

Information Circular

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Communication received from the Governor of Norway to the Agency concerning the International Symposium of Minimisation of Highly Enriched Uranium in the Civilian Nuclear Sector

1. The Director General has received a communication from the Governor of Norway, attaching the Chair's Summary of the discussions held during the International Symposium of Minimisation of Highly Enriched Uranium in the Civilian Nuclear Sector which was held in Oslo from 17 to 20 June 2006 as well as the summary from the technical workshop of the Symposium.
2. The communication and, as requested therein, the attached two summaries, are herewith circulated for the information of Member States.



ROYAL MINISTRY
OF FOREIGN AFFAIRS

International Atomic Energy Agency
Director General Mohamed ElBaradei
Postbox 100
A-1400 VIENNA
Østerrike

Your ref.:

Our ref.:
06/01533-69

Date:
23 June 2006

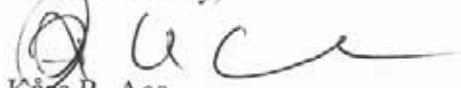
Dear Director General,

I would like to express my deep gratitude for the excellent co-operation with your dedicated staff at the IAEA in the preparations for and the actual conduct of the International Symposium of Minimisation of Highly Enriched Uranium in the Civilian Nuclear Sector, which was held in Oslo 17 – 20 June 2006.

We believe that the Symposium was a success, both from a substantial and organisational way. With the help of your staff, we managed to produce a Chair's Summary, which captured the discussions in Oslo and which contribute to the deliberations in the Board of Governors on this matter.

I would appreciate if this Summary as well as the summary from the technical workshop could be circulated to the IAEA Member States.

Yours sincerely,



Kåre R. Aas
Director General and
Governor to the IAEA
Copy:
Ambassaden i Wien

Enclosure 2

Postal address:
PO Box 8114 Dep
N-0032 Oslo, Norway

Office address:
7. juni plass 1
N-0251 Oslo

Bank payments:
6345.05.02822
Org. no.: 972 417 920

Telephone:
+47 22 24 36 00
Fax:
+47 22 24 95 80/81

Enquiries to:
Knut Langeland
post@mfa.no
www.odin.dep.no/ud

International Symposium on the Minimisation of Highly Enriched Uranium (HEU) in the Civilian Sector

Oslo, June 17 - 20, 2006

Chair's Summary

Director-General Kåre Aas,
Norwegian Ministry of Foreign Affairs (co-chair)

Director-General Ole Harbitz
Norwegian Radiation Protection Authority (co-chair)

1. An international symposium on the minimisation of highly enriched uranium (HEU) in the civilian nuclear sector was organised by the Norwegian Government, in cooperation with the International Atomic Energy Agency (IAEA), in Oslo 17-20 June 2006.
2. The symposium was opened by the Norwegian Minister of Foreign Affairs, Mr. Jonas Gahr Støre, and by a message from the Director-General of the IAEA, Dr. Mohamed ElBaradei. Some 130 participants from 45 countries took part in the event.
3. The symposium was divided into two parts. A preparatory technical workshop was held from 17 to 18 June, which allowed for thorough discussions on the technical and financial feasibility and related challenges for the conversion of nuclear facilities from using HEU to low enriched uranium (LEU).
4. A summary (Annex 1) was presented by the Chair of the workshop, Professor Dr. José Goldemberg (Brazil). He noted that experts, in general, agreed on the feasibility of substituting HEU with LEU in the civilian sector in almost all cases.
5. The second part of the symposium – the policy segment - benefited from the substantial discussions held during the technical workshop. This policy segment focused on existing national practices with regard to HEU uses, and discussed future directions for minimisation. Attention was also given to the role of HEU minimisation in the larger proliferation and disarmament context, existing bilateral and international cooperative programmes and projects, and to the contribution of the IAEA in this respect.

