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Info

CISAM CENTRO INTERFORZE STUDI APPLICAZIONI MILITARI ISTITUTO AUTORIZZATO

VERBALE DI INTERVENTO
SFOR - Brigata Multinazionale
Area Contingente Italiano in Bosnia

INDEX

1. Introduction

1.1 Foreword
Following war events in Bosnia, CISAM's specialized personnel was formally tasked, by disposition n. COI/J4L/28801 of 21 December 2000, to deploy preliminarily to Bosnia, joining the Italian Forces operating in that area in order to identify the radioprotection situation as

related to the military personnel operating in the theatre since December 15 and to the troups that are now committed in the same area. The preliminary inspection in Bosnia has been carried out by Rear Admiral Francesco Andreuccetti, who has acted in cooperation with Manager Dr. ittorio Sabbatini, certified epert, registered with n.5 on the list of the eperts holding 3rd level certification. Radiological checks have been carried out on 23 December 2000 at Sarajevo and in the area surrounding the city with the cooperation of the Italian military personnel led by LTC Buschettari and with the participation of NBC specialized personnel.

1.2 Aims of inspection
The mission, whose objective was to give a preliminary evaluation of the radiological conditions conseuential to the utilization of D ammunition by the NATO forces in the Sarajevo area, pursues the following goals:

a to evaluate eventuel residues of the above mentioned amunition in the areas occupied by Italian troups since 15 and in those which are now being used.
b to provide SMD and COI with immediate input on the inspected sites, on the basis of the first measurements performed.
c to draw environmental samples from the mentioned areas which are to be submitted to lab tests in order to determine the concentration of D necessary to evaluate the doses affecting personnel.
d indicate protective measures to be adopted.
e prepare for a successive, more complete radioprotection investigative campaign.

All radiological checks have been carried out in compliance with the norms in force.

1.3 Directions to personnel
During the inspections, when the situation called for it, the personnel has been duly informed on the identified, specific risks and instructed on the protective measures to be adopted.

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nowledge by the NATO forces of 10.800 shells euipped with 300 gr D piercing projectiles, but lack of detailed information coordinates and number of projectiles actually utilized on the areas and targets affected, and on the weather conditions at the time of the eplosions, left us no alternative but that of acting on the basis of input provided by the Italian Military Command represented by en. Sanpaolo and Col. Beraldo. e have, thus, proceeded with a preliminary inspection of the sited around Sarajevo, where the Italian military presence has been and still is concrete, and where the signs of ruin and machine gunning of various types and intensity are uite evident. nvironmental samples have been drawn from these areas where deemed appropriate.

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Areas subjected to radiological evaluation and relative geographic

denominations are shown in the following chart:
Chart n. 1
Areas subjected to preliminary radiological evaluation
Areas subjected to preliminary radiological evaluation City: Remarks:
"Tito Barracks", e ugoslavian Army Academy, Battle roup S.
Sarajevo City damaged, tottering, shut down buil dings, absence of hit tanks.
"Tito Barracks", e ugoslavian Army Academy, area assigned to Task Force. Sarajevo City damaged, tottering, shut down buildings, absence of hit tanks.
8th Regiments S and Italian Field ospital from Dec 5 to June 7.
ogosca Area located between tottering buildings, shut down premises, ab sence of hit tanks.
elicopter Suadron S and e seat of ugoslavian Air Force
Academy. Railovac Controlled by erman and French units, absence of hit tanks.
Brigade Command S from 12.5 to 15.3.2000 and e Sarajevo
Pediatric ospital. Sarajevo, etra Damaged, tottering, shut down buildings, absence of hit tanks.
Carabinieri Installation close to Sara jevo Airport Sarajevo, Butmir
New prefab buildings, reclamed land, absence of hit tanks.

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4.1 Measurement instrumentation utilized on site
The following portable monitors have been utilized to assess the cardiological situation in the areassubjected to inspection and listed on chart n.1.

Air erma rateo monitor, ictoreen 20 SI with .M. beta gamma 18 4 probe
ROTM DA 3 with beta gamma M 10
Surface contaminometer, Contamat FT 111M.

4.2 Formalities for the drawing of environmental samples.
Soil samples have been drawn from the areas subjected to radioprotection tests for lab measurements to be carried out in CISAM's ealth Physics and Radioprotection departments of the CISAM Nuclear Office.
The mentioned soil samples have been drawn in significan areas, according to the procedures set by NATO SIRA Standard Identification of Radiological Agents.
hile on site radiometric checks and sample drawings were being carried ou, a search was conducted in the damaged buildings and in the areas close to them for ammunition residues showing radioactivity, particularly shells and projectiles from 30 mm guns along with other residues. Such search has given negative results.

