Transport Security of Nuclear and Radioactive Materials

Mexico

GOBIERNO DE MÉXICO | SENER SECRETARÍA DE ENERGÍA | CNSNS COMISIÓN NACIONAL DE SEGURIDAD NUCLEAR Y SALVAGUARDIAS

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National Commission for Nuclear Safety and Safeguards

The National Commission for Nuclear Safety and Safeguards (CNSNS) is a semi-autonomous organization under the Secretariat of Energy, with responsibilities assigned by the Regulatory Law of Article 27 of the Constitution on Nuclear Matters. CNSNS is also responsible for addressing international commitments and requirements in the areas of nuclear safety and security, as well as safeguards.

National Commission for Nuclear Safety and Safeguards CNSNS

- Oversee the implementation of nuclear safety and security standards, and safeguards
- Review, evaluate and authorize the sitings, design, construction, operation, modification, close down, closure, and dismantling of nuclear and radiological facilities
- Propose regulations, as well as review and evaluate them and, where appropriate, authorize the basis for the design, construction, adaptation, preparation, operation, modification and closure of facilities
- Recommend and advise on nuclear safety, security, and administrative measures, and safeguards that could be enforced under anomalous or emergency conditions
- Issue, revalidate, replace, modify, suspends and revoke permits and licenses required by radiological facilities in accordance with legal provisions

National Commission for Nuclear Safety and Safeguards CNSNS

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Some roles of CNSNS[1]

- ✓ Order and carry out audits, inspections and verifications.
- ✓ Participate in entering into cooperation agreements between the Secretariat of Energy and other national organizations on matters related to nuclear safety and security, and safeguards

National Commission for Nuclear Safety and Safeguards CNSNS

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Some roles of CNSNS[1]

- ✓ Establish the requirements for technical training programs on aspects related to nuclear safety and security, and safeguards, and provide advise
- ✓ Assist the authorities working on prevention, prosecution and the administration of justice, in cases in which nuclear materials and fuels or radioactive materials are the subject of a crime, are lost or misplaced or are involved in incidents, as well assist custom authorities as per the terms of the pertinent Law.

1- As established in Chapter VI. The National Commission for Nuclear Safety and Safeguards of the "Regulatory Law of Article 27 on Constitution of Nuclear Matters"

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Legal framework for nuclear security in Mexico

Legal framework for nuclear security in Mexico

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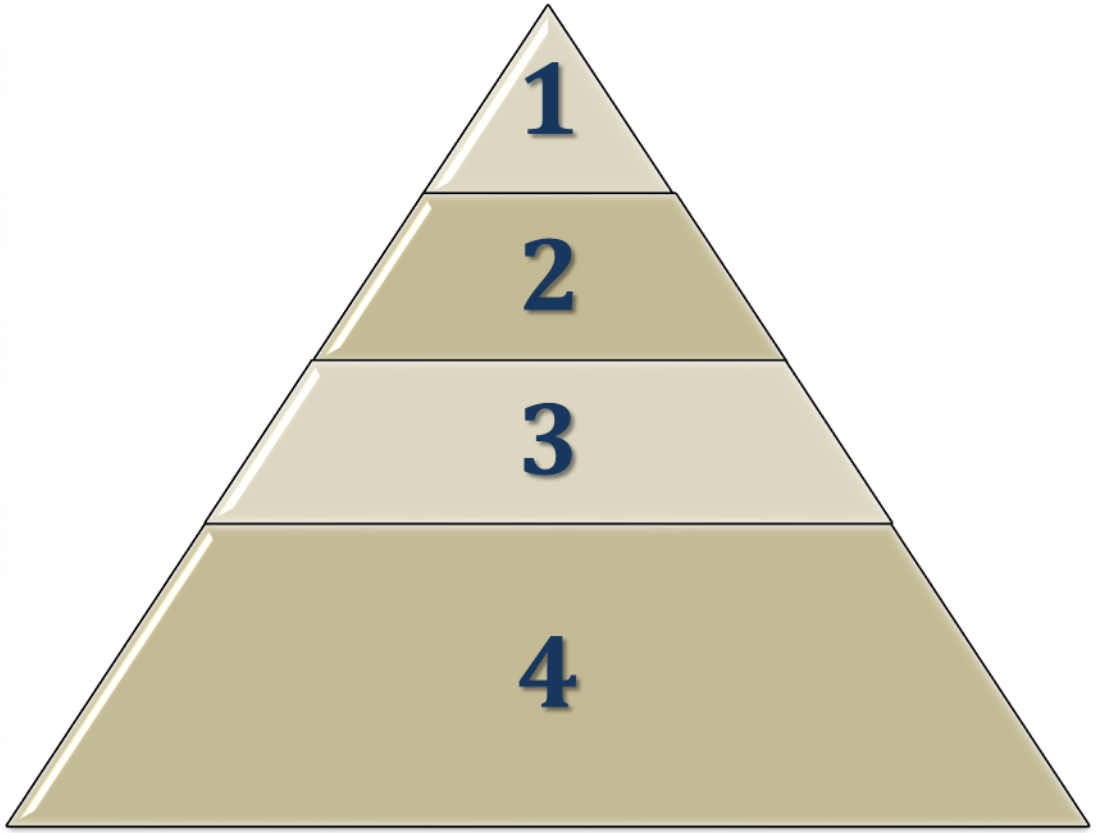
The Constitution, International Treaties and Agreements

