

# International Conference on Nuclear Security 2020 (ICONS-2020)

## INCIDENTS OF RADIOACTIVE MATERIAL OUT OF REGULATORY CONTROL IN VIETNAM

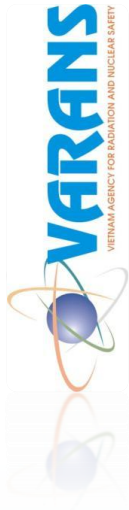
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# Content

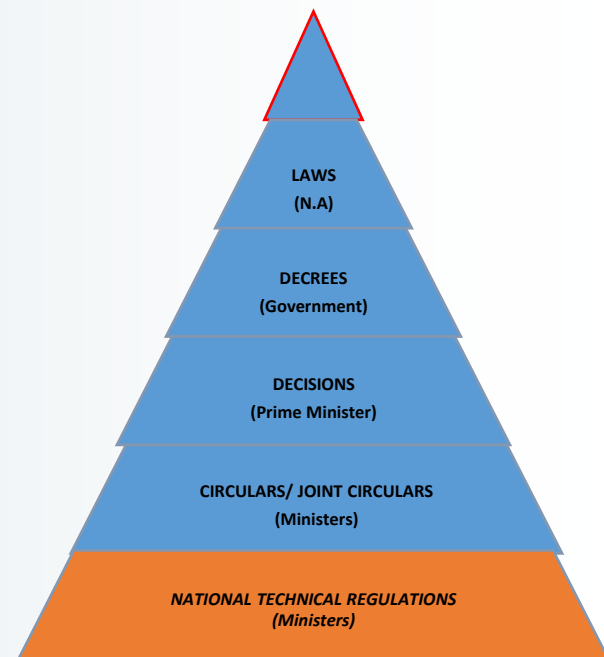
- I. REGULATORY CONTROL IN VIETNAM
- II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM
- III. LESSON LEARNED AND IMPLEMENTATION SOLUTIONS
- IV. CONCLUSIONS AND ACKNOWLEDGEMENTS



# I. REGULATORY CONTROL IN VIETNAM

## Legal documents on radioactive source security and incident response

- Atomic Energy Law (Law No. 18/2008/QH12 dated June 3, 2008)
- Decree of the Government detailing and guiding the implementation of a number of articles of the Atomic Energy Law (Decree No. 07/2010/ND-CP dated January 25, 2010)
- Decision of the Prime Minister promulgating the National Plan on responding to radiation incidents and nuclear incidents (Decision No. 884/QD-TTg dated June 16, 2017)
- Prime Minister's Decision approving the National Plan of Action on Prevention, Detection and Preparation of Risks, Chemical, Biological, Radiation and Nuclear incidents in the Period of 2019-2025 (Decision No. 104/QD-TTg dated January 22, 2019)
- The Circular of the Minister of Science and Technology stipulating the preparation and response to radiation and nuclear incidents, developing and approving the radiation and nuclear incident response plan (Circular No. 25/2014/TT-BKHCH dated October 8, 2014)
- Circular of the Minister of Science and Technology providing for security of radioactive sources (Circular No. 01/2019/TT-BKHCH dated May 30, 2019)

