

2020 & 2021

NCNR Sample Environment Update

Tanya Dax

Activities Overview



2020 Shutdown

Fall 2020 Cycles

Cross Training

New Magnets Procurement

Other Procurements

New Parts Designs

Managing our Space

Future Projects Summary

Mar – Jun 2020

Initial response to COVID shutdown:

Ensure all SE and lab equipment in safe condition

Shut down anything that isn't needed

Biweekly checks on essential equipment to keep in safe condition

Work From Home Tasks

Manuals editing for lab and SE equipment

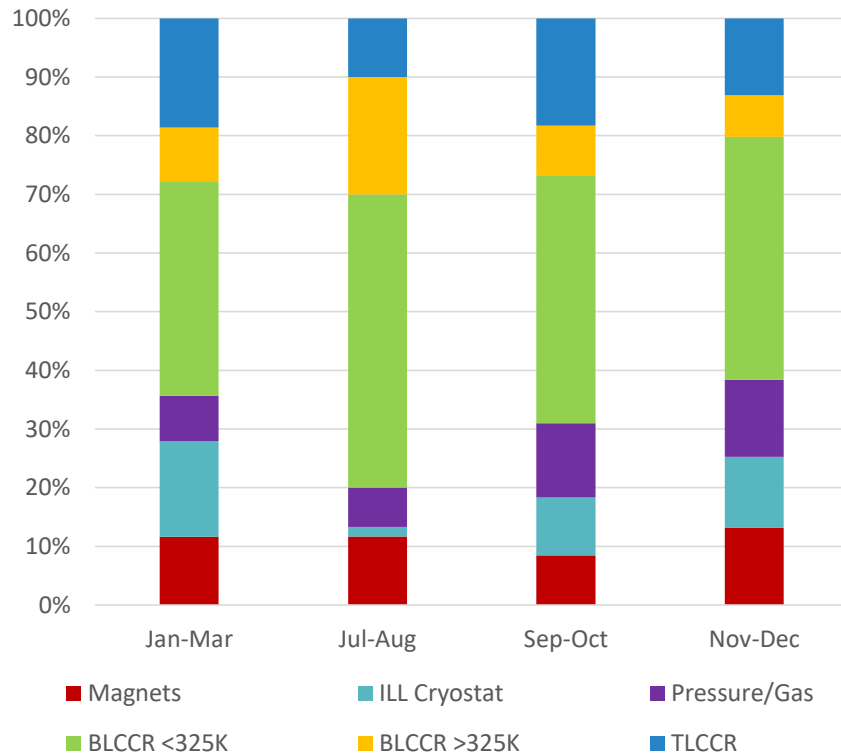
Maintenance tracking app

SE Teams site, Tasks Planner, Sharepoint

Science Group budget meeting

Jul – Dec 2020

SE Equipment Utilization



Preparations

Maintenance of all CCRs
 User Stations fully stocked
 Gasses fully stocked for CCRs and Glove Boxes

Experiment Support

Phone support
 In person – socially distanced
 Cross Training – Full Team Effort!

Equipment Scheduling

No complex equipment or LHe in the July-August cycle
 CCRs were 80% of scheduled equipment in the first Cycle

