LEAGUE OF RED CROSS AND RED CRESCENT SOCIETIES

# REPORT

# ON

# ASSESSMENT MISSION TO THE AREAS

# AFFECTED BY THE CHERNOBYL DISASTER, U.S.S.R.

FEBRUARY, 1990

# TABLE OF CONTENTS

## INTRODUCTION

In November 1989, the Alliance of Red Cross and Red Crescent Societies of the USSR proposed that the League undertake consultations with regard to the present situation in the areas affected by the Chernobyl disaster, with a view to establishing international cooperation in this field. As a result, a League team of 6 people visited the Soviet Union on 9th-16th January 1990 in order to carry out such an assessment. The composition of the team was as follows:-

Mr. Renny Nancholas, Head of the Mission
Head, International Aid Department, British Red Cross, London

Dr. PehrOlov Pehrson
Medical Adviser, International Department, Swedish Red Cross, Stockholm

Prof. Dr. Robert Giel
Head, Department of Social Psychiatry
University Hospital, Groningen, The Netherlands

Prof. Dr. Albrecht M. Kellerer
Director, Institute of Medical Radiology
University of Wurzburg, Federal Republic of Germany

Dr. Kiyoshi Kuramoto
Vice-Director, Hiroshima Red Cross Hospital and Atomic Bomb Survivors Hospital, Japanese Red Cross Society

Dr. Elizabeth Smales
Senior Medical Officer, Department of Health and Social Security, Hannibal House, Elephant and Castle, London

Terms of reference relating to the mission (see appendix 1) can be broadly summarised as :-

a) To appraise the current situation after consultations with Red Cross representatives, government officials, local authorities and people affected by the disaster.

b) To recommend any future actions for the Red Cross/Red Crescent in the USSR and other countries in terms of disaster preparedness in accidents of this nature, and propose support (if any) for current Red Cross activities in the Republics affected by the disaster.

It needs to be stated that this report can only deal with these issues in a general manner. The mission itself was of short duration and although people throughout were very willing to provide information to the team, gaps in available data meant that it was difficult to gain a thorough knowledge of the overall situation. The need for constant translation from Russian to English and the lack of hard data in English

also added to the difficulties. Nevertheless, the team was satisfied that it gained a reasonable overview of the situation given the above circumstances. Sincere thanks are offered to the Soviet Red Cross and to government representatives at different levels for the hospitality and friendliness shown to the team throughout its mission and for their endeavours to ensure as fruitful an outcome as possible.

## ITINERARY

| | | |
|---|---|---|
| Jan. 8th 1990 | | Team briefings at LORCS HQ Geneva |
| Jan. 9th | | Travel Geneva, Zurich, Moscow. Arrive evening. |
| Jan. 10th | am - | Meetings at Alliance HQ Moscow. |
| | pm/evening - | Team divided into two groups:<br>(a) Mr. Nancholas, Dr. Smales and Dr. Kuramoto accompanied by Dr. Abramov (Head Prevention Dept) to Kiev.<br>(b) Dr. Pehrson, Prof. Kellener and Prof. Giel accompanied by Dr. Dunin (Dep. Head Prevention Dept) to Minsk. |
| Team (a) | | |
| Jan. 11th | am - | Meetings at Ukrainian RCS HQ Kiev with RC and Health Dept officials |
| | - | Meeting with Deputy Chairman of Ukrainian SSR Council of Ministers |
| | pm - | Visit Centre of Radiation Medicine, Kiev and Institute of Clinical Radiology |
| Jan.12th/13th | | Field trip to Polesskoye District, Kiev Region and Narodichi/Luginy Districts, Zhitomir Region. Visits to RC Regional HQ at Polesskoye and Narodichi, discussions with RC officials. Visits to various local hospitals, including wards and labs and to various villages including some to which people had been evacuated, some from which people had been evacuated and some which are due to be evacuated. Extensive talks with local people in these villages. |
| Jan. 14th | - | Further meetings at Ukrainian RCS HQ and with Ukrainian Minister of Health. |
| | evening - | Depart for Moscow. |
| Team (b) | | |
| Jan. 11th | am - | Meeting at Byelorussia HQ Minsk with RC officials. |
| | - | Meeting with Chairman and other representatives of the Byelorussia SSR Council of Ministers. |
| | pm - | Visit Radiology and Haematology Centre, Minsk and attached hospital.<br>Travel to Mogilov. |

| | | |
|---|---|---|
| Jan. 12th | am | Meeting with Chairman and other officials of the Mogilov Regional Supreme Soviet. |
| | pm | Visit RC socio-medical centre/food distribution centre, blood donation centre. Travel to RC health centre in Cerikov District to visit abandoned villages and new settlements. Visit RC health post/RC centre in Slavgorod. Travel to Gomel. |
| Jan. 13th | am | Meeting with Chairman and other officials of the Gomel Regional Supreme Soviet. |
| | pm | Visit school, meeting with teachers and village residents in Chojniki, Cernigov District. |
| Jan. 14th | am | Travel to Novozybkov, Russia Federation and meet with Chairman and representatives of town executive committee and local/regional RC officials. |
| | pm | Visit central district hospital, Novozybkov. Visit Krasnaya Gora. Meet with executive committee and RC officials. Visit RC office and hospital. Travel to Bryansk. |
| Jan. 15th | am | Meet with Bryansk Regional Health Department and RC representatives. |
| | pm | Team reassembles in Moscow. Consultations between members. Begin drafting report. |
| Jan. 16th | am | Drafting report continued. |
| | pm | Final meeting with Alliance Representatives. |
| Jan. 17th | | Depart Moscow. |

AREAS VISITED BY TEAM

## SUMMARY

Following the accident at the Chernobyl nuclear power plant in 1986, approximately 100,000 people were evacuated from a 30 kilometre zone around the plant. In July 1989 it was decided that in areas where the lifetime radioactive dose exceeds 35 rem per person, further evacuations would need to be carried out over the next three years. This could involve relocation of as many as another 100,000 people.

