Chapter 7
Ethics and Governance of Nuclear Technology:
The Case of the Long Term Management of Radioactive Wastes

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ABSTRACT

Radioactive waste, remaining radioactive for very long periods up to hundreds of thousands years, introduces a new time dimension never experimented in the field of risk management. This situation led for more than 10 years, to reflections on the societal and organisational mechanisms for the development of protection systems, able to cope with those periods. Within the framework of the European research project COWAM 2, dedicated to the improvement of governance of radioactive waste management in Europe, a panel of stakeholders involving experts, authorities, waste managers, locally elected representatives and NGOs, opened a dialogue on the ethical considerations related to the long-term dimensions of this management. This article presents the main results of this panel, with specific emphasis on the meaning of the long term and what is at stake, the ethical dimension regarding long term issues, and the continuity and sustainability of the vigilance and surveillance of radioactive waste facilities.

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INTRODUCTION

Due to the half-life of some radionuclides, their chemical nature and concentration, radioactive waste introduces a temporal dimension that has never been experienced so far in existing risk management. According to the waste, time scales of the order of thousands or even millions of years have to be considered. In order to identify management devices adapted to this situation, discussions were initiated over ten years on societal issues associated with radioactive waste management (NEA/OECD, 2010[1]; Hériard Dubreuil et al., 2007[2]; Lavelle, 2006[3]; ICRP, 2012[4]). These reflections have particularly highlighted the issue of the transfer of radioactive waste management system to the next and future generations. These rules concern not only the transfer of protective devices but also the means to ensure the continuity of vigilance and surveillance over the long term.

In the framework of the European Commission research project "COWAM2" (COmmunity WAste Management[5]) related to the governance of radioactive waste management, the ethical considerations associated with its long-term dimension have been addressed, in a dedicated panel of stakeholders, involving experts, authorities, waste managers, locally elected representatives and NGOs. This panel opened a dialogue to identify, discuss and analyse the institutional, ethical, economic and legal considerations raised by the long-term management of radioactive waste (Schneider et al., 2006[6]). Its aim was to identify a set of practical recommendations in order to better address long-term issues in decision-making processes.

This article presents the results of the work performed during this 3-year project, with specific emphasis on:

- **What is at Stake with Long-Term Dimensions?:** Focussing on the meaning of "long-term" from technical and societal points of view.
- **Ethical Considerations Regarding Long-Term Issues for Radioactive Waste Management:** Addressing the rights and duties of current and future generations, long term responsibility, democracy and justice.
- **Continuity and Sustainability of Vigilance and Surveillance:** Providing recommendations related to the memory and knowledge conservation and transfer, the local and regional economic development, the distribution of responsibilities between territories and generations, as well as the efficiency of financial schemes.

WHAT IS AT STAKE WITH LONG-TERM DIMENSIONS?

There is not "a unique" definition of the long-term and it is essential to first delineate what is at stake in terms of time dimension when dealing with long term governance. Regarding radioactive waste management, two long-term perspectives have to be considered: a technical perspective and a societal perspective. This section points out the key issues associated with these two perspectives and identifies the main features for the long-term governance.

Long-Term Dimensions from a Technical Point of View

The use of radioactive materials in any activity generates radioactive waste. In the case of the nuclear fuel cycle, part of the radioactive waste remains radioactive for very long periods up to hundreds of thousands years. Because the wastes concentrate the radioactivity, they are dangerous and need to be dealt with care to avoid or reduce as much as possible the risks for human and the environment. People would be affected by direct external exposure to the radioactive waste if they are standing in the vicinity of the wastes, and by