

## **Legal Elements For Nuclear Security: Egyptian Nuclear Law As A Case Study**

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### **ABSTRACT**

**This paper deals with the legal bases for nuclear security. First, It analysis the international legal framework for nuclear security. Second, it analysis the legal bases for the import–export control. The legal aspects related with illicit trafficking (IT) were also reviewed. Third, It deals with the Egyptian nuclear law no. 7 and its executive regulation. The Egyptian legal regime for nuclear security and the role of State System for Accounting and Control of Nuclear Materials (SSAC) in realizing the nuclear security were also discussed. The purpose of the paper is to evaluate the Egyptian legal framework for nuclear security.**

**Key Words:** *nuclear security, Nuclear law, Egyptian nuclear law*

### **INTRODUCTION**

The term ‘nuclear security’ is generally accepted to mean “the prevention and detection of, and response to, theft, sabotage, unauthorized access, illegal transfer or other malicious acts involving nuclear material, other radioactive substances or their associated facilities.”<sup>(1)</sup> The State responsibility is to establish and maintain legislative and regulatory framework for nuclear security, define what the nuclear security and establish or designate a competent authority responsible to implement and control framework for nuclear security<sup>(2)</sup>. The operators’ responsibility is to implement and enforce the laws and regulations, establish guidance documents implementing security requirements of national laws and regulations relevant to their specific activities, establish and implement security plans and procedures based on the national laws and regulations. There is a new international nuclear security framework is emerging<sup>(3)</sup> based on obligations contained in the Convention on the Physical Protection of Nuclear Material (CPPNM) and its Amendment, the International Convention for the Suppression of Acts of Nuclear Terrorism, the relevant Security Council resolutions and the non-binding Code of Conduct for the Safety and Security of Sources and its supplementary Guidance<sup>(4)</sup>.

### **PART I : THE INTERNATIONAL LEGAL FRAMEWORK FOR NUCLEAR SECURITY**

The international legal framework for nuclear security consists of many treaties in particular, the Convention on the Physical Protection of Nuclear Material (CPPNM) and the 2005 Amendment there to, the Convention on Early Notification in the Event of a Nuclear Accident, the Convention on Assistance in the Case of a Nuclear Accident or Radiological Emergency, and the International Convention for the Suppression of Acts of Nuclear Terrorism that concluded under the auspices of the United Nations. Non-binding legal

instruments also promulgated under IAEA auspices, including the Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities (INFCIRC/225/Revision 5) and the Code of Conduct on the Safety and Security of Radioactive Sources<sup>(5)</sup>

### **FIRST: THE LEGALLY BINDING INTERNATIONAL INSTRUMENTS**

Over the past three decades a number of international instruments have been developed both to help strengthen physical protection in individual States and to encourage greater consistency in requirements and procedures among States in this important area.

#### **1- CONVENTION ON THE PHYSICAL PROTECTION OF NUCLEAR MATERIAL (CPPNM)**

The most important legal instrument is the CPPNM of 26 October 1979 and adopted on 3 March 1980. In force since February 1987 till August 2012, the CPPNM has 145 parties and 45 signatories. The CPPNM sets forth a range of measures to ensure the protection of nuclear material (basically, enriched uranium and plutonium), primarily in international transport. However, the Convention also contains important provisions covering the domestic use of these materials. The CPPNM focuses primarily on nuclear material being shipped in international commerce, but it also contains other important requirements related to domestic physical security measures. In summary, the CPPNM requires Parties to:

- (a) Make certain physical protection arrangements and ensure specific defined levels of physical protection for international shipments of nuclear material;
- (b) Co-operate in the recovery and subsequent protection of stolen nuclear material;
- (c) Make specified acts (e.g. thefts of nuclear material and threats or attempts to use nuclear material to harm the public) punishable offences under national law;
- (d) Prosecute or extradite those accused of committing such acts.

#### **1.1. REQUIREMENTS FOR PPNM**

General requirements for PPNM may be listed as follow:

- 1- Physical protection measures can be implemented by the State itself, by an authorized person (e.g. the operator) or by any other entities authorized by the State
- 2- The State (through the regulatory body or otherwise) should verify continued compliance with physical protection requirements through periodic inspections and other monitoring procedures.
- 3- The designated authority should be provided adequate authority to enforce physical security requirements.
- 4- Essential for an effective physical protection system is the establishment by legislation of a well designed and well supported State system for recording and monitoring the quantities and locations of the nuclear material under the State's jurisdiction or control.
- 5- Legislation should contain provisions requiring the development and implementation of emergency plans for responding to the unauthorized removal and subsequent unauthorized use of nuclear material, the sabotage of nuclear facilities and attempts to perpetrate such acts.
- 6- Protecting the confidentiality of information whose unauthorized disclosure could compromise the physical protection of nuclear material and nuclear facilities (PPNMF) <sup>(6)</sup>.

## **1.2.REQUIREMENTS FOR PROTECTION OF NUCLEAR MATERIAL AT THE SHIPPING**

- 1-taking into account the category of nuclear material and its location use, storage and during transport.
- 2-Whether the weather conditions prevailing in the country or on the road transport.
- 3 -When you consider the necessary measures to provide physical protection of nuclear material against theft or other, the State must take into account the natural self-protection of radioactive materials.
- 4-The physical protection requirements set on the concept of defense in depth to be prevention and protection measures for each facility which handled a nuclear materials.
- 5- An assessment of the likelihood of sabotage to the means of transport.
- 6-To ensure that the shipping arrangements in accordance with international regulations for both the receiving State or other States that the shipments will pass<sup>(7)</sup>.

