

The August 4 Beirut Port Explosion: Early CBRN Response: First Hours and Follow Up

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Outline



The Beirut Blast in numbers

CBRN activities shortly after the blast

CBRN activities follow up and results

Lessons learned – The Way Forward

Beirut Port Blast – August 4th 2020 at 18h08



The Explosion

2,750 tones of NaNH_4
stored since 2014
in very bad conditions in warehouse 12
~ **1.1 kilotons TNT**
Mushroom cloud + Brownish cloud color



Consequences

220 deaths
6500 injuries
300,000 people homeless
5 Billion US\$ damage cost
3 Hospitals seriously damaged



Prompt CBRN Activities – August 4th



Rumors, Statements, and 'experts'

Media, Videos, Voice messages

- Tactical 'small' nuclear bomb
- Chemical weapons
- 'Bombing of some kind'
- Massive pollution devastated the city



Prompt CBRN Activities – August 4th



Immediate actions

- 1-Coordination with CBRN First Responders LAF-CD-BFFs-RC
- 2-Radiation EWS
- 3-On Site Radiation/Chemical survey and sampling
- 4-Sampling for Lab Analysis (Water, Soil, Smear, Building Materials,..)





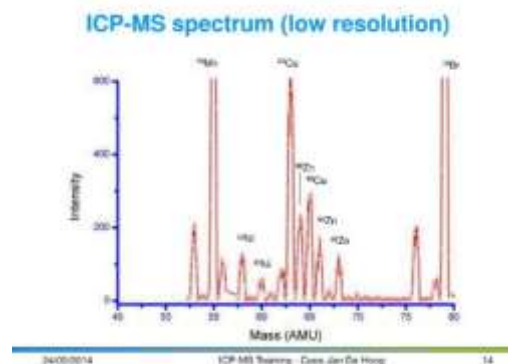
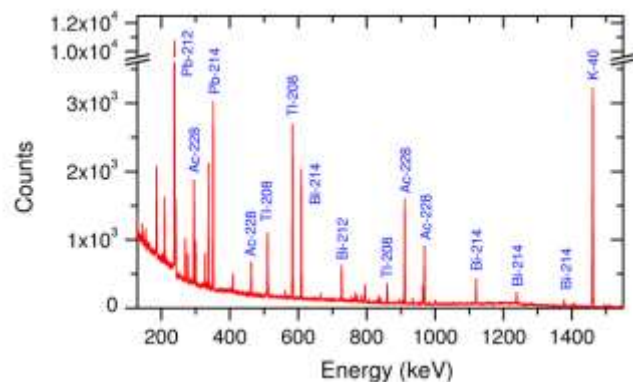
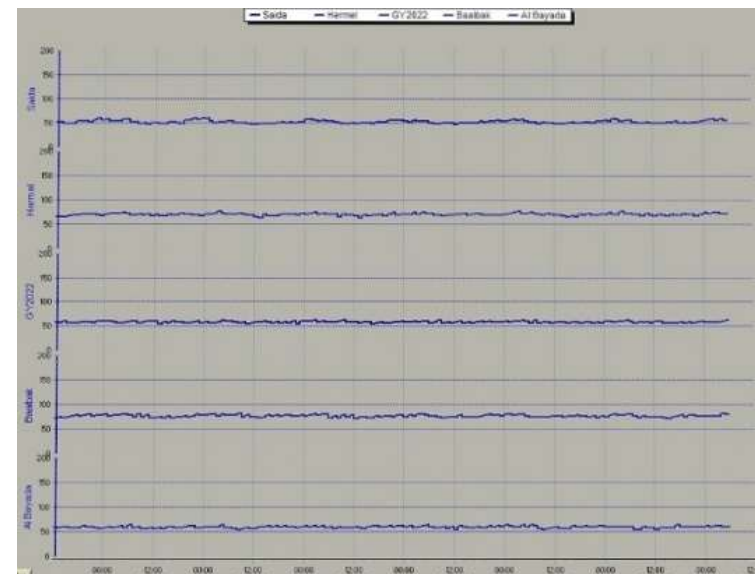
CBRN Activities Follow up

Radiation Early Warning System (26 stations)

- 2 stations in the impacted zone (intact)
- 1 station in Beirut

Radiation laboratory measurements

- Sample (smear, soil, water, building materials)
- Laboratory analysis (Gamma, Alpha, ICP-MS)





