

In-Kind Visit DoC @ Elettra on October 14-15, 2019

Dates: 14-15 October, 2019

Location: Elettra, Trieste, Italy - Room 82

Chairman: Alesandro Fabris

Attendees:

ESS	M. Zambelli	R. Fabris
	C. Darve	R. Laghi
	M. Skafar	C. Pasotti
INFN	P. Mereu	R. Visintini
Elettra	A. Fabris	N. Guidi
	D. Castronovo	M. Peloi
	M. Ferianis	R. Pugliese

Agenda : October 14-15

October 14, 2019

14:00-14:15 Welcome and Introduction of Participants
 14:15-15:45 Short Review of ESS Project Status (M. Zambelli)
 Short Review of Elettra In-Kind Contributions to ESS (A. Fabris)
 Quality Issues at ESS (M. Skafar)
 Open Discussion
 15:45-16:00 *Coffee Break*
 16:00-17:30 Visit to Elettra/FERMI facilities and Labs
 20:00-21:30 *Dinner at "Antica Ghiacceretta", Via dei Fornelli 2, Trieste*

October 15, 2019

09:00-10:45 Status Presentations of IK Contributions (D. Castronovo, R. Fabris, M. Ferianis, C. Pasotti, R. Visintini)
 Open discussion
 10:45-11:00 *Coffee Break*
 11:00-12:30 Management System and Certification at Elettra (Roberto Pugliese)
 Open discussion
 12:30-13:30 *Lunch*
 13:30-14:00 Wrap-up
 14:00 End of Meeting

Minutes

1 Welcome (Alessandro Fabris)

Alessandro Fabris opened the meeting by welcoming everybody, this followed by a tour the table were everybody presented themselves. The participants were mainly from ESS and Elettra with the exception of Paulo Mereu from INFN.

2 Short Review of ESS Project Status (M. Zambelli)

MZ gave a brief introduction to the current situation regarding ESS project status in the context of In-Kind Contributions. Accelerator installation proceeds well, with the Ion Source and LEBT commissioned, the MEBT and the RFQ are now installed in the tunnel. All LWU integrating Elettra magnets are being delivered from STFC.

MZ introduced the new ESS organization with its Project management Team composed of the Director General and the Project and Technical Directors. The ESS Work-Unit leaders interfacing with Elettra Work Package leaders (contacts) are still located in the Technical Directorate. An In-Kind Project coordinator has been added in the Project Directorate to follow-up on IK schedule milestones. The In-Kind Group is located in the Strategy Directorate.

The evolution from conceptual toward implementation phase, drives the in-kind group to further Support technical tasks like the delivery of quality documentation in collaboration with the ESS Quality Division. Christine Darve will be supporting this interface to ease the tasks of the In-Kind contributors. Quality Division, led by Mattias Skafar, is still responsible for defining the ESS needs. ESS focus is on delivering first science in 2023.

3 Short Review of Elettra In-Kind Contributions to ESS (A. Fabris)

AF gave a presentation on Elettra IK contribution status to ESS.

Elettra was founded in 1987 and is composed of a 3rd generation storage ring, FEL, FERMI.

At a glance, Italy is a founding member of the ESS with a total contribution of 110.189 MEuro., 80% IK. The Ministry of Education, University and Research (MIUR) agrees with 3 institutions (Trilateral agreement): INFN (ESS Representing Italy entity in ESS), CNR (National Research Council) and Elettra. The two trilateral agreements are INFN+Elettra+ESS and INFN+CNR+ESS.

The organization of Elettra activities are mapped into Five Accelerator system technical annexes: AIK 2.1 (Magnets for ESS linac); AIK 7.4 (Beam Diagnostics- Wire Acquisition System for the ESS linac); AIK 17.2 (Power Converters for Magnets to the ESS linac); AIK 17.7 (Spoke RF Power Station); AIK 17.8 (Spoke RF Power Station Installation, Testing and Commissioning). These Elettra WPs were later covered in more detail by the given WP leader.

