

## A CRITICAL LOOK AT UNEP REPORTS CONCERNING DEPLETED URANIUM ON YUGOSLAV TERRITORY

by

Marko M. NINKOVIĆ<sup>1</sup> and Ružica GLIŠIĆ<sup>2</sup>

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A critical look at UNEP Reports concerning depleted uranium on Yugoslav territory is presented in this paper. The subjects of the analysis are summarized as remarks highlighting the following three points: (a) those concerning the use of terms *significant* and *insignificant* doses (risks), (b) those concerning the use of 1 mSv as a border between these two risk types, and (c) those concerning the composition of expert UNEP Teams investigating the depleted uranium issue.

To start with, the assumption that it should be possible to express the risks (consequences) caused by the intake of depleted uranium (by ingestion/ inhalation and/ or external exposure) to  $\beta$  and  $\gamma$  rays from depleted uranium as *insignificant* or *significant* for comparison purposes is, in our view, in collision with the linear non threshold hypothesis, still valid in the radiation protection field.

Secondly, the limit of 1 mSv per year as a reference dose level between *insignificant* and *significant* risks (consequences) is not acceptable in the case of military depleted uranium contamination. This is because the reference level of 1 mSv, according to the ICRP Recommendation, can be used in the optimization of radiation protection as an additional annual dose limit for members of the public solely for useful practices. Military usage of depleted uranium cannot be classified as being useful for both sides – the culprit and the victim alike.

Our third objection concerns the composition of expert UNEP teams for Kosovo (Desk Assessment Group, Scientific Reviewer Group, and UNEP Scientific Mission) as not being representative enough, bearing in mind all UN member-countries. This last objection may be rather difficult to understand for anyone viewing it from the perspective other than that of the victims.

*Key words: depleted uranium, critic of the UNEP reports, insignificant and significant risk, LNT-hypothesis, radiation safety limits*

### INTRODUCTION

As is already well known, during the bombing of the Yugoslav territory in the spring of 1999, the North Atlantic Treaty Organization (NATO) used, among other weapons, those with depleted uranium (DU) [1]. NATO officers, probably expecting nega-

tive reactions not only from Yugoslavia, but from all around the world, initiated, under the auspices of the United Nations Environment Program (UNEP), an assessment of the potential health and environmental impact of DU used in the conflict, as early as May of 1999. Very soon, two international expert groups, the Desk Assessment Group and the Scientific Reviewer Group, were established for the purpose. The Desk Assessment Group was composed of: *Jan Olof Snihs*, chairman, The Swedish Radiation Protection Institute (SSI), Stockholm, Sweden; *Gustav Akerblom*, SSI, Stockholm, Sweden; *Peter Stegnar*, International Atomic Energy Agency (IAEA), Vienna, Austria; *Rolaf van Leeuwen*, World Health Organization (WHO), De Bilt, The Netherlands; *Michelle Allsopp*, Greenpeace, Exter, UK; *Carol Robinson*, IAEA, Vienna, Austria; and *Jenny Pronczuk de Garbino*, WHO, Geneva, Switzerland. The members of the Scientific Reviewer Group were: *Burton Benett*, United Nations

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Authors' addresses:

<sup>1</sup> VINČA Institute of Nuclear Sciences

P. O. Box 522, 11001 Belgrade, Serbia and Montenegro

<sup>2</sup> Advanced Medical School, University of Belgrade

254, Cara Dušana str.,

11000 Belgrade, Serbia and Montenegro

E-mail address of corresponding author:

markon@vin.bg.ac.yu (M. Ninković)

Scientific Committee on the Effects of Atomic Radiation (UNSCEAR), Vienna, Austria; *Keith Baverstock*, WHO, Geneva, Switzerland; *Branko Bošnjaković*, United Nation Economic Commission for Europe (UN/ECE), Geneva, Switzerland; *Claudia Canivari*, European Commission, Directorate-General XI – Environment Safety and Civil Protection, Brussels, Belgium; *Simon Carroll*, Greenpeace, Exeter, United Kingdom; *Dirk Densow*, Bundeswehr Medical Office, Nuclear, Biological and Chemical Medical Defense, Bonn, Germany; *Nel Kelly*, European Commission Directorate-General XII – Science, Research and Development, Brussels, Belgium; *Gordon Linsley*, IAEA, Vienna, Austria; and *Gabby Voigt*, GSF – Institute für Stralenschutz, Neuherberg, Germany. As can be seen, the groups included prominent experts in the field of radiation protection from various national and international organizations. However, it is also evident that there were no experts from non-allied or countries that had not openly, directly or indirectly, supported NATO's punitive action against Yugoslavia.