- 1 Advanced Construction Technology Services _ACTS_ SAL
- 2 Al sahel hospital
- 3 Almaza
- 4 American University of Beirut Medical Center
- 5 Beirut Arab University BAU
- 6 Bsalm
- 7 Centre de medecine nucleaire
- 8 Ciemenso medical center
- 9 Doctors Center Radiology
- 10 Hindi Medical Laboratories
- 11 Hotel Dieu De France Hospital
- 12 Jesus heart hospital
- 13 LAEC
- 14 Lebanon Hospital
- 15 Makased Hospital
- 16 middle east institute for health
- 17 Modern Laboratories
- 18 Mount lebanon hospital
- 19 Rafic Hariri University Hospital
- 20 Red Cross Spears
- 21 Rizk hospital
- 22 Saint George Hospital University Medical Center
- 23 Saint Joseph Hospital
- 24 Saint Joseph University USJ
- 25 Saint Mark Center Zalka
- 26 South for Construction
- 27 zahraa hospital

Legend	Practice/Equipment
Red	Teletherapy Units (TT), Blood Irradiators (BI), (Accumulated Waste, TT Waste, BI Waste)
Orange	Moisture Gauges, Cross Belt Analyzers, High Dose Rate Ttherapy, Radioisotope Productions units, Corresponding Waste)
Yellow	Level Gauges, Low Dose Rate Brachytherapy Units, Corresponding Waste
Blue	Nuclear Medicine , RiA, Research, Thickness Gauges, Level Alarm Detectors

Legend

-  Hospitals
-  Red Cross
-  Schools

Hazard Significance

-  Very High
-  High
-  Medium
-  Low



CBRN Activities Follow up - II



Radiation Survey - site inspections

Beirut Port, Scrap Yards, Hospitals

Request of Assistance from IAEA (IEC and NS)

Radioactive waste storage (hospitals)

High activity radioactive sources (RC)

3 scrap yards

Survey at Beirut Port

Evaluation of the damage of the RPMs



IAEA Assistance to the Lebanese Republic

AGREEMENT
ON THE
ASSISTANCE ACTION PLAN

Provision of assistance in radiation-related matters following
the explosion in Beirut Port

Date effective: 11 September 2020

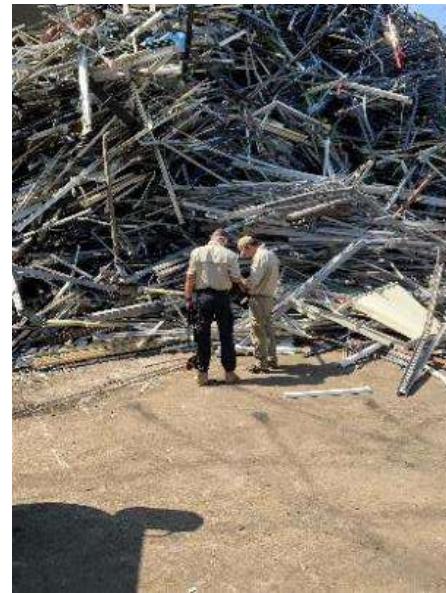
Version No.: 06 Date prepared: 10 September 2020

INTERNATIONAL ATOMIC ENERGY AGENCY
Incident and Emergency Centre

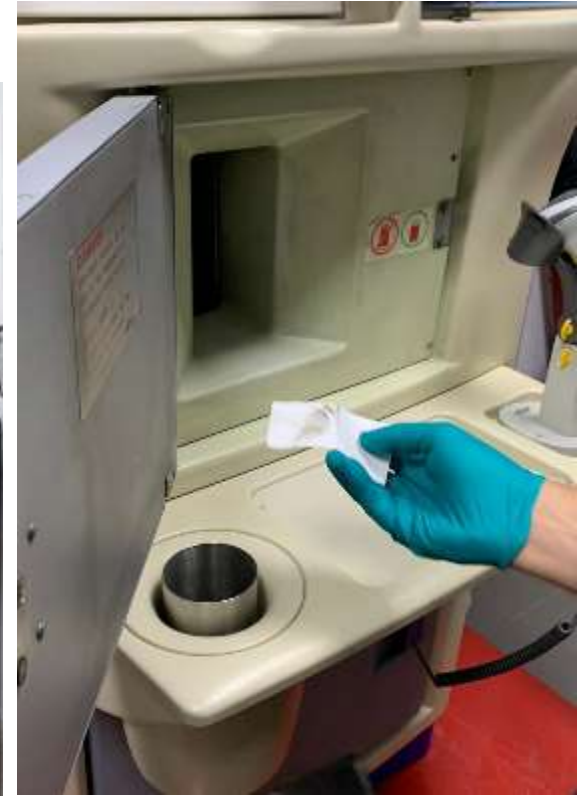
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INTERNATIONAL ASSISTANCE TO LEBANESE REPUBLIC ASSISTANCE ACTION PLAN