If radiation dose were the only criterion for relocation, there would be some contaminated areas where life would be possible provided permissable levels of contamination in food stuffs were not exceeded. However, our overall impression was that in practice, in these agricultural communities, there are too many restrictions to permit an acceptable qualify of life under these conditions. Therefore, in accordance with well established principles of radiological protection, the indications for relocation should include consideration of the socio-economic conditions as well as the radiological situation.

Among the health problems reported it was felt that many of these, though perceived as radiation effects both by the public and by some doctors, were unrelated to radiation exposure. Little recognition appears to have been given to factors such as improved screening of the population and changed patterns of living and of dietary habits. In particular, psychological stress and anxiety, understandable in the current situation, cause physical symptoms and affect health in a variety of ways. We feel that there is a need for more objective information in order to allay many of the fears of the population.

The Soviet Red Cross has been active in assisting the victims of the Chernobyl accident and intends to continue providing medical and welfare assistance both to the people who have already been relocated and to those about to be relocated. It is felt that there are a number of ways in which Red Cross workers could provide additional help to the victims of the accident, with some assistance from the League. In brief, these would include: the provision of accurate information to people directly affected by the accident; the use of counselling skills in order to help alleviate many of the psychological problems apparent in much of the population living in the affected areas; and, the provision of geiger counters to Red Cross workers in order to help allay many of the fears of the affected population.

It is also felt that closer cooperation between scientists both within and outside the Soviet Union, should be encouraged and that closer links be established between organisations who have an interest in this field.

In addition, it is felt that other national societies can better formulate their own disaster preparedness plans in

accidents of this type by learning from the experience of the Soviet Red Cross. Finally, it is becoming increasingly evident that many large scale disasters result in much stress related behaviour and it is recommended that the Red Cross movement as a whole explores how it can better respond to the psychological effects of disasters.

# REPORT ON CHERNOBYL

## 1. Assessment of Situation

Our assessment of the situation in the affected areas of the Ukraine, Byelorussia, and the Russian Federation is considered under the following headings:

1. Radiological/Ecological
2. Socio-economic
3. Information
4. Psychological
5. Medical
6. Data collection
7. Overall impression of psychological and medical symptoms

### 1.1 Radiological

During the reactor accident at Chernobyl large quantities of different radionuclides were emitted. The largest contamination occurred within the thirty kilometre zone around the reactor; the immediate area was evacuated within days and the remainder of the area within weeks after the accident. This involved evacuation of approximately one hundred thousand people. Outside the thirty kilometre zone, the contamination occurred in irregular patterns depending on meteorological conditions, as these have a major influence on the levels of deposition from the plume.

The main concern was, initially, with the short lived radioisotopes of iodine. However, at the present time, approximately three and a half years after the Chernobyl accident, the main problem is contamination of the soil with radiocaesium (half life of the more dominant caesium isotope, caesium-137, is approximately 31 years). Strontium-90 plays a less important role; however, it poses problems because of the difficulties in measuring the levels present in the environment.

Three zones of contamination are now distinguished:

1. Zone of occasional control:
   Regions with a $^{137}Cs$ contamination between 1 and 15 $Ci/Km^2$

2. Zone of permanent control:
   Regions with contamination between 15 and 40 $Ci/Km^2$

3. Strict control zone:
   Regions with a contamination in excess of 40 $Ci/Km^2$

There is general agreement that life in zone 1 should pose very few problems although any radioactive contamination is

in principle undesirable. The major problems occur in zones 2 and 3. We were told that approximately 10,000 $Km^2$ are considered contaminated with more than 15 $Ci/Km^2$ caesium-137 of which 7,000 $Km^2$ are in Byelorussia, 2,000 $Km^2$ are in the Russian Federation and 1,000 $Km^2$ are in the Ukraine.

We have attempted to assess from the information we were given the size of the affected population in the three republics of the USSR which we visited. We were told that in the Ukraine approximately one million people live on territory with Caesium 137 levels between 1-100 $Ci/Km^2$ and that in Byelorussia approximately 2 million people live in areas contaminated with more than 1 $Ci/Km^2$. However, we were not given details of the number of people living in the "permanent control zone" and the "strict control zone", although we were told that in Byelorussia alone more than 100,000 persons with roughly 30,000 children live in these two zones. In the Ukraine we were informed that there are plans to evacuate 14 settlements and relocate approximately 3,000 families over 3 years. In Byelorussia there are plans to relocate 174 settlements involving over 20,000 people. In the Russian Federation a further 3,000 people from 23 settlements are scheduled to be relocated.

