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P3.191 Method of determination and optimisation of the control parameters for an LPCE process

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The hydrogen isotopes separation plants have special requests related to safety operation and avoidance of radiological fluid leakage and explosion conditions. For the LPCE, part of the ICSI Rm.Valcea “Experimental Pilot Plant for Tritium and Deuterium Separation”, the process transformation from a laboratory setup into a semi-industrial plant, as well as migration from a local control to an automatically controlled process involves complex activities. The objective of these activities is to identify the functions and sub-functions that must be performed by the equipment configuration in order to satisfy the requirements for operating in safety conditions. That involves monitoring and acquisition of the process parameters, complex parameter control, as well as specific calculation for each control loop from the plant, according to the process requirements (temperatures, flows, pressures). The system developed and described in the present paper is based on a SCADA (Supervisory Control and Data Acquisition) platform which contains: network communication, PLCs (Programmable Logic Controller) and HMI (Human Machine Interface). The control of process parameters has been done using the functions from the embedded programmable code of the PLC's which allows to have independent or combinations of PID components: proportional/integrator/derivative. Choosing the right control scheme and tuning PID loops corrects behavior of the system, improves the performance and leads to a safe operation of the LPCE process.

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