

## Updates for DREAM instrument (October 2024)

*The following report describes the major activities of the instrument project since the last STAP meeting in April 2024.*

### **Recruitments**

Florence Porcher has been recruited as Lead scientist for DREAM as of October 2024. She remains associated researcher with CEA/LLB.

The recruitment of a commissioning scientist for DREAM with Uppsala University is ongoing, first interviews are scheduled week 41. The position will be permanent with employment at Uppsala University.

The recruitment of the Operation Instrument Engineer for DREAM is also ongoing. An offer has been sent to one candidate. The position is a time-limited, 3-years contract.

### **Schedule update**

The current planning assumes a complete installation of DREAM components (Final TG5) by March 2025, which is still before the current beam-on-target (BOT) date estimates (Oct. 2025).

### **Utilities**

The DREAM instrument is part of the Common Utility Project (CUP) and Common Electrical Project (CEP) led by ESS which deliver gases, water and electrical supplies to experimental caves and control hutches.

CUP project is almost finished, except the cooling skids to be installed later this year. CEP is also close to the end. Energization of DREAM area main cabinet is expected end October, and all other downstream cabinets shortly after. Energization of the bunker area is expected a little earlier.

The instrument control system (ICS) installation is also almost complete.

The Motion Control cabinets (MCA) were delivered and their installation is scheduled within few weeks.

The vacuum infrastructure is ready.

The PSS CDR was organized at the end of May. The installations inside the cave (cables, lights) and population of the cabinets on the elevated floor has started.



*Figures 1: PSS cabinets on DREAM elevated floor – ICS, Vacuum and Master & Slave Detector racks behind the cave. The surrounding elevated floor is scheduled for November. – The chopper racks in the South bunker area.*

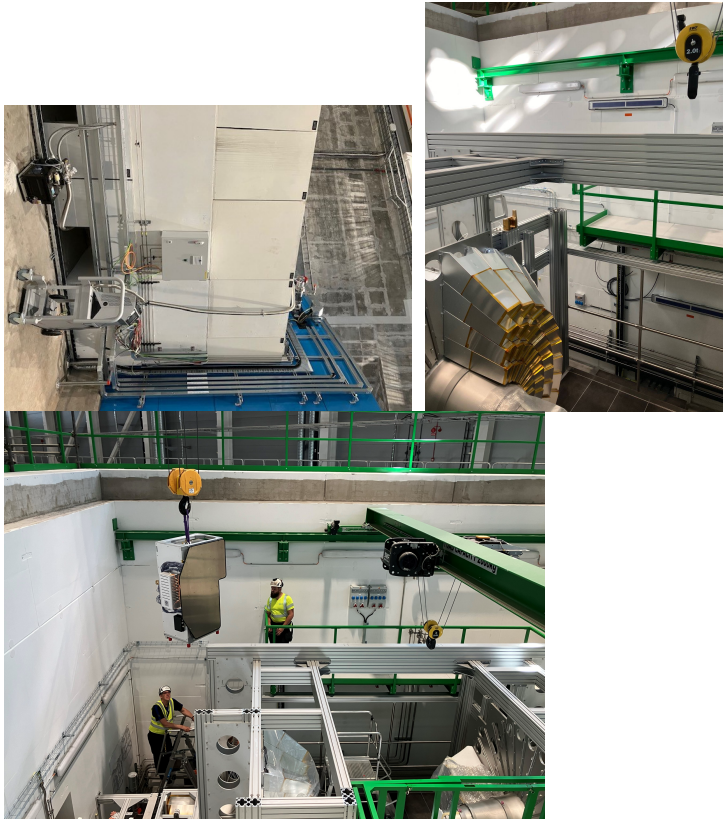
### **Chopper system**

The fast chopper assembly (PSC & OC) has been received from FZJ and installed inside bunker area in September. The vacuum test of fast choppers + band chopper BC section is ongoing, with satisfactory vacuum level reached. SAT for these choppers is scheduled in-November, week 48. T0 chopper, which is also installed inside bunker area, will be tested later on, once its two specific racks are delivered, in December.

### ***Cave area infrastructure***

The cave internal crane and retractable platform and the external elevator will be available again once DREAM main distribution board is energized and after actualized controls & certifications, in November.

The steel covers aimed at protecting lead bricks shielding cave feedthroughs have been manufactured at ESS. The bricks and the feedthroughs covers will be installed soon, before the elevated floor around the detector, ICS and vacuum racks is finalized in November.



*Figures 2: Vacuum test of (PSC–OC–BC) first choppers section ongoing. – Overview of first & second floors of DREAM cave where the PSS “blue lights” are being installed - Craning half of the high resolution backscattering detector module to its final position in the cave.*

### ***Detectors & Beam monitors***

The two endcap and back-scattering HR detectors are installed. The manufacturing and delivery of mantle detector have been delayed and is expected end of November 2024, together with the NanoSANS detector (out of instrument scope).

The neutron beam monitors for the in-bunker area & cave manufactured by CDT have been delivered to ESS in September after tests at ISIS. Installation of the in-bunker monitor shall take place before bunker is closed, in November. In-cave monitor will be installed later, together with the polarizer changer and the upstream optics.

The two detector racks in the cave area are installed, the monitor rack outside bunker area is designed and expected for December.

DREAM CDT Detectors and beam monitors require a constant Ar/CO<sub>2</sub> gas flow during operation, which will be provisioned by premix gas cylinders stored neared the cave. One needs an automated system able to control the output pressure and regulate the gas flow to the detectors and switch between the 2 bundles of gas cylinders before refill. For the moment, only a preliminary design exists for this system. The start of commissioning of the detectors is pending and delayed until the delivery of this gas system.

### ***Sample exposure system & sample environment***

Upstream of the sample, the slits are in place inside the guide and the first (fixed) part of the boron nose inside the conical end. The second part (removable) of the nose is ready and stored at FZJ. The integration of the slits piezo drivers is almost done (ICS/ECDC). The energization of the MCA racks will be needed for subsequent testing. The polarizer part (out of scope) is under manufacturing at FZJ. A call for tender for the DREAM- sample changer cryofurnace was reopened mid-2024. One offer was received but with an unsatisfactory design. Additional information was demanded in September. A standard cryofurnace with V-windows or the capillary sample changer with cryostream developed by ESS sample environment team are possible backup options if the tendering is not successful. The delivery of the used cryofurnaces and furnaces from LLB is still in standby due to administrative reasons.

### ***Hutches & Sample preparation lab.***

Purchase order for the furniture for the Control Room and Data analysis room was sent in September. The furniture is expected to be installed early November, and IT equipment for beamline control shortly after. It is expected that the instrument Control & Data analysis hutch are energized at this time.

### ***Cold commissioning***

The integration of DREAM components (motors, choppers, detector modules...) in EPICS/NICOS is ongoing in parallel with discussions on metadata and data archiving in Nexus files. A first presentation on generic live control and rendering of detector data was presented by ECDC to F. Porcher & C. Durniak on the demonstration beamline YMIR, and is the topic of the new bimonthly DREAM-DMSC-ECDC meetings.

An update on data workflow for DREAM will be presented by C. Durniak during STAP.