6. Participants fostered a rich discussion, in which views were expressed on a wide range of technical, financial and policy issues relevant and related to the subject of the symposium. A number of issues were considered, and suggestions were made on the possible ways forward:
 - A. It was generally recognised that considerable scientific and human development benefits are being derived from nuclear facilities using HEU, and that substituting HEU with LEU should not affect those benefits.
 - B. Fissile materials, in particular HEU, as well as radiological sources pose a proliferation and security risk as they can be used for the production of nuclear weapons and other explosive devices.
 - C. HEU minimisation can make an important contribution to international non-proliferation and disarmament objectives, while also promoting the peaceful uses of nuclear energy and technology.
 - D. The symposium underlined that efforts towards HEU minimisation should not and need not curtail the inalienable right to use nuclear energy and technology for peaceful purposes as enshrined in the Treaty on the Non-Proliferation of Nuclear Weapons.
 - E. While many national policies favour HEU minimisation, a number of participants expressed the view that the international consideration of minimisation should be linked to broader goals for non-proliferation, disarmament and peaceful use of nuclear energy and technology. Other participants emphasised the urgency of HEU minimisation in the civilian sector and called for practical steps to be taken without delay.
 - F. While outside the scope of the symposium, it was noted that the largest quantities of HEU are currently in military uses and remain outside international safeguards. Some noted that down-blending military excess HEU from weapons programmes could make an important contribution to ongoing non-proliferation and disarmament efforts.
 - G. Some participants noted that civilian HEU stocks in many countries are under IAEA safeguards and expressed the view that such safeguards, including the Additional Protocol, contribute to the physical security. Others cited uneven levels of security and argued that IAEA safeguards do not adequately address concerns about theft and other malicious acts.
 - H. Some participants noted the security risks posed by plutonium and other high-risk materials, and expressed the view that use of these materials should be discussed further by the international community.

- I. Several participants called for further improvement of the safety, security and physical protection of existing stocks of HEU, and underlined the importance of HEU management practices. Participants agreed on the need for the continuous improvement of relevant IAEA safety standards. They also took note of proposals to develop international non-binding guidelines relevant to the management of HEU in the civilian sector.
- J. Many participants agreed on the importance of technological developments for facilitating HEU minimisation. Particular emphasis was placed on international collaboration, both for high density fuel development and qualification efforts, and for shared facilities offering the experimental set-up in question.
- K. The production of medical and other isotopes using LEU targets should to the extent possible be encouraged, taking into account technical and economic considerations. The IAEA contribution in this regard was noted.
- L. It was noted that an increasing number of countries, on a voluntary basis, favour the conversion from HEU to LEU in civilian applications. Participants underlined the need for a non-discriminatory approach, taking into account technological, economic and commercial constraints.
- M. It was furthermore noted that national and international, governmental and non-governmental initiatives, such as the Reduced Enrichment for Research and Test Reactors (RERTR) programme, to promote and facilitate conversion from HEU to LEU in the civilian sector are achieving important results. In some cases, however, considerable financial and technical challenges remain.
- N. The importance of financial and technological support was underlined by several participants as a prerequisite to meeting these challenges, and countries in a position to do so were encouraged to provide further assistance. There was also a call for further study of the financial benefits of conversion from HEU to LEU use.
- O. Some participants expressed the view that efforts to minimize and eventually eliminate civilian uses of HEU could not be seen in isolation from a multilateral, non-discriminatory international treaty to ban the production of fissile material for nuclear weapons. It was noted that prompt commencement of negotiations on such a treaty would be essential, and some participants underlined that such negotiations should also address the question of military excess material.
- P. The need for more rapid repatriation, based on contractual agreement, of used and unused HEU fuel to the countries of origin for down-

blending and reuse was emphasized as well. Supplier countries were encouraged to accept such returns.

Q. The positive contribution of the IAEA's role in response to Member States' requests to convert their nuclear facilities was noted and appreciated. Some called for an even more active and stronger role by the Agency in this regard.