The necessity to relocate people from contaminated zones is not a decision which can be based purely on clearly defined dose levels. With ionising radiation one cannot distinguish a safe dose range from that which implies some level of increased risk. In none of the contaminated regions outside the thirty kilometre zone is there a danger of acute radiation effects with observable symptoms. The danger is from late effects which occur with small probabilities after several years (mainly leukaemias) or after decades (generally other cancers). A small increase of hereditary damage due to mutations of germ cells is also a possibility. According to present knowledge, a radiation dose of 35 rem may increase the contribution of cancer deaths to total mortality from a value of approximately 20% to perhaps 22%. However, such small increases are difficult to observe statistically.

A WHO group of experts met in June 1989 and a decision was made to choose as the criterion for relocation an increment of 35 rem lifetime dose due to the accident. As a comparison, 'natural' radiation exposure (cosmic rays, terrestrial radiation, radioactivity in the human body, x-ray diagnostics, etc.) amounts on average to 10-15 rem in a lifetime. There are, however, considerable regional variations. The expected dose in a region is computed from the contamination of the environment and from the intake of contaminated food, assuming that the legal limits in food are observed. According to the 35 rem concept, no relocation would be required in the permanent control zone, nor would relocation be automatically required in the strict control zone provided permissable levels of contamination in food stuffs are not exceeded. However, this implies constraints,

such as the exclusion of crops, which are highly disruptive in an agricultural population. The people and the authorities, especially in Byelorussia, have therefore voiced strong opposition against the simple 35 rem concept and they see the need for relocation not only in the strict control zone but also in some of the permanent control zones.

In the contaminated areas there is a need for regular radiological monitoring of milk, meat, vegetables and other locally grown produce. The maximum permitted levels of radioactivity are, apart from that in mushrooms, largely in line with conventions in Westerm European countries, i.e. 370 bq/l for milk; 1,000 bq/kg for beef and lamb; 600 bq/kg for pork; and 10,000 bq/kg for mushrooms.

According to the information we were given in the Polesskoye district of the Kiev region, approximately 25% of milk, 25% of meat, 50% of mushrooms and berries and 1-8% of vegetables have contaminations exceeding permitted levels and cannot be used. Even higher levels were reported for the regions in excess of 15 $Ci/Km^2$ in Byelorussia and in the Bryansk region of the Russian Federation. Fishing and mushroom/berry picking have been forbidden in many of these areas. The diet of the local population in the more heavily contaminated areas is supplemented by bringing in non-contaminated food.

## 1.2 Socio-Economic

The contamination of the soil and locally grown produce has resulted in considerable alterations in the life-style of people living in rural communities. People are no longer able to work on their land, nor are they able to eat or sell their produce. Although non-contaminated food is brought into these areas, we were told by local people that there was insufficient "clean" food and that they sometimes ate food which was contaminated. In regions in excess of 40 $Ci/Km^2$ they receive a monthly allowance of 30 roubles to cover the increased cost of food. In the regions from 15 to 40 $Ci/Km^2$ they receive 15 roubles.

The socio-economic situation is further complicated by the interdependency of villages and fields. An uncontaminated village may have to cultivate contaminated land or vice versa. An uncontaminated village may be dependent for facilities, such as schools or shops, on a community in a contaminated area which is to be relocated. People's livelihood is threatened because they cannot sell their products. All in all, the complexities of social structure increase the population subject to relocation, encompassing more people than actually live on contaminated soil. In summary, life is sometimes possible in a contaminated area, but with too many restrictions to permit an acceptable style of life.

## 1.3 Information

There was general agreement by authorities to whom we spoke that not enough information was given to the population at the time of and in the period immediately after the accident. This view was confirmed by talking to people who said they had first heard of the accident through rumours or by seeing busloads of people being evacuated. Not all information given by the authorities was believed, although people told us that recently they had been getting more information and were a little more inclined to believe it.

The impact of the disaster was less circumscribed than in most disasters because of the invisibility of the threat, its near and far, short term and long term consequences, and because of some irregularities in the provision of information.

The explosion and resulting fire in the reactor were observed by few people, and announced only after two days, playing down the possible consequences. However, large scale evacuation started within 36 hours and was completed from the nearby areas (within a radius of 30 km) during the month of May. This must have made many more people aware of the enormity of the disaster. Nevertheless, on the 5th or 6th of May, the Minister of Health of Byelorussia announced that everything was under control.

In June 1986, a large decontamination and relocation operation was started, indicating to many people that the damage was far greater than expected. Altogether 600,000 people were involved in the "liquidation" and decontamination operation, spreading further the news of the wide scope of the disaster. Dispersed and large areas of Byelorussia were involved, and smaller areas of the Russian Federation and the Ukraine. This operation was completed in the autumn of 1986 but many restrictive measures and relocation plans were being enacted or were under consideration. These affected work and living conditions, recreation, outdoor activities of children and it involved radioactivity checks of food, and regular and repeated medical examinations, including thyroid and whole body counts.

As a result of increasing pressure from the public and the media, the authorities could no longer continue withholding information. In March 1988, almost two years after the accident, they started to provide full and detailed information on the past and present situation and on plans for the future. The new and sometimes inadequately presented information must have caused a delayed impact following the disaster, temporarily increasing the credibility gap of the government and uncertainty of the population.

There is still a general mistrust towards the authorities and while information is now regularly reported in newspapers,

and posters have been put up in pharmacies, shops, health centres, etc., nevertheless such information is still not wholly believed.