Sample Tags Redesign

HP and Instrument Scientists input
 Standard and SNM tags

Cross Training

Manuals Testing

11T, 7T, and 10T manuals updates and tests

CCR Maintenance and Beamtime Support

TLCCR + Sticks- Juscelino

BLCCR -Low Temp- Yegor and Donna

BLCCR -High Temp- Alan

Planning and Organizing

Equipment Scheduling - Yegor

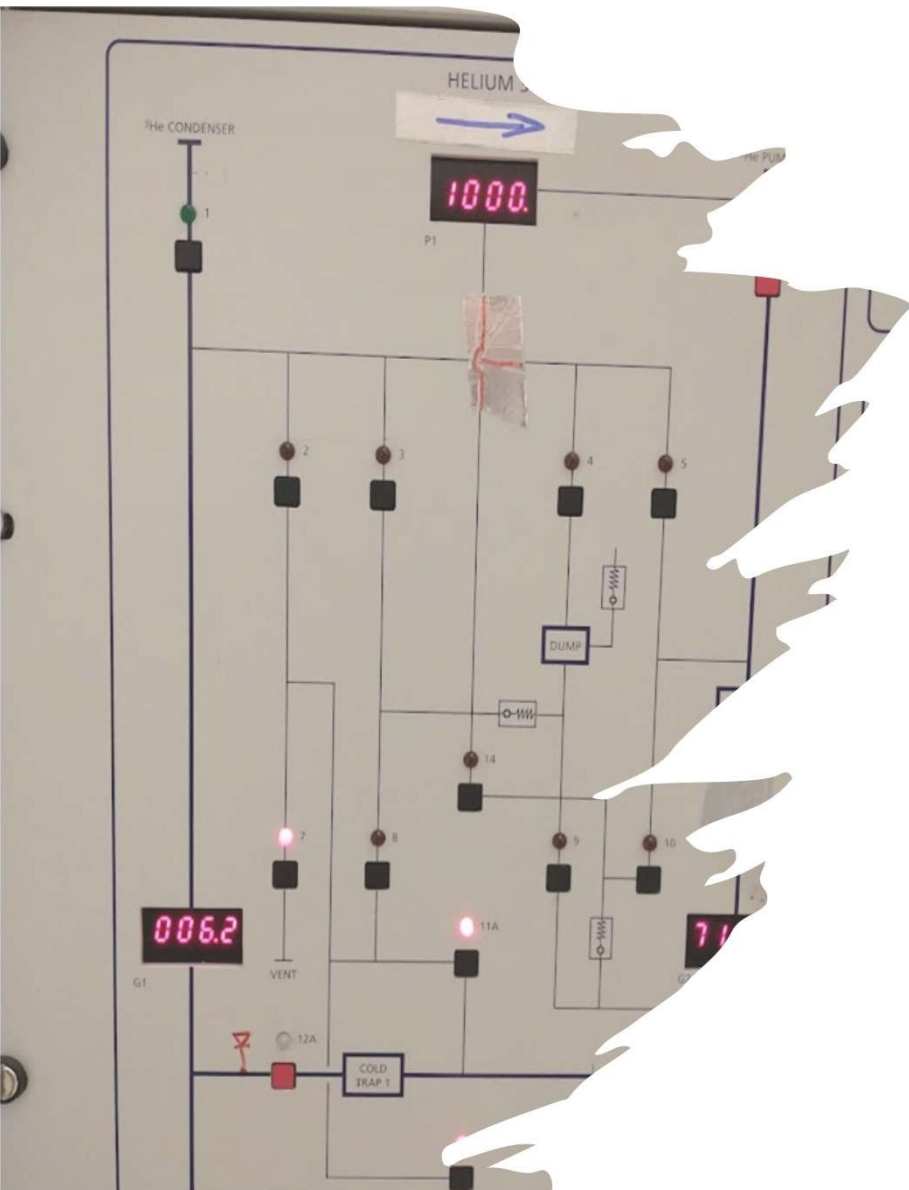
Equipment Maintenance Tracking – Everyone

SE Teams Site and SharePoint - Everyone

Lab Equipment

XRD routine maintenance – Donna

Glove Box Maintenance – Juscelino



7T Dry Magnet Procurement

Helium Loss Mitigation Project

NCNR Ref. 1333ND20PNB610890, Vendor Ref: J4997
Vendor: Cryogenic Limited / Cryogenic US LLC

Awarded 9/29/2020

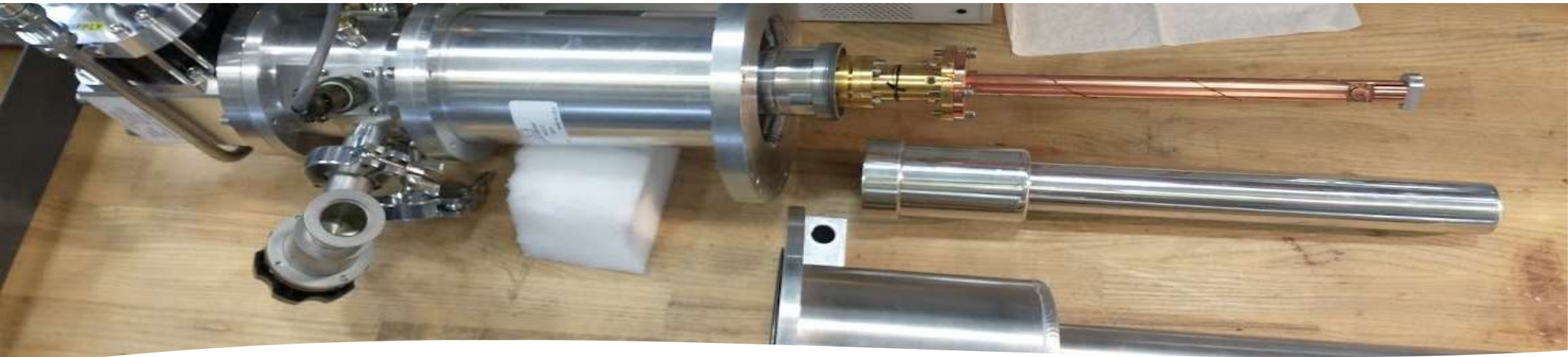
Kickoff Meeting 10/15/2020
Biweekly Meetings in Design Phase
Design review package expected 9/22/21

