

IRPA 10

TOPICAL SESSIONS Report of Chairman for Highlight Sessions

T-17: Exposures of Workers to High Natural Radiation Levels

Wednesday, 17 May 2000

Chair and Keynote: M. Sohrabi

Co-Chair: J. Schmitz

The Session on Exposure of Workers to High Natural Radiation Levels included four oral presentations and chaired by **Dr. Sohrabi** (Iran) and co-chaired by Dr. Schmitz (Germany). The **keynote** speech in this session was delivered by the Chairman. It was focused on the exposure of workers (radiation workers and non-radiation workers) to elevated levels of natural radiation (ELNR) from terrestrial radionuclides or cosmic rays or both in certain workplaces such as uranium and non-uranium mines (e.g. coal mines, metal mines, etc.), metal processing industries, oil and gas industries, radon spas, jet flights and space missions, as well as subways, tourist mines, etc. The state of control and the level of exposures in such workplaces in some countries as well as the state of international recommendations and standards were also presented. It is concluded that such recommendations and standards will address the existing problems and provide guidelines for regulatory control of such workplaces. Some further modifications may still be considered in the new proposals being under investigation by the ICRP. The regulatory control in some European countries have recently been started or is in progress. However, the exposure of non-radiation workers in many such workplaces in particular in developing countries need to be yet identified and controlled. It was recommended that due to higher level of exposures in some living environments, the exposure of workers under such living environments also to be considered in the overall exposure of workers. The responsible international organizations could play a major role in assisting for provision of recommendations, identification and control of exposures of workers in such workplaces in particular in developing countries.

The two other oral presentations were devoted to cohort studies of uranium miners in Germany and France. The first results of the German cohort studies as presented by **Dr. Burkart**, is on 60,000 miners in Saxony and Thuringen. About 49,000 miners are defined as exposed in underground or in processing operations, while internal control cohort group (unexposed only) consists of 1000 workers. On average, the workers were employed for 13 years at the Wismut Company. 1,436 lung cancer deaths among cohort members are presently reported. The first mortality follow-up will be finished in early 2002, and a total of about 3,000 lung cancer deaths are expected by them. This largest minor study so far will also allow to precise confounders such as smoking, arsenic and dust. It also addresses the questions of extra pulmonary cancers such as stomach, liver, pharynx and leukaemia.

The results of French cohort studies were presented by **Dr. Timarche**. Lung cancer linked to low chronic exposure to radon decay products has been studied in a cohort of French uranium miners characterized by very low annual exposures (3 WL) spread over an average of 11 years of exposure. The follow up of the 5,089 miners over 26 years confirms a linear dose response relationship between cumulative radon exposure and relative risk of lung cancer deaths. In order to precise the close role effect of these daily miner exposed miners population, a European project, coordinated by Dr. Timarche, is ongoing, including miners from the Czech Republic and from Germany, under the condition of a precisely measured individual exposure. This project includes also an analysis of recently performed animal experiments showing the dose-rate effect. A group of statisticians studying mechanistic modeling in order to approach the question of initiating and promoting of the alpha chronic exposure on the lung carcinogenesis is also participating in this joint analysis.

The paper on insignificant risk at low dose rate (radiation predicted by cytogenetic studies as indicators of radiation exposure) was presented by **Dr. Hayata** from Japan. Based on the cytogenetic studies on dicentric and translocations in the literature and the residents of high level natural radiation areas of China, Hayata concluded by pointing out that there is no threshold in radiation dose in the induction of chromosome aberrations which have statistically potential risks of causing malignant or congenital diseases. Also the effect of radiation on the induction of chromosomal effects of metabolic factors and/or mutagenic agents (excluding radiation) at least up to the dose three times higher than normal level.