

# FAIR Commissioning & Control Working Group

Notes from the meeting held on May 18<sup>th</sup>, 2016

e-mail distribution: [FAIR-C2WG-ALL at GSI.de](mailto:FAIR-C2WG-ALL@GSI.de), [participants list](#)

## Agenda:

- Experiences with UNILAC Recommissioning & Operator Training in 2016 – Lessons for FAIR Operation in 2018 ([jump below](#)), Stephan Reimann

### 1. Experiences with UNILAC Recommissioning & Operator Training in 2016 – Lessons for FAIR Operation in 2018, Stephan Reimann

The motivation, preparation and realisation of Operator Training in 2016 were presented (see [slides](#)). At the end the conclusion for FAIR commissioning were drawn.

The operator's training is a legal requirement and implies a periodical hands-on training. The goal for 2016 was to allow less experienced operators to practise machine setup under the supervision of the more experienced colleagues, while also fostering better sharing of knowledge amongst the operating crew. The last hands-on training has been performed in 2012. Because of the long period without training and new, less experienced members joining the department, it was decided to organize a formal training in 2016. An additional goal of the training was to prepare the documentation describing machine setup procedures for the UNILAC.

A small working group of 6 persons was created to prepare the training period, mostly consisting of shift leaders that rarely meet (due to scheduling) during the same shifts. This group tried to identify the most important requirements and to prepare an efficient training plan. In addition, the whole operator crew was asked to send their training demands, although very few individual preferences were submitted. The most common request coming from operators was to be trained "to setup the whole beam chain".

Nine shifts between April 22<sup>nd</sup> and 24<sup>th</sup> were allocated for the training at the UNILAC. Two sources and two target beam-lines were available during this time. A similar period using SIS-18 as a training platform has been cancelled due to technical problems with the machine in 2016.

UNILAC has been divided into 7 logical sections: PIG source, EZR source (HLI), HIS (with gas stripper section), Alvarez, single-resonators, M-beam-line and X-beam-line. Separate documents describing the setup of each section have been prepared. Each shift was composed of an experienced shift supervisor, one person responsible for the documentation and between 2 to 4 trainees. The trainees were asked to set up the machine alone, guided by the shift supervisor and following the documentation, which was updated during the exercise

The training was evaluated as excellent by the operators. The resulting documentation is rather

average quality and needs further work. It is clear that similar training periods shall be organized regularly in the future. The situation will become very complex when the new FAIR machines will become online. It is suggested that the shift leaders will be strongly involved in the commissioning of the new machines and in preparation of the operational procedures.

### **Discussion:**

*S. Reimann: it is planned to initially revise the developed set-up procedures together with the machine experts and then to put them onto the FC<sup>2</sup>WG wiki page: <https://fair-wiki.gsi.de/FC2WG/BeamCommissioning/WebHome>*

*R. Bär: What about troubleshooting? Was there any training w.r.t. recovering from machine failures? Trouble shooting guide-style documentation?*

*S. Reimann: It was discussed but at the end no such situations were trained.*

*R. Steinhagen: At CERN the discussion and remedies of first-order issues (“things that could go wrong”) were part of the nominal commissioning procedure. Proved to be useful to anticipate common/simple problems and mistakes.*

*R. Bär: Maybe it should be considered for the future.*

*R. Bär: Is there equipment not used in consoles?*

*P. Gerhard: 95% is used, maybe there are too many cable terminals not in use. Maybe too many cameras.*

*R. Bär: One should evaluate the 'used' vs. the 'need' case of such devices.*

*J. Stadlmann: For SIS-18 there are not enough screens, there are overlapping applications. It is also too flexible, some monitoring applications should be always on the same console.*

*M. Schwickert: Every shift leader has his preferences concerning the layout of controls, so flexibility is needed. Some applications had too many options in the past. There seems to be no “democratic” way of how to organise this.*

*R. Steinhagen: We should check what we will still need in the new HKR.*

*J. Fitzek: It is necessary to converge about applications and options needed in the future.*

*S. Reimann: Need somebody to “bring it together”. Volunteered to collect the opinions.*

*R. Steinhagen: The written procedures are important to judge which applications are needed (+ priorities). There are several options, the challenge is to find an efficient solution that works for FAIR as a whole. The aim is to initially collect all requirements and opinions from all stake-holders: operators, machine experts, machine coordinators, equipment experts, experiments, etc. FC<sup>2</sup>WG mandate is to provide the platform to collect, discuss and coordinate these various requirements on commissioning, operation and controls integration.*

S. Reimann: Agreed. There are several good options, but experience with present operation showed also bad solutions (i.e. not working during day-to-day operation). S. Reimann offered to aggregate and filter the various ideas and opinions coming from an operations point of view.

J. Stadlmann: Fixed displays needed since long time: losses around the machine and transmission plots.

R. Steinhagen: Agreed. The list of priority w.r.t. beam-based applications is already available on the FC<sup>2</sup>WG page: <https://fair-wiki.gsi.de/FC2WG/BeamBasedApplications> The beam transmission monitoring (BTM) is already assigned 'top 1' priority.

R. Bär and R. Steinhagen: In 2018 the new transmission monitoring system should be online. A prototype application has been already written as a proof-of-concept.

P. Schütt: There was already a system like that – Java GUI from Cosylab.

R. Bär: Yes, but based on obsolete services. Cannot be ported to new control environment.

J. Stadlmann: It is offline most of the time. A reliable system is needed. We have OP applications but fixed displays are needed.

R. Steinhagen: 'Page 1' is needed as a facility status overview. A discussion about what and how to present it needed.

P. Schütt: 'Page 1' needs to be carefully designed. It will be even more important when we have more machines. We even have a physical screen in the HKR foreseen for that purpose.

J. Fitzek: Achim and Christian should be included in 'Page 1' discussion as they have some ideas and worked on this topic in the past.

D. Severin: Back to OP training: what is the minimal duration?

S. Reimann: 1-2 shifts per person.

P. Gerhard: 1 shift per UNILAC segment. Maybe training could be on parts of the injectors not used for experiments? (parallel training).

D. Severin: How to organize the training in 2018? One block at the beginning or spread it during the operation (beginning of each new beam)?

R. Steinhagen: 2018 will start with complex commissioning (LSA), can be partially used as training.

S. Reimann: Commissioning should not be mixed with training. A lot of unexpected events can happen during commissioning which disrupts training.

D. Severin: Maybe a concept of mini-training every time there is a new beam setup is good?

R. Steinhagen. SIS-100 commissioning – no manpower for 24/7 commissioning. Maybe need to mix commissioning with physics operation (with reduced performance) and possibly operator training? Also the nominal intensity ramp-up will provide some training and early physics tests opportunities (e.g. detector calibration). The FAIR commissioning, notably the Dry-Runs, will start with some

*systems as early as September 2017.*

*D. Severin: the physics community gained due to the operator training session and could quickly establish nominal beam for the experiments. The intensity ramp-up is also useful from a physics experiment point of view to set-up their experiments.*

*All: Plan for 2018 should be discussed; a plan B in case of delay should be ready.*

Reported by J. Fitzek, M. Sapinski, R. J. Steinhagen