Federal, General and Regulatory Laws

Regulations

Decrees, agreements, guidelines, standards and specialized administrative provisions



Legal framework for nuclear security in Mexico

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1

- ✓ Articles 25, 27, paragraphs: IV, V and VIII (National Assets: For the exclusive use by the Nation) and 28 of the Constitution of the United Mexican States, contain constitutional provisions on energy matters.
- ✓ Convention on the Physical Protection of Nuclear Material and Nuclear Facilities *(Enacted by Decree in Mexico on June 14, 1988)*
- ✓ Amendment to the Convention on the Physical Protection of Nuclear Material and Nuclear Facilities. *(Ratified in Mexico on May 17, 2012, and its enactment decree on July 26, 2016)*

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- ✓ **UN Security Council Resolution 1540 (2004).** Mexico established the "National Action Plan" for the Implementation of resolution 1540 (*November 21, 2014*)

- ✓ **Counter-Terrorism Committee as per UN Security Council Resolutions 1373 (2001) and 1624 (2005).** This Committee was created after the terrorist attacks of September 11, 2001 in the United States of America, and strives to strengthen the capacities of UN Member States to combat terrorist activities within their borders and in all regions.

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Regulatory Law of Article 27 of the Constitution on nuclear matters *(Entry into force on January 27, 1979)*

Other related laws :

- ✓ Liability Law for Nuclear Damage. Published in the Official Gazette of the Federation on December 31, 1974
- ✓ Quality Infrastructure Law. Published in the Official Gazette of the Federation on July 1, 2020, replaces the *Federal Law on Metrology and Standardization*
- ✓ Federal Criminal Code. Focused on the malicious use of nuclear and radioactive materials

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- ✓ General Safety Regulations (RGSR) Establishes in broad terms that radiological facilities must implement security measures (published in the Official Gazette of the Federation on November 22, 1988)
- ✓ Regulations for the Safe Transport of Radioactive Material (published in the Official Gazette of the Federation on April 10, 2017)

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Regulatory projects

- ✓ Draft Project for General Security Regulations, its scope will govern the national territory, establishing nuclear security requirements, measures and actions at nuclear and radiological facilities, to prevent acts that could damage or alter public health and safety. The main legal basis for issuing this regulation is the Regulatory Law of Article 27 for the Constitution on nuclear matters, in addition to the Convention on the Physical Protection of Nuclear Materials and its corresponding Amendment, and its technical basis stem from IAEA recommendations and guidelines.

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Regulatory projects

- ✓ PROJECT for the Official Mexican Standard PROY-NOM-042-NUCL-2019, Categorization of fissile substances and other radioactive materials and nuclear security requirements for transport.
- ✓ DRAFT PROJECT for the Official Mexican Standard PROY-NOM-043-NUCL-2019, Security Plan for the transport of nuclear and radioactive material (and its expansion to fixed facilities).
- ✓ Establishment of security requirements as part of the license conditions for category 1 and 2 radiological facilities (practices such as Cobalt-60 Teletherapy, industrial irradiators using cobalt-60, medical irradiators, mobile industrial radiography, among others)

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AUTHORITIES RESPONSIBLE FOR THE TRANSPORT OF RADIOACTIVE MATERIAL IN MEXICO