4 Quality Issues at ESS (M. Skafar)

MS presented some slides used at the latest Accelerator Technical Board meeting, which took place in Lund on . The slides covered Quality issues and explained ESS expectation on IKC and how these expectations are to be met. MS described that Quality needs to be Planned, performed and demonstrated in order to give assurance to ESS and its stakeholders. MS further described that prior to shipment of IKC the related documentation needs to be reviewed and approved by the IK contributors and sent to ESS for review of completeness and compliance. When this is performed the order to ship will be issued.

The second part of the presentation dealt with CE marking and how it relates to Intellectual properties (IP). In October, the discussion around the impact of component CE-marked w.r.t. IP ownership, was extensively discussed, without conclusion.

If the IK contributor issues the CE-mark, then the Technical File related to the component is the IP of IK contributor. In this case, it is the IK contributor who is the Manufacturer with full responsibility of the component and intellectual property ownership.

→ Action item:

1. Check the IP ownership w.r.t CE marking performed by ESS or by the In-Kind contributor.

5 WU2.1_Linac Magnet – Definition (Davide Castronovo)

DC summarized the history and progress for the correctors, quadrupoles, and dipoles magnets to be produced by Elettra. Danfysik produced Q5, Q6, Q7, C5 and C7 and SigmaPhi produced D1, Q8 and C8. The magnetic measurements are performed at Elettra. The Elettra test stand was designed and implemented with CERN lessons-learned (incl. magnet design). The FAT and SAT have been completed in collaboration with ESS WP leader (Edgar), after Danfysik delivery, magnetic measurements at Elettra (not for SigmaPhi magnets) and integration at STFC-Daresbury. Procedure manual for opening/closing magnets has been issued. Test is now on-going at ESS TS3 with the Power Converter. The visit of Elettra test stand permitted to witness the magnetic measurement process. Magnetic background is monitored. Maximum temperature measured is less than 30 degrees C.

→ Action item:

2. Check choice of materials w.r.t. ESS radiation hardness ESS-0063691, e.g. cooling plastic tube (araldite F, epoxy, etc). Get MSDS from IKC (Material Safety Data Sheet; called SDS since 2017).

6 WU2.1_Linac Magnet - Manufacture verification (Riccardo Fabris)

Elettra Quality plan was received by Edgar (ESS WP leader) and presented at the CDR.

The call-for-tender process was summarized by RF, from the construction, verification quality plans to the construction and test report. Magnetic test requirements were very conservative (e.g. 10U would be acceptable, but the ESS requirement is 2U).

Non-conformities are tracked, and reported to ESS WP and stored in CHESS system. Verification of the lamination 1/10,000 pieces, 10 first used for benchmarking.

→ Action item:

3. Check Interface requirements and the capacity for purging the magnet cooling systems.

7 WU7.4 - Wire Scanner Acquisition (and more) (Mario Ferianis)

MF recalled the SoW (ES-0044053) (2016). The Optical and Analogue front Ends were described. The use of EPICS was an interesting challenge to Elettra. Technical documentation has been exchanged with ESS Quality division, with minor comments from Maurice Looft (post meeting information).

MF underlined the good human relationship/spirit with the ESS team (Clement, Cyrille, Slava and Tom). A Skype technical meeting takes place every 2 weeks, with MoM.

Test time of CERN Linac4 (2017 for AFE and BE) and in Julich (2019, OFE) has been very valuable for the deliverable validation. Each circuit board has been tested after assembly.

8 WU17.7 - Spoke RF Power Station (Cristina Pasotti)

CP described the RF Tetrodes (26 amplifiers) to be provided for the Spoke cryomodules, with emphasizes on safety and regulations. Hazard are being identified, risks reduced and residual risk signaled. The tender was completed and influenced by technical requirement (>80%).

Legislative and technical documents are being prepared with specific emphasis on Quality and compliance with EU standards. The EU Directives are being systematically checked and analysed. Visits to the contractor with ESS representative permit to secure the documentation quality. Tests were performed at Thales but not certified by an accredited body.

The operating and repair manuals, the user guides are being defined along the safety expectation and the technical requirements for the ESS operations. Ingress protections are also included in the RFPS design.

All documentation will be provided in order to complete the Declaration of Conformity (DoC). Meaning that all tests will be conducted but no third body inspection is foreseen, due to the escalation of the cost (based on PC project process).

