Thank you, Chair.

The PFM-1 series of Anti-Personnel mine (APM) differs from the vast majority of APM in that it has a liquid explosive filling (VS6-D). Consequently, it presents particular risks, hazards and problems during long-term storage and destruction. The liquid explosive is corrosive and the products (emissions) of detonation or burning may be highly toxic and poses therefore significant environmental hazards.

In order to avoid pollution of the environment by toxic substances and dioxins it is critical to establish a destruction process that can treat and clean the off-gasses from burning or full detonation.

To meet the emission standards set by national authorities, the current rotary kiln furnace needs upgrading. The Rotary kiln is operated by the Pavlograd Chemical Plant, a partly privatised ammunition destruction facility and explosive factory. The rotary kiln had originally been used to destroy large quantities of small calibre ammunition (smaller than and including 12.7 mm), but was later used to destroy approximately 154,440 PFM-1 mines. The project was stopped due to unacceptable levels of emissions from off-gases.

In order to overcome these problems and continue the PFM-1 destruction project, the National Space Agency of Ukraine approached the Government of Norway through its embassy in Kiev. They sought financial support to upgrade the armoured rotary kiln furnace to national and international emission standards.

In Ukraine one has chosen burning in an armoured rotary furnace as the fastest, safest and most cost effective method.

To upgrade the rotary kiln, several modifications will have to be made. Off-gases from the kiln will be ventilated through an expansion chamber out to a wet scrubber unit, which will deal with the majority of heavy metals and the CO^2 emissions.

An after-burner unit capable of exposing off-gasses from the furnace to more than $1000^{o}C$ for a period of no less than two seconds is needed. This installation will ensure that dioxins from the destruction process, which in fact are free radicals, will be rendered inert after the heat treatment. The after-burner unit is being manufactured in Ukraine. Further to the after-burner installation, the rotary kiln will also need a wet scrubbing unit, cyclones and dry filters installed. The dry filters have been ordered from a manufacturing company in the United Kingdom, which specialises in filter technologies.

The filters are a set of rings filled with hydrated calcium (lime), which will bind the nitrogen oxide (NO_X), hydrogen chloride (HCI), hydrogen fluoride, heavy metals, sulphur dioxide, total organic carbon, carbon monoxide (CO), and dust. The CO^2 will be trapped in the wet filters of the furnace system. The charged hydrated calcium will be used to enrich the bulk explosives made from the ICBM SS-24 rocket propellant, in order to make it more potent and effective for the civilian market.

The PFM-1 destruction project can therefore be described as a '*swords to ploughshares*' process, wherein components from military ordnance are made into products that can be used by the civilian community in industrial use. The total cost of the rotary kiln upgrade is estimated to be US$ 1.3 million.

From what was reported by the representatives of the National Space Agency of Ukraine, and from

what was observed during the visit to the Pavlograd Chemical Plant, it seems viable that the project, encompassing a combination of manual disassembly and destruction by burning, if carried out as it has been described, will be:

- ✓ Safe
- ✓ Affordable
- ✓ Easily upgradable to national emission standards
- ✓ Simple to maintain and operate
- ✓ Built using readily-available materials
- ✓ Capable of sustaining high rates of output

Furthermore, there are several direct benefits in selecting a national model for stockpile destruction; in particular when one are facing stockpiles of such magnitude as in Ukraine and with the expertise and skills as the Ukrainian clearly possesses. These advantages includes:

- ✓ Greater "ownership", participation and regional cooperation in implementation
- ✓ Savings on transportation, storage and security costs
- ✓ Lower inclusive costs
- ✓ Local investment, employment and capacity-building
- ✓ Community benefits through the re-use of by-products and materials

Thank you!