7T(dry) Cryomagnet

+3He Dipper
+Dil Fridge Insert
+High Temp Stick
+Linear and Rotational Translation of Sample Probes

No Reduction in Capabilities

Must fill all existing requirements of 7T and 10T at
MACS, DCS, all other instruments that currently use 7T or 10T



Other Procurements

CANDOR CCR

New! Purchased in 2019
Delivered October 2020
Accepted with base temp less than 3 Kelvin

Compressor Repairs

SHI CSA-71
Submitted and awarded in 2020
Yegor - shipping and acceptance testing Completed

TLCCR Compressors Replacement

SHI CNA-31- Obsolete
Submitted by Alan
Awarded in 2021

Vanadium sample cans (BT1)

Juscelino/Craig - submitted
Sole Source
Awaiting award

Stock Cans and Accessories

Various standard parts submitted to Colin
Received
Some to be sent for barcoding



Bankcard Purchases

Barcoding

DCS Lids, NSE Ti cells, Standard cans, etc.
2020 batch was stuck at the vendor for a long time, received
Consistency of markings between vendors and standard naming conventions
2021 batches waiting for quotes and purchase order approvals

Helium Flexlines Repairs – Juscelino and Alan

Shipped 8 lines out to H&J, but half were damaged beyond repair
Alan tested the returned lines
Need to purchase more new lines

Glove Box Supplies

ISP Helium cylinders, gloves, filters, regen gas, o-rings, etc.
Keeping them in stock and good condition is a safety requirement

Leak Checker Service - Yegor

“Standard” service of certain equipment under \$10K no longer requires procurements!
Yegor handled the entire quotation, shipping, acceptance process for both leak checkers

CANDOR CCR Cart - Yegor

Designed to hold the new CCR using the typical X-Rail setup for reflectometry magnets
Smaller footprint than existing reflectometry CCRs, and liftable over the CANDOR arm

New Parts Designs

Corrosion Resistant Sample Cans – Titanium Versions

HFBS/NSE versions have been tested and work great
DCS First batch received Aug 2021

HFBS Powder Capacitance Sample Holder

First prototype is untested, was not leak tight

Reflectometry Multi-Sample Holder

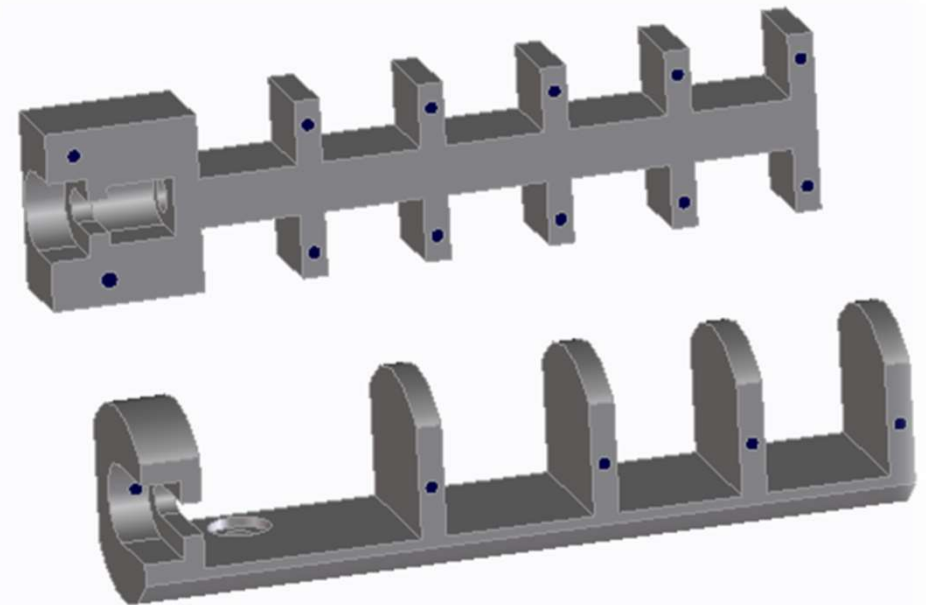
Major change in sample mounting process for reflectometry CCRs
Up to 8 sample positions, vacuum sealed “can”
Design in progress

HFBS/NSE Flat Plate Sample Holder

Clone an existing design - drawing in progress

Boron Shielding of Sample Holders

Various designs in progress
Boron nitride ceramic preferred
Boral sheets (limited supply)