The CPPNM has been promoting during 2005, within the framework of the Conference which the States parties agreed on the amendment, so as to provide further protection of nuclear facilities and materials during use, storage and transport within the State for peaceful purposes. The amendment also provides to expand the scope of cooperation between States on the identification of nuclear materials stolen or smuggled and recovery, and mitigation of any radiological consequences would result from acts of sabotages, as well as related crime prevention and combat it. CPPNM Amendment was adopted on 8 July 2005. As August 2012, the CPPNM Amendment had been formally approved by only 48 states and has not yet entered into force. Under the convention's amendment provision in Article 20 (2), the Amendment will enter into force only after two thirds of the parties have formally approved. With its current large membership of 145 states parties, the CPPNM therefore requires 95 States to approve the Amendment. Given that it has taken some five years for only about a third of the necessary States to approve the Amendment, considerable delay in implementing this important instrument seems likely<sup>(8)</sup>.

The national legislation, in the area of Nuclear Security, should contain provisions realizing the nuclear security and provide for protecting the confidentiality of information. It also should set forth the regulatory functions essential for protecting public health, safety and the environment. A fundamental element of an acceptable national framework for the development of nuclear energy is the creation or maintenance of a regulatory body with the legal powers and technical competence necessary in order to ensure that operators of nuclear facilities and users of nuclear material and ionizing radiation operate and use them safely and securely.

## **2- INTERNATIONAL CONVENTION FOR THE SUPPRESSION OF ACTS OF NUCLEAR TERRORISM <sup>(9)</sup>**

In April 2005, the General Assembly approved to the International Convention for the Suppression of Acts of Nuclear Terrorism. It deals in detail the crimes relating to possession and use of radioactive material or a radioactive devices and nuclear facilities or destruction of the illegal and deliberate<sup>(10)</sup>.

The Nuclear Terrorism Convention has a broader scope than the CPPNM and the Amendment thereto as follow:

- 1.It criminalizes acts involving ‘radioactive material’, which includes not only nuclear material, but also other radioactive material, as defined by the Convention.
- 2.It also brings under its scope, nuclear material and facilities used or retained for military purposes, which are explicitly excluded from the scope of the CPPNM and of its 2005 Amendment.
- 3.States Parties are obliged to establish their jurisdiction and to make the offences listed in Article 2 punishable under their domestic law.
- 4.States Parties are also obliged to cooperate and provide for mutual assistance, notably in relation to criminal investigations and extradition.

Article 7 States that parties are obliged to take appropriate measures in order to inform, where appropriate, international organizations in respect of the commission of offences set forth in Article 2 as well as preparations to commit such offences about which they have learned. Article 7.1 obliged the States Parties to inform the UN Secretary-General of their competent authorities and liaison points responsible for sending and receiving the information referred to in Article 7. The Secretary-General shall communicate such information regarding competent authorities and liaison points to all States Parties and the IAEA. Such authorities and liaison points must be accessible on a continuous basis. The States Parties according to article 7.4 shall make every effort to adopt appropriate measures to ensure the protection of radioactive material taking into account relevant IAEA recommendations and functions. The convention is primarily an international criminal law instrument that defines certain acts as criminal offences and obliges States Parties to establish their jurisdiction over such offences, to render them punishable under their domestic law.

### **3-THE CONVENTION ON EARLY NOTIFICATION OF A NUCLEAR ACCIDENT AND THE CONVENTION ON ASSISTANCE IN THE CASE OF A NUCLEAR ACCIDENT OR RADIOLOGICAL EMERGENCY**

The Early Notification and Assistance Conventions were adopted immediately following the Chernobyl accident in 1986. The IAEA General Conference adopted the two Conventions at a special session on 26 September 1986. The Early Notification Convention entered into force on 27 October 1986 and the Assistance Convention entered into force on 26 February 1987, and each has now 112 and 107 States Parties. While conceived and adopted as safety instruments, the Early Notification and Assistance Conventions strengthen the international response to nuclear accidents or radiological emergencies, including a terrorist or other malicious act by, respectively, providing a mechanism for rapid information exchange and a mechanism for mutual assistance with a view to minimizing the consequences of such accidents or emergencies and protecting life, property and the environment against the effects of radioactive releases<sup>(11)</sup>.

### **4-UN SECURITY COUNCIL RESOLUTIONS ADOPTED UNDER CHAPTER VII Of The UN CHARTER**

Day after the terrorist attacks on the United States of America on 9/11/ 2001, the Security Council of the United Nations unanimously adopted resolution No. (1373/2001) which states, inter provisions that all countries should criminalize assistance for terrorist activities, and refuse to provide financial support and safe resort for terrorists and exchange information on groups that are planning to launch terrorist attacks<sup>(12)</sup>. It also established at the same time the Counter-Terrorism Committee, which consists of 15 members to follow up the

implementation of the resolution. In an effort to revitalize the work of the Committee, the Security Council adopted Resolution No.1535 in 2004, that established the Executive Directorate of the Counter-Terrorism Committee to provide expert advice to the Committee in all areas covered by resolution 1373, and to facilitate the provision of technical assistance to the states, as well as closer cooperation and coordination within the United Nation organizations and among regional bodies and intergovernmental<sup>(13)</sup>.

Following a Security Council debate on weapons of mass destruction on 22 April 2004, and in connection with its continuous efforts to elaborate a comprehensive counter-terrorism regime, the Security Council unanimously adopted UNSCR 1540 (2004) on 28 April 2004 by which it decided that all States shall refrain from supporting by any means non-State actors that attempt to acquire, use or transfer nuclear, chemical or biological weapons and their delivery systems. Both UNSCR 1373 (2001) and UNSCR 1540 (2004) were adopted under Chapter VII of the UN Charter and are therefore binding on all States. In UNSCR 1887 (2009), the Security Council, among other things, reaffirmed resolution 1540 (2004) and the need for its full implementation <sup>(14)</sup>.

