

# **Joint Communiqué from Scientists On the UN Resolution Concerning Depleted Uranium Weapons**

On November the 1st, the resolution entitled '*Effects of the use of armaments and ammunitions containing depleted uranium*' was passed at the UN First Committee by an overwhelming majority. The resolution was drafted by the Movement of Non-Aligned States and submitted by Indonesia. We the scientists who have been concerned about the harmful effects of depleted uranium (DU) weapons, welcome this resolution.

The resolution was adopted, because the majority of UN member states took 'into consideration the potential harmful effects of the use of armaments and ammunitions containing depleted uranium on human health and the environment' (Preparatory Paragraph: PP 4); 'convinced that as humankind is more aware of the need to take immediate measures to protect the environment, any event that could jeopardize such efforts requires urgent attention to implement the required measures' (PP 3). It was also 'guided by the purposes and principles enshrined in the Charter of the UN and the rules of Humanitarian International Law' (PP 1) and showed the determination 'to carry forward negotiations on arms regulation and disarmament' (PP 2) on the issue of DU weapons.

We are convinced that, and expect that, this resolution will be the first step to place the issue of DU weapons on the disarmament agenda, following the issues of Landmines and Cluster Munitions, and the beginning of a serious discussion about the deleterious nature of DU weapons and a possible ban, among the member nations of the UN.

We really respect and appreciate the effort of the leading countries on behalf of this resolution. We also appreciate the support from all the countries that voted for the resolution. We request and believe that these supportive countries will vote for the resolution again at the Plenary Session in December.

We strongly urge the countries that abstained from voting, to seriously reconsider the international meaning of the resolution stated in the PPs and to vote in its support at the Plenary Session, based on the independent political will of each country.

There is mounting scientific research, including studies reported in the most recently peer -reviewed papers, which clearly indicate 'the potential harmful effects of the use of armaments and ammunitions containing depleted uranium on human health and the environment'. We think that the previous reports from a number of governmental bodies and international organizations have not yet fully reflected and referenced these scientific studies. They mainly focus on the radiological toxicity to the lung and the chemical toxicity to the kidneys. It is not right to vote against the resolution based on those previous reports, without considering these omissions.

The countries which voted against the resolution, should seriously consider such circumstances, take account of the multilateralism and dialogue with many other countries which are concerned about the effect of these weapons and at least come to the table to discuss the issue. Therefore, we urge these countries to change their previous stance and vote to support the resolution at the coming Plenary Session.

We, the scientists who have been working from the viewpoints of specialists in different scientific fields including medicine, chemistry, biology, physics, environmental science and epidemiology, have been deeply concerned about the potentially harmful effects on the environment and human health, which may be caused by the radioactive and chemical toxicity of DU following the use of DU weapons.

DU is 'nuclear waste' produced from the enrichment process and is mostly made up of the alpha emitting isotope Uranium 238 and is depleted in the fissionable isotope Uranium 235, as compared to

concentrated natural uranium (NU). DU is somewhat less radioactive than NU, yet has about 60% of the radioactivity of concentrated NU (NU in nature is thousands of times less concentrated). DU is mostly an alpha emitter, a very damaging type of radioactivity inside the body. DU and NU are identical in terms of the chemical toxicity, which is also a source of potential damage to the body. With regard to DU's radioactivity, it is well known that concentrated DU is one of a number of radioactive materials, which are strictly controlled by laws in most of the countries of the world.

Uranium's high density gives DU shells increased range and penetrative power. This density, combined with uranium's pyrophoric nature, results in a high-energy kinetic weapon that can punch and burn through armour plating. Striking a hard target, DU munitions create extremely high temperatures of more than 3000<sup>o</sup>C. The uranium immediately burns and vaporizes into an aerosol, which is easily diffused in the environment, while the shell is penetrating the target. The uranium particles formed by this heat are unlike forms of naturally formed uranium in terms of their size (10 to 100 times smaller). These extremely small particle sizes are known to be much more toxic and more rapidly absorbed from the lungs than larger (micron-sized) particles.