## FIRST UNEP REPORT

Operational activities of the UNEP groups started in the summer of 1999. Their objectives and scope were to assess the potential impact on human health and the environment arising from the use of DU in the conflict (not officially confirmed by NATO at the time). In August 1999, the Desk Assessment Group conducted a field mission during which it visited areas in Kosovo, around the towns of Prištine, Klina, and Peć, trying to find evidence or indications of the presence of DU. Investigations were carried out in close cooperation with UN and NATO troops which after the conflict occupied Kosovo. No traces of DU were found.

It is interesting to note that the Desk Assessment Group did not visit areas in Yugoslavia outside Kosovo where the evidence for the use of DU had already been found and the sites located [2].

In October of 1999, the Depleted Uranium Desk Assessment Group together with the Scientific Reviewer Group, under the auspices of the UNEP and UNCHS Balkans Task Force (BTF), prepared a Report [3] and submitted it directly to Mr. Kofi Annan, UN Secretary-General. Due to lack of data from the field, only general information on approximately 70 pages were provided: where uranium can be found in nature; the origin and properties of DU; characteristics and behavior of DU rounds upon impact on hard and soft targets; how rounds are fired from aircraft and how target coordinates and the number of rounds fired are reg-

istered automatically; expected levels of contamination from DU and its spread through the environment; pathways of internal contamination of humans at the moment when the target is struck and later; chemical and radiological toxicity: expected maximal effective doses, both for military personnel and civilians, from external and internal exposure under specific circumstances, *etc.* Then, conclusions and recommendations of urgent measures to be taken in order to reduce harmful effects on people and the environment were given. Finally, the Groups concluded that further investigation concerning the DU issue would not be meaningful without the confirmation from NATO that DU had indeed been used and information on the amount and detailed site coordinates provided.

On October 14, 1999, upon the receipt of the UNEP report, Mr. Kofi Annan, the UN Secretary General, wrote a letter to Lord George Robertson, NATO Secretary General, requesting information on the use of DU in the conflict [1]. The reply of the NATO Secretary-General arrived about four months later, on February 7, 2000 [1]. The letter confirmed the use of DU in about 100 NATO missions over Kosovo and of approximately 31,000 DU rounds having been fired during the conflict. The operations, as emphasized, were focused on the area west of the Peć-Djakovica-Prizren highway, around Klina and the area to the north of the line Suva Reka -Uroševac, but on some other areas as well. A general map of Kosovo, in A5 format, with roughly marked areas, was enclosed. Other targeted sites on Yugoslav territory, outside Kosovo, were not mentioned.

The information provided by NATO was reviewed by the scientists, members of the UNEP/BTO Desk Assessment Group, at a meeting held on March 20, 2000 [4]. It was found insufficient for the implementation of recommended countermeasures against harmful effects of DU used in Kosovo, as now officially confirmed. Additional information was requested, particularly that concerning the coordinates of the targeted sites. A reply sent by NATO to the UN Secretary-General arrived as late as July 2000 [4]. In this letter, NATO made available a detailed map of sites where DU had been used and a table indicating coordinates of 112 separate strikes by DU ammunition and the corresponding number of rounds fired. The conditions were finally set for new investigations and eventual remedial actions.

In our view, an *incomprehensible delay on the part* of NATO officials in providing key data in their possession, crucial for solving the problem caused by the use of DU they themselves approved, has to be pointed out. Such an attitude betrays the basic principle regarding measures to be taken in case of accidents with radioactive and toxic materials. To our mind, the difference be-

tween bombing by DU rounds and an accidental event is that, as opposed to a truly accidental event, bombing is a *planned* military operation.

## SECOND UNEP REPORT

Additional information provided by NATO was reviewed at a meeting in Geneva in September 2000 [5]. The meeting, organized by UNEP, was attended by representatives of numerous international institutions concerned with the DU issue in Yugoslavia. To our regret, no representatives from Yugoslavia were invited. Besides UNEP representatives and UNEP DU Assessment Groups members, representatives of NATO, IAEA, United Nations High Commission for Refugees (UNHCR), United Nations Interim Administration Mission in Kosovo (UNMIK), the UN Medical Service in Geneva and the UN Department for Disarmament Affairs, were also present. According to information coming from NATO, as a result of serious discussions, a *UNEP Field Mission to Kosovo* was organized with the task to conduct a field investigation of sites in Kosovo struck by DU ordnance. Members of the UNEP Mission were: *Pekka Haavisto*, UNEP, Chairman, *Jan Olof Snihs*, SSI, Scientific leader, *Gustav Akerblom*, SSI, Technical leader, and further 11 experts, representatives of well reputed laboratories from Italy, Switzerland, United Kingdom, USA, and the IAEA.

