## Mechatronics and Systems Integration 2020 Q1 report

### Achievements

* Substantial progress has been made in the development of generic electronics for internal SE controls, not covered by other standard platforms. This work is essential for developing tools and structures to provide efficient support for SE. A PLC crate have been designed and built with a modular approach allowing different IO modules to be used depending on application (including availability of the MC&A standard for motion control based on the same platform).
* Together ICS, MESI and NPI partners have initiated the development of high resolution high accuracy timestamping, meeting ESS requirements, for the NPI stress/strain rig project. The ESS SES work is coordinated by SE-PREMP.
* After finalizing the SINE2020 part of the SECoP project MESI have focused on providing a demonstration of the ESS implementation, improve the project structure and also to further define the interfaces. The implementation, now named Octopy, allows configuring and presenting a SES as a SECoP device through a GUI or CLI. Basic integration of a waterbath over TCP/IP as well as simulators over EPICS, TCP/IP and Beckhoff have been demonstrated. Efforts have also been made to align it and make it compatible with SES controls in general.
* Together with stakeholders an agreement on a way forward for SECoP at ESS have been met. As the next step a selected SES will be integrated and run with and without SECoP to allow an objective evaluation of advantages/disadvantages.
* Two new mobile SES racks are being assembled at YMIR in Utgård. The two systems will contain various SE equipment suitable for control system development and testing. Plug and Play, Network mobility, calibration/configuration handling are some of the functionalities that can be better developed with availability to these systems. Continuous access to such systems are essential in the development process.

### Challenges

* To ensure a stable communication between the Beckhoff PLC system and the ESS SECoP implementation Octopy.
* Work with ICS WP12 to ensure full compatibility between Octopy and EPICS.
* Maintaining seamless migration of control system infrastructure and services for the SE team as SE team moves to site.