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NATO Information

Info

**CISAM CENTRO INTERFORZE STUDI APPLICAZIONI  
MILITARI ISTITUTO AUTORIZZATO****VERBALE DI INTERVENTO  
KFOR - Brigata Multinazionale Ovest****INDEX**

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Radioprotection evaluations relative to the use of depleted Uranium in Kosovo

**1. Introduction**

## 1.1 Foreword

Following the war in Kosovo and the consequent environmental inspections performed by expert technicians from CISAM (November

1 April and August 2000 a CISAM team was formally tasked to continue environmental inspections at Italfor Kosovo already underway by disposition n. COI/4/2570 of 1 November 2000. Members of the CISAM team were Rear Admiral (Naval Arms Francesco Andreuccetti CISAM Director Dr. Ittorio Sabbatini Director of the Nuclear Office certified expert of 3rd level and Physicist Director Dr. Armando Benedetti certified expert of 3rd level. The environment radiological tests were performed within the period of 21 to 24 November 2000 with the cooperation of the NBC Company led by Cpt. Daniele Pisani.

## 1.2 Inspection goals

to inspect areas affected by the utilization of DU ammunition already subjected to environmental tests particularly around the city of Dakovica.

to comply with requests of technical information submitted by members of the Italian press particularly representatives of the national radio and T (RAI present in the area of Italfor Kosovo).

to draft transportation documents on the environment samples provided by members of the Multinational Brigade to be analysed in the CISAM laboratory.

to draft transportation documents on samples drawn by UNP (United Nations Environmental Protection) providing transportation of the same to Italy for direct consignment to ANPA (National Agency for the Protection of the Environment).

to brief the Ministry of Defense on the program of protective actions and environmental checks performed by CISAM in reference to the use of DU ammunition.

If during the inspection of the Dakovica area the situation required it the following actions would have been undertaken in compliance with the protection norms in force:

identification and classification of radioactive materials.

fencing of areas presenting ionizing radiation risks.

verification of protective devices and instrumentation.

radioprotection and environmental evaluation

indication of eventual necessary actions to be undertaken

## 1.3 Directions to personnel

During the various phases of the operation the Italian military personnel has been informed on

incumbent specific risks

preventive protection measures to be adopted

□ □ontrolled □re□□

The areas listed below are those near Dakovica subjected to radiological checks and radioprotection tests.

a north of the city close to the dam on lake Radonicko eero.

b ex Barracks on the way to the Moribas Pass by the bridge on the River Beladrin.

In order to monitor the unfolding of the radiological situation in the above mentioned areas radiometric measurements have been taken and drawing of environmental samples biological indicators in particular has taken place. In the same areas the following items have been identified collected and conditioned:

1 shell and 1 fragment of a DU projectile weighing about 50 grams. Inspection of the B area was carried out in the presence of Mr. Paolo Di Iannantonio reporter for the Italian National Radio and Television (RAI) also witness of the activity was TC Scalas public information officer for the Multinational Brigade est.

#### □ Measurement procedure □

##### 3.1 Measurement instrumentation utilized on site.

The following portable monitors have been utilized to assess the radiological situation in the tested areas.

automess/Kerma rateo in air with extention probe  
ROTM DA 3 with beta gamma M 10 probe

##### 3.2 Formalities for the drawing of environmental samples

Samples have been drawn from the areas subected to radioprotection tests for the lab measurements to be carried ot in the ealth Physics and Radioprotection departments of the CISAM Nuclear Office.

Two kinds of samples have been drawn: soil samples and biological indicator samples. The soils samples have been drawn according to the standard procedures indicated in the NATO proceduced SIRA document. Samples from the mentioned formal inspection and those gathered by the NBC Company during the UNP campaign have been transferred to CISAM for lab measurements. Moreover transportation documents for the UNP samples and delivery of the same to ANPA Italy have been provided.

##### 3.3 Measurements

The rateo dose density measurements performed on the shell found near the dam on the lake of Dakovica have shown values up to a maximum of 2 microy/h and up to 5.5 microy/h in correspondence of the contaminated hole left in the ground. The verified dose intensities have decreased to a level where values could not be distinguished from those present in the environment at a distance of 30 cm from the residues. On the contrary measurements performed on the projectile section of a depleted Uranium shell found near the Dakovica barracks have shown a Kerma rateo in air of about 200 microy/h with a circular irradiation field measurable up to 2.5 m from the projectile side. After the fragment has been screened and secured the measurements taken have shown dose intensity values up to maximum of 1 microy/h.

On site instrumental environmental measurements performed on the soil have confirmed the values of superficial contamination and of Kerma rateo measured in previous inspections. Lab measurements are contemplated for the samples delivered to CISAM. These measurements being of considerably higher sensitivity will allow for an evaluation of the DU concentration and for the identification of

eventual additional radioisotopes.

#### **□ □ radiologic evaluation □**

The following pertinent radiological observations are reported for radioprotection purpose.

According to legislative decree 230/5 in force depleted Uranium is radioactive material belonging to low toxicity (4th group). Thus the quantity that would determine the compulsive application of this protective norm is 5 MBq where the level of concentration 1Bq/g existing in the concerned material were to exceed simultaneously. The total DU radioactivity in a 300 gram projectile is approximately 4 MBq therefore the level in one projectile falls below the limits for the application of the mentioned decree 230/5.

It should be remembered that by the same decree the annual limit of intake is 40 Bq for the type (highly insoluble oxides generated by the interaction of DU with the environment).

The presence of DU generates protection problems illustrated as results of precedent inspections which are summarized as follows:

irradiation from DU shells and/or their parts in the area of their permanence.

DU incorporation due to careless handling.

Measurements performed on site during the present inspection confirm that where DU has been utilized external exposure risks of considerable entity exist in case of extended permanence close to the shells along with a risk of incorporation when operations in the affected areas are carried out ignoring the established protective measures.

#### **□ □ precaution measures □**

The precaution measures adopted as result of previous inspections in order to keep to a minimum risks from ionizing radiations caused by DU are to be deemed still valid and are epitomized by the following important ones:

a permanence of personnel in the areas affected by DU ammunition to be reduced to the strictly essential.

b personnel operating in these areas to be escorted by NBC Company personnel.

c DU projectiles and shells found during the inspections to be collected according to established norms and stored in a designated depot.

#### **□ □ Briefing to the Minister of Defense □**

On 23 November 2000 during the presence of the CISAM team a visit by the Minister of Defense on. Mattarella took place at Italfor Kosovo in Pec. Following the briefing by en. Torelli Cdr of the Multinational Brigade east and by en. Cabiggioso KFOR Commander on the operations performed by the Italian military in Kosovo Dr. Sabbatini illustrated the CISAM activity as outlined in the paper "Radioprotection evaluations relative to the use of depleted

Uranium in Kosovo".

Copy of this document is reported in appendix.

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The areas in Kosovo assigned to the Italian troops that have been subjected to radiological checks have been evaluated by CISAM with regards to the effects caused by the use of depleted Uranium occurred in the spring of 1. CISAM paid particular attention to the evaluation of irradiation and incorporation risks caused by the presence of DU and its dispersion. The implementation of preventive measures in force for sometime causes the doses eventually absorbed by the personnel operating in the mentioned areas to be comparable in intensity to those existing in the natural environment. Additional samples now being examined in the CISAM labs will make the monitoring of the evolving present situation possible.

The UNP samples have been handed over to the ANPA personnel at the Fiumicino Rome airport.

