NATO
Science for Peace and Security (SPS) Programme

Mélange Conversion of Rocket Fuel Oxidizers in Azerbaijan and Uzbekistan

Workshop on CBRN Defence – 22-24 October 2013 – Brussels

Emerging Security Challenges Division

NATO

NATO SUPPORT AGENCY (NSPA), October 2013
Overview

- NATO Support Agency (NSPA)
- General Services Programme (LG)
- Environmental Initiative
- CBRN Projects
- Mélanj Conversion
NSPA Organization

Organization

- North Atlantic Council
- NSPO Agency Supervisory Board
- NSPA

Chartered in 2012

NSPA successor of:
- NATO Maintenance and Supply Agency (NAMSA)
- Central Europe Pipeline Management Agency (CEPMA)
- NATO Airlift Management Agency (NAMA)

Main Locations

- Fully customer funded
- no profit – no loss
- 28 NATO Nations
- 1,200 staff members
NSPA Vision

Smart Support Vision...

- NATO’s premier integrated logistics and services provider team.
NSPA Mission

- Provide responsive, effective and cost-efficient logistics, operational and systems support and services...
  - to the Allies, NATO Military Authorities and Partner Nations (*),
  - individually and collectively,
  - in time of peace, crisis and war;
  - and where required to maximize the ability and flexibility of their armed forces, contingents, and other relevant organizations, within the guidance provided by the NAC, to execute their core missions.

Reference: NSPO Charter June 2012

(*) Partner Nations: PfP Nations, Mediterranean Dialogue and Istanbul Cooperation Initiatives Nations, Troop Contributing Nations to an operation
LG General Services Programme

Mission
- Manage acquisition and follow-on support projects for NATO/SHAPE and for Nations
- Manage customer funded Support Partnerships and individual requirements

Objective
- Provide timely, cost-effective and high quality logistics support services to the NATO and Partner Nations and to NATO/SHAPE
LG General Services Programme is ISO 14001 certified since September 2011
NSPA Statement of Work: contractor’s obligations

- The contractor shall be in compliance with environmentally relevant:
  - EC Directives and regulations
  - NATO STANAGs
  - National, regional and local environmental laws and regulations
  - Multilateral international conventions

- Health and Safety
  - OHSAS18001

- Contractors shall have an implemented Environmental Management System (EMS) in compliance with ISO14001 or equivalent
Examples of Activity Areas

- Demilitarisation, Dismantling and Disposal (D3) in Nations and support to TCNs as part of ISAF redeployment activities
  - NATO Smart Defence Project
  - Disposal of excess military equipment
  - Feasibility study of plasma arc incinerator
- Mélange Conversion of Rocket Fuel Oxidizers
- Disposal of pesticides and dangerous chemicals
- Disposal of radioactive waste
- Environmental survey and land remediation
- Initiatives on sustainable camps
- Providing renewable energy to remote areas
- Environmental oversight on Ammunition and mine disposal
Examples of CBRN Projects

- **Mobile NBC Laboratories**
  - Acquisition of five mobile NBC Biological field laboratories
  - Built on a 20-foot ISO shelter, equipped with all instruments & equipment necessary to operate in operational theatres

- **NRF Assets and Support Collective Protection (COLPRO) Capabilities**
  - Against BC agents sufficient to allow essential staffs and support elements to operate within a contaminated environment for 72 hours
Examples of CBRN Projects

- CBRN Laboratory Project
  - CBRN Research and Analysis Laboratory is a turn-key facility project
- Disposal of NBC Uniforms
- Acquisition of Hydrogen Peroxide Vapour Bio-Decontamination Equipment
Mélanj Conversion of Rocket Fuel Oxidizers in Azerbaijan and Uzbekistan

- **Objective:**
  - To develop and produce a pilot Mélanj treatment plant to neutralize stocks of Mélanj in rocket propellant

- **Funded:**
  - By The NATO Science for Peace and Security Committee
  - In-Kind Contributions from Azerbaijan and Uzbekistan

- **Mélanj:**
  - Is a highly toxic substance
  - Used by the Soviet Forces as a liquid propellant oxidiser
  - Consists of nitric acid, in the form of Inhibited Red Fuming Nitric Acid (IRFNA)
  - Highly reactive liquid stored in steel or aluminium tanks
Mélanj Conversion of Rocket Fuel Oxidizers in Azerbaijan and Uzbekistan
Uzbekistan

- Started in November 2008 and closed in October 2010

- Successfully converted 1,023 tonnes of Mélanj in the military base of Oqtosh in Samarkand region

- A unique and innovative mobile plant for safe and environmentally responsible melanj neutralization which is ready to be used for similar projects
Mélanj Neutralisation Plant Layout
The neutralization steps are as follows:

- 1.5 part of water from water tank is introduced to the reaction tank
- 1 part of Mélanj from process tank is fed continuously with calcium hydroxide slurry from lime tank to keep the pH between 7.5 and 9.7
- Once addition of Mélanj is completed, pH of final product is adjusted manually
- End-product, Calcium Nitrate, is finally sent to storage tank
End product

$\text{Ca}^{2+}$ improves soil acidity and soil structure

$\text{NO}_3^-$ is a plant nitrogen nutrient

$2 \text{HNO}_3 + \text{Ca(OH)}_2 \rightarrow \text{Ca(NO}_3\text{)}_2 + 2 \text{H}_2\text{O}$
- Possible contamination of the sludge with heavy metals such as with Arsenic (As) and Chromium (Cr)

- The result of acid attack of the storage tanks by melanj
Supplemented in Uzbekistan that manages ultimate waste (tank sludge) in the tanks
Achievements

Azerbaijan
1,272 tonnes

Uzbekistan
1,023 tonnes
Conclusion

- A unique capability was developed for the conversion of Mélanj
- A fruitful International Cooperation
  - NATO funded
  - Host Nations (Azerbaijan and Uzbekistan) in kind contribution

- NSPA has expertise and experience in the neutralisation and disposal of dangerous chemical substances