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Investigation on Human Resources Needs and Competences Building for ALFRED Implementation in Romania

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ALFRED is the demonstrator of Lead Fast Reactor (LFR) technology. According to strategic documents (at national level and of FALCON international consortium), it is planned to be built on Mioveni nuclear platform. An experimental infrastructure consisting of six experimental facilities (ATHENA, HELENA2, ELF, ChemLab, HandsON, Meltin'Pot) and a coordination Hub is planned to be built on the same site in support of the licensing process and technology development.

The development of the LFR technology faces various challenges including: (1) Research and Development (R&D) open issues (such as development and behaviour of the structural and cladding materials, the control of lead and cover gas chemistry, development of the instrumentation and control, fuel and fuel cycle, deterministic and probabilistic analyses, thermal-hydraulics for large pool configuration of molten lead, etc.) and (2) the novelty of the qualification, demonstration, validation and verification process for the ALFRED demonstrator. An appreciable number of high qualified personnel is estimated to perform the envisaged activities. In this context, the human resources including the competences building process are considered as crucial factors for the success of the implementation.

Considering the complexity of the scientific activities, the high degree of specialization and the existing offer of the workforce market, an education and training program is essential. Update/adaptation of the existing curricula in the education programme of the Romanian universities is needed, and can be achieved for example by new specializations/courses devoted to Generation IV systems (with a focus on LFR technology), a dedicated internship programme in European or worldwide experimental facilities, specialised/dedicated/thematic workshops, summer schools on simulation and experimental activities, etc.

This paper presents the outcomes of the investigation on human resources needs for ALFRED implementation in Romania, developed in the framework of Romanian PRO ALFRED project. The jobs estimation has been accounted for the ALFRED infrastructure R&D activities, operation and realization of the specific activities for each experimental facility and for the Hub, as well as for the safe operation of the ALFRED demonstrator. Around 600 jobs have been identified for the operation of ALFRED demonstrator and its support infrastructure, as well as for the R&D related activities. For each identified job, the specializations and the minimal competencies have been established.

To see how the existing Romanian educational programs cover the minimal competences required by ALFRED infrastructure, an expert judgement evaluation has been performed in University of Pitesti and University Politehnica of Bucharest.

Country/Int. organization

Romania

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