## 1.4 Psychological

The authorities, radiation experts and doctors frequently referred to the problem of "radiophobia" in the affected populations. Most of the people we spoke to demonstrated some degree of psychological stress and anxiety. The groups of people we met could be classified as follows:

i) People who had been evacuated shortly after the accident from the contaminated area to a "clean" area

These people were anxious about the radiation dose they had received prior to evacuation, and many reported non-specific symptoms of poor health. In particular, young women were worried about future pregnancy. People wanted reassurance that radiation levels in their present environment were normal and many asked for radiation measurement in their houses to be made by the team and were greatly reassured to see a normal reading.

ii) People living in a contaminated area waiting to be relocated

The majority of these people were living in a situation with restrictions on what they could eat and had undergone changes in their lifestyle (not being able to work the land, keeping children indoors, etc). The people knew they lived in a contaminated area and felt the need for relocation but did not know of a time schedule, complained of lack of information and some had heard of the planned relocation through rumours. Most expressed the wish to be moved as soon as possible to a "clean" area. Many people, especially women, were very concerned about the health of their children and grandchildren as well as their own health. Many people complained of a variety of non-specific symptoms.

Our impression from talking to both these groups of people was that their anxiety was understandable. (i) The first group were in the contaminated area immediately after the accident and had been potentially exposed to increased levels of radiation at the time of the accident. Furthermore, relocation in itself can cause anxiety and worry because of the disruption of normal patterns of life. (ii) The second group of people know they were living in a contaminated area, had experienced changes and even severe constraints in their life style and are uncertain of their future. In both groups of people, the anxiety is understandable.

We tried to establish if the general anxiety had resulted in deviant behaviour, such as agressiveness, delinquency,

suicide, divorce and alcoholism, but this could not be confirmed.

## 1.5 Medical

We were told by the Health Ministry of Byelorussia that medico-demographic indices, such as infant mortality rates, crude death rates, and frequencies of severe disabilities did not exhibit negative changes; infant mortality, for example, in the Gomel region, decreased from 16.3 per thousand in 1985 to 12.3 per thousand in 1988. At the same time we were told by the same authorities that there was a two-to-fourfold increase, in comparison with the preceding years, in morbidity of hypertension, diabetes, chronic bronchitis, ischemic heart disease, nerve diseases, ulcers and chronic bronchopulmonary diseases. However, our assessment of the situation was limited by lack of reliable health data. Some of the health problems reported were as follows:

a) Thyroid Disorders

A considerable quantity of radioiodine was released during the accident, resulting in exposure of the population to radioiodine by inhalation and ingestion routes. Although prophylaxis with stable iodine was given, in many cases probably late, a considerable part of the population received thyroid doses in the range of 200-1,000 rem. The data for iodine are, however, less reliable than those for caesium, because most of the measurements had to be made immediately after the accident and they were later found to be faulty. Calculations were, therefore, required but they were difficult because the geographic distribution of the contamination differed from that for caesium. According to the preliminary data from the USSR Ministry of Health, 20% of the children from the Gomel region had thyroid doses in excess of 200 rem and 5% doses in excesss of 1,000 rem.

The All Union Institute of Radiation Medicine has established a register to follow up the population exposed after the accident. This includes exposure to radioiodine, and the epidemiological follow-up may demonstrate a somewhat increased rate of thyroid cancers after an expected latency period of about 10 years.

We have been informed of side effects of the prophylactic administration of stable iodine (thyrotoxicosis), but have not been given actual data. However, we found a widespread conviction among the population and among the medical profession that there are substantial increases of pathological changes in the thyroid due to radiation exposure. This belief runs counter to well established clinical knowledge that thyroid doses well beyond 10,000 rem of radioiodine are required to produce hypothyroidism, even in children. Large parts of the affected areas in

Byelorussia are iodine deficient with resultant goitre endemism; thyroid disorders must, accordingly, have been common even before the accident.

b) A reported increase in a number of other conditions which are virtually certain to be unrelated to radiation exposures but are nevertheless perceived as radiation effects by both the public and a considerable part of the medical profession. These conditions include:-

In children : diseases of respiratory organs
tonsils and adenoids
digestive organs
neurastheric syndromes

In adults : rheumatism
cholecystitis
cardiovascular diseases, hypertension,
ischemic heart disease
chronic bronchitis
nerve diseases
diabetes

c) A possible increase in: premature deliveries
miscarriages
birth defects

We were not able to obtain definite data, but were told by the authorities in Byelorussia that an observed increase in the controlled areas of congenital anomalies as cause of the infant mortality from 25% to 31% was a particularly negative influence on the psychological state of the population.

d) An increase in termination of pregnancy, especially during the year 1987. This increase appears to reflect anxiety among the population, but it is also partly due to advice by the medical profession.

e) Iron deficiency anaemia - which could be due to change in diet as a result of dietary controls, or changes in soil as a result of the accident. However, it could also have been present before and could, therefore, be merely an apparent increase due to better monitoring of the population.

f) In Byelorussia we were told that the radioactive contamination was accompanied by lead contamination, and that increased lead concentrations are now measured in erythrocytes, especially of children. The efforts to extinguish the burning reactor and to avoid criticality of the molten reactor fuel included the dumping of large amounts of lead into the fire; it would therefore be desirable to assess the magnitude of the resulting dispersion of vaporised lead, a factor which seemingly has hardly been considered up to now.

