN) and gives DSRSN all the functions of ANPSR. In addition, this Decree assigns responsibility for nuclear security and safeguards to ANPSR.

The Decree N°2012-1112 also established an administrative board "CAP-SRSN" composed of 11 Directors General from various ministries and head by the “Directeur du Cabinet Militaire et de la Sécurité Nationale” of the Prime Minister. This transitory situation will stop with the current project of establishing ANPSR as an "Etablissement Public à caractère Administratif" (EPA) completely separated from INSTN.

As specified in the Decree N°2012-1112, the Board “CAP-SRSN” has all powers and approvals necessary for the administration of the Agency. For this purpose, it rules by deliberations general issues of interests to the directorate and shall: 1. Approve the annual actions programme of the DSRSN; 2. Approve the annual budget; 3. Adopt the organizational chart of the Agency establishing organizational structures and their functions; 5. Adopt the staff regulations of the DSRSN; 8. Set the prices of services provided by the DSRSN, if applicable; 11. State on the annual report submitted by the Director. Responsibilities and Core Functions: As indicated by art. 3 of law 97-041, in addition to the core mission of the DSRSN of authorization and assessment, control and inspection, enforcement, DSRSN is responsible for: a) instruct and prepare the decisions of the ANPSR (through the President of the ANPSR, the CAP-SRSN and the Board of Directors of the INSTN); b) execute the decisions taken by the ANPSR; c) prepare

the activity and intervention programs of the ANPSR within the framework of the mission conferred on it and submit them for approval to the decision-making bodies of the ANPSR; d) carry out the programs approved for the ANPSR; e) define the administrative procedures for the intervention of the technical bodies; f) prepare technical or administrative guides; g) prepare the draft budget to be allocated to the achievement of the mission of the ANPSR; h) manage the credits and assigned assets of the ANPSR; i) recruit and propose for appointment by the Director General of the INSTN the staff members over whom he has authority; j) assist and represent the President of the ANPSR in acts of civil life of the ANPSR as well as in the various appeals involving the ANPSR, in particular in the context of repressive actions; k) draw up the annual activity report of the ANPSR.

### **Article 9: Responsibility of the License Holder**

The law 97-041 stipulates that the license holder is solely responsible for the safety of its installation, and its article 32 reads as follows, “The authorization holder must respect all the limits imposed and satisfy all the conditions attached to the authorization.”

Control of radiological facilities are carried out under the authority of the ANPSR. Although they do not yet have any nuclear installations, inspections of installations using radioactive sources are carried out periodically based on the established program in order to ensure that licensees exercise their responsibility in terms of safety and each time license is issued, the safety principles and appropriate measures are recalled.

### **Article 10: Priority to Safety**

Law 97-041 provides provisions ensuring support of questions of the safety of radiological installations. According to international nuclear safety standards, provisions relating to safety culture are included in the draft of the new nuclear law in order to ensure that users give the required priority to nuclear safety. However, ANPSR is establishing its integrated management system “IMS” and its associated processes and procedures which give high priority to safety and security. In fact, all the processes identified are intended to enable ANPSR to fulfill its primary mission of protecting workers, society, public and the environment from the harmful effects of ionizing radiation and thus ensure a high level of safety and security in all relevant



installations and activities. In this context, ANPSR continued its efforts to develop a nuclear and radiological safety and security culture through training, awareness and communication programmes with operators, stakeholders and through regional and international cooperation.

### **Article 15: Radiation Protection**

The regulatory principles and objectives for protection against ionizing radiations in relation to radiation protection are established in the law 97-041. The regulatory requirements dealing the protection of exposed workers and the public against the risks arising from exposure to ionizing radiation are governed by the decree 2002-1199. The regulations on the protection against ionizing radiation for exposed workers according to article 13, 14, 15 of the decree 2002-1199 establish the dose limits for workers.

The principles of radiation protection (justification, optimization and limitation of individual doses), which are the basis of the radiological protection system are provided in the decree n° 2002-119 and ensure that radiation doses arising from normal and anticipated operational occurrences are optimized and do not exceed the dose limits during the full life cycle of an authorized facility. Licensees design, construction, operation, effluents release, dismantling and decommissioning phases must comply with ALARA principle taking into account the radiological impact of modifications relevant to the safety of the facility. The principle of optimization or the “as low as reasonably achievable (ALARA)” principle is considered as the main objective to be achieved by licensees through the implementation at their facilities of the dose limits and criteria defined in the decree 2002-1199.

### **Article 16: Emergency Preparedness**

Law 97-041 and the Article 8 its application decree N° 2012-1112 requires the applicant to submit the internal emergency plan, which complements the application and requires the emergency plan to be reviewed periodically. According to international nuclear safety standards, provisions relating to emergency preparedness are included in the drafted new nuclear law and its application decree. ANPSR expects emergency plans to be in place for any action that could give rise to a need for emergency intervention and to be based on an assessment of the consequences of foreseeable accidents, including those with off-site

consequences. In the event of a radiological accident, information will be provided to the Ministry of Interior, which will continuously monitor the situation and inform stakeholders, including the public, of important updates, in accordance with the National Emergency Plan. Madagascar is a Contracting Party to the Convention on the Early Notification of a Nuclear Accident and the Convention on Assistance in the case of a Nuclear Accident or Radiological Emergency. ANPSR is the designated National Focal Point for these Instruments.