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Use of Toxic Industrial Chemicals as Chemical Weapons - a Threat?

Case Study and investigative challenges - Syria

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Outline

1. OVERVIEW OF CW/TIC INVESTIGATIONS IN SAR AND NEIGHBORING COUNTRIES
2. TIC RELATED THREATS
3. LESSONS LEARNED FROM ONGOING AND RECENT INVESTIGATIONS/DEPLOYMENTS

1. OVERVIEW OF CW/TIC INVESTIGATIONS IN SAR AND NEIGHBORING COUNTRIES - 1

1. Supplement to the CWC for non-ISP – **IAU per request of the SG UN**, Para 27 of Part XI of the VA of the CWC (**MARCH – DEC 2013**)
2. **OPCW - UN Joint Mission** – UN SC & OPCW EC Decisions, UN SC resolution 2118, 2013 & EC-M-33/DEC.1 from 27.09.13 (**SEP 2013 – SEP 2014, OPCW Mission** (UNOPS supported) **ONGOING**)
3. **Declaration Assessment Team** – In acc. of UN SC resolution 2118, 2013 & TS OPCW DG Decision (**APRIL 2014 - ONGOING**)
4. **Facts Finding Mission 1 & 2/3** – TS OPCW DG Decisions & Art. IX of the CWC (**APRIL-DEC 2014, then MARCH 2015 - ONGOING**)
5. **Request for assistance** (TAV) – Art. X of the CWC (**SEP 2015 – ONGOING**)
6. **Joint Investigative Mechanism** (UN); with OPCW Support (FFM 4) – UN SC Resolution 2235 from AUG 2015 (**started SEP 2015**)



1. OVERVIEW OF CW/TIC INVESTIGATIONS IN SAR AND NEIGHBORING COUNTRIES – 2

IAU UNSGM Syria

- **22.03.13** UN requests OPCW to assist in the conduct of a fact-finding mission and appointed Prof. Åke Sellström as head of Mission under the UNSGM (on **26.03.13**)
- **End of April** Hand-over of the event-analysis to the UNSG
- **13.08.13** Syria agreed mission modalities
- **15.08.13** Deployment of Investigation team
- **21.08.13** CW attack in Ghouta, Damascus, investigation re-focused
- **22 - 25.08.13** CW attack in the Damascus against Syrian soldiers
- **30.08.13** Inspection team visit Military hospital





1. OVERVIEW OF CW/TIC INVESTIGATIONS IN SAR AND NEIGHBORING COUNTRIES – 3

IAU UNSGM Syria

- **31.08.13** Investigation team departs from Syria
- **02.09.13** Samples send to OPCW designated Labs
- **14.09.13** Syria joins the CWC (full membership 14/10/2014)
- **mid. Sep.** Lab. results confirmed the use of CW

- **13.09.13** Preliminary IAU report issued
- **25 – 29.09.13** UNSGM Investigation team returned to Damascus to follow up investigation of pending allegation
- **12.12.13** FINAL IAU REPORT ISSUED (CW has been used!)

1. OVERVIEW OF CW/TIC INVESTIGATIONS IN SAR AND NEIGHBORING COUNTRIES – 4

OPCW-UN Joint Mission Syria

- **14.09.13** Syria joins the CWC (full membership 14/10/2014)
- **19.09.13** Submission of disclosure of CW program by the SAR to UNSG
- **29.09.14** Initial deployment of OPCW-UN Joint Mission to Syria to perform initial visits (disclosed CW, agents and precursors inventoried and secured, disabling production capacities) – initial deadline - end of October 2013



1. OVERVIEW OF CW/TIC INVESTIGATIONS IN SAR AND NEIGHBORING COUNTRIES – 5

OPCW-UN Joint Mission Syria

- **01.11.13** OPCW-UN Joint mission permanent presence in Syria with additional mandate aims (declared CW, agents and precursors destroyed and verified, CW production facilities destroyed, etc.) – initial deadline - end of June 2014
- OPCW-UN Joint mission completed on OCT 2014, **OPCW Mission (UNOPS Supported) started** (CWPF destruction)
- Mission had over 100 deployments in combined CBRN & non-permissive environment
- JOINT Mission exceptionality challenges - L & L pending completion of the mission

1. OVERVIEW OF CW/TIC INVESTIGATIONS IN SAR AND NEIGHBORING COUNTRIES – 6 OTHER INVESTIGATIONS - DAT

Declaration Assessment Team (DAT) – Started APRIL 2014 - ONGOING

- ✓ Established by DG TS OPCW to clarify discrepancies and anomalies in Syria's initial declaration of its chemical weapons programme.
- ✓ Continues to work on outstanding issues regarding the Syrian initial declaration, as encouraged by the OPCW Executive Council at its Seventy-Sixth Session (paragraph 6.17 of EC-76/6, dated 11 July 2014) and by the UN SC.





