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English - Or. English

**NUCLEAR ENERGY AGENCY
COMMITTEE ON RADIATION PROTECTION AND PUBLIC HEALTH**

Information System on Occupational Exposure

**ISOE EXPERT GROUP ON WATER CHEMISTRY AND SOURCE-TERM MANAGEMENT
(ISOE-EGWC).**

Terms of Reference

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Background

ISOE provides a forum for radiation protection professionals from nuclear electricity utilities and national regulatory authorities worldwide to share dose management information and operational experience to improve the optimisation of worker radiological protection at nuclear power plants. The ISOE programme, with its participating utilities and regulatory authorities, is a key organisation in developing safe, sustainable and socially acceptable strategies for emerging issues in the field of occupational radiation protection (RP).

At its meeting in November 2010, ISOE Management Board discussed a new proposal, suggested by the ISOE Chair-elect and supported by the ISOE Bureau. There are many approaches to water chemistry in PWRs and BWRs with very various results and consequences in terms of radiation protection performance. As such, it was suggested that radiation protection (RP) aspects of primary system water chemistry and source-term management should be discussed by an ISOE ad-hoc expert group on water chemistry. The Group could address the experience of various ISOE utilities with various water chemistry regimes to see if experience exchange could help to improve radiation protection performances. Members of the Management Board also noted that water chemistry should not be viewed only from the context of radiation protection issues, but also from the context of operational and safety issues, and it was proposed to be grouped into a few of the most commonly used water chemistry approaches (e.g. zinc injection, pH control, iron injection, hydrogen water chemistry, etc.) to focus the exchange of experience discussions. For each approaches, it is expected to identify how RP benefits are evaluated with a focus on measurement techniques such as CZT gamma spectroscopy.

The ISOE Management Board welcomed the proposal and decided that the WGDA should take the lead in managing the work of this group. The Management Board also agreed that the ISOE Technical Centres should participate actively in the Group's work, and that the Group should discuss its work with the CRPPH EGOE as appropriate to build on its experience. It was noted that this activity would benefit from a broad ISOE participation to ensure that the final product would be cohesive and valuable. Thus, it was requested that a call for nominations be sent by the Secretariat to the full Management Board. Following this direction, a call for nominations to the newly established ad-hoc Expert Group on RP aspects of primary system water chemistry and source-term management was sent to the ISOE membership in January 2011.

Terms of Reference

The objective of the ad-hoc Expert Group on Radiation Protection Aspects of Primary Water Chemistry and Source-Term Management (EGWC) is to develop a report on radiation protection aspects of primary water chemistry and source-term management, in order to reflect the current state of knowledge, technology and experience on radiation protection issues directly related with radiation protection.

Under the Working Group on Data Analysis (WGDA), the EGWC will undertake a review and analysis of current knowledge, technology and experience, and produce a summary report. The outcome of the work will be a new ISOE publication on RP aspects of primary water chemistry and source-term management that will find broad use within the NPP radiation protection community. The EGWC will undertake its work by:

- collecting information and practical experience available in the nuclear industry on addressing operational aspects of primary water chemistry and source-term management of nuclear reactors with special emphasis on effects on the management of occupational exposures,
- identifying factors and aspects which play key roles in achieving good practices in water chemistry management (knowledge, experience, technology, regulatory requirements and guidance, worker involvement, information exchange and networking, etc) and analysing and quantifying their impact on worker doses and operational costs,
- submitting a report, including possible recommendations for further work, to the ISOE Management Board for approval, and to the CRPPH.

Related NEA developed reports will serve as the starting point in the group's work. It is expected that the group will need 3 to 4 meetings to accomplish its tasks.

Products and Timeline

- By June 2011: First meeting of the EGWC to identify topics of interest, and develop methodologies for completing its work (and if possible, a feedback of this first meeting outcomes to the WGDA in May 2010)
- November 2011: Presentation of a draft report for ISOE Management Board and WGDA comment
- May 2012: Progress report to WGDA
- November 2012: Approval of final report by ISOE Management Board

ANNEX 1

Expert Group on Water Chemistry and Source-term Management

Working program - Draft

The objective of this document is to describe what is expected from the ISOE-EGWC. It is expected to provide this document together with the terms of reference of the expert group to all ISOE national coordinators.

The expert group is expected to discuss the following topics:

1. Description of strategies and techniques aiming to limit the level of activity in the primary coolant - prevention of contamination -;
2. Description of strategies and techniques for the decrease of activity in the primary coolant or circuit decontamination - remediation of contamination -;
3. Performance indicators to assess results from the above strategies and techniques: measurement techniques and performance assessment - monitoring -;
4. Management of iodine, xenon and alpha risks.

A particular care will be paid to the collaboration between the different actors involved in the management of source term: operation, chemistry and radiation protection.

Prevention of contamination

It is expected from utilities representatives participating to the EGWC to provide description of the way they manage their source term so as to prevent (limit) contamination of the primary coolant (pH, Zn injection, steam generator materials, radio-chemical spec. for operation, etc.) and the driving factors that lead to their current approach (cost, radiation protection, safety, etc.). These elements will be debated and discussed within the expert group.

Supporting documents such as operational guidelines and procedures (spec., etc.) will be welcome. Benefits as well as drawback of the different strategies will be identified.

Remediation

If a contamination (general or localized) is observed, what techniques are used, what procedures are followed so as to move back to normal conditions? What indicators are used to identify a contamination that must be dealt with?

Performance indicators

Various measurement techniques (for instance CZT gamma spectroscopy measurement devices) and indicators (dose rate at some key points in the reactor building, collective dose, etc.) may be used so as to assess results of prevention strategies or remediation actions over time. It is expected to get an overview of these key elements within this topic.

Deliverables

- Report for the ISOE network.
- Synthesis for utilities (RP, operation and chemistry Departments).