

## **NRC INTERNATIONAL TRAVEL TRIP REPORT**

### **Traveler, Office, Division, Phone Number**

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### **Subject**

65th Session of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR)

### **Dates of Travel, Countries and Organizations Visited**

8 to 15 June 2018, at the Vienna International Center, Vienna, Austria

### **Desired Outcome**

To prepare an annual report for the United Nations General Assembly. Additional discussions include the future program of work, exposure of medical patients and occupational workers to ionizing radiation, lung cancer from exposure to radon, selected evaluations of health effects and/or risk inference due to radiation, and biological mechanisms influencing health effects from low-dose radiation exposure.

### **Background/Purpose**

Since the establishment of the United Nations Scientific Committee on the Effects of Atomic Radiation (UNSCEAR) in 1955, the mandate of the Committee has been to undertake broad reviews of the sources of ionizing radiation and the effects of that radiation on human health and the environment. In pursuit of its mandate, the Committee thoroughly reviews and evaluates global and regional exposures to radiation, and also evaluates evidence of radiation-induced effects in exposed groups, including survivors of the atomic bombings in Japan. The Committee also reviews advances in the understanding of the biological mechanisms by which radiation-induced effects on health and on the environment can occur.

The Committee, comprised of scientists from 27 Member States, meets annually and issues a comprehensive report every two to five years, based on input from outside scientific consultants. The following served as officers of the Committee (also referred to as the Bureau): Hans Vanmarcke (Belgium) as Chair; Patsy Thompson (Canada), Peter Jacob (Germany) and Michael Waligórski (Poland) as Vice-Chairs; and Gillian Hirth (Australia) as Rapporteur.

### **Summary of Pertinent Points/Issues**

The position of Scientific Secretary to UNSCEAR has been vacant since February 2018. As a result, the sixty-fifth session, which was originally scheduled for April 2018, was postponed two months until June 2018. After the completion of the sixty-fifth session, a third round of recruitment was initiated by the United Nations Environment Programme (UNEP). UNSCEAR held an abbreviated sixty-fifth session in Vienna, Austria, from 11 to 14 June 2018, to consider three documents for technical discussion and two documents to receive progress reports. The Scientific Secretary (acting) provided program updates on outreach activities being conducted by the Secretariat and three proposals for the future program of work. The sixty-sixth session of the Committee will convene in Vienna, Austria from 10 to 14 June 2019.

Dr. Vincent Holahan, NRC, led the U.S. delegation as the U.S. representative to the 65<sup>th</sup> session. The U.S. delegation, composed of a representative, two alternate representatives (Pawel, Ansari), and five technical advisors (Bolch, Grogan, Harley, Napier, Woloschak), reviewed five documents, chaired two working group sessions, and participated in two expert groups during the course of the year leading up to and including the 65<sup>th</sup> session. Four UNSCEAR consultants/invited experts from the USA participated in portions of the technical meeting. They were G. Ibbott (MD Anderson Cancer Center), S. Simon (National Cancer Institute), B. Smith (University Iowa) and D. Melo (private consultant).

## **Discussion**

*R728, Selected evaluations of health effects and of risk inference due to radiation exposure.* At its sixty-second session, the Committee agreed to evaluate selected health effects and the inference of risk. Five scenarios were developed for risk evaluation based on literature reviews: leukemia after medical CT (computed tomography) scans during childhood; leukemia after occupational exposure; solid cancer risk after occupational exposure; thyroid cancer risk after exposure during childhood; and risk of circulatory diseases after acute radiation exposure. The draft report considers some of the uncertainties involved in the estimation of health effects and of risk inference. The Committee noted that it needs more time to fully analyze these and other uncertainties for each scenario, as well as to ensure that the review is consistent with the newly completed annex on quality criteria for the Committee's review of epidemiological studies. The expert group noted that minor contributors to uncertainty are often very difficult to quantify. It expects to finalize the work with a view to approve the scientific annex at the sixty-sixth session (2019).

*Exposures of Patients (R729) and Workers (R730) to Ionizing Radiation.* In 2010, the Committee agreed to a long term strategy for improving data collection, analysis and dissemination to include a global survey of medical and occupational exposures. However, the information requested in the survey forms was very complex and detailed, and few Member States responded by the sixty-fourth session. During the last year, 45 countries submitted data for the Medical Exposure Survey and 39 countries submitted data for the Occupational Exposure Survey. The data currently submitted to the Secretariat is insufficient to allow a comprehensive assessment of global practices. Important data gaps remain, especially due to a lack of data submissions from several Member States. The deadline for submission of data is extended until September 2018.

The expert group on patient exposure also has started a systematic review of more than 300 relevant new publications identified by literature search since the Committee's last global evaluation of medical exposure in 2005. The quality of the submitted data remain quite variable and the data are insufficient to allow a robust assessment of global medical practices. The Committee provided guidance to the expert group on a number of technical issues (e.g., tables, format, and text) and encouraged its members to identify and provide relevant literature on patient exposure, especially from non-English scientific literature.

The expert group on occupational exposure also has started a systematic review of more than 250 relevant new publications identified by literature search since the Committee's last evaluation of occupational exposure in 2002. The expert group drafted a document based on the articles reviewed. Occupational exposure information contained in the 2016 annex on

“Radiation exposures from electricity generation” was not considered by the expert group, but relevant information will be incorporated in the next draft annex. Significant data gaps were identified which can be filled with new literature search terms (the current search terms were too limiting and significant data sources had been excluded from expert group consideration). The Committee asked Member States to identify additional experts to help with the work of the expert group.

The Committee recommended encouraging United Nations Members States to submit relevant national reports or evaluations to the Secretariat for both medical patient and occupational exposures.