CNSNS-SICT

Nuclear Facilities

2 Power reactors

1 Research reactor

2 Teaching reactors

Radioactive Waste Storage Facility

Radiological Facilities

Pest control irradiation

Industrial irradiation

Teletherapy treatment

Blood irradiation

Brachytherapy

Soil density and thickness gauging

Level gauging

Fixed and mobile industrial radiography

Nuclear medicine

Others

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Incident

Hueypoxtla Case: Theft of a disused teletherapy unit containing a Co-60 radioactive source

BACKGROUND:

A Tijuana Hospital transfers a teletherapy unit containing a Co-60 source to the Radioactive Waste Storage Facility, with authorization from CNSNS.

The vehicle transporting the teletherapy unit stops in front of a gas station to rest in the town of Tepojaco, State of Hidalgo. In the early morning of December 2, 2013, the truck with the teletherapy unit is stolen.

At around 07:30 in the morning, the theft of the vehicle transporting the radioactive material is reported to the CNSNS emergency line.

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Incident

News Bulletin

CNSNS contacts the people who made the report to obtain more information.

Subsequently, CNSNS issues an "Alert Bulletin for a Lost Radioactive Source" and sends it to the General Coordination of Civil Protection.

CNSNS notifies the International Atomic Energy Agency (IAEA) of the incident.

CNSNS, in coordination with the Secretariat of Energy, engages with the media, both national and international.

SEGOB

Sistema Nacional de Protección Civil
Coordinación Nacional Protección Civil
Comisión Nacional de Seguridad Nuclear y Salvaguardias

Dirección General de Protección Civil

BOLETÍN DE ALERTA POR FUENTE RADIACTIVA EXTRAVIADA

NOTIFICACIÓN

Boletín 02.12.2013
Emisión: 11:00

Riesgo: ALTO
Extremadamente Peligrosa

Estados de la República Mexicana en los que podría localizarse la fuente

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Response Phase

Personnel from the Federal response forces of the Mexican State inform CNSNS of the alleged appearance of the stolen source in the town of Hueypoxtla, State of Mexico.

CNSNS analyzes photographs sent by the Federal forces and determines that it is indeed the container, but without the radioactive source.

The CNSNS sends out four brigades to search for the radioactive source.

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Recovery Operation

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Transporting and securing the radioactive material

CNSNS measures radiation levels in the environment and finds natural background levels.

Personnel from CNSNS, Federal response forces, other government institutions, and the carrier agree on the time, route, and escort for the transport operation of the radioactive source.

Subsequent activities in the area where the radioactive material was recovered

CNSNS returns to the area to measure radiation levels and determine whether there is radioactive material, and obtains natural background readings.

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SECRETARÍA DE ENERGÍA

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RELACIÓN DE EMERGENCIAS RADIOLÓGICAS

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2010 – 2018						
Fecha	**Material Nuclear o Fuente Radiactiva Involucrada**	**Lugar del Evento**	**Robo o Extravío**	**Cantidad Involucrada**	**Denuncia ante CNSNS/MP/PGR**	**Destino Final del Material**
02 de diciembre de 2013	Cobalto-60	Tepojaco, Hidalgo	Robo	1	CNSNS/MP/PGR	Recuperado y confinado

https://www.gob.mx/cnsns/es/articulos/relacion-de-emergencias-radiologicas?idiom=es

Training of personnel involved in the transport of radioactive material

CNSNS has developed training courses for Federal Government institutions and for different stakeholders with security responsibilities at the national level.

Security-related activities conducted by CNSNS

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Support provided by US organizations and laboratories

U.S. DEPARTMENT OF ENERGY

NNSA National Nuclear Security Administration

ORS Office of Radiological Security
Protect · Remove · Reduce

Pacific Northwest NATIONAL LABORATORY

Los Alamos NATIONAL LABORATORY EST. 1943

Sandia National Laboratories

OAK RIDGE National Laboratory

Security-related activities conducted by CNSNS

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Support provided by international organizations

