



2018-IPR-G-000-010805

Sealing system automation

Position for:

Trainee

As the science and knowledge service of the Commission, the mission of Joint Research Centre is to support EU policies with independent evidence throughout the whole policy cycle.

The JRC is located in 5 Member States (Belgium, Germany, Italy, the Netherlands and Spain). Further information is available at: <http://www.jrc.ec.europa.eu>

Short description of activity:

The trainee position is available at the Nuclear Security Unit. The unit focus is on state of the art enabling research, the use of specific technology, development of instruments and methods, delivering technical services and training in the domain of nuclear safeguards, non-proliferation and nuclear security. In this way, the unit supports the verification of international treaties and agreements related to nuclear safeguards and non-proliferation.

The Nuclear Security Unit develops Sealing and Identification Techniques for nuclear safeguards, especially underwater and dry storage casks.

In this field of application, there is an urgent need for sealing system that can be installed and possibly removed by an operator without the physical presence of nuclear inspectors.

The Seal Team is developing a special bolt-seal designed for nuclear spent fuel transport casks. To ensure that a cask is correctly sealed by the operator and not opened during transport, the sealing system will combine mechanical seals, electronic seals and remote monitoring equipment.

This project proposal focuses on the development of a special 10 -doors cabinet, each closet containing a seal for the cask. The cabinet should be equipped with electronics that monitors its integrity, the door state, the

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| | <p>state of the seals contained in each closet.</p> <p>The scope of the traineeship will be the collaboration to the design of a system based on a single board computer (e.g. Raspberry, Linux, QT) to control a cabinet with multiple closets (actuation of locks, signaling LEDs, anti-tamper features etc.) and the communication over RS485 with electronic seals, that may also eventually require firmware upgrades (C language, MSP430 microcontrollers). It is foreseen the design of an extension board for the single board computer that will include all the required interfaces (KiCad design and layout). A board prototype will be manufactured and tested, and the relevant software developed.</p> <p>The trainee will be part of a small team of specialists and will be guided through the various aspects of the project.</p> <p><u>Qualifications:</u></p> <p><u>Essential:</u></p> <ul style="list-style-type: none">• University studies: BSc in electronic engineering or equivalent.• Knowledge of electronic circuitry and its design and analog/digital electronics• Software programming (C/C++ and/or C#)• Good knowledge of English language (B2 level) <p><u>Advantage:</u></p> <ul style="list-style-type: none">• <i>Experience on sensor data acquisition</i>• <i>Experience on control of actuators</i>• <i>Microcontroller and/or ARM boards programming.</i> <p><u>For general eligibility requirements, please read the rules governing the traineeship scheme of the JRC:</u></p> <p>https://ec.europa.eu/jrc/en/working-with-us/jobs/temporary-positions/jrc-trainees</p> |
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| Unit /Directorate | Unit G.II.7 – Nuclear Security Directorate G – Nuclear Safety and Security Further information: https://ec.europa.eu/jrc/en/research-topic/nuclear-safeguards-and-security |
| Indicative duration | 5 months |
| JRC Site | Ispra |
| Country | Italy |
| <u>JRC contact details</u> | For any technical problems with your application, please contact: HR-AMC8-RECRUITMENT-TOOLS-SUPPORT@ec.europa.eu |