## **SECOND: LEGALLY NON-BINDING INTERNATIONAL INSTRUMENTS**

### **1. NUCLEAR SECURITY RECOMMENDATIONS ON PHYSICAL PROTECTION OF NUCLEAR MATERIAL AND NUCLEAR FACILITIES**

Non-binding instruments concluded under the auspices of the IAEA such as Nuclear Security Recommendations on Physical Protection of Nuclear Material and Nuclear Facilities(INFCIRC/225/Revision 5). Following the publication in 1972 of Recommendations for the Physical Protection of Nuclear Material, these recommendations were revised by the IAEA and the revised version was published in 1975 as INFCIRC/225. These guidelines have published in 1972 before the conclusion of CPPNM, and included elements of the texts of the Convention. The document was revised in 1977, 1989, 1993, 1998 and 2010. INFCIRC/225/Revision 5 reflects the recommendations of the national experts to assist States in implementing a comprehensive physical protection regime in respect of nuclear facilities and nuclear material, including any obligations they may have under international agreements, such as the 2005 Amendment to the CPPNM.

The guidelines developed elements and protection requirements such as:

- 1 - Elements of a national system of physical protection and nuclear facilities.
- 2- Requirements for the Physical Protection of Nuclear Materials, used and stored, from unauthorized access.
- 3- Requirements for physical protection of nuclear facilities from sabotage and terrorist operations involving nuclear material being used, stored, and transported.
- 4 - Requirements for physical protection of nuclear material during the transport <sup>(15)</sup>.

### **2- THE CODE OF CONDUCT ON THE SAFETY AND SECURITY OF RADIOACTIVE SOURCES AND THE SUPPLEMENTARY GUIDANCE ON THE IMPORT AND EXPORT OF RADIOACTIVE SOURCES <sup>(16)</sup>.**

The objectives of the Code and Guidance are, through the development, harmonization and implementation of national policies, laws and regulations, and through the fostering of international cooperation, to (i) achieve and maintain a high level of safety and security of radioactive sources; (ii) prevent unauthorized access or damage to, and loss, theft or

unauthorized transfer of such sources so as to reduce the likelihood of accidental harmful exposure to such sources or the malicious use of such sources to cause harm to individuals, society or the environment; and (iii) mitigate or minimize the radiological consequences of accidents or malicious acts involving a radioactive source.

The Code applies to all radioactive sources listed in Annex I that may pose a significant risk to individuals, society and the environment. The Code does not apply to nuclear material as defined in the CPPNM, except for sources incorporating plutonium-239. The Code does not apply to radioactive sources within military or defence programmes. The Guidance applies to the Category 1 and 2 sources within the scope of the Code. The Code establishes guidance for each State regarding the legislation and regulations that should be in place. It further recommends that the regulatory body be granted appropriate authority and resources, and sets out a number of functions that the regulatory body should have. The Code provides recommendations on the import and export of radioactive sources (supplemented by the Guidance).

## **PART II : IMPORT AND EXPORT CONTROLS OF NUCLEAR MATERIAL OR RADIOACTIVE SOURCES**

Export and import controls play a central role in preventing the unauthorized acquisition of licensed material. It must be implemented within a State's general legal framework for regulating foreign commerce. A State's basic law for nuclear export and import controls should focus on a few important objectives such as to ensure that transfers of nuclear material, equipment and technology take place in a secure, safe and environmentally responsible manner and such transfers do not directly or indirectly using nuclear material for unauthorized purposes. National nuclear law should reflect the fact that sanctions for non-compliance should be commensurate with the seriousness of the non-compliance and should authorize a range of penalties

### **FIRST: THE IMPORTANCE OF EXPORT AND IMPORT CONTROLS**

There is an importance of all state to issue a legal framework to control the export and import of the nuclear materials and equipments for many reasons as follows <sup>(17)</sup>:

- 1- Nuclear export and import controls also support a State's fundamental regulatory task of preventing unauthorized persons in that State from acquiring material and technology that they are unable to manage safely and securely
- 2- It is providing a barrier against nuclear explosives development and nuclear terrorism,
- 3- Export and import controls are also necessary in order that a State may comply with its obligation under multilateral treaties and conventions such as the NPT, particularly under Article I (for nuclear weapon States) and Article II (for non-nuclear-weapon States), not to assist non-nuclear-weapon States in acquiring nuclear weapons or to seek or receive assistance in acquiring them<sup>(18)</sup>. Also, export controls are essential for meeting the NPT Article III.2 obligation not to provide source or special fissionable material, or equipment or material especially designed or prepared for the processing, use or production of source or special fissionable material to a non-nuclear-weapon State, even for peaceful purposes, unless the source or special fissionable material is subject to IAEA safeguards<sup>(19)</sup>. Parallel commitments and obligations are provided for in other treaties:
  - a)Article 4 of the CPPNM to permit exports and imports of material covered by the convention only after receiving assurances that the material will be protected at levels described in Annex I to the convention<sup>(20)</sup>.

b)Article 27 of the Joint Convention requires Contracting Parties to participate in the transboundary movement of covered material only when specified conditions are met<sup>(21)</sup>.

So, establishing an adequate legislative framework for nuclear export and import controls is important for all States. Even States that are neither exporters nor importers of nuclear material or technology need a basis for controlling any nuclear transfers through their territories<sup>(22)</sup>.