This Agreement on the Assistance Action Plan (AAP) is made between the Assisting Parties (Denmark, France and Switzerland), the International Atomic Energy Agency (hereinafter referred to as the IAEA), an international organization established by its Statute, whose address is Vienna International Centre, P.O. Box 100, 1400 Vienna, Austria and the Lebanese Republic (hereinafter referred to as the Requesting State). Hereinafter, the Assisting Party/Parties, the IAEA and the Requesting State are also referred to individually as a

Radiation Survey at 3 Scrapyards



Blood irradiators - HDF and Red Cross



Hotel Dieu de France


Red Cross

NORM contaminated materials at Beirut Port



Findings

INTERNATIONAL ASSISTANCE TO THE LEBANESE REPUBLIC ASSISTANCE MISSION REPORT

 **IAEA**
International Atomic Energy Agency

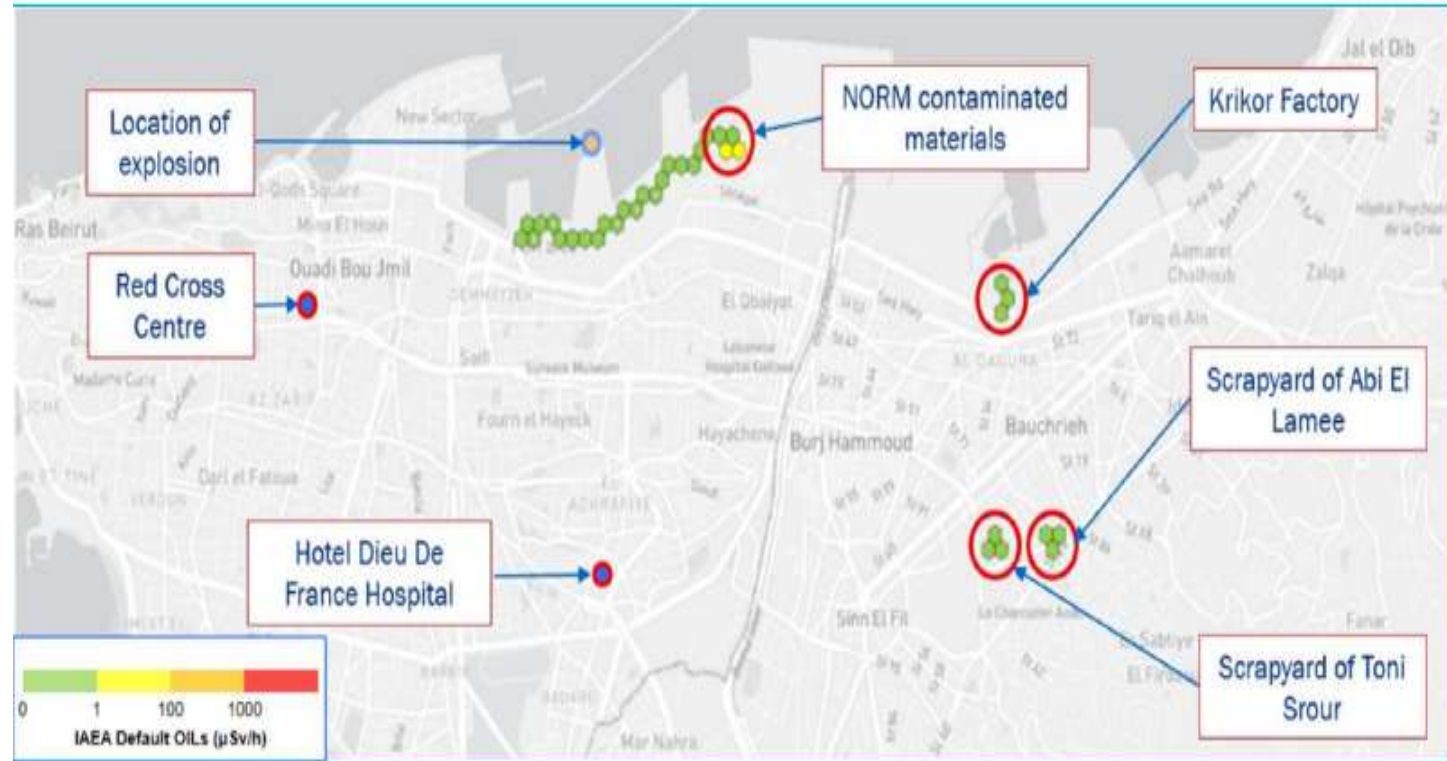
IAEA Assistance to the Lebanese Republic