The poor performance of the Tetrodes operating in Uppsala are worrisome, 3,000hr (DB Science station), 600 hr (Electrosys station), and have to be considered with the Uppsala test condition environment. Still the dedicated test is being conducted and the reliability study should be available in the coming 2 months.

9 WU17.2 – Power Converters for Magnets to the ESS Linac (Roberto Visintini)

RV summarized the status of the LWU magnet power converters (133 Quad 50V/200A); 144 Correctors (+/-20V/+/-20A), 1 dipole (100V/400A) and 6 Quad (50V/400A).

Elettra Quality assurance includes the full documentation, ISO 9001:2008, etc.

The CE certification process (A2720) is undergoing.

There are two separated output for the electronics (UPS compatibility). Test, SAT, to be conducted at ESS on week 44 (incl. TDK-Lambda). There are 4 interlocks (Temperature switches).

→ Action item:

4. Check why no LPS logging.

10 Elettra Process - CE marking (Marco Peloi)

MP is the Head of the Elettra Industrial Liaison Office. He presented the CE Marking process followed by Elettra. For more than 25 years Elettra have been developing and applying know-how, toward commercialization of scientific instrumentation. Diverse and numerous hardware procured to worldwide research institutes and company were listed.

If 1) those components were Manufactured/Tested by an external supplier, then the CE mark is in the responsibility of external supplier; if 2) they are manufactured by external supplier And tested by Elettra, then the CE Mark is the responsibility of Elettra.

11 Management System and certifications at Elettra (Nicoletta Guidi and Roberto Pugliese)

Since 2009, Elettra has run projects following the ISO 9001 certification, ISO 29990 certification and the BS OHSAS 18001 and their update.

The technology infrastructure support, called VUO (Virtual Unified Office), manages and reports most aspects of Elettra daily administration operation and quality management information. VUO gather functions as diverse as our ESS HR data base (Unit 4 – Business World) and our CHESS.

Visit to Elettra/FERMI facilities and Labs: see pictures at: [link](https://photos.google.com/share/AF1QipNTDES85LmtHuueXJbJTwQ_WexcBxH66oMthmq_sPQIIIRdFNFPmwXm7iq2l5x77dRg?key=cXNCWnNmZmtObDAxQzJnM3M5ZEZrVVZIRF9uRHVn)
(https://photos.google.com/share/AF1QipNTDES85LmtHuueXJbJTwQ_WexcBxH66oMthmq_sPQIIIRdFNFPmwXm7iq2l5x77dRg?key=cXNCWnNmZmtObDAxQzJnM3M5ZEZrVVZIRF9uRHVn)

Action Items list

→ Action item 1:

1. Check the IP ownership w.r.t CE marking performed by ESS or by the In-Kind contributor.

The following is a clarification of how the ESS stands regarding CE marking and intellectual property (IP) rights.

All products used within the EEA (European Economic Area) are in one way or another covered by some kind of Union legislation, usually meaning that it needs to be CE-marked according to one or more directives.

The ESS default approach for all equipment is that it shall comply with all Union legislation within the EU and that the IK collaborator shall function as the manufacturer and CE-mark the equipment (in case CE-marking is required by the legislation). This means that the IK Collaborator shall put the CE-mark on the equipment, issue a declaration of conformity (DoC) and provide a user instruction as minimum according to applicable directives.

The directives also require that the manufacturer draw up a technical documentation. The technical documentation shall contain all relevant information (e.g. risk assessments, drawings, calculations, etc.) needed to show that the product meets the essential requirements of the applicable directives. As default the ESS require access to the technical documentation to ensure that maintenance can be done in a correct way. However, if the IK collaborator is the manufacturer, this technical documentation is his property including the IP rights and the ESS may not distribute information in the technical documentation to any third party without written permission from the concerned IK collaborator.

For equipment that shall not be CE-marked the relevant technical documentation must be handed over to the ESS to be incorporated into the final technical documentation for final assembly of equipment. The ESS will then become the manufacturer of this final assembly meaning that, the ESS shall comply with the requirements laid down by the applicable directives and then CE-mark the assembly (as a product) and issue a declaration of conformity (DoC).

