**Facts about the Chornobyl** **aftermath**

**by David R. Marples**

The disaster at Chornobyl on April 26, 1986, contaminated an area of about 100,000 square miles. This area encompassed about 20 percent of the territory of Belarus; about 8 percent of Ukraine; and about .5 to 1 percent of the Russian Federation. Altogether the area is approximately the size of the state of Kentucky, or of Scotland and Northern Ireland combined. The most serious radioactive elements to be disseminated by the accident were iodine-131, cesium-137 and strontium-90.

Ten years after the event, Chornobyl remains shrouded in controversy as to its immediate and long-term effects. The initial explosion and graphite fire killed 31 operators, firemen and first-aid workers, and saw several thousand hospitalized. Over the summer of 1986 and in the period 1986-1990 it also caused high casualties among clean-up workers. According to recent statistics from the Ukrainian government, over 5,700 "liquidators" have died - the majority young men in their 20s. A figure of 125,000 deaths issued by Ukraine's Ministry of Health appears to include all subsequent deaths, natural or otherwise, of those living in the contaminated zone of Ukraine.

According to specialists from the World Health Organization, the only discernible health impact of the high levels of radiation in the affected territories has been the dramatic rise in thyroid gland cancer among children. The comment appears unwarranted in light of regional research. In Belarus, for example, a study of 1994 noted that congenital defects in the areas with a cesium content of the soil of 1-5 curies per square kilometer have doubled since 1986, while in areas with over 15 curies, the rise has been more than eightfold.

Among liquidators, and especially among evacuees, studies have demonstrated a discernible and alarming rise in morbidity since Chornobyl when compared to the general level among the population. This applies particularly to circulatory and digestive diseases, and to respiratory problems. Less certain is the concept referred to as "Chornobyl AIDS," the rise of which may reflect more attention to medical problems, better access to health care, or psychological fears and tension among the population living in contaminated zones. Increases in the incidence of children's diabetes and anemia are evident, and again appear much higher in irradiated zones. The connection between these problems and the rise in radiation content of the soil have yet to be determined.

To date, the rates of leukemia and lymphoma - though they have risen since the accident - remain within the European average, though in the upper 75th percentile. One difficulty here is the unreliability or sheer lack of reporting in the 1970s. The induction period for leukemia is four to 15 years, thus it appears premature to state, as have some authorities, that Chornobyl will not result in higher rates of leukemia.

As for thyroid cancer, its development has been sudden and rapid. Today about 1,000 children in Belarus and Ukraine have contracted the disease, and it has yet to reach its peak. One WHO specialist has estimated that the illness may affect one child in 10 living in the irradiated zones in the summer of 1986, hence ultimate totals could reach as high as 10,000. Though the mortality rate from this form of cancer among children is only about 10 percent, this still indicates a further 1,000 deaths in the future. Moreover, this form of cancer is highly aggressive and metastasizes rapidly if not operated upon. The correlation between thyroid gland cancer and radioactive fallout appears clear and is not negated by any medical authority today.

Turning to the question of the Chornobyl reactor itself, it continues to pose enormous problems for newly independent Ukraine and for the nuclear industry in general. In the spring of 1994, eight years after Chornobyl disaster, the IAEA belatedly declared the reactor unsafe. Pressure from the Group of Seven has forced Ukraine to agree to the closure of the station by the year 2000, but Ukraine's price tag-some $4.4 million to shut down Chornobyl and to construct a new thermal power station in the vicinity - has been offset by only about 50 percent from G-7 subsidies and loans.

Both the current director of the Chornobyl plant, Serhiy Parashyn, and former director Mykhail Umanets have vocalized their view that the station's lifespan is only 50 percent complete and that Chornobyl today is safer than other Soviet-made RBMK (graphite-moderated) reactors at Ignalina, Lithuania (an RBMK-1500); and the Russian stations of Sosnovyi Bor (near St. Petersburg), Kursk and Smolensk.

Both Ukraine and Belarus face significant energy crises and have been reliant on expensive imports of oil and gas from Russia and Turkmenistan. Both have turned back to the nuclear option. Yet the industry remains short of skilled personnel, adequate and well-paid safety regulators, and reliable reactor units. Several potentially serious mishaps have occurred in Ukraine, including two recent accidents that involved leakages of radiation at Zaporizhzhia-4 (April 1995) and Chornobyl-1 (November 1995, now acknowledged to have been a more serious Class 3 accident on the international scale rather than Class 1 as initially reported).

In addition to such a serious dilemma, the funding of a new sarcophagus over the destroyed reactor has not been determined. The current structure, which cover some 20 tons of radioactive fuel and dust, is cracking and is not anticipated to last more than a further 10 to15 years. Though plans have been formulated to re-cover the original concrete shell, the financial backing for such a structure is problematic. Moreover, the present plan will likely entail the permanent closure of Chornobyl-3 and as such is regarded with skepticism by those of Ukraine's energy sphere who wish to continue reliance upon nuclear power.

It is fair to say that the dangers presented by former Soviet nuclear power stations today exceed those of one decade ago. In the meantime, some 3.5 million people live in contaminated zones. Even evacuees are known to be dissatisfied with their new homes. From a necessary panacea, evacuation of those living in zones with high soil contamination, today has become an unpopular and slow-moving process.

Finally, the lack of consensus on the effects of the Chornobyl disaster helps no one. It does not help the economically floundering governments of Ukraine and Belarus; and it places a serious impediment on the work of charitable and humanitarian organizations. And, the one-sided statements to the effect that morbidity and diseases may have causes other than Chornobyl, or that they are caused by "radiophobia," detract from the prime need, which is to provide aid for a population facing an acute health crisis with inadequate resources.

Ultimately, it will be seen that Chornobyl has compounded a health crisis of extraordinary dimensions. Thyroid gland cancer is proof of the relationship between the 1986 nuclear disaster and dilemmas faced today by Belarus and Ukraine.