## 1.6 Data Collection

Although everyone was very willing to give us any available information, we found that there were insufficient health data for an objective assessment of such a complex situation. We were given figures for the incidence and prevalence of certain disease in the years since the accident but there were no comparable data for the years before the accident or for areas not affected by the radiation contamination.

There is a clear need for better health statistics and for making the data available to the medical profession. In view of reported increases of the rates of malignant neoplasms in some of the contaminated areas, there is a special need for better information on the on-going epidemiological follow-up of the more highly exposed persons that is performed at Obninsk, near Moscow. Reliable information on possible radiation effects will not be acquired on the basis of local statistics, but only in the large study. The people who collect the data locally will need to be better informed, and this may require special lectures and consultations.

## 1.7 Overall impression of psychological and medical symptoms

The general public and the medical profession are in agreement that there has been an apparent increase in morbidity in the population. However, they do not perceive that this is due to:

(i) much improved medical screening of the population leading to better case findings;

(ii) changed patterns of living and of dietary habits;

(iii) psychological stress and anxiety, causing physical symptoms and affecting health in various ways (such as sleeplessness, headaches, hypertension, gastrointestinal complaints.

Many doctors seem to support their patients in their suspicions that their symptoms are due to radiation and appear to lack knowledge of scientific facts on matters of radiation protection. It appears that people attribute all their complaints to radiation, clinging to this explanation which is in line with their worst expectations. All anxiety seems to be channelled into massive health concern and this was particularly evident in women with children. There is insufficient objective information to correct these erroneous beliefs, and to let people and the medical profession understand that the only health effects due to continued exposure can be later increases of cancer rates or of hereditary effects, that are both unlikely to be recognisable, except in a thorough epidemiological study.

There is a tendency to use the term "radiophobia" to describe the situation. We conclude that this technical term referring to a form of psychoneurosis with irrational fears of situations or objects which normally elicit no fear, is unjustified for the following reasons:

a) First, it must be recognised that there is scientific evidence that increased exposure to radiation is associated with an increased risk of late effects, such as leukaemia and cancer. Although the expected magnitude of the risk may be too low to be observed against the normal incidence of their disease, the increased risk must be taken into account.

b) The radioactive contamination of the environment and food has in fact led to increased radiation exposure.

c) The problem is complicated by the fact that the distribution of increased radioactivity is irregular and can only be quantified by detailed measurements.

d) In addition to the present problem of continuing contamination, there is genuine anxiety and uncertainly about the radiation doses received in the immediate period after the accident.

e) Finally, we know that the rates of tumors in childhood can be substantially enhanced even by doses of only a few rem. This special sensitivity and the still incomplete knowledge of late effects of radiation in childhood show that much of the anxiety is rational, even if the risks are overestimated in the light of current knowledge.

## 2. Red Cross Role

It is clear that the Red Cross Societies in all three Republics directly affected by the Chernobyl accident have played an important role in assisting the victims. Many members of the medical profession in the Soviet Union are also Red Cross members so close collaboration between the Ministries of Public Health and the Red Cross has been a feature of assistance given.

In view of the lack of information available to the general public at the time of the accident, there has understandably been some mistrust of official government information. This mistrust does not however appear to apply to the Red Cross to the same degree and, in most places visited by the team, the Red Cross was spoken of highly by officials and public alike. People appeared to be aware of the Red Cross's role and in particular its international component, possibly as a result of Red Cross action following the Armenian earthquake. This factor may have an important bearing on any future action.

Red Cross action has varied somewhat in different Republics but, in general, actions have centred around: assisting in the distribution of iodine; assisting in evacuation from contaminated areas and in resettlement in both temporary and permanent areas; providing general food supplements, and informing people on radiation, personal hygiene, food preparation, etc. by distributing booklets and other visual aids. All people evacuated from the 30km 'dead' zone around Chernobyl also received a grant of 50 roubles per person from Red Cross funds. RC sanitary teams assisted in the decontamination of houses, food, water and clothes.

In particular, vulnerable groups such as the elderly, lonely, sick, handicapped and large families have been targeted for additional assistance. This has taken the form of visits by trained Red Cross nurses and volunteers or provision of financial assistance, 'clean food', clothing or medicines. Orphans and other children have been given holidays at health resorts. Blood donor sessions and fund raising campaigns were held throughout the USSR. Approximately 40 million roubles was raised in this way which, as well as enabling the above activities to take place, was also used to purchase a range of medical equipment for various hospitals, polyclinics and the Radiation Centre in Kiev.

An integrated plan of action for the years 1990-2000 has now been developed by the Soviet Government in order to eliminate the after effects of the Chernobyl accident. The Red Cross is included in this programme and future activities include the provision of medical and welfare assistance to vulnerable groups as well as providing material assistance to those people yet to be relocated from areas which are still considered to have unacceptable contamination levels. It is intended to increase the numbers of trained Red Cross nurses

working in the affected areas. Funds will be made available to enable children from the disaster area to be given holidays in other parts of the country. Some efforts will focus attention on sanitation and nutrition, particularly in relation to children. Help will be given to people who need constant medical examinations and to those hospitalised as a result of the accident.