Field studies were carried out in cooperation with NATO, Kosovo Force (KFOR) and UNMIK. The team measured levels of radiation and contamination and collected samples of soil, water, biota, *etc.* Thus obtained samples were then sent for independent analysis to five eminent laboratories whose representatives also happened to be members of the Mission. On the bases of the results obtained, the Mission prepared a report presented in March 2001 [6]. The report gives an assessment of possible environmental contamination and consequential risks to people and recommends remedial actions, indicating their necessity and possible modalities.

The intention of the authors of this paper was not to analyze all of the conclusions and recommendations given in this rather exhaustive report of over 200 pages (including graphics and tables), *but to present some critical comments in accordance with the current knowledge pertaining to the field of radiation protection, on assumptions used for the assessment of potentially harmful effects that can be expected from DU rounds.*

## BASIC ASSUMPTIONS OF THE UNEP MISSION FOR THE ASSESSMENT OF THE DEGREE OF CONTAMINATION BY DU ROUNDS

In the section of the Report entitled Risk Assessment, dealing with the radiological risks (consequences) from the use of DU rounds, several assumptions were made, two of them opposed to the basic, currently widely accepted radiation protection principles.

The first assumption is that a given risk (consequence) can be expressed as *insignificant* or *significant*.

The second one that a dose limit value of 1 mSv for additional exposure of a member of the public can be used as a limit between defined risk levels.

These assumptions result from the following basic premises of the Mission: "One possible way of judging the consequences of events or circumstances where exposure to DU may have occurred is to compare findings, measurements or assessments with *natural levels* (which is acceptable), and given *safety limits or standards* (which, in our opinion, is simply not acceptable)".

## COMMENTS ON THE BASIC ASSUMPTIONS OF THE MISSION

The first assumption, that risks can be expressed as *insignificant* or *significant*, contradicts the *Linear Non Threshold Hypothesis (LNT-hypothesis)* which is the basis of currently accepted radiation protection concepts.

This is confirmed by the following facts. The International Commission on Radiological Protection (ICRP), in its Publication 26 issued in 1977 [7], adopted the LNT-hypothesis as a starting point for the development of the basic limits and standards recommended for implementation in radiation protection. Very soon, these recommendations were accepted by international organizations such as: IAEA, WHO, the International Labor Organization (ILO) and others, and later on by national organizations all around the world which incorporated them into their current practices utilizing radiation sources and fields. The essence of the LNT-hypothesis is that there is no threshold for the occurrence of stochastic harmful effects from exposure to radiation. The only possible conclusion to be drawn from this is that any unnecessary additional exposure to radiation, no matter how low, must be avoided, and that any unavoidable exposure, even in useful practices, must be reduced to the lowest optimal level, in accordance with the *As Low As Reasonably Achievable principle (ALARA-principle)*. Such an approach was confirmed by ICRP and the re-

quests made even stricter in its 1990 Recommendation [8]. Following ICRP, other mentioned international organizations dealing with occupational radiation protection and protection of the members of the public from exposure to radiation acted in the same way [9].

The second assumption, concerning the use of the 1 mSv dose as a dose limit between *insignificant* and *significant* risks (consequences), if scientifically founded, which is not the case, as we believe to have proved, is also unacceptable.

The truth is that there is a dose limit of 1 mSv, used as a limit for *additional annual exposure* of the members of the public, but only in *useful practices*, as explicitly given in paragraphs 123, 124, 125, 189, and 192 of the ICRP Publication 60 [8]. *The use of DU-ammunition* by NATO over Yugoslavia, *i. e.*, Kosovo, certainly *does not belong to the category of useful application of radiation*, especially from the point of view of those targeted which, we suppose, must have been clear to the mission team as well.

