Reflection Group on **"The need for (and character of) a transdisciplinary knowledge base for nuclear safety and radiological protection"**

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Content

Rationale

The EC 7FP Project TRASNUSAFE[1] Description of Work states in its introduction that

[…] Nuclear Safety Culture is the result of a continuous effort and commitment to keep high safety standards at all steps of design, construction, operation and dismantling of nuclear installations, including transport of fuel, waste, and other radioactive materials like medical radio-isotopes. It includes the requirement to match the ALARA goals of the radiological protection of the persons. Nuclear safety culture is based on knowledge and understanding, research, experience feedback, training and communication, management commitment and assessments […]

With this description in mind, two reflections can be made with respect to the knowledge base for nuclear safety & radiological protection culture:

[1] The need to resolve a democratic deficit with regard to the justification of risk-inherent technologies such as nuclear.

In reflecting on nuclear safety culture and its relation to radiological protection, two principle contexts need to be distinguished: the occupational context of radiological protection on the one hand and the broader societal context of human and environmental protection against adverse effects of nuclear technology applications on the other hand. While in terms of the technical knowledge base, there are obviously many similarities between the two contexts, their normative reference base is essentially different. Occupational safety requires an enabling regulatory framework designed for a justified practice. On the other hand, the question what would be a responsible safety culture towards society is essentially an element of an inclusive exercise that starts from a deliberation on the justification of the nuclear technology application as such. In other words: *the intention to maintain and further enhance nuclear safety is a necessary but insufficient condition for the societal justification of (the risk of) nuclear technology applications*. Responsible nuclear safety culture is thus only a part of 'good governance' of risk-inherent technological applications, as nuclear safety culture can never include its own justification. One can observe that existing regulations and recommendations with regard to nuclear safety and radiological protection 'struggle' with (or even tend to deny) this 'democratic deficit' with regard to justification.

Citizens have a stronger sense for democratic justice than for technological risk. In other words: the risk is a lesser problem than the fact that they have no say in the justification of that risk. In addition, an exercise in 'joint justification' of a risk is much more (and actually something different) than 'receiving correct information' on that risk. No party can alone produce this correct information – it needs to be generated jointly as a first step in inclusive decision making. This obviously doesn't mean

[1] The objective of this EC FP7 project is to design, develop and test two relevant training schemes on Nuclear Safety Culture within a European environment, based on a specific evaluation of the training needs.
See http://www.enen-assoc.org/en/training/for-nuclear-community/efts-fp7/trasnusafe-fp7.html

that participation in decision making on this justification would logically lead to acceptance of that risk. A deliberation process that is organised along the criteria of ‘better knowledge generation’ (see [2]) would either lead to ‘better acceptance’ or ‘better rejection’ of the risk-inherent technology application. In this, ‘better’ refers to better awareness of the consequences of acceptance or rejection and thus also to more trust (or actually real trust) in the decision taken. Societal trust needs to be generated by the method of decision making, not by a one-sided explanation and defence of a decision taken. This brings us to the second reflection.

[2] The need for ‘better knowledge generation’ in the interest of good governance of risk-inherent technologies.

The assessment of benefits and burdens of risk inherent technology applications in a societal context typically needs to take into account expert and lay peoples opinions and beliefs that cannot always lean on rational evidence or factual knowledge. How ‘good’ or responsible these assessments may be, there will always remain factors beyond full control (time, natural events, human behaviour), which makes that in the end justification of risk inherent practices such as nuclear electricity production or geological disposal of radioactive waste will have to rely on opinions that can be ‘deliberate-political’ but never purely ‘rational-scientific’. Therefore, as a part of 'responsible knowledge generation' in the interest of good governance of these technology applications, it is of key importance to generate insight into scientific uncertainties, system complexities and the rationale behind the different normative standpoints related to the justification of risk-related practices. In this perspective, one may agree that this process of responsible knowledge generation is as much a key element of nuclear safety and radiological protection cultures as the development and proper use of advanced technology, robust and transparent regulation and adequate human resources management. This reasoning is applicable for as well the energy-related as the medical context of nuclear technology applications.

Taking into account the above thoughts, one could say that ‘better knowledge generation’ in the interest of good governance of risk-inherent technologies is twofold:

(a) the development of a transdisciplinary and holistic view on ‘the issues at stake’ by the ‘initiating actors’;
(b) the development of a deliberate societally-responsible position wrt the justification of the application of the envisaged risk-inherent technology by also involving the (potentially) ‘affected actors’ from the start of the deliberation process (that is: from first conception phase).

The dynamic of (a) should be initiated and maintained by the research institutes and the relevant academic sectors, and facilitated (financial and methodological) by the political. The bridge between (a) and (b) needs to be made by the political (by organising an inclusive and transparent science-policy interface) and (b) should be moderated by the political. Only in this way, the democratic deficit with regard to justification (described in [1]) can be effectively and fairly overcome, which means that only in this way a society can take full responsibility for the decisions taken. The question of how to practically organise this ‘double’ deliberative democracy (deliberative in both policy supportive knowledge generation and subsequent decision making) is relevant but may not be used to question the normative vantage point as such (this question of the practical feasibility of deliberative democracy is still used in many political settings as an excuse to maintain the comfort zone of ‘technocratic’ decision making in close relationships between authorities and the private sector) .