## 3. Discussion and Recommendations

The overriding socio-medical problem appears to be the anxiety about the poorly understood consequences of radiation exposure. In addition, there are worries about the future of people who have been relocated or are to be relocated, and those remaining behind in a reduced or restricted social environment. One of the crucial factors in this anxiety is the lack or unreliability of information, particularly in relation to levels of radioactivity, its short-term and long-term consequences for health and progeny, and the necessity of adequate measures against contamination. This lack of information is evident not only among the public in general but also among the medical profession who appear to ascribe general increases of morbidity to radiation exposures, although they are not directly related, and who are insufficiently informed about the real risks of the exposures, namely a certain increase of leukemias and other cancers that can only be ascertained in an epidemiological study.

While it is acknowledged that the Soviet Red Cross is already committed to a range of activities in assisting the affected population, it is felt that there would be a very valuable additional role in which they, with support from the League and sister Red Cross Societies, could assist in alleviating some of the problems outlined above. Such assistance would fall into four categories :-

(a) Provision of accurate information to people directly affected by the accident.

A misdirected information policy has led to anxieties and restrictions that obviate a normal life, especially for children, even in some areas with contaminations acceptable from a radiological point of view. A continued effort will be required to alleviate this situation.

Even though information given to people by the authorities is now fairly extensive, doubts still exist in the minds of many people as to the credibility of such information. In addition, much of the information is put over in a somewhat complicated way, not easily understood by many people. It is possible that information provided by the Soviet Red cross, assisted by the League's Information Department, may be more readily accepted by the affected population. It is, therefore, suggested that a group of specialists, including "independent" Soviet specialists, could be brought together in order to develop simple illustrated pamphlets, easily understood by lay people, covering such topics as radiation and morbidity risks and protection from contamination. This same group could work on providing guidelines and information of a more general nature covering such subjects as nutrition.

It is suggested that as a first step there needs to be liaison between the League's Europe and Information Departments together with the Alliance, in order to determine the feasibility of producing an initial run of say 10,000 leaflets. The contents of such leaflets would need to be discussed with the Soviet authorities and a body such as the Centre of Radiation Medicine in Kiev. WHO have experience in this field and their advice should also be sought. Within the RC movement, Amcross is a Society with similar experience following the Three Mile Island accident and perhaps the provision of an Information Delegate from such a national society may facilitate the exercise.

In addition, it seems important that the Soviet Red Cross in the three affected Republics be enabled to provide bulletins, information news and situation reports to the populace. The lack of basic equipment apparent in the HQs of the Ukrainian, Byelorussian and Russian Federation Red Cross Societies could be remedied by interested National Societies providing such equipment as duplicating machines, (model SF-7350, Sharp Corp.), photocopiers (model Xerox 1050), stencil printers (model Superfax 5500 Japan) and typewriters.

(b) <u>The use of counselling skills in order to help alleviate many of the psychological problems apparent in much of the population living in the affected areas</u>.

It is suggested that a series of workshops could be set up in the Soviet Union, run by an experienced counsellor, with the aim of imparting simple counselling skills to two groups of people - (i) members of the medical profession dealing with people affected by the accident and (ii) active Red Cross nurses/volunteers.

(i) There would appear to be some lack of knowledge amongst doctors on the relationship between irradiation and health and of the possible health effects of anxieties and of restricted conditions of life. It is felt that simple counselling skills may enable doctors to allay many of the fears of their patients by spending more time in listening to their problems, many of which may not be directly connected to the effects of radiation.

(ii) Red Cross nurses and volunteers working directly with the affected population could benefit greatly by acquiring some instruction in the psychology of counselling. This would enable them to advise people and comfort them. One of the aims of such an activity would be to reduce the burden of unnecessary health care consumption.

In order to provide such training, it may be more effective to first train a selected group of people such as doctors, psychologists, teachers and others working directly with the affected population in such a manner that they in turn can

train others, such as Red Cross workers, in counselling skills, i.e. the training of trainers.

It may be that suitable trainers can be found within the affected Republics. Alternatively, the League may be able to recruit a counsellor with the necessary skills from an organisation such as WHO or from national societies. The possibility exists that IAEA could contribute to a training, teaching or counselling programme.

(c) Provision of geiger counters to Red Cross workers

The provision of simple, easily useable, rugged and reasonably priced hand held geiger counters to Red Cross workers is regarded as a potentially valuable tool in helping to allay many of the fears of the population living in affected areas. It may be possible to purchase equipment which also includes attachments for occasional examination of food samples. It is suggested that the provision of a total of approximately 100 such devices, to be used by Red Cross workers in all three affected Republics, would greatly assist in their work. It would be imperative that good instruction material accompanied the provision of such items of equipment. Attached (appendix 2) is information on the potentially suitable geiger counter. If 100 or more are ordered, the cost would be approximately 580 CHF per instrument. A more refined instrument with food sampling capacity is likely to cost approximately 2,250 CHF. Further enquiries will need to be made as to whether cheaper food monitoring equipment is available.

A Red Cross worker armed with counselling skills, a geiger counter and appropriate publicity material could do much to help the population affected by the Chernobyl disaster come to terms with their new situation.

(d) Encouragement of closer cooperation between scientists and other interested parties both within and outside the Soviet Union

It is felt important that continued dialogue takes place between interested scientists within and outside the Soviet Union. It is particularly important that epidemiological studies be set up to assess the possible health effects on the population as a result of the accident. The Red Cross, possible in cooperation with other organisations, could act as a catalyst in setting up meetings to enable such cooperation to take place.

