Contribution ID: **10** Type: **Oral**

From Engineering to Alignment: how functional geometrical requirements on equipment are handled and transferred into installation drawings

Abstract

The European Spallation Source (ESS) is a joint European organisation committed to building and operating the world's leading facility for research using neutrons. Under construction since 2014 on the outskirts of Lund -Sweden, ESS project is now going through an intense installation period of all equipment part of the 600 m long proton linear accelerator, 6m wide and high cylindrical target systems and 15 neutron scattering detectors. From a dimensioning perspective, the ESS Survey Alignment and Metrology Section has been part of the larger effort across ESS to ensure a correct and unambiguous expression of the functional requirements into functional drawings and specifications. This was made possible after deploying at all levels of the organization, ISO Geometrical Product Specification standards. Benefits of these efforts have immediately shown up during the following manufacturing phase but also mostly for geometrical validation and acceptance of equipment. Additionally, an innovative strategy based on the transversal use of situation features (plane, straight line and point) for both geodetic and geometric datums has been implemented in order to unable and maintain the traceability from functional needs into installation drawings, so crucial for the surveying and alignment team. This direct connection "from Engineering to Alignment"is detailed.

Keywords: Geometrical Product Specification, Functional drawing, Verification drawing, Installation drawing, Engineering to Alignment.

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Session Classification: Session 8 - Surveying Concepts and Strategies I

Track Classification: Surveying Concepts and Strategies