
NUCLEAR SAFETY BASED ON NUCLEAR KNOWLEDGE – A ROMANIAN APPROACH

^a S. C. Valeca, ^b D. Popescu

^a Pitești University, Romania

^b Nuclear Agency, Romania

E-mail address of main author: serban.valeca@kranz.ro

The recognized “father” of the nuclear field, the scientist A. Einstein inherited us with a CONTRADICTION. On one hand he was the supporter of researches in the nuclear field, but on the other hand, when he saw the first devastating results of the atomic explosions he suddenly became a fervent opponent. In such conditions, the nuclear field made its first step in the conscience of humanity. Unfortunately it was a left first step. For this reason and also because of the nuclear incidents passed over the history of the field and due to yet unclear strategies regarding the final disposal of radioactive waste, a part of public opinion “embraced” the concept “NIMBY – Not In My Back Yard”. At present and for the future we have to fight against this concept in order to transform it in PIMY – Please In My Yard”. As a consequence, alongside numerous activities well-known by the specialists in the field, regulated and authorized by the regulatory body in the nuclear field, associated programmes for the CONTINUOUS qualification and education of human resources are needed.

The Concept of Nuclear Security covers all the activities resulted from the nuclear fuel cycle. Taking into consideration the international experience in this field in our country’s case, these activities were estimated for periods of approximately 70 years, as following:

- 10 years: the characterization and selection of the site, the design, construction and the commission of a nuclear power plant;
- 40 years: the operation, maintenance and modernization of a nuclear power plant;
- 20 years: the preservation for the decommissioning and the decommissioning of the nuclear power plant.

In all these stages until present Romania based a lot on the indigene component regarding the activities of research & development, design, construction – assembling, exploitation and maintenance (both for NPP Unit 1 and Unit 2, where this component was approximately of 50%).

In such conditions, it was needed the elaboration of a National Nuclear Programme (PNN), strategically document approved by the Governmental Decision no. 1259/2002 which contains the fundamental objectives and the derivatives objectives and also the associated strategies for accomplishing these objectives. The strategic document was published in the Romanian Official Journal in order to be near at hand for the public and increase the debate and acceptance of the nuclear field. The National Nuclear Programme contains an associated plan of actions with responsibilities and terms of achievement for the activities which fall into the responsibility of public central administration institutions representing “the owner”, into the responsibility of the national companies representing “the utility” and into the responsibility of nuclear units themselves representing “the operator”.

All these above mentioned activities need a source of labour, human resources, qualified and specialised both on the research & development, design and exploitation component and the execution equipment, construction – assembling, exploitation and maintenance component.

The qualification and the specialization of these types of human resources enforced the identification and the definition of associated programmes for the qualification of the staff starting from high schools and universities. Related to this education programme, the same strategic document nominates in an explicit manner 4 Romanian universities which have to take into consideration educational programmes in the nuclear field:

- Polytechnic University – Bucharest;
- Pitești University;
- Faculty of Physics within University of Bucharest;
- Ovidiu University – Constanța.

Within the education framework of these universities are taking place lectures, seminars, workshops and also master and doctorate courses. These types of qualifications were selected based on 3 primordial criteria:

- The competence of the teaching staff;
- The geographical location nearside nuclear units/important Romanian research centers;
- The possibility of training stages within these units/centers.

In this manner “the source” of human resources working now and in the future in the nuclear field is easy accessible and the continuity is assured. In this context it must be mentioned that were developed university educational programmes for young people wishing to work in the nuclear field and also post graduating programmes addressed to improve knowledge in the nuclear field for the personnel which is already working in the nuclear field in the design, execution equipments, construction – assembling, exploitation and maintenance activities.

We have to take into consideration the fact that the migration of qualified human resources and the average level of age of the personnel involved in the nuclear field are considerably high. These 2 factors are representing aspects with which are confronted all the actors in the nuclear field, at an international level, including Romania. For these reasons, the Romanian PNN defines the strategy through which the education process must take into account these problems starting early, from the high school level.

Concluding, attracting and developing human resources at a national level, needed in all stages of promotion, design, construction and exploitation of the investments in the nuclear field remains a challenge for the nuclear community in general but also for the decision-making factors at a governmental level, the industry and especially for the academic level. This challenge involves the existence of 4 strategic directions:

- A legislative package needed for the promotion and the development of nuclear field;
- A knowledge data base in the nuclear field;
- Qualified human resources, capable to work within different types of activities in the nuclear field; and
- The transfer of knowledge to future generations.