It is felt important that closer cooperation with organisations such as the WHO, IAEA and other interested agencies, perhaps including governments, should take place in order to foster continuity and aid coordination between various agencies and exchange views with the international

scientific community. The League, together with the Soviet Red Cross, could do much to facilitate such cooperation.

In addition to the four categories of assistance outlined above, it is felt that the Chernobyl accident and the ensuing actions of government and Red Cross alike, provide some valuable lessons for the Red Cross movement as a whole.

Many countries have nuclear power installations and some Red Cross/Red Crescent Societies have disaster preparedness plans which include action in the types of emergency typified by the Chernobyl accident. However, many do not have such plans and even those that do may in some ways have inappropriate actions planned. It therefore appears important that concerned National Societies are given the opportunity of learning from the experience of the Soviet Red Cross with a view to better formulating their own disaster preparedness plans. It is suggested that the League could be instrumental in setting up a meeting together with representatives from the Soviet Red Cross and other interested National Societies in order to achieve such a goal. To learn from the experience of the Soviet Red Cross is important not only in relation to nuclear accidents but also in the case of other chemical/environmental disasters.

As has already been stressed throughout this report, one of the most damaging aspects of a disaster such as the Chernobyl accident relates to the psychological problems apparent in the population affected by such a disaster. It is becoming increasingly apparent that many large scale disasters result in much stress related behaviour among victims - the Armenian earthquake is but one other example - and that the Red Cross/Red Crescent movement as a whole has paid little attention to these important aspects of disasters. It therefore seems imperative that the League gives serious thought to the possibilities of incorporating meaningful responses in this sphere of activity into its disaster response plans. Material support in disasters is clearly necessary but so too is support of the kind highlighted in this report. The planned seminar on dissemination of health and nutrition policies in relief to be held in November 1990 may be an appropriate forum for introducing the topic of the psychosocial processes in disasters, with a view to formulating additional appropriate responses in disasters.

Finally, some comments regarding the supply of other equipment. During the team's visit, there were numerous requests from health authorities and some Red Cross sources for medical equipment. While accepting that there is a general shortage of such equipment in the Soviet Union, most of that requested did not directly relate to the issue of radiation. Requests were made for ultrasonic, endoscopic or NMR equipment, based on the premise that x-ray diagnostic procedures need to be reduced because of the otherwise elevated radiation exposures. However, it was felt that while reduction of radiation dose in diagnostic procedures is always desirable, it is not specifically required in this case. The matter of balancing medical exposure against medical benefits of the diagnostic procedure is regarded as independent of doses due to other sources. Another factor is, of course, the expense of such equipment. It may be that in the future some National Societies would be interested in donating such equipment but it is felt that the recommendations in this report should take priority.

APPENDIX 1

17.11.1989

TERMS OF REFERENCE

MISSION TO THE SOVIET UNION (UKRANIA, BIELORUSSIA, RUSSIA)

League of Red Cross and Red Crescent mission to area affected by the Tchernobyl nuclear accident to assess situation three and a half years after.

1. Get up-to-date information on present situation and assess needs of affected population in order to identify possible Red Cross action in the near future.

2. For this purpose to study existing information on the aftermath effect of the disaster and to meet and discuss with government officials and Red Cross representatives in Moscow, Kiev and Minsk. Visit affected rural areas in Ukrania, Bielorrusia and Russia and meet with local authorities and people.

3. Discuss with Soviet Red Cross representatives their role, administrative capacity and man-power potential, and envisage modalities of League involvement in eventual operational assistance to the affected populations.

4. Based on the outcome of 2 and 3 above, identify vulnerable groups of the affected population, their numbers and location, as well as short and longer-term needs that could be incorporated into any eventual League appeal*.

5. Discuss with Soviet Red Cross broad prospects of potential future cooperation of the Red Cross in order to define " Red Cross role in prevention and alleviation of suffering of victims of large scale industrial accidents in the future." (quoting Soviet RC).

6. Provide an initial verbal report, then within the range of 2-weeks after completion of this mission, present a written report in accordance to these terms of reference, including an outline of operational plan, and placing emphasis on the future Red Cross action.

Steve Davey

Andrei Kisselev

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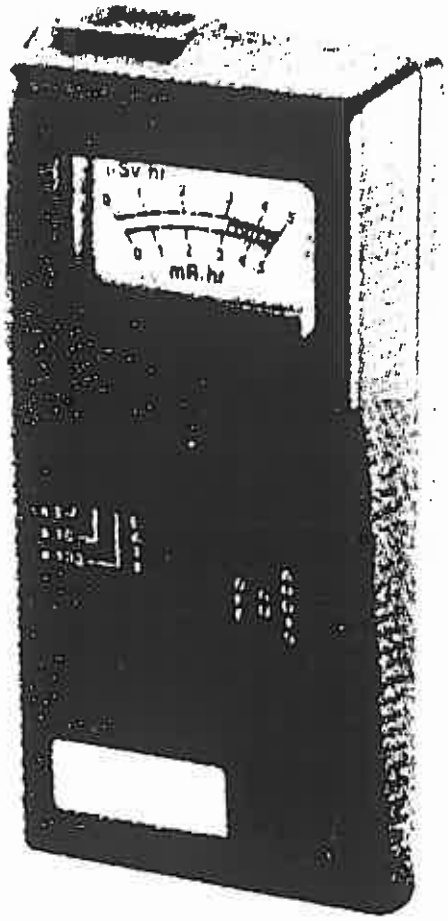
* League's appeal is subject to formal request for assistance from the Soviet Red Cross addressed to the League, since Dr. Venediktov's letter of 15 November requests only that "...a group of experts of the League could take part in consultations with the Alliance and any interested National Societies with the view of establishing Red Cross cooperation in preventing and alleviating suffering of the victims of similar accidents."