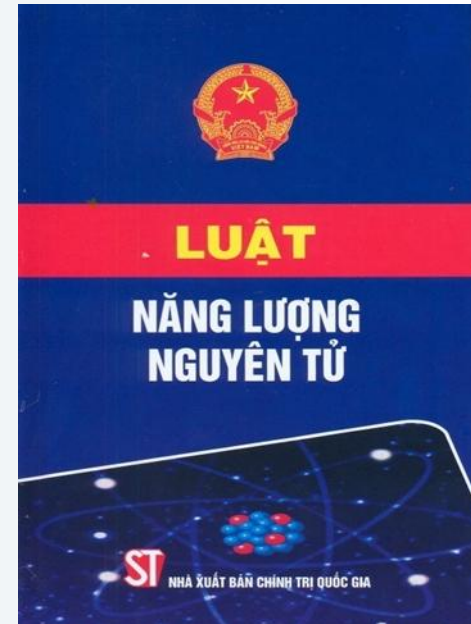


# I. REGULATORY CONTROL IN VIETNAM

## Atomic Energy Law of Vietnam

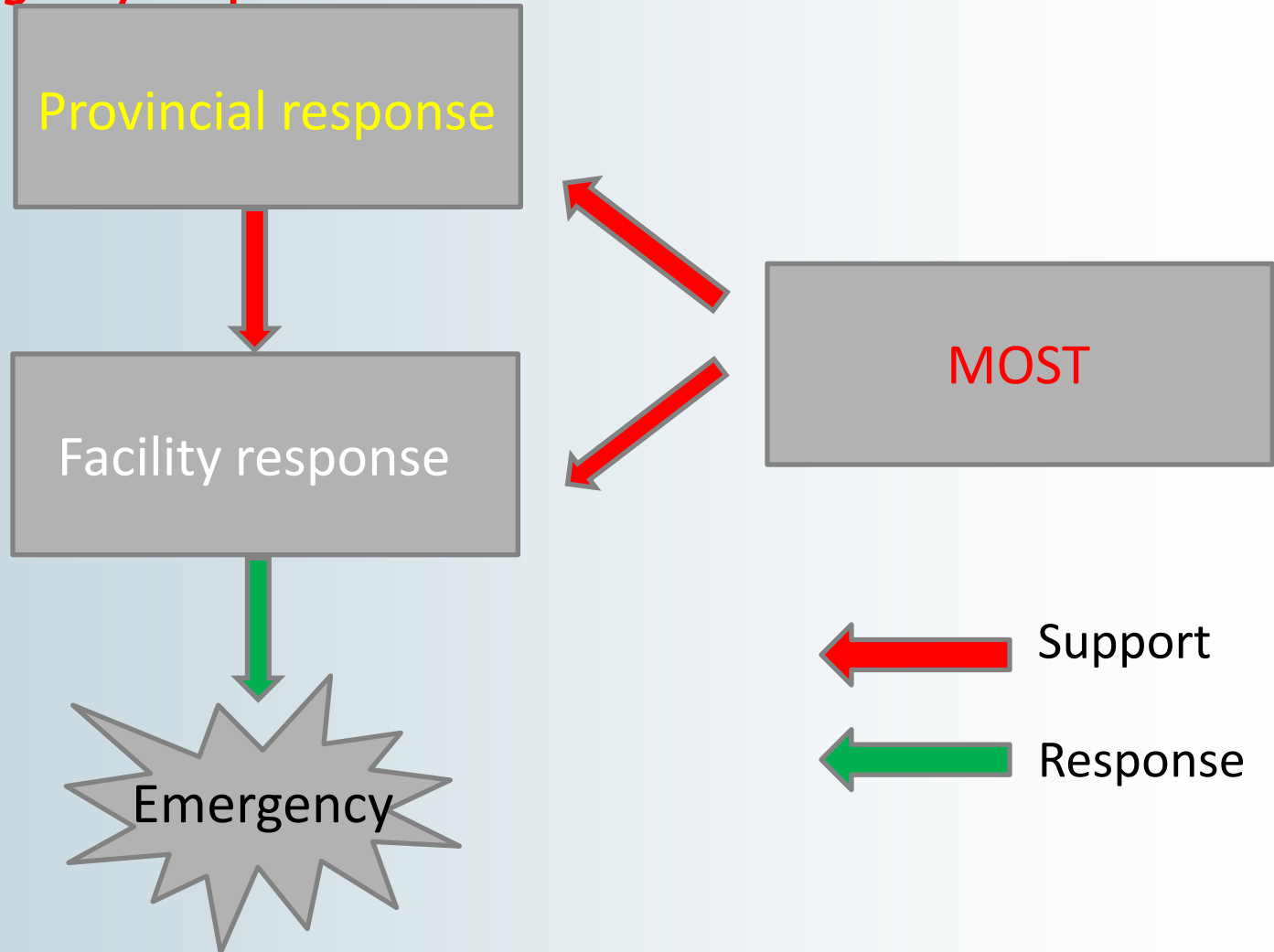
**Article 8.** Duties and authorities of the Agency for Radiation and Nuclear Safety :

- ❑ The agency for radiation and nuclear safety (VARANS) is under the Ministry of Science and Technology (MOST) and has the responsibility to assist the Minister in performing the following duties and authorities:
- 6. To take part in emergency response to radiation and nuclear incidents within its competency;