*R731, Lung Cancer from Exposure to Radon and to Penetrating Radiation.* At its sixty-third session (2016), the Committee had agreed to thoroughly re-assess available literature and clarify recent developments in risk estimates of lung cancer from exposure to radon and convey an up-to-date picture of radon dosimetry. While the draft annex will focus on radon, the expert group should also explain issues associated with thoron since the presence of thoron might disturb measurement of radon. The Committee proposed that epidemiological experts from additional countries (e.g., France, Canada and Germany) should be invited to join the radon expert group to ensure direct access to recent epidemiological data. The Committee also requested that the expert working group study further the interaction of smoking and radon exposure on the risk of lung cancer from radon. The Committee envisages that a draft annex can be reviewed and finalized at its sixty-sixth session (2019).

*R732, Biological Mechanisms Influencing Health Effects from Low-Dose Radiation Exposure.* At its sixty-third session (2016), the Committee decided to develop an up-to-date assessment on biological mechanisms of radiation actions relevant to disease development, particularly at low incremental doses and dose-rates, their implications for the dose–response relationship of health effects at low doses, and thus their relevance for estimation of associated health risks. The Committee agreed that the title should be revised to “Biological mechanisms relevant for the inference of low dose radiation cancer risk.” While Committee direction after the sixty-fourth session was to constrain the range of biological endpoints considered, direction after the sixty-fifth session is to additionally consider repair of radiation damage to DNA, epigenetics and chromatin re-modelling, effects on stem cells including stem cell competition, epithelial-mesenchymal transformation, potential cancer-promoting effects of radiation, and signal transduction/cytokine responses. Additional phenomena to be considered also include adaptive response, bystander effects, transmissible genomic instability and hyper-radiation sensitivity. The Committee expects to review a more mature draft document at its sixty-sixth session.

#### Future program of work.

The Committee discussed plans for four new projects:

- (a) Second primary cancer after radiotherapy,
- (b) Epidemiological studies of radiation and cancer,
- (c) Levels and effects of radiation exposure due to the accident at the Fukushima Daiichi nuclear power station: implications of information published since the 2013 UNSCEAR report, and
- (d) Implementation of the Committee’s long-term strategic directions, including discussion of a concept of operations of standing working groups.

Having considered the current work program, the capacity of both the Committee and its Secretariat, the second primary cancer project and the epidemiology studies of radiation and

cancer project will not be started before the sixty-sixth session (see administrative issues below). However, a plan for the revision of the 2013 UNSCEAR report on the levels and effects of radiation exposure due to the 2011 Fukushima Daiichi accident was developed and contributions have been made to support this work. Information contained in previous white papers do not change the results contained in the 2013 report on exposures and effects associated with the Fukushima accident. A final report is requested to be released by the tenth anniversary of the accident. An expert group will focus on summing up findings since the accident. General Trust Fund resources will be used to hire staff to perform outreach, administrative, management, and editing tasks related to this project. At present, the Secretariat may not be sufficiently staffed to successfully complete this project by the sixty-seventh session (2020).

The Committee endorsed the establishment of an ad hoc working group to develop a draft future program of work on mechanisms and effects of radiation exposure (2020-2024) by providing recommendations for future projects based on their scientific insights in the Committee's priority areas. Dr. David Pawel has been identified by the Secretariat as a potential member of this ad hoc working group although other solicitations of interest were being accepted through 20 June 2018.

#### Administrative Issues.

Malcolm Crick, the UNSCEAR Secretary, in January 2017, tendered his intended resignation from his position effective in November 2017. A recruitment process for a new secretary was opened by the United Nations Environment Programme (UNEP) on 25 July 2017. However, after two rounds of recruitment, a new secretary was not been identified by the sixty-fifth session in June 2018. A third round of recruitment for a new secretary was initiated by UNEP on 18 June 2018. The appointment of a Scientific Secretary with the highest standard of scientific qualifications and experience is critical for the effective operation of the committee and for implementing the future program of work. The Committee noted that the United Nations budget is not adequate to conduct its full program of work. The Committee again suggested that the UN General Assembly urge Member States to consider making regular pledges of voluntary contributions to the General Trust Fund or to make contributions in kind.

P. Thompson (Canada) was unable to attend the sixty-fifth session and as such was ineligible for re-election to the Bureau due to her absence. The Committee decided to postpone the election of new officers to guide the Committee at its sixty-sixth and sixty-seventh session until the beginning of the sixty-sixth session when all current Bureau members should be present.

#### Next meeting

The Committee agreed to hold its sixty-sixth session in Vienna from 10 to 14 June 2019.

#### Pending Actions/Planned Next Steps for NRC

The traveler will continue to coordinate technical issues with the UNSCEAR Secretariat to include submitting additional U.S. occupational exposure data into the UNSCEAR Global Survey by September 2018 and coordinating with the UNSCEAR Bureau to foster the development of a project plan on epidemiological studies of radiation and cancer.

#### Points for Commission Consideration or Items of Interest

Staff will make the Commission aware of any technical issues that may develop as a result of these scientific reviews.

**“On the Margins”**

The traveler met with Mr. Brian Anderson, U.S. Nuclear Safety Attaché stationed in Vienna, during the 65<sup>th</sup> session. Issues discussed included the size, composition, and effectiveness of the U.S. delegation, UNSCEAR’s future program of work, administrative issues within the UNSCEAR Secretariat to include efforts to recruit a new committee Secretary, dates for the 66<sup>th</sup> session and the need to receive early accreditation of the 2019 U.S. delegation. A trip report will be provided to the State Department and the traveler will be available to discuss any aspect of the 65<sup>th</sup> session with State Department representatives.

**Attachment**

Agenda