
A TRANSDISCIPLINARY APPROACH TO EDUCATION AND TRAINING IN RADIOLOGICAL PROTECTION AND NUCLEAR ENGINEERING

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This paper aims at developing an argumentation for an approach to education and training in radiological protection (RP) and nuclear engineering that is broader than the ‘classical’ acquiring of factual knowledge related to physics and regulation. As for most other areas where applications of a technology are connected to a certain risk, the complexity of applications of radioactivity and nuclear technology has generally technical as well as social dimensions.

As well the nuclear worker as the policy maker, or any other person working within an application field of ionising radiation, could face situations requiring action where, apparently, the available factual knowledge does not lead unambiguously to a way forward that is ‘justified enough’ in relation to the potential risk. And if the solution *would* be justified for him/her, it could be that others involved have different opinions. Having this in mind, it is clear that education and training in RP - seen as a continuous learning process - should elaborate on as well the socio-technical complexity of ‘risk assessment’ as on the conditions and methodologies to ‘find a way out’.

Rather than dwelling on methodologies for the organisation of this ‘broader’ education and training, this paper will analyse elements of complex problem solving and make a link to ethical aspects in order to found the argumentation for this broader approach. We will highlight how the key ideas related to complex problem solving have been translated already in specific methodologies in socio-political science and epistemology.

Based on the philosophical reasoning and on the related (existing) methodologies, we will then argue that the theory and practice of RP could and should develop as a systematic and interactive practice of a diversity of disciplines and skills, and that RP, in this sense, has the potential to serve as a key example of a transdisciplinary interaction of science with society.

The paper then looks at the specific issue of justification and optimisation in the field of applications of low level ionising radiation, and sheds the light on a new approach to optimisation and on some challenges within the scientific community and the broader society.

It will conclude with some examples of the application of the outlined transdisciplinary approach as developed by the Belgian Nuclear Research Centre SCK•CEN.