## **1. IMPORT, TRANSIT AND EXPORT OF RADIOACTIVE SOURCES**

Many of radioactive sources are used in industry, agriculture and medicine. A large number of portable sealed sources, most of them of low activity, are used in industry and medicine; consequently, it is not surprising that, in spite of inventory keeping and controls, some sources are lost. The construction of most sealed sources is quite robust, so that accidents involving lost sources are usually due to human error. The regulatory body should control over the sources and determine which activities and which sources can be exempted from regulatory control. The national nuclear law should also contain provisions regulate and control the import, transit and export of radioactive sources. Categorizes 1 and 2 according to code of conduct is supplementary guidance on the import and export of radioactive sources. The legislation should identify and assign clear responsibilities to assure the safety and security of the radioactive sources. It should require the finders of such orphan sources to report them to the regulatory body and to assign to the regulatory body the responsibility to develop a national strategy for recovery orphan sources.

Each state intends to import or export of radioactive sources takes into account the following rules:

- 1- Not to approve on the import of radioactive material unless authorized for a recipient and the receipt the source under its national law, and the availability of technical and managerial capacity, resources and appropriate regulatory structure necessary for a secure disposal of radioactive sources in a secure way.
- 2- Not to approve the export of radioactive material unless it had a notification in advance that the receiving State is authorized to receipt and possession of source, and have available the technical capacity and appropriate administrative and supervisory resources and structure necessary for a secure disposal of radioactive sources in a secure way.
- 3- The state that authorized to the import or export of radioactive source, should take the appropriate steps to ensure that the import or export is in a manner consistent with international standards for the safe transport of radioactive materials, especially to maintain the continuity of control during the process of international transport<sup>(23)</sup>

## **2. THE BASIC REQUIREMENTS FOR THE ISSUANCE OF EXPORT OR IMPORT LICENSES**

As with all other activities involving nuclear material and technology, a transfer of such commodities and information across national boundaries should be permitted only after the issuance of a license (or permit or other authorization) that clearly states the essential features of the transfer. These include: the identity of the licensee; the precise subject matter of the transfer (in terms of the types and quantities of material or the character of technology); the destination of the transfer; the end use or (if different from the destination) the end user of the

material; the duration of the license; and any relevant limitations or conditions (such as the mode of transport and the required physical protection measures).

The following are some typical requirements:

- (a) That the receiving State have made a binding commitment to use transferred material and information for peaceful purposes only;
- (b) That international safeguards be applied to the transferred item;
- (c) That the receiving State place all its nuclear material and nuclear facilities under international safeguards (the full scope safeguards requirement);
- (d) That retransfers of previously transferred material and technology to a third State be subject to a right of prior approval by the supplying State;
- (e) That the levels of physical protection that will apply to the international transport of nuclear material be consistent with those given in Annex I to the CPPNM (Article 4 of the CPPNM);
- (f) That, in the case of certain material, the State of destination have received prior notification of and have consented to the transfer such as the Joint Convention<sup>(24)</sup> in Article 27(1)(i);
- (g) That, in the case of certain material, the State of destination have the administrative and technical capacity and the regulatory structure needed to manage the material in a safe and secure manner such as , Article 27(1)(iii) of the Joint Convention<sup>(25)</sup>.
- (h) That transfers of certain material be not to the Antarctic region such as the Article 27(2) of the Joint Convention<sup>(26)</sup> .

## **SECOND: NUCLEAR SECURITY AND THE ILLICIT TRAFFICKING**

One of the most serious of threats is IT and nuclear terrorism<sup>(27)</sup>. Among the factors that have helped it appears are:

- 1- Some groups and political actors try to achieve its objectives independently and not through the existing institutions of power.
- 2- Increasing numbers of non-governmental organizations and the financial impact and potential of growing in international relations, such as terrorist groups and organized crime groups across national borders, and movements of ethnic separatism and religious extremism<sup>(28)</sup>.

## **THE NATIONAL LAW AND THE ILLICIT TRAFFICKING**

A widely accepted working definition of IT reads as follows: "**A situation which relates to the unauthorized receipt, provision, use, transfer or disposal of nuclear materials, whether intentional or unintentional and with or without crossing international borders**". IT of nuclear materials defined as the movement of sensitive nuclear materials from the viewpoint of non-proliferation (ie, uranium enriched at 20% or more and plutonium, in addition to facilities fuel cycle that can be accessed illegally), within the State of origin or transported illegally to another State. The latter is the most dangerous from the standpoint of the non-proliferation<sup>(29)</sup>. Thus an IT situation may arise when physical protection measures have failed.

The General objective of the law in this field to reduce to a minimum the possibility of smuggling of nuclear or radioactive materials in to the country or through the country and to have an effective plan to react in case of an illicit traffic event in the state.

Provisions that are contained in export and import control legislation regarding IT should be carefully reviewed to ensure their consistency with the laws dealing with physical

protection. Discrepancies in the scope of coverage, requirements, definitions or procedures between, on the one hand, export and import control legislation and, on the other hand, legislation against illicit trafficking, can lead to inefficiency and confusion in these two closely related fields. A State's export and import control laws should authorize relevant governmental agencies and officials to provide relevant information to the IAEA's Illicit Trafficking Database (ITDB) for the purpose of helping the international community to prevent unauthorized transfers of potentially dangerous material and technology

In fact the existence of a regulatory authority empowered to establish effective physical protection on one hand and accountancy and control measures on the other hand enhances the states capability to prevent, intercept and respond to illicit use of nuclear materials. Design and implementation of a system of physical protection is the responsibility of the state. That system is entrusted to take the necessary steps to minimize the possibilities of unauthorized removal of nuclear material or sabotage, undertake the necessary measures to locate and recover missing materials as rapidly as possible and minimize the effect of sabotage.