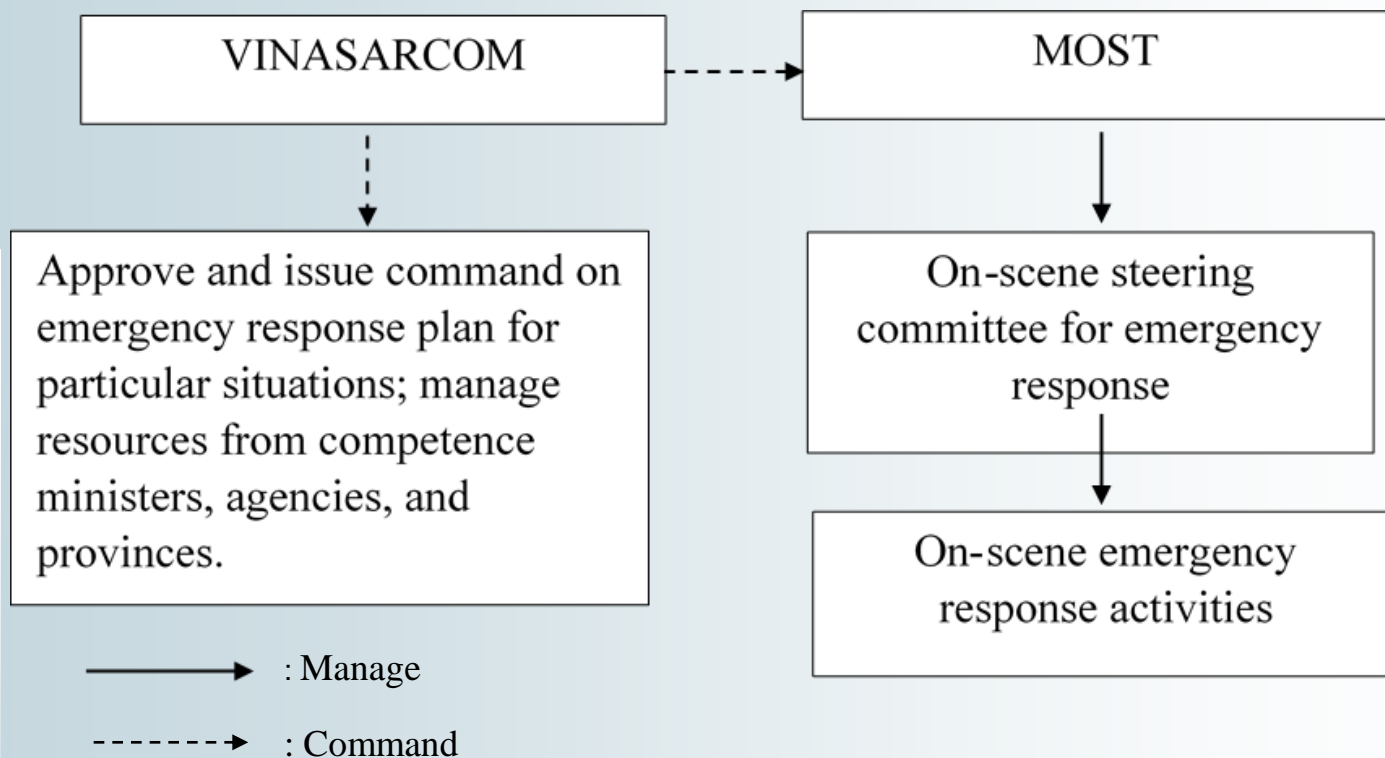
# I. REGULATORY CONTROL IN VIETNAM

## Emergency response – Provincial level



# I. REGULATORY CONTROL IN VIETNAM

## Emergency response – National level



## II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM

### 1. Incidents of loss radioactive sources have not been found

- Cs-137 radioactive source was lost to measure the automatic discharge of clinker at Viet Trung Cement Joint Stock Company, Ha Nam province, in 2003;
- Cs-137 radioactive source was lost at Song Da Cement Joint Stock Company, Hoa Binh province, in 2006;
- Co-60 radioactive source was lost at Pomina Steel Plant, Ba Ria - Vung Tau province, in 2014;
- Cs-137 radioactive source was lost to measure the automatic discharge of clinker at Bac Kan Cement Joint Stock Company, Bac Kan province, in December 2016.

## II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM

### 2. Some incidents of detection of radioactive material out of control and in steel scrap

- In May 2006, the source of Eu-152 was lost (in powder form, activity 14 mCi with the size of 54.8 mg) at the Institute of Rare Radiation Technology. It was sold scrap.
- In September 2017: detected poor uranium material at the scrap purchasing facility in Hung Yen province;
- April, May and December 2018: detected radioactive sources during domestic procurement and scrap import at Vina Kyoei Steel Co., Ltd. (Ba Ria - Vung Tau province);
- April 2018: Detected Ra-226 radioactive source during domestic procurement (using handheld measuring device);
- May 2018: Detected NDT radiography equipment (using RPM port, unidentified domestic or imported origin);
- December 2018: Detected radioactive source Ra-226 (using RPM port, unidentified domestic or imported).
- In April 2019, radioactive contamination was detected at 11/95 containers of metal scrap, and in June 2019, 01 container of contaminated radioactive products was imported into Hai Phong Port.