1. OVERVIEW OF CW/TIC INVESTIGATIONS IN SAR AND NEIGHBORING COUNTRIES – 7 OTHER INVESTIGATIONS

- **Fact Finding Missions (FFM) – started APRIL 2014 - ONGOING**
- ✓ **FFM 1** – started and completed in 2014, (Report #3 submitted DEC 2014)
 - Followed use of toxic chemicals (Chlorine reportedly) – confirmed usage of Cl as a weapon¹
- ✓ **FFM 2/3** – started MARCH/APRIL 2015 - ongoing, (submitted interim reports SEP-OCT 2015)
 - Followed allegations of SAR (soldiers as casualties from the use of TC)² - not determined usage of a chemical as a weapon.
 - Followed additional two allegations³ (usage of Cl-containing TC in March - May 2015 period, and usage of H in August 2015) - confirmed usage of TC/H as a weapon
- **Joint Investigative mechanism (JIM/UN) with OPCW Support (FFM 4) – started SEP 2015 (expected to be operational DEC 2015) – under the UN SC Resolution 2235 – Atributting responsibility for usage of toxic chemicals**



2. TIC RELATED THREATS – 1

BASICS

- **Toxic Industrial Chemicals - Basics**
- ✓ Toxic industrial chemicals (TICs) are created and used by commercial or medical industries that can seriously harm human health if released into the environment.
- ✓ TICs release could occur from a leak or spill from a large industrial container, a fire, a natural disaster or a terrorist attack.
- ✓ Injury caused by a TIC depends on the chemical and the amount, the length and type of exposure.
- ✓ Toxic industrial chemicals can be in the gas, liquid, or solid state. They can be chemical hazards (e.g., carcinogens, reproductive hazards, corrosives, or agents that affect the lungs or blood) or physical hazards (e.g., flammable, combustible, explosive, or reactive). The following table lists the most common TICs listed by their hazard index.



2. TIC RELATED THREATS – 2

MAIN REPRESENTATIVES

HIGH HAZARD	MEDIUM HAZARD	LOW HAZARD
Ammonia	Acetone cyanohydrin	Arsenic trichloride
Chlorine	Carbonyl sulfide	Bromine
Fluorine	Chloroacetone	Chlorine trifluoride
Formaldehyde	Ethylene dibromide	Cyanogen chloride
Hydrogen bromide	Methyl bromide	Dimethyl sulfate
Hydrogen cyanide	Methyl isocyanate	Ethyl chloroformate
Nitric acid	Phosphorus oxychloride	Iron pentacarbonyl
Phosgene	Sulfuryl chloride	Isopropyl isocyanate
Sulfur dioxide	Trifluoroacetyl chloride	Nitric oxide
...



2. TIC RELATED THREATS – 3

PRE-WAR SAR ECONOMY

- **Pre-war SAR classified (World Bank) as „lower middle income country“**
- **Economy based on (in order of priority/income):**
 - **Petrochemical industry**
 - ✓ Oil and gas
 - ✓ toxic chemical raw material, products and waste (including flammables, benzene, cyclohexane, toluene, sulphur oxide, nitrogen oxide, carbon monoxide, organic compounds, fugitive hydrocarbons...)
 - **Agricultural industry**
 - **Tourism**
 - **Basic Chem.Processing Industry - Phosphates mines based (ISIS threatened)**
 - **Infrastructure industry (water supply)**
 - **Heavy metal industry**
 - **Polymer industry**



2. TIC RELATED THREATS – 4

PRODUCTS AND CHEMICALS IN PETROCHEMICAL COMPANIES

Company	Product	Chemical used*
1	Polyester	Acetic acid, acetone, acetylene, antimony trioxide, Dowtherm (biphenyl), chloroform, dichlorobenzene, diethyl ether, ethylene glycol (EG), ethyl methyl ketone, fuel oil, phenol, phosphoric acid, pyridine, sulfuric acid, terephthalic acid, toluene
2	Phenolic resin	N/A
3	Nylon tyre cord	Acetone, acetylacetone, acetylene, aluminum chloride, barium chloride, cadmium chloride, calcium hydroxide, carbon tetrachloride, 1,3-dihydroxybenzene, ethyl alcohol, ethyl chloride, formaldehyde, formic acid, hydrochloride, hydrogen gas, hydrogen peroxide, methyl alcohol, nitrogen gas, oxalic acid, oxygen liquid, phosphoric acid, potassium dichromate, potassium hydroxide, potassium permanganate, silver nitrate, sodium carbonate, sodium hydroxide, sodium hypochlorite, sodium nitrite, sulfuric acid, toluene
4	Melamine formaldehyde compound	No data
5	Methyl methacrylate (MMA), butyl methacrylate (BMA)	Acetone, butyl alcohol, butyl methacrylate, cupferron, diethanolamine (DEA), hydroquinone, hydroquinone monomethyl ether, isobutyl alcohol, isobutylene, isobutyl methacrylate, kerosene, liquefied petroleum gas (LPG), methacrolein, methacrylic acid (MAA), methyl alcohol, methyl methacrylate, nalco 356, nalco 7,208, potassium nitrate, sodium bisulfate, sodium hydroxide, sodium hypochlorite, sodium nitrite, sulfuric acid, tertiary butyl alcohol (TBA), tetra-n-butyl titanate, toluene, triethanolamine (TEA)
6	High density polyethylene (HDPE)	N/A
7	Ethylene, propylene	No data
8	Ethylene, olefins, propylene	No data
9	Benzene, cyclohexane, toluene	No data
10	Polystyrene (PS)	Ethylbenzene, styrene monomer