SSAC are complementary measures contributing to the prevention of illicit uses of nuclear materials. This is realized through the establishment of SSAC which should comprise a set of requirements and procedures applicable to all nuclear materials to ensure that such material is not diverted to unauthorized uses.

### **PART III : THE EGYPTIAN NUCLEAR LAW NO. 7 FOR REGULATING THE NUCLEAR AND RADIATION ACTIVITIES AND ITS EXECUTIVE REGULATION**

As we mentioned, the State should establish and maintain a legislative and regulatory framework to govern physical protection. The legislation should designate a regulatory body responsible for the implementation of the legislative and regulatory framework.

#### **FIRST: THE EGYPTIAN NUCLEAR LAW FOR REGULATING THE NUCLEAR AND RADIOACTIVE ACTIVITIES LAW NO. 7 ; 2010**

Egypt started its legal framework to regulate the peaceful uses of nuclear energy by the law no 59 in the year 1960.. It also issued many republican decrees regulating the uses of nuclear energy. In September 2006, Egypt decided to study all alternatives for energy production. So, in 2007, it also decided to review its legal framework and drafting a unified nuclear law. In March 2010, Egyptian nuclear law was issued to regulate the nuclear and radioactive activities; It called law no. 7 for the year 2010. It contains provisions govern all the elements of national nuclear legislation according to many of the IAEA documents. The Egyptian nuclear law also establishes (in chapter no.3) a legislative framework for the licenses of the nuclear facilities. It also regulate the safe management of all nuclear materials and radiation sources to ensure that individuals, society and the environment are protected against radiological hazards. It also contains provisions regulate and control the import, transit and export of radioactive materials. It contains provision to put used sources under regulatory control. The Egyptian nuclear law provides for the regulatory body to issue the regulations contain requirements for every stage of the licenses. The law contains provisions (in chapter no. 5) to regulate nuclear safeguards and realizing the nuclear security.

#### **1.THE LAW AND PHYSICAL PROTECTION**

The objectives of physical protection legislation are, inter alia:

- (a) To provide for the implementation of the State's relevant international obligations such as the CPPNM;
- (b) To establish or designate a regulatory body with the powers and resources necessary for implementing the legislative and regulatory framework relating to physical protection;
- (c) To promulgate a clear and comprehensive set of basic obligations that authorized persons must fulfill in order to ensure the effective physical protection of nuclear material and facilities;
- (d) To establish the requirements that must be met in order to protect against the unauthorized removal of nuclear material in use and storage, and during transport;
- (e) To establish the requirements that must be met in order to protect against the sabotage of nuclear facilities and against sabotage involving nuclear material in use and storage, and during transport;
- (f) To establish the requirements for the preparation and exercise of contingency plans for a rapid response to any cases of the unauthorized removal of nuclear material, including the location and recovery of missing or stolen nuclear material (and in the event of sabotage) <sup>(30)</sup>.

Although Egypt is not a state party to the CPPNM, the law contained the most of the physical protection recommendations. In Article (9), the law stated that "Be the Ministries of Interior, Foreign Affairs and the competent ministry to both the civil aviation and transport, the Suez Canal Authority, and the General Intelligence Service, and the Atomic Energy Authority and other relevant authorities, respective, responsible for taking the necessary measures to ensure the protection of radioactive materials in the framework of international transportation in accordance with the provisions set forth in international conventions governing it and be into force in Egypt<sup>(31)</sup>).

The law stated in part III Chapter II entitled licensee in Article (38) item 6 that "The licensee shall exercise nuclear or radiological activity with develop and implement measures and procedures required in significant nuclear security of nuclear materials and facilities and radioactive sources, and that against different threats.". The law in Article (41) stated that the licensee shall establish a security system for nuclear or radiation facility or nuclear materials and radioactive sources of his or her possessing and to fulfill all the requirements specified by the ENRRA to achieve the required levels of protection".

The following are some general requirements that may be considered for inclusion in legislation <sup>(32)</sup>:

- (a) A categorization of nuclear material.
- (b) A provision that primary responsibility rests with the holders of the relevant licenses or with the holders of other authorizing documents (e.g. operators or shippers).
- (c) A provision that the responsibility for physical protection during international transport should be the subject of agreement between the States concerned, with a clear definition of the point at which the responsibility is transferred from one State to another.
- (d) A provision that the operator or some other authorized person should prepare plans for effectively countering the design basis threat through, inter alia, the actions of an emergency response force.
- (e) A provision that the State's system for physical protection should ensure that competent authorities consider the following in establishing detailed requirements for physical protection:
  - The category and location of the nuclear material (and whether the material is being used, stored or transported);

- The need for taking into account possible radiological consequences when establishing physical protection requirements against sabotage;
- The value of defence in depth through a combination of preventive and protective measures based on the appropriate facility design, hardware (security devices) and procedures (including the use of guards);
- Whether there is a credible threat of the malevolent dispersal of nuclear material.

Although general requirements may be codified in legislation, detailed requirements are typically promulgated by the regulatory body in regulations or rules.

## **2. THE LAW AND THE ILLICIT TRAFFICKING**

The law establishes the legal base against IT in articles 31,55&62. In article (31) the licensee shall notify the ENRRA in writing immediately after knowing the loss or theft of any shipment containing radioactive materials, in accordance with rules and procedures prescribed by the Executive Regulations of this law. Under the title of Import, export, transport and transit, the Article (55) stated that “Prohibited, without the approval of the ENRRA in accordance with the conditions and standards set by the import, export or transfer any radioactive materials or any components or products of radiological nature and unlike X-ray machines for use in the medical field”<sup>(33)</sup>. The article (107) punished by imprisonment for a term not exceeding five years and a fine of not less than one hundred thousand pounds and not exceeding four hundred thousand pounds Whoever violates deliberately none of the provisions of articles 55 of this law, and ruled in the case of conviction export the seized items at the expense of the defendant.