4.3 Measurements
The rateo dose density measurements erma rateo in air taken from numerous traces left on buildings and roads by projectiles of different types, have shown levels undistinguishable from those found in the natural environment not superior to 0.5 microy/h.

Further, on site measurements, taken from the ground surface and from the buildings, have failed to show levels of superficial contamination and dose intensity distinguishable from those present in the natural environment. The drawn samples are epected to undergo lab measurements which, being characterized by higher sensitivity, will allow an evaluation of eventual traces of D and of other radiosotopes.

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Depleted ranium, which by law decree n. 230/5 is classified as lo toicity, radioactive material, is made of .7 uranium 238 238, 03 235 and traces of 234.
ranium 238 is the founder of the natural uranium family, while ranium 235 is the founder of the Actinium ranium natural family. The two radioisotopes, whose balance is characterized by alpha, beta and gamma emission descendants, have halving times of respectively 4.5 billion and 0.7 billion years. Such isotopes, which are generally known to eist in low concentration, are naturally present in the earth waters and soils.
The use of depleted uranium in perforating projectiles causes the following two problems of radioprotection nature:
a risk from eternal irradiation in proimity of D shells or consistent parts of them.
b risk of D incorporation from inhalation or swallowing

As for the first possibility, we must remember that the measurements taken during the osovo campaigns from an integral projectile have shown, upon contact, a dose intensity of about 200 microy/h which has gradually decreased as the distance from it increased, until becoming undistinguishable from the density level present in the natural environment.
For what concerns the second possibility, the eperience acuired during the osovo environmental campaigns in areas hit by numerous armor piercing projectiles, has shown that the highest risk comes from swallowing, associated with the careless and etended handling of D shells.
As far as Bosnia and osovo, incorporation by direct inhalation of D fumes produced by the projectile target impact must be ecluded, owing to the time lapsed between the end of the war activities September 15 and the arrival of the Italian force in the theatre 20.12.5.
Finally, the risk from inhalation associated with re suspension, which may be determined by lifting dust from the contaminated soil, must be deemed negligible and technically justifiable, given the physical characteristics of uranium, and on the basis of the results obtained from the specific measurements taken.
The on site measurements taken in the checked areas and those previously taken in areas hit by D shells in osovo, reveal that the eternal irradiation risk is negligible, while it leads us to conclude that the eposure level affecting the personnel operating in the mentioned areas is below the safety limits epected for the general public.

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Precaution and conservative measures recommended for implementation in order to reduce the risks from ionizing radiations generated by the presence of D are listed below:

a reuest from the competent authorities a detailed list of the sites in Bosnia where D shells have been utilized, along with coordinates and number of eploded shells.

b demand that NBC personnel conduct preventive inspections of the areas where D ammunitions are admittedly used, while reducing the permanence of other personnel in the concerned areas to the bare minimum necessary

c personnel operating in these areas must be euiped with anti dust masks and disposable gloves, and must be escorted by NBC personnel carrying revelation instruments

d under the supervision of NBC personnel and complying with given instructions, all identified, eploded ammunition, shells and other material must be collected and stored in two distinct metal containers euipped with lids, one for D projectiles and fragments, the other for contaminated materials. These containers must be stocked in warehouses located in guarded, assigned areas, while no one must be allowed to get closer to them than 5 meters.

e Personnel must be warned about the areas affected by D ammunition and informed about the characteristics of the same, while solicited to contact NBC personnel immediately upon identification of such ammunition.

f arn the company and platoon Commanders of the importance to ensure that their personnel, acting contrary to the given instructions, have not picked and kept suspicious objects that have not been checked by NBC personnel.

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The instruments utilized by the CISAM personnel in the areas subjected to radiological checks have revealed absence of D shelling traces and verified a subseuent absence of risk associated with the presence of D.

In order to obtain more precise evaluations and more effective protective measures for the operating personnel and the population at large, while at the same time providing a complete picture of the radioprotection situation in Bosnia, more environmental checks must be carried out in the areas where Italian personnel has been and is now engaged. Thanks to the specialistic activities conducted in osovo and to the eperience gained from them, we are now in a position to evaluate, among the possible risks that may affect and may have affected the people involved, that of irradiation from integral projectiles and that of internal contamination resulting from swallowing and caused by the careless handling of eploded D shells. The same eperience leads us to classify as negligible the risks from irradiatin caused by shells on the ground and risks of internal contamination caused by inhalation of re suspension dust.

The implementation of the protective measures suggested, allows the reduction to negligible levels of the risks for the personnel operating in Bosnia.


Home
Index