2. TIC RELATED THREATS – 5 THREAT

- **HAZARDS (TICs) PRESENT**
- **ACCESSIBLE**
- **INTENTION & MOTIVATION**
- **ETHYCS**
- **(UN)DESIRABLE EFFECTS**
- **RECOMENDATIONS**



3. LESSONS LEARNED FROM ONGOING AND RECENT INVESTIGATIONS/DEPLOYMENTS - 1

PREPAREDNESS FOR THE RESPONSE

1. Personnel (background, experience, core/home teams...)
2. Equipment (statement/interview/scene recording, detection, sampling & analysis, protection, medical, decontamination, security, comms, office...)
3. Training (readiness for CI/IAU, investigative techniques, negotiation skills, table-top execs, major exercises...)
4. Planning and coordination (SOPs/WIs on IAU/CI, UN-OPCW Relationship Agreement modalities, arrangements with member states, inter-agency cooperation...)
5. Latest deployments & lessons learned



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3. LESSONS LEARNED FROM ONGOING AND RECENT INVESTIGATIONS/DEPLOYMENTS - 2

PREPAREDNESS FOR THE RESPONSE



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3. LESSONS LEARNED FROM ONGOING AND RECENT INVESTIGATIONS/DEPLOYMENTS - 3

UN-SGM TEAM

TEAM (HoM, UNODA, UNDSS, WHO, OPCW) - FORMING & STORMING issues

UN/WHO vs. OPCW culture:

- Mandates,
- Rights, obligations, JDs,
- Deployment conditions:
logistics/benefits/security,
- Common language/vocabulary
- Understanding other organization...
- Team hierarchy
- Team investigation methodologies
- Epidemiology - Methodology
- Team confidentiality regimes, incl.
chain of custody
- Reporting



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3. LESSONS LEARNED FROM ONGOING AND RECENT INVESTIGATIONS/DEPLOYMENTS - 7

UN-SGM TEAM

L&L **Safety and Security**

- Need of trained drivers,
- Need of additional back-up vehicles,
- Establish the right contacts (in disputed territories) before movements,
- Procedures for short notice evacuation (sudden end of suspension of hostilities),
- Compromising safety for security in controlled manner?



3. LESSONS LEARNED FROM ONGOING AND RECENT INVESTIGATIONS/DEPLOYMENTS - 8

UN-SGM TEAM

Initial L&L **Procedures & Equipment**

- Promptness in detection & initial analysis was of the essence
- Selecting the right sampling point was crucial (time delay, multiple impact area from conventional munition, cross contamination and crowd issues)
- Team footprint and portability of the equipment
- Crowd controls
- Near real-time media recording



3. LESSONS LEARNED FROM ONGOING AND RECENT INVESTIGATIONS/DEPLOYMENTS - 9

UN-SGM TEAM

Initial L&L **Various**

- It wasn't possible to do multiple site visits at once according to the circumstances, team size, number of vehicles and the security situation.
- We were overwhelmed with the many forms we created. These forms are for field use and should be less and simple as possible.
- Flexibility, creativity, and most important team spirit makes the difference between failure or success of a mission.



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3. LESSONS LEARNED FROM ONGOING AND RECENT INVESTIGATIONS/DEPLOYMENTS - 10

UN-OPCW JOINT MISSION



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في بداية العملية * مصدر عسكري: لوقتنا



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3. LESSONS LEARNED FROM ONGOING AND RECENT INVESTIGATIONS/DEPLOYMENTS

- 1. Personnel – selection, fitness, qualified experts rooster, short notice deployments, admin arrangements packages...**
- 2. Equipment – multiple detectors, TIC user programmable, portable analytical equipment, working in combined IPE&PPE, communication & tracking**
- 3. Training – data analysis, investigative interview, non-permissive environment, negotiation, crowd control... - upgrades of existing training**
- 4. Planning and coordination – UN-other int.agencies awareness and modalities, local authorities, L&L continuous...**

Key references

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5. UN SGM IAU Report, DEC 2013
6. OPCW TS Notes – FFM Reports, 2014 and 2015
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8. J. Occup. Health, 2011, 53, 384-392, Safety and Health in Petrochem Ind. ..., U. Langkulsen et al.,
9. The Secretary-General's Mechanism for Investigation of Alleged Use of Chemical, Bacteriological (biological) or Toxin Weapons, A lessons-learned exercise for the United Nations Mission in the Syrian Arab Republic
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10. Various news and blog analysis and reports
11. ...



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