Chapter sixth from part III, titled “Possession, handling and production licenses of nuclear materials and radioactive sources inclusion in Article (62) that states “Prohibited without a license from the ENRRA in accordance with the rules, conditions and procedures specified by the possession, handling or production or bring nuclear materials or radioactive sources. The issuance of the license referred to, and in accordance with the requirements of the need for a period determined by the ENRRA and be subject to renewal unless there requires review of the license during the duration of effect. In all cases, prohibits the natural person or a representative of the legal person possessing, trading or production or bring materials or sources referred to in his personal capacity<sup>(34)</sup>. The article (108) punished by imprisonment for a period not less than one year and a fine of not less than ten thousand pounds and not exceeding fifty thousand pounds every person who violates any of the provisions of articles (31, 53, 14, 74, 50, 15, 52, 45, 58, 61.66, 37 ) of the Act.

The law also establishes a system for nuclear security in article 77 to control procedures and measures to combat illicit trafficking in materials and sources.

## **3. THE LAW AND OFFENCES**

There is a need to the law to include two kinds of sanctions: first, a range of administrative sanctions for the unauthorized removal or use of nuclear material and for non-compliance with physical protection requirements; and, second, for more serious violations (such as sabotage), a range of criminal sanctions. The Egyptian law punished the violators by imprisonment and fine for non-compliance with nuclear security, prevent illicit trafficking and physical protection requirements(Articles 106,107,108)

## **SECOND: THE EXECUTIVE REGULATION OF THE LAW NO.7 AND THE NUCLEAR SECURITY**

The second Chapter of the executive regulation for The Egyptian nuclear law no. 7 that regulating the nuclear and radiation activities in the state included many articles related to Nuclear Security.

### **1.THE EXECUTIVE REGULATION AND PHYSICAL PROTECTION**

In the article (12) one of the requirements for license of the nuclear facilities is an initial plan for the physical protection and security of nuclear installations. In Article (94)The ENRRA shall specify the requirements for the physical protection of nuclear materials used and stored and is being transmitted and nuclear facilities and that are resistant to withdraw without the permission of nuclear material or sabotage of the facility, respectively. Article (95)stated that “Borne by the licensee or owner of the facility or activity bear the primary responsibility for providing security toward nuclear facilities and activities, radiological and nuclear materials and nuclear fuel and radioactive sources, including radioactive waste and spent nuclear fuel. Article (99) The ENRRA shall review inventory and classification of nuclear materials and radioactive sources state into categories determined by rules and regulations, standards and technical regulations from the perspective of the nuclear security of nuclear materials and review the measures to be taken regarding each category of protection commensurate with its gravity within the principle of the cost analysis for yield to enhance security (the gradient approach). Article (98)The licensee shall implement the adopted of the Authority system to give full protection and security of nuclear facility or nuclear activity and subject those systems to control of the ENRRA directly to confirm the effectiveness of that system, including the inspection of all components of the system used, if necessary. Article (102) ENRRA to cooperate or consult with relevant organizations and institutions at home in matters concerning the operations of the physical protection and development, as well as foreign bodies in the case of cooperation for the recovery of any materials were stolen or loss through the official bodies and in coordination with the Supreme Committee for Nuclear and Radiological Emergencies.

### **2.THE EXECUTIVE REGULATION AND NUCLEAR SECURITY**

Article (93) stated that “The Egyptian regime of nuclear security has the authority to ensure the availability of protection systems for nuclear and radiation installations, as well as of nuclear materials and radioactive sources used or stored and in particular what is being transferred internationally and has the audit be conducted of the systems or field inspection. The licensee of any facility or nuclear activity or radiological, according to Article (96), shall identifies sources of threat that could harm the safety of property, plant and environment such as theft, sabotage, and should develop plans to ensure confront that threat. Article (97) included that ”The licensee shall develop systems and plans nuclear security required under the cost analysis for yield to enhance security (the gradient approach) to counter all kinds of threats expected of the facility or activity nuclear or radiological or nuclear materials and view a report of nuclear security to ENRRA for approval”.

Article (100)The ENRRA shall confidentiality of any information or documents have confidentiality and maintain on physical protection systems also identify confidentiality requirements associated with this matter and associated documentation accurate information or details that could lead disclosure without permission to prejudice the physical protection of nuclear material and nuclear facilities that are subject to protection and confidentiality. Article

(101) determine the kind of the restrictions imposed on the preview of sensitive information by restricting who require the nature of their work found, and information that relate to what is going to be gaps in the physical protection systems should provide maximum protection.

### **3. THE EXECUTIVE REGULATION AND LICENSE OF POSSESSION OR HANDLING OR PRODUCTION OF NUCLEAR MATERIAL**

Chapter VI of Part II of the executive regulation deal with the Possession or handling or production 'license of nuclear material. The Article (31) stated that possessing or handling licenses or production of nuclear materials are subject to the rules and the following conditions: 1 - Submitted to the Chief of ENRRA immediately the data and information on the handling of nuclear materials within the Arab Republic of Egypt or in any place under its control or supervision, as well as data and information on import and export of such materials, so as to meet the requirements of the IAEA contained safeguards agreement, including design information of the facility.

2 - Early notification to the head of ENRRA the design information of the facility and any change happening on this information before 6 months of its occurrence.

3- The ENRRA, in coordination with nuclear installations or locations outside facilities, prepare a document (facility attachment) specify in detail how to apply the procedures relating to the activities of the Egyptian regime of accounting and control of nuclear materials within each facility or location and is approved by the ENRRA Board of Directors in the finalized form.