## II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM

### Incident I: Level gauges



#### Events:

- Be in used: Sept-1999 without licensing from authority.  
=> Loss of regulatory control
- Accident time: Dec-2003, report to local police but no information for VARANS  
=> Loss of physical control
- Inspection time: May- 2004  
=> No accident report

## II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM

### Incident I: Level gauges

#### Response:

- Come to Hospital and collect patients data
  - Cooperate with police search source at scrap metal store
  - Enlarge for searching to adjacent provinces
- ⇒ **No result**

#### Lesson learn:

- Loss of control in declaring and licensing
- Lack of necessary informations for facility
- Lack of information exchange between organization, Police and VARANS

## II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM

### Incident II: Industry Radiography

#### Events:

- Onshore oil-rig at Vung Tau province
- Accident time: 11.30am-0.30pm 28 Dec-2007
- RT team's lost RT source on the rig but they only detected this accident at their own container.
- RT team report to contractor about the incident



## II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM

### Incident II: Industry Radiography

#### Response:

- Evacuate workers out of rig from 1.55pm to 2.15pm
- RT team search and recover source from 3.00pm to 3.40 pm



## II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM

### Incident II: Industry Radiography



#### Lesson learn:

- RT team did not follow the RT procedure.
- Hundreds worker's been stress because of fear of their health.

#### ⇒ Small source big effect

After response, maximum effective dose of one member equal to 34 mSv.

- Roles of regulatory body
- Some news paper provides incorrect informations

## II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM

### Incident III: Lost Eu-152 isotope

#### Events:

- 10 am May 31.2006: MOST & VARANS inspected Institute for Technology of Radioactive and Rare Elements (ITRRE). Facility reported Eu-152 (25 mCi at Oct.1995) had lost.
- 10.30 am May 31.2006, the isotope had found at 628 Bach Dang st. Ha Noi – a scrap metal facility.

#### Cause:

- ITRRE repaired facility at May.2006. ITRRE did not have sufficient control to store radioactive source at this time.
- Srcap metal facility had bought and broken this source.



## II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM

### Incident III: Lost Eu-152 isotope

#### Response:

- VARANS cooperate with ITERR, and VAEI decontaminated the contamination zone from May 31.2006 to June 5.2006.
- People in this facility had been transferred to hospital to monitor their health.
- The maximum effective dose absorption by people in this facility is 5 mSv.



## II. SOME INCIDENTS OF RADIOACTIVE MATERIAL IN VIETNAM

### Incident III: Lost Eu-152 isotope

#### Lesson learn:

#### ITRRE had not:

- Followed the radiation control and safety rules during the facility repaired time.
- Controled stranger come inside radioactive source store zone.
- Reported timely to authority after lossing radioactive source.

**People did not have knowledge to identify the radioactive source.**





### III. LESSON LEARNED AND IMPLEMENTATION SOLUTIONS

Reconsider the above-mentioned loss of radioactive sources, lessons learned after the incidents, as well as making corrective measures to enhance the work of ensuring radiation safety and radioactive source security, the Regulatory Agency in Vietnam has focused on the following issues:

- Enhance inspection, verification to ensure the security of radioactive in Vietnam. When conducting inspections, there must be contents on security of radioactive sources, in which the existence of radioactive sources must be verified. Establish a national database of radioactive sources. Strengthening coordination between relevant ministries, branches, People's Committees of provinces and cities in radioactive sources security.
- Strengthening the capacity of VARANS and local Agency to well perform the function of managing radiation safety and security of radioactive sources, ensuring human resources, infrastructure and equipment for inspection activities and management, focusing on staff training.
- Strengthening propaganda through media, dissemination and guidance on the implementation of legal regulations, training and awareness rising on radiation safety and security of radioactive sources for organizations and individuals in the local area.
- Raising awareness among leaders and employees of the facility about responsibility for ensuring radiation safety and security of radioactive sources, building safety and security culture, focusing on training employees on radiation safety and security of radioactive sources.
- Need to build a national storage facility to meet the requirements of safety and security management of disused radioactive sources.

## IV. CONCLUSIONS

- The state management of radiation safety and security of radiation sources should be further improved. It is necessary to consider and complete the system of legal documents and guidelines to improve the management of radiation courts and security of radioactive sources.
- It is necessary to strengthen measures (administrative and technical) to control and detect radioactive materials at import border gates, at steel production and processing factories as well as at domestic purchasing establishments. Communication and awareness raising (to understand risks and benefits) plays a very important role.
- The risk of radioactive materials appearing in both domestic and imported iron and steel scraps is not small. The consequences of radiation incidents may cause severe impacts on society, economy, human health and the environment.

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**Thank for your attention!**