7. Although there was no desire to pre-judge any international deliberations, the expectation was expressed that the question of HEU minimisation could be explored further in relevant international fora, including the IAEA.

Annex 1: On the Minimisation of Highly Enriched Uranium (HEU) in the Civilian Sector – Workshop Report

**On the Minimisation of Highly Enriched Uranium (HEU)
in the Civilian Sector**
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Workshop Report

Professor José Goldemberg (chair)
International Panel on Fissile Materials

More than 25 years ago, it was clearly realised that the widespread use of HEU in research reactors and other nuclear uses poses significant proliferation risks. This realisation led to the decision, taken by 59 countries, which participated in the International Fuel Cycle Evaluation, to agree that:

“Effective measures can and should be taken to minimise the danger of nuclear weapons without jeopardising energy supplies or the development of nuclear energy for peaceful purposes.”

This decision meant, basically, that enrichment levels in nuclear reactors be reduced to 20% or less. The urgency to act on the decision above was heightened more recently by concern about the threat of nuclear terrorism. It is felt that reducing this threat is consistent with broader international action on the Fissile Material Cut-Off Treaty (FMCT), effective implementation of resolutions of the Security Council, and the fulfilment of the objectives of the Nonproliferation Treaty, which will eventually lead to the elimination of all nuclear weapons in a fair and equitable fashion.

The task of the technical workshop was to update information on the minimisation of HEU in civilian use, and particularly review:

- The current status of HEU in civilian use
- Where can LEU successfully replace HEU today, and
- How can the production and use of HEU be further reduced in the future.

In the last two days, we have discussed a wide range of technical issues related to reduction and the eventual elimination of HEU use in the civilian sector. More than 100 experts from 41 countries participated in these discussions. As chairman of the meeting, I cannot be expected to summarize in detail what was discussed, debated and clarified, and I will only try to give my own impression of the main points raised.

1. Generally speaking, conversion of research reactors to the use of LEU fuel can be accomplished without significant loss of capability. Fuel change to LEU without further modifications may result in 5-10% decrease in neutron flux and corresponding experiment performance. Neutron flux can be optimized through core configuration, fuel assembly design, size of the core, and experimental positions. Experience has shown that an LEU configuration acceptable to operators can be found which has no significant decrease in fuel cycle and experiment performance. Substantial capabilities related to successful conversion, analysis and planning have been developed in many countries. Of the research reactors in existence 43 were converted from HEU to LEU and 43 more can be converted with available technology, and only a small number of facilities may require the continued use of HEU for a period of time.
2. Successful conversion of research reactors and accelerator-driven systems in Belarus, Canada, Chile, the Czech Republic, Ghana, the Netherlands, Romania, and South Africa were presented. Experience in designing new reactors for use in Argentina and Australia were also presented. The U.S. is committed to convert all of its domestic research reactors to LEU by 2014.
3. Special importance should be given to the high density fuel development and qualification effort, based on strong international collaboration, and recognizing that this effort is in a promising path to successfully develop and qualify the fuels necessary to convert those reactors for which conversion is presently not feasible.
4. Efforts by Argentina, Australia, and Indonesia to develop the use of LEU for radioisotope production were discussed. The conversion of radioisotope production, specifically ^{99}Mo , to LEU is technically feasible, and that remaining obstacles to conversion of this activity are chiefly of commercial nature. However, for countries starting new programs of isotope production, important advantages of using LEU targets were noted.
5. There is room for innovative technologies that could expedite minimizing the use of HEU. There is clearly a role for more physical security measures in a number of countries to protect installations that use HEU or have been decommissioned.
6. Finally, the technical workshop recognized the important role played by the International Atomic Energy Agency in international efforts regarding HEU minimization and elimination as well as the achievement of the Reduced Enrichment for Research and Test Reactors (RERTR) program, and urged the IAEA to continue to support the efforts for HEU minimization and eventual elimination.