The ESS will also be responsible for ensuring that a technical documentation is available to the national market surveillance authorities in the country where the ESS is located, i.e. Sweden. Since the ESS is the manufacturer this might affect the IP rights, these must then be aggregated upon in a separate appendix to the general agreement.

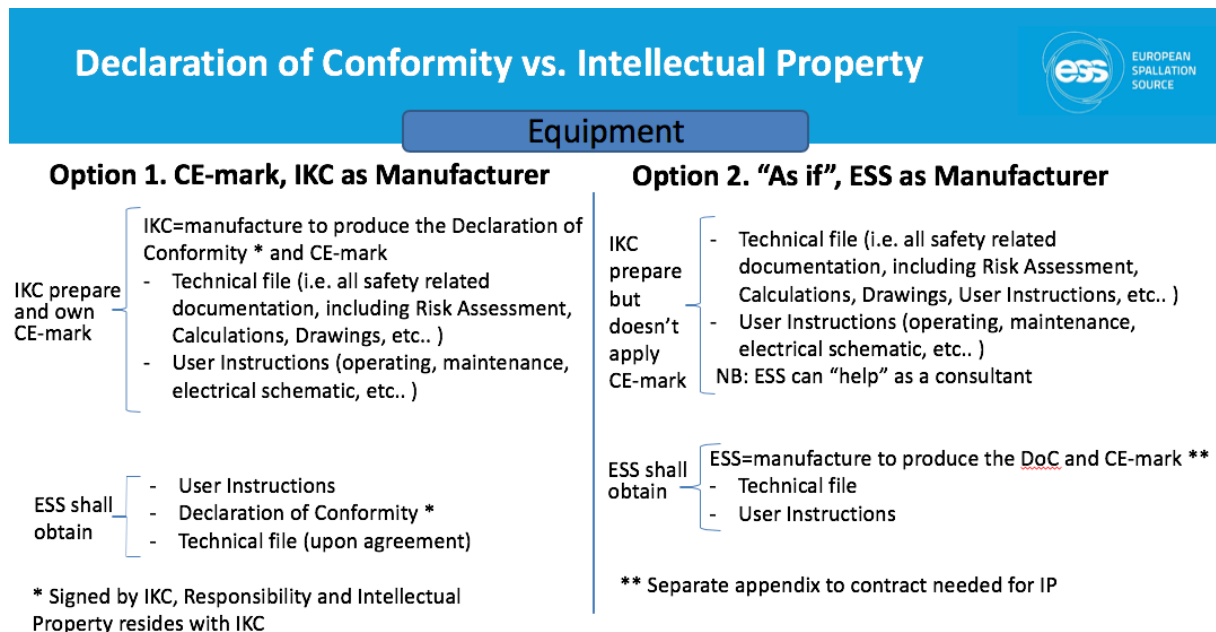
In the event that the equipment shall be CE-marked but the IK collaborator does not intend to CE-mark it, the same applies as above. The information needed to be compiled in the technical documentation shall be handed over by the IK collaborator to the ESS. This technical documentation will then become the ESS's responsibility and property.

If this affects the IP rights, these must also in this case be aggregated upon in a separate appendix to the general agreement.

It should also be clarified that the equipment should not be CE-marked until those parts of the equipment that have an impact on the essential requirement (safety related) of the applicable directives is fully constructed. That means that, if it is still in the design phase when delivered

to the ESS and that phase is intended to be completed on site at the ESS, the CE-marking shall not be done until this phase is completed. This usually means that when performing Site Acceptance Test (SAT) and those parts related to the essential requirements of directives are found to be ok, it is possible to CE-mark the equipment.

Figure 1 shows an explanation.



Actions On-going :

→ Action item 2:

Check choice of materials w.r.t. ESS radiation hardness ESS-0063691, e.g. cooling plastic tube (araldite F, epoxy, etc). Get MSDS from IKC (Material Safety Data Sheet; called SDS since 2017).

→ Action item 3:

Check Interface requirements and the capacity for purging the magnet cooling systems.

→ Action item 4:

Check why no LPS logging.