IAEA
International Atomic Energy Agency
Atoms for Peace and Development

FORO
Foro Iberoamericano de Organismos Reguladores Radiológicos y Nucleares

WINS | World Institute for Nuclear Security

Examples of activities supported by the IAEA and US DOE

Event	Date	Organization
Latin American Regional Workshop on the Safety of Radiation Sources and the Security of Radioactive Materials	September 2002	IAEA
Regional Training Course On Physical Protection of Nuclear Facilities and Materials	December 2003	IAEA
IPPAS Mission	December 2003	IAEA
Design Basis Threat Workshop	August 2004	IAEA
Regional Training Course on the Physical Protection of Radioactive Sources	August 2005	IAEA
Physical Protection Principles	December 2005	IAEA
National Course on the Physical Protection of Radioactive Sources	April 2006	IAEA
IPPAS Follow-up Mission	June 2006	IAEA
Regional Training Course on the Detection and Response to Illicit Trafficking	June 2006	IAEA
Meeting of Senior Experts in Latin America: Sharing experiences in implementing the Code of Conduct on the Safety and Security of Radioactive Sources	December 2006	IAEA
National Radioactive Source Security Awareness Seminar	February 2007	IAEA
INSServ Mission	December 2009	IAEA

Number of Workshops, Courses and Security Events supported by IAEA, NNSA, GTRI-ORS, WINS

- In 2010 - 1
- In 2011 - 4
- In 2012 - 2
- In 2013 - 9
- In 2014 - 3
- In 2015 - 1
- In 2016 - 6
- In 2017 - 1
- In 2018 - 4
- In 2019 - 2
- In 2020 - 2
- In 2021 - 3
- In 2022 - 1

CHAPTER V
NUCLEAR SECURITY DURING TRANSPORT

Article 54. - The purpose of nuclear security is to provide physical protection to prevent the unauthorized removal of Fissile or other Radioactive Material; implement measures to locate and recover such material; protect the Fissile Material or other Radioactive Material against sabotage or any other illicit act; and mitigate or reduce to a minimum the radiological consequences of sabotage.

Article 55. – A graded approach shall be applied in the physical protection of Fissile Material or other Radioactive Material, according to the categorization and requirements established in the relevant Official Mexican Standard. This Standard shall set out the means to categorize Packages and Packaging and specify that they must have global positioning systems or other available means to accomplish the same purpose. It shall also indicate the circumstances under which a response force provided by the State shall accompany the transported material.

Article 56. - The Consignor and the Carrier shall include the means needed to ensure early and effective detection of any unauthorized access to conveyances of Fissile Material or other Radioactive Material, or to areas where material is being prepared for Shipment or storage in transit, according to the categories and requirements established in the relevant Official Mexican Standard.

Article 57. - The Consignor and the Carrier shall provide safety measures for avoiding or, at the very least, delaying any attempt at the theft or sabotage of Fissile Material or other Radioactive Material, pursuant to the categorization and requirements established in the relevant Official Mexican Standard.

Article 58. - In accordance with the preceding Articles of this Chapter, conveyances used to transport Fissile Material or other Radioactive Material shall have at least:

I. A means to detect access by unauthorized persons;

II. Two-way communications systems or devices, global positioning systems or other available means to accomplish the same purpose;

III. Overpacks and tie-downs to delay any attempt at unauthorized removal of the material, and

IV. Security and emergency plans.

The security plan should provide for action by a response force sufficient to counter any threat against the material under transport, including the design basis threat.

If conveyances are not in compliance with the previous paragraph, the Commission shall not issue the appropriate Shipment Approval.

Article 59. - All actions related to nuclear security shall be implemented under a quality assurance plan established by the Consignor; its format, scope, content and technical specifications shall adhere to the relevant Official Mexican Standard. The Commission shall evaluate the quality assurance plan and issue the necessary approval so long as it complies with the above-referenced Official Mexican Standard.

Article 60. - The Consignor, the Carrier and the Consignee shall design procedures to limit access to information about the transport of Radioactive Material, Fissile Material and the quality assurance plan mentioned in the preceding Article, with implementation of such procedures after approval by the Commission.

Article 61. - Workers involved in the Shipment shall receive training on nuclear security and shall comply with the requirements of trustworthiness, in accordance with the provisions established by the Commission. Omission of this constraint shall give rise to the revocations mentioned in Article 101 of these Regulations.