The use of 1 mSv as a dose limit can be criticized from the following standpoint, too. Namely, this limit refers to the additional annual exposure of the members of the public to all radiation sources used in practice. When additional exposure to a single radiation source is considered, ICRP recommends an approximately three times lower dose limit of 0.3 mSv. For prolonged radiation exposure, the recommended dose limit is even lower, *i. e.*, 0.1 mSv. It means that these limits, as well as the limit for occupational exposure, represent the limit of the allowed level of exposure determined by applying the ALARA-principle. According to the ICRP recommendations, the use of the ALARA-principle for limits below 0.1 mSv is justified only to the acceptable limit of 0.01 mSv [10]. In this manner, one comes to the lowest, or so called "*de minimis*" level, which justifies the investment of means in radiation protection measures which are to reduce the exposure of individuals to any single radiation source of planned useful practice. Therefore, *according to the authors, only the dose limit of 0.01 mSv could have been used as a reference in assessing the relative degree of risks for members of the public from the use of DU-ammunition on the territory of Yugoslavia.*

UNEP mission experts were probably very well aware of the fact that in the ICRP dose limit system there is this considerably lower dose limit of 0.01 mSv, one which can be applied to any exposure to radiation, and therefore to additional radiation exposure to depleted uranium, too. Also, they could have eventually used the corresponding new, somewhat higher value of 0.03 mSv, accepted as a *trivial annual exposure dose limit*, according to the latest concepts of radiology protection [11].

Neglecting the facts given, the UNEP mission decided to use 1 mSv as a reference level which, ac-

ording to the latest radiation protection concepts, is unacceptable in this case. The choice can be "justified" by "pragmatic reasons" solely. *Useful* for the *culprit*, but certainly not for the *victim*.

## CONCLUSION

Facts undoubtedly show that the use of a reference value of 1 mSv for the assessment of the relative degree of risk arising from exposure to depleted uranium in Yugoslavia is not based on latest radiation protection concepts. Further more, it could be said that this is *a typical example of dose limit misusage* in conditions of additional exposure of the members of the public to radiation. As pointed out, *solely a limit a hundred times lower, the so-called "de minimis" limit value of 0.01 mSv, should have been used for the purpose.*

According to the authors, *the deliberate, uncontrolled spreading of depleted uranium in an environment, as in military conflicts, cannot be justified at all* [12]. Because both depleted and natural uranium are hazardous substances: toxic as arsenic, lead or mercury [13] and radioactive, too. *In this respect, UNEP reports cannot change anything, no matter how much their authors strive to prove that the expected harmful effects be small or less probable, they are by no means not negligible from the standpoint of contemporary radiation protection concepts.* The only proper way to deal with the matter of the bombing of Yugoslavia with depleted uranium would have been *for NATO to take countermeasures proscribed for nuclear accidents, i. e. urgent measures to reduce possible harmful effects on humans and the environment.* Unfortunately, these urgent countermeasures, particularly in Kosovo, for some incomprehensible reasons, did not take place.

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**Марко М. НИНКОВИЋ, Ружица ГЛИШИЋ**

### **КРИТИЧКИ ОСВРТ НА UNEP-ОВЕ ИЗВЕШТАЈЕ ПОВОДОМ УПОТРЕБЕ ОСИРОМАШЕНОГ УРАНИЈУМА НА ТЕРИТОРИЈИ ЈУГОСЛАВИЈЕ**

У овом раду изложени су критички погледи, са становишта савремених концепција заштите од зрачења, на UNEP-ове извештаје поводом употребе осиромашеног уранијума на територији Југославије. Критика се односи на три основне тачке: (а) коришћење израза *занемарљив* и *значајан* ризик (доза); (б) избор дозе од 1 mSv као границе између ова два ризика, и (в) састав УНЕП-ових тимова који су радили на проблему осиромашеног уранијума.

По мишљењу аутора, коришћена претпоставка да се ризик унутрашњег и спољашњег излагања осиромашеном уранијуму може класификовати као *занемарљив* и *значајан*, несагласна је са LNT- хипотезом, још увек важећом у заштити од зрачења.

Коришћење дозе од 1 mSv, као границе на основу које се разликују *занемарљив* и *значајан* ниво ризика, није прихватљиво за случај ратне контаминације осиромашеним уранијумом. То непосредно следи из чињенице да се, према препорукама ICRP, ова вредност границе дозе може користити у процесима оптимизације заштите од зрачења, као границе годишњег додатног излагања зрачењу појединаца из становништва *искључиво* у случајевима *корисне* примене извора зрачења. Међутим, употреба осиромашеног уранијума у ратне сврхе не може се сматрати корисном за обе стране у рату.

Трећа критичка примедба односи се на састав UNEP-ових тимова који су учествовали у испитивању и оцени последица употребе осиромашеног уранијума. Сматра се да UNEP при избору чланова ових тимова није водио рачуна о њиховој репрезентативности посебно, имајући у виду све земље чланице Уједињених нација и њихов однос према конкретној ратној операцији.

*Кључне речи:* осиромашени уранијум, критика UNEP-ових извештаја, занемарљив и значајан ризик, LNT-хипотеза, сигурносне границе зрачења