TERMREF/TBMICHAEL/LCT24

APPENDIX 2

# RADIATION MONITOR 4




- THE MONITOR 4 IS A VERSATILE POCKET GEIGER COUNTER, WHICH SERVES AS A USEFUL TOOL IN THE FIELDS OF RESEARCH, INDUSTRY, LABORATORIES, HOSPITALS, EDUCATION AND PERSONAL PROTECTION.
- THE MONITOR 4 IS SENSITIVE TO A BROAD SPECTRUM OF IONISING RADIATION AND ALTHOUGH CALIBRATED TO READ GAMMA RAYS, WILL ALSO INDICATE THE PRESENCE OF BETA, ALPHA AND LOW ENERGY X-RAYS.
- THE LATEST TECHNIQUES ARE USED IN THIS INSTRUMENT AND PROVIDE A VERY AFFORDABLE MONITOR WITH A GOOD SPECIFICATION. ITS LOW BATTERY CONSUMPTION GIVES VERY LONG PERIODS OF OPERATION, NORMALLY 2000 HOURS.
- THE MONITOR 4 HAS THREE SWITCHED LINEAR RANGES AND PULSES OF RADIATION BEING RECEIVED CAN BE OBSERVED AT LOW COUNT RATES BY AN LED INDICATOR. IF PREFERRED, AN AUDIBLE SIGNAL IS ALSO SELECTABLE. THE BATTERY MAY BE CHECKED BY A POSITION ON THE RANGE SWITCH.
- THE UNIT IS HOUSED IN A STRONG PLASTIC BOX AND IS EASY TO HOLD IN ONE HAND. BATTERY REPLACEMENT IS VIA A REMOVABLE PANEL.
- THE MONITOR 4 COMES COMPLETE WITH A ZIP CASE WHICH CAN BE FIXED TO A WAIST BELT.

automess

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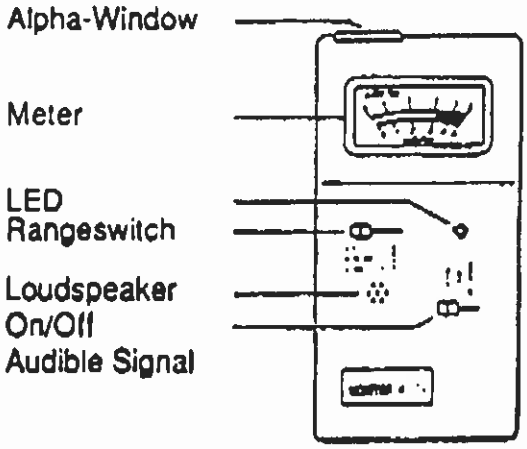
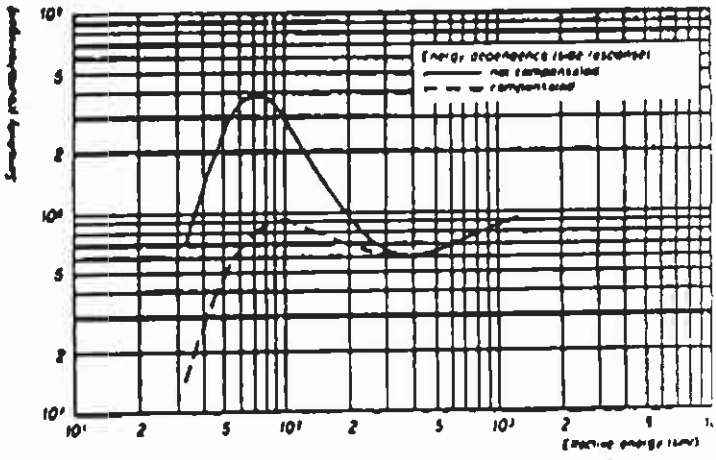
DAIMLERSTRASSE 27, TELEFON (06203) 3031, TELEX 465004 amess d, TELEFAX (06203) 16230

## SPECIFICATION

| | |
|---|---|
| Detector: | Halogen-quenched Geiger Mueller Tube with thin mica end window of 1.5 to 2.0 mg/cm squared thickness. |
| Calibration: | Cesium 137 gamma source. Direction of radiation side on to detector centre line. |
| Ranges: | x1, x10, x100 giving 0 to 5 μSv/h (0 to 0.5 mR/h). |
| Energy Sensitivity: | Detects alpha down to 2.5 MeV. Typical efficiency at 3.6 MeV is 80%. Detects beta with an efficiency of 35% per 50 KeV and 75% at 150 KeV. Detects gamma down to 10 KeV through end window, 40 KeV through case. |
| Power Requirement: | One 9 volt PP3 type battery. Alkaline type. |
| Power Consumption: | Less than 3 milliwatts in a low radiation field. 250 milliwatts maximum in a high radiation field. |
| Battery Life: | Up to 2000 hours at normal background radiation levels. |
| Size: | 145 mm x 72 mm x 38 mm |
| Weight: | 230 gms (8 ozs) |



ENERGY RESPONSE, MONITOR 4