Aerosolized DU dust can easily spread over the battlefield, and can be re-suspended by the winds especially where the climate is dry, spreading over civilian areas, sometimes even crossing international borders. Therefore, not only the military personnel but also the civilians, including children who are very sensitive to such toxic substances, might inhale the fine DU particles and internalize them in their bodies. It was also recognized that DU weapons were actually used even in highly populated residential areas. The contamination also continues after the cessation of hostilities. DU particles will remain in the environment and retain their radiation for decades and centuries if not longer. Taking these aspects of DU weapons into account, we consider that DU weapons are illegal under binding international humanitarian, human rights and environmental law and is one of the inhumane weapons of 'indiscriminate destruction'.

Uranium is a radioactive element naturally distributed in the environment. However, we repeat that the very fine particles of DU created at the extremely high temperatures that result from the impact of a DU shell on a tank are micron- and nano-sized and can travel in the body once inhaled. They have no analogue in history. In addition, the high temperatures at impact sublime the metals in the tank around the penetrating holes and in the shell casing, adding tiny particles of these metals and their oxides to the aerosol which can be internalized if inhaled, like the uranium, and which are toxic to the body. We have been facing an entirely new type of contamination to humans and the environment through these weapons.

It is true that we do not, as yet, understand the full impact of fine particles of DU oxide on the human body. However, there is a considerable amount of basic scientific evidence from both animal and cellular studies (including studies of human lung cells) that suggest deleterious effects on human health from inhaled DU particles through both radiological action and chemical toxicity. These data clearly indicate that the internalized uranium (both soluble component and insoluble particles) has genotoxic effect (carcinogenic, mutagenic), for it affects directly and/or indirectly the DNA, which codes the genetic information of the cell. It has also been pointed out that the internalized uranium may affect the intracellular organelles and/or enzyme proteins and damage some of the repair mechanisms of the cells. These harmful effects are possibly produced in the various tissues and organs in a body, including potential damage to the immune and nervous systems. If genotoxic effects are produced in the germ line cells, it might lead to trans-generational effects. A teratogenic effect to the fetus was detected in animal studies where rodents were exposed to DU during gestation, as well as exposed prior to mating; also a number of Gulf War veterans were found to have DU in their semen. We should in addition consider the possible synergistic effect of radio-toxicity and chemical-toxicity from DU exposure.

We think it critical to immediately launch a full-dress, long-lasting and independent environmental

monitoring as well as health and medical research on possibly exposed populations, both military and civilian, in the areas where the DU weapons have been used. We should also pay serious attention to the contamination and possible harmful health effects due to the manufacturing of DU weapons; a recent study clearly indicates that the workers of the DU weapons-producing factory as well as residents living nearby were contaminated by DU. However, we should also note that it may take many years, even decades, before we get statistically significant results on affected populations from epidemiological studies.

In the *Rio Declaration on Environment and Development*, which was adapted at the 1992 UN Conference on Environment and Development (Earth Summit) in Rio de Janeiro, they stated: 'In order to protect the environment, the precautionary approach shall be widely applied by States according to their capabilities. Where there are threats of serious or irreversible damage, lack of full scientific certainty shall not be used as a reason for postponing cost-effective measures to prevent environmental degradation; Principle 15.' This 'precautionary principle' has been confirmed repeatedly in the UN. It is also recognized widely in the international community as one of the most important principles concerning the international as well as the domestic policies for environmental and public health protection. It is also a valuable and logical principle for us, scientists, when we take responsibility for our society. The issue of DU weapons should be also discussed seriously based on the 'precautionary principle' among the UN member countries.

Considering the basic scientific evidence we already have, it is not right to continue using DU weapons making the excuse that 'no definitive conclusions had been reached' in the present limited risk assessments of the health and environmental impact of DU. We request all the UN member countries to discuss seriously what concrete measures are needed, including the immediate clearance of contaminated remnants, and the protection of the environment and the public health of contaminated populations following the use of DU weapons. We request the member nations of the UN to refrain from using DU weapons, unless they are proved to be completely safe. The burden of proof is on the users. Furthermore, we hope very much that the international community will go forward to ban DU weapons, one of the inhumane weapons of 'indiscriminate destruction'.

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