ASSISTANCE MISSION REPORT

IAEA Assistance Mission to the Lebanese Republic to provide assistance, upon their request, in radiation-related matters following the explosion in Beirut port

Version No: FINAL Date prepared: 28 September 2020

INTERNATIONAL ATOMIC ENERGY AGENCY
Incident and Emergency Centre



Sites visited

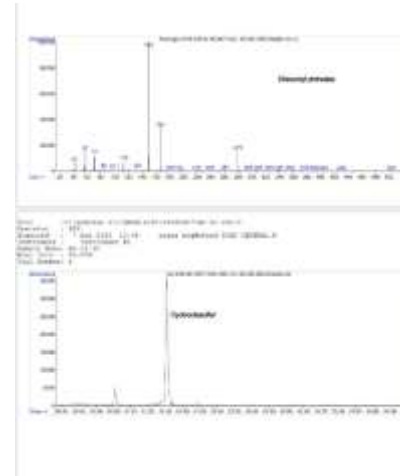
CBRN Activities Follow up - III



Chemical analysis

Warehouse 12 sampling - results

- # Di-tert-butylbenzene
- # Phtalates
- # Oxyurea
- # Toluene
- # Phenols
- # aliphatic hydrocarbons



Asbestos

- # exists



CBRN cooperation with LAF - France/Italy
Beirut port

CBRN cooperation
Outside Beirut port

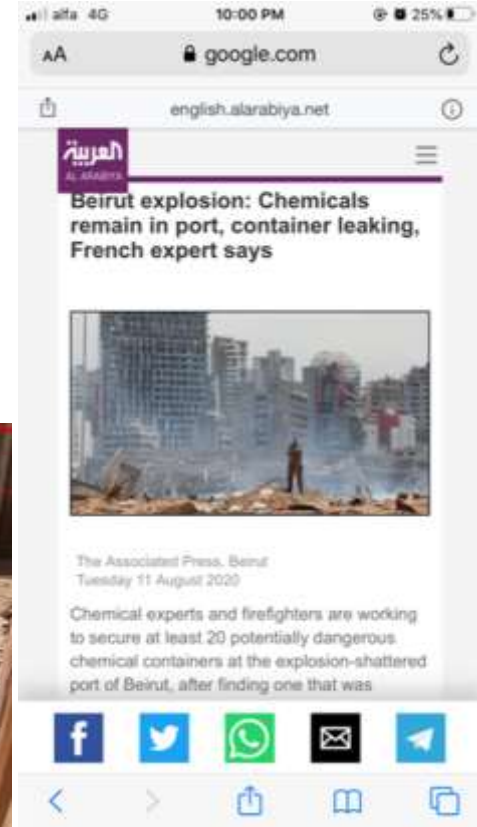


CBRN Activities Follow up – IV

Beirut Port ... Again



Chemicals found by LAF and CD in big quantities in bad conditions at different locations



CBRN Activities Follow up – V

Beirut Port ... Again



Chemicals found by LAF and CD in big quantities in bad conditions at different locations (**Known**)



Unknown

CBRN Activities Follow up – VI

Beirut – Port Chemicals: Destruction and Neutralization



Some Chemicals found at Beirut port are destroyed, neutralized on stored safely and securely (CBRN – LAF)



Lost of trust in the concerned safety systems:
Fear of the population
Chemical storages and Chemical industries issues



The CBRN national commission is solicited by the Prosecutor on weekly basis for evaluating chemical storages and for proposing prompt solutions (safe storage, neutralization and destruction schemes)

19 chemical storages visited to date

Cooperation with concerned Ministries to propose short and medium term strategy

From the Chemical Storages Evaluation visits ...



From the Chemical Storages Evaluation visits ...



Neutralization and destruction...



Role and Impact of the CBRN-CoE Program in the Response to Beirut Port Explosion



- Establishment of the CBRN Commission (inter-agency cooperation and coordination)
- HRD, Capacity Building of CBRN first responders and HazMat teams (LAF/CD/FFs/RC)
- Support in the evaluation of the chemical storages visited
- Starting developing new project on Chemical Safety and Security in the Region (P97)



P97-Enhancing Chemical Safety and Security in the ME

- Comprehensive inventory and control of hazardous chemicals in the country: Chemical hazard – risk based mapping
- Evaluating chemical storages and disposal of chemicals (HRD – Capacity building)
- Revisit the legal and regulatory framework on licensing processes



Conclusions and Perspectives

Port of Beirut Governance is a priority
(role/power/responsibility of Customs-Security Agencies and Port Management Directorate)

The Safety and Security levels related to Hazardous Materials need to be strengthened

State System for Accountancy and Control of Chemical of Security Concerns



Thank You



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Research Institute