4 - To get out of the regulatory of the ENRRA on nuclear material, required the approval of the Egyptian regime of accounting and control of nuclear material.

Article (32) stated that "the issuance of a license for possession, handling or production of nuclear materials with the following procedures:

1 - The applicant provides a written request is accredited to the President of ENRRA meets the following data and documents: -

A- The name of the facility and public statements about the location and / or outside locations, and the name and address of the person responsible and described.

B- Describe the site or outside sites and the approximate area and full address and telephone and fax numbers and e-mail.

C- General description of the activity of the facility (or outside sites) and the quality and quantities of nuclear material to be acquired or handled or produced and the purpose of the activity.

D- Description of the system (or systems) of measurement to determine the types and quantities of nuclear material under the possessed or traded or produced and any change thereof.

E- Provide an information document for the design and adoption of correctness of the information came from.

F- Description of the accounting system of nuclear materials, including models of the records and reports used.

G- The presence of an trained responsible person on accounting and control of nuclear material.

H- Approval to accept inspections by the ENRRA and the IAEA until the completion of the facility attachment according to the requirements set by the systems and standards, rules and requirements issued by the ENRRA.

I - Approval of correctness of the data in the license application.

J- Payment of the prescribed fees.

k- Deciding on the license application within thirty days from the date of completion<sup>(35)</sup>.

#### **4. THE EXECUTIVE REGULATION AND THE EXPORT AND IMPORT**

Part V Regarding the import, export and transport of radioactive sources / radioactive materials, in Chapter I titled Conditions for obtaining approval, the Article (61) stated that “the approval to import radioactive sources / radioactive materials will be subject to the following conditions: -

1 - Obtain a license for the handling and use of radioactive sources / radioactive materials to be imported or obtain a license operation to gamma irradiation facilities and electronic and ionic accelerators.

2 - Provide all the technical data for the device and belongings which will contain radioactive sources / radioactive materials and obtain the approval of ENRRA with the conformity to safety specifications.

3 - Apply procedures and radiation protection requirements through an expert or official protection certified and registered so special Authority records and determine technical regulations issued by the ENRRA obligations.

4 - Provide a statement from the body requested the approval of the re-export of radioactive sources / radioactive materials that have expired for work or discarded to the imported state or disposed it through the radioactive waste management facility.

In Article (62) the ENRRA obliged to establish a record codifies approvals to import radioactive sources / radioactive material.

#### **5. EGYPTIAN NUCLEAR SECURITY SYSTEM AND SSAC**

Egypt started its SSAC with the presidential decree no 152 in 2006<sup>(36)</sup>. The same obligations included in the nuclear safeguards chapter from the nuclear law. Article (71) stated that the ENRRA shall implement all the actions of the Egyptian SSAC in a manner that ensures accounting for and control of all nuclear material in Egypt or in any place under its jurisdiction or control or supervision and to meet the basic technical requirements according to the application of safeguards. The article (73) obliged the bodies and persons subject to the provisions of this Act shall submit to the ENRRA data, information and documents on the activities related to the work of nuclear safeguards, in accordance with the rules and procedures specified by the ENRRA in this regard. Article (74) gives the ENRRA the right to enter into any site and in the inspection and measurement and inventory, sampling and other necessary to validate the data, information and documents submitted by the licensee entity or sites outside as to the ENRRA put containment and surveillance systems.

In chapter III from part V titled “ Nuclear security”, the Article (77) stated that “ the organizational structure of the ENRRA shall Established a system for nuclear security of nuclear and radiological installations and activities, nuclear materials, nuclear fuel and radioactive sources, including radioactive waste and spent nuclear fuel, to ensure the achievement of the following:

- Follow-up the types of threats expected that must be reservists in the design of nuclear security systems in the country, and analysis on the national level, and determine the appropriate means to meet them.

- Review the design of nuclear security systems and evaluate the performance of these systems during operation in the light of possible threats and appropriate means to meet them.

- Develop appropriate category of nuclear material and radioactive sources from the perspective of nuclear security, and the measures that are required in each category to protect materials and sources referred to in order to ensure proportionality between the seriousness and the level of protection required.
- Approval on the import and export operations.
- Control procedures and measures to combat illicit trafficking in materials and sources.
- Create a database of nuclear materials and radioactive sources in the country in all fields so as to ensure compatibility with the data related to the Egyptian system of accounting and control of nuclear material.
- Sure to provide the necessary protection for nuclear and radiological facilities, as well as nuclear materials and radioactive sources used, stored and what is being transferred by any means, including international transportation, and through the implementation of administrative and technical measures necessary.

The law also obliged the applying of the provisions of this article, by coordination with the Ministry of Interior, Foreign Affairs, the competent ministry to both transport and civil aviation bodies concerned to import and export, the General Intelligence Service, the Suez Canal Authority, the Atomic Energy Authority, the nuclear power plants to generate electricity Authority, the nuclear materials Authority and other ministries and relevant agencies, Within the limits of their respective jurisdiction. This will help these authorities in requesting radiation monitoring to detect any IT. Exit portals of all facilities in which radioactive sources or nuclear materials are handled or used or stored should be provided with suitable radioactive monitors to detect any unlawful acquisition, or theft of any amount of radioactive materials or any radioactive source on the spot.

According to the law (article 72'73'74'75'76) The SSAC have the jurisdiction to:-

- a- Ensure that the nuclear materials are imported, exported, produced, transferred, stored, used or disposed of only by an authorized party through the license or approval by ENRRA.
- b- Ensure that the licensee are well known of their responsibilities and applicable procedures and requirements associated to the nuclear security.
- c- Maintain an updated data base system of all nuclear materials present in the country. In case of radioactive sources, it is a usual practice to apply adequate security measures, using the graded approach, to assure that the radioactive sources are under adequate and effective control.

