EUROPEAN COMMISSION
DIRECTORATE-GENERAL HUMAN RESOURCES AND SECURITY
Directorate HR.AMC –Account management Centre
HR.DDG. AMC 8

2018-IPR-G-000-9866 **Dispenser for Operator Applied Seals**

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 state of the seals contained in each closet. A display should also allow the operator to input

	codes to open a specific closet. The seal extracted from the cabinet should be installed in a specific time-frame and the seal distance from the cabinet should not exceed a maximum allowed. All the monitoring data should be collected and sent to the inspector HQ in a secure way. The main part of electronic design and development consists in the electro-mechanical control of the closets, the sensor data collection for tamper detection of the cabinet, the data communication with the electronic seal. The main computing board would probably be some arm-based board, like Raspberry-Pi. The electronic design would mainly focus on an extension board for such system to connect to sensors and actuators and to a serial communication channel to the electronic seals. The extension board will be designed, manufactured and tested with software developed for the computing board. The trainee will be part of a small team of specialists and will be guided through the various aspects of the project. The planned contributions of the trainee are suitable for presentation as a thesis project at MSc level. **Qualifications:** Essential: • 3rd or 4th year university student in engineering (in this case the thesis has to be registered, and the subject has to match with the project itself); • Knowledge of electronic circuitry and its design and analog/digital electronics; • Some experience on sensor data acquisition and control of actuators; • Experience with microcontroller programming, C/C++ programming; • Good knowledge of English language (B2 level). **For general eligibility requirements, please read the rules governing the traineeship scheme of the JRC:** https://ec.europa.eu/jrc/en/working-with-us/jobs/temporary-positions/jrc-trainees

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 **Preferred starting date**	5 months As soon as possible
JRC Site **Country**	Ispra Italy
JRC contact details	**For any technical problems with your application, please contact:** HR-AMC8-RECRUITMENT-TOOLS-SUPPORT@ec.europa.eu