► Implications for the meaning of a ‘responsible nuclear safety / radiological protection culture’

Based on these reflections, in a somewhat straightforward way, one could say that a 'reasonable' nuclear safety / radiological protection culture needs 'to look inside' in order to better understand the ‘limits’ of a responsible occupational radiological protection approach in the context of societal justification on the one hand, and 'to look outside' in order to embed itself in a responsible way in the broader context of governance of nuclear technology applications on the other hand. In this sense, a responsible nuclear safety / radiological protection culture also serves as a bridge between the occupational context and the broader societal context.

Aim and approach of the reflection group

The reflection group aims to review these thoughts in terms of how they would affect both radiological protection and nuclear safety culture. The discussion is proposed to be organised according to the following scheme:

Part 1 - introduction

Introductory presentation commenting the rationale of the reflection group
[Done by: Gaston Meskens, with the possibility of direct interventions by the participants]

Followed by a discussion on the relevance of the two 'postulates' that form the rationale of this reflection group, namely '*the need to resolve a democratic deficit with regard to the justification of risk-inherent technologies such as nuclear*' and '*the need for 'better knowledge generation' in the interest of good governance of risk-inherent technologies*'.
[Done by: all participants]

Part 2 – setting the scene

This part discusses the relevant contexts of application. A guiding question in this sense is: *to what extent should an assessment of the above phrased postulates make a distinction between the energy-related and the medical context?*
[Done by: all participants]

Part 3 – review of the normative reference base

This part aims to review and discuss existing frameworks that aim to provide normative reference for nuclear safety and radiological protection. The objective of this part is to assess to what extent existing regulations, recommendations and guidelines respond to the needs formulated in [1] and [2]. In order to keep the discussion focused (taking into account the limited time), the reflection group will briefly discuss the character of the IAEA, EC and ICRP recommendations and of the IRPA guidelines in this sense. In addition, attention shall be given to the role and the applicability of the Aarhus convention[2] (and of its translation into European Directives and national legislation). Given the broad character of the topic and the variety of aspects meaningful in both the energy and the medical context, the conclusions of this part cannot go beyond the formulation of general considerations on the character of these regulations, recommendations and guidelines.
[Done by: all participants]

Part 4 – discussing the relevance and content of a transdisciplinary nuclear technology assessment course module

The final aim of the reflection group is to discuss the relevance and content of a course module that would provide future course participants with broader and deeper insights into the normative reference base and scientific methods of nuclear technology assessment (NTA). The discussion will rely on the reflections made in part 1, 2 and 3 and also take into account the fact that NTA integrates aspects of safety with economic, ecological and (other) social considerations. The character of the envisaged course would (1) help course participants to better understand the place of safety culture and its occupational aspects in a broader societal context and (2) stimulate their critical sense with regard to the normative base for the societal justification of risk-inherent technologies, taking into account social, cultural, political and ethical aspects. Therefore, next to inquiring into what can and cannot be done by science, an important part of the course module would consist of an interactive critical review and analysis of existing regulations and recommendations for safety culture, environmental protection and technological risk governance in general.
[Done by: all participants]

[2] Aarhus Convention: Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters. See http://www.unece.org/env/pp/.

Practical organisation

This document is intended to facilitate dialogue and is thus neither meant to direct the discussion towards a specific conclusion or to limit the possibilities to introduce other elements, views and/or approaches in the discussion.

The reflection group meeting shall be held with those participants from the EUTERP workshop who replied positively to our invitation (see list below) and will be introduced and moderated by Gaston Meskens (SCK•CEN). The timing of the meeting is from 2 to 4 pm on Wednesday 30 March 2011. The location of the meeting room will be communicated during the EUTERP workshop.

A synthesis report of the discussions will be sent to the participants for review and approval afterwards. This synthesis report will serve as a deliverable of the TRASNUSAFE project and will thus be available for wider distribution after completion of the project.

To facilitate a comprehensive but in-depth synthesis of the reflection group discussions, the meeting will be audio-recorded. These recordings will only be used to make the synthesis report and will be destroyed afterwards. The recordings will be transcripted, but these transcripts will not be published, not in the context of the TRASNUSAFE project and neither on any other future occasion (although the participants can receive a copy on request for personal use). If however participants would have objections to the recording, they are invited to let us know before the start of the meeting. Audio recordings will only be made if all participants agree in principle.

List of participants (as of 23 March 2011)

Name	Organisation	Country
Dr. Thomas Berkvens	SCK•CEN	Belgium
Dr. Stelios Christofides	Nicosia General Hospital	Cyprus
Dr. Michèle Coeck	SCK•CEN	Belgium
Mr. Pascal Crouail	CEPN	France
Dr. Peter De Regge	European Nuclear Education Network Association	France
Ir. Folkert Draaisma	Nuclear Research and consultancy Group	Netherlands
Dr. Antonio Falcao	ITN	Portugal
Mrs. Eva Godske Friberg	Norwegian Radiation Protection Authority	Norway
Ir. Dadastone Ipoma N'Kanga	Institut National de Recherche	Congo
Dr. Swen-Gunnar Jahn	Swiss Federal Nuclear Safety Inspectorate ENSI	Switzerland
Mrs. Sanja Krajinovic	Ruder Boskovic Institute	Croatia
Mrs. Ryoko Kusumi	European Nuclear Education Network Association	France
Mr. Gaston Meskens	SCK•CEN	Belgium
Mr. Richard Paynter	Health Protection Agency	United Kingdom
Mrs. Annemarie Schmitt-Hannig	Bundesamt für Strahlenschutz	Germany
Prof. Marcel Schouwenburg	Delft University of Technology	Netherlands
Mrs. Jurate Vaicekaviciute	Radiation Protection Centre	Lithuania