Some experts considered the accountancy measures are also complementary to the effective control over radioactive sources. This could be achieved by applying registration systems for following up of the radioactive sources. In order to discover illicit trafficking or inadvertent movement of radioactive materials, the following steps are required: detection of any abnormal radiation level, verification of such detection, localization of the origin of the radiation, radiation safety measurement, and identification of the radioactive material (<sup>37</sup>)

## **THE CONCLUSIONS**

The aim of the international security system in the nuclear field to be transfers of nuclear materials, equipment and technology to safe and secure manner to humans and the environment. It also aims to help ensure that such transfers, directly or indirectly to the illegal use of nuclear materials. Many cases of illicit trafficking in nuclear materials led to the recognition of the need to strengthen the international system of physical protection.

Therefore, need to make every state possession of nuclear materials a crime punishable under national law, and enforcement of laws and regulations pertaining to this matter in order to achieve deterrence of such acts. It also should cooperate each State with other States and international bodies through the exchange of information on this subject, as well as plans or attempts to procure nuclear material illegally<sup>(38)</sup>.

The CPPNM sets forth a range of measures to ensure the protection of nuclear material (basically, enriched uranium and plutonium), primarily in international transport. However, the Convention also contains important provisions covering the domestic use of these materials. In force since February 1987, the CPPNM has 142 parties and 45 signatories.

As of early 2010, the CPPNM Amendment had been formally approved by only 34 states. Under the convention's amendment provision in Article 20 (2), the Amendment will enter into force only after two-thirds of the parties have formally approved with its current large membership of 142 states parties, the CPPNM therefore requires 95 States to approve the Amendment. Given that it has taken some five years for only about a third of the necessary States to approve the Amendment, considerable delay in implementing this important instrument seems likely.

#### **EVALUATION OF THE EGYPTIAN NUCLEAR LAW**

The purpose of this work is to evaluate the legal situation in the country for the combat of IT in the framework of the international law rules and the Egyptian law. We must emphasize that the security is a matter of national sovereignty so, although it has common features, the Legislation, Regulation etc, and associated processes are vary from State to State. The General objective of the law in this field to reduce to a minimum the possibility of smuggling of nuclear or radioactive materials in to the country or through the country and to have an effective plan to react in case of an illicit traffic event in the state. State must enact state legislation to a system of physical protection of nuclear material is laying the groundwork that could reduce the vulnerability of nuclear materials to theft or loss or destruction, and ease of facilitating information and providing technical and financial assistance, for the recovery of stolen or lost and to reduce the radiation effects of sabotage or terrorist operations.

The Egyptian legislative framework provides legal bases for nuclear security of nuclear and radioactive material. The law contains provisions govern all these objectives above. It also contains a chapter to establish a regulatory body with the legal powers and technical competence necessary in order to ensure that operators of nuclear facilities and users of nuclear material and ionizing radiation sources operate and use them safely and securely. It provides the regulatory body with legal authority to issue a regulation of physical protection that should include many principles. The law also establishes a legislative framework for the safe management of all radiation sources. It also contains provisions regulate and control the import, transit and export of radioactive sources. It contains provision to put used sources under regulatory control. The Egyptian nuclear law contains provisions for nuclear safeguards and realizing the nuclear security. It also provides for the regulatory body to issue the regulations contain requirements for nuclear security. As well as, it reflected the all elements that should be included in the national law in the area of nuclear security.

A State's nuclear export and import control legislation should be consistent with applicable international agreements to which that State is a Party. The Egyptian nuclear law is

applied all Egyptian obligations according to the international treaties and conventions associated with the nuclear security which Egypt is a state party.

Because of the law criminalized the possession, handling or production or bring nuclear materials or radioactive sources without a license from the ENRRA in accordance with the rules, conditions and procedure, the Article (106) Punishable by imprisonment for a term not less than five years and no t more than seven years and a fine of not less than twenty thousand pounds and not exceeding one hundred thousand pounds Whoever violates any of the provisions of articles (25, 26 first paragraph, 49, 53, 62) of this law.

The law addresses specifically the illicit trafficking as an illegal act against the illicit trafficking and consequently there is penalty in case of an event of such nature occurs. Customs have radiation monitors to detect the traffic of nuclear or radioactive material. This law provides a legal base against the IT although it doesn't represent a serious threat at present in Egypt. It is very important to put at the border enter/exit points, as well as at air and sea ports in Egypt radiation detecting portals to enable the customs officials to detect and prevent any unlawful movement of nuclear materials or radioactive sources across the borders.

As the establishment of any legal system in terms of effectiveness requires the availability of three elements:

- 1- Set of Principles and the principles and objectives underlying the system.
- 2- A set of rights and obligations to achieve the objectives of the system, and accepted by the people of the system.
- 3 - An institution or a body that is on the application and implementation of the legal system.

To confront the IT,<sup>(39)</sup>efforts need to intensify to prevent illicit trafficking of nuclear materials by:

- 1-Reinforcing the defense first such as the storage of nuclear materials in a safe and guaranteed.
- 2-Take effective measures for the prevention and control.
- 3-Tighten national controls on exports and import of radioactive materials.
- 4-Increase the international cooperation in this field, because it cannot resolve this problem without the consolidation of cooperation between the countries, especially universal adherence to the NPT and the implementation of effective mechanisms and provisions, as well as to join the convention for the protection of nuclear material<sup>(40)</sup>.

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