TRANSITORY PROVISIONS

FOURTH. – Until such time as the Official Mexican Standard establishing the categorization and requirements referred to in Article 55 of these Regulations, Packages or Packaging having global positioning systems or other available means that fulfill the same purpose shall be used to transport:

I. Cobalt-60;
II. Cesium-137;
III. Iridium-192;
IV. Strontium-90;
V. Americium-241,
VI. Fissile Material.

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COORDINATION OF TRANSPORT OPERATIONS FOR:

*NUCLEAR MATERIAL
*RADIOACTIVE MATERIAL CATEGORY 1

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Pre-shipment Activities

Transport Security for Category 1 Radioactive Material

In Mexico, SENER coordinates the custody of nuclear materials, and CNSNS coordinates the transport of Category 1 radioactive materials.

The coordination groups include SEDENA, SEMAR, SICT, the National Guard, National Coordination of Civil Protection, SSPC, and the Customs Authority to ensure protection against the theft or sabotage of these materials during transport throughout the national territory.

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Pre-shipment Activities

Licensing process to check the implementation of safety and security measures during the transport of nuclear and radioactive materials

Check compliance with safety measures

Check security plans

Shipment Authorization

Transport Authorization

Ownership and transfer Authorization

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Pre-shipment Activities

Transport Security for Category 1 Radioactive Material

Preliminary Meetings

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Pre-shipment Activities

Transport Security for Category 1 Radioactive Material

Security Inspection: Communications equipment and package tie-downs

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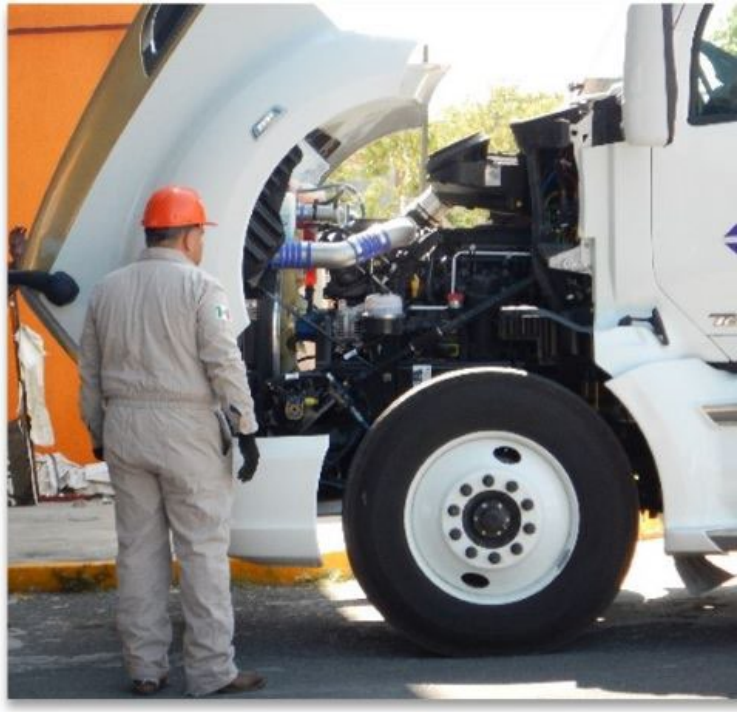
Pre-shipment Activities

Transport Security for Category 1 Radioactive Material

Medical check-up for drivers

Mechanical Inspection



In Transit Activities

Security of Category 1 Radioactive Material during transport

Shipment protection

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In Transit Activities

Security of Category 1 Radioactive Material during transport

In transit storage at authorized locations

Shipment monitoring

Activities before, during, and after transport

Security of category 2, 3, 4 and 5 radioactive material during transport

Licensing Process

Communications with: CNSNS and 911

Notification to CNSNS of shipments conducted

In transit Monitoring

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Enhancements Implemented

- ✓ Participation of different institutions such as the National Guard, SEMAR, SEDENA, SSPC, SICT (Federal agency responsible for motor transport), Customs (ANAM), National Coordination of Civil Protection, SENER, and CNSNS.
- ✓ The shipper, together with the carrier, submit the Transport Security Plan, which includes (among other measures) the package and vehicle tracking systems. Additionally, inspections are conducted to verify the operation of the physical protection system during transport.

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Areas of Opportunity

- ✓ Upcoming publication of specific Transport Security Regulations (NOM)
- ✓ Establishing agreements with countries shipping Category 1 radioactive material.
- ✓ Proposal for an International Agreement on transport security of category 1 radioactive material.

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Questions or comments

Thank you

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