Managing Sample Environment Space

More Equipment

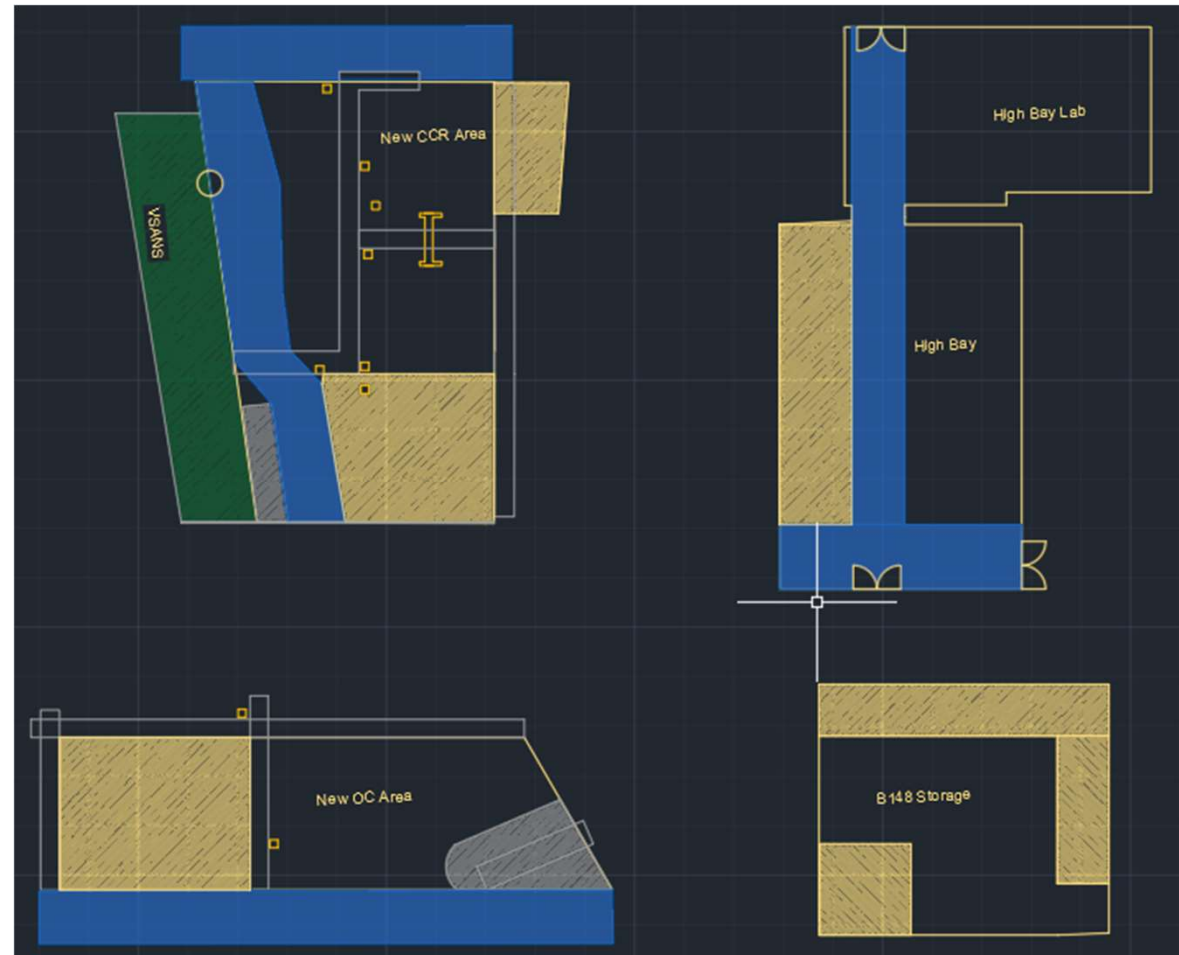
- Two new magnet carts
- One new dil fridge cart
- One new 3He Dipper
- Always adding more to meet user needs

Facility Changes

- Helium Recovery System
- New Instrument between DCS and VSANS
- RFO needs in the High Bay
- RFO needs near NSE
- = at least 600 sq.ft. loss

Use Our Space Wisely

- Swap CCR and OC areas
- Go vertical
- Excess old equipment
- Find more space



Future and Ongoing Projects Summary

CCR user and tech manual, SOPs, lifting docs

Edits to other user and tech manuals

Testing equipment manuals : 11T, Dil Fridges, 3He Dippers, etc

New carts for ARS and TLCCRs

Sensors and heaters upgrades of BLCCRs

New Sample Mount Accessories

Backup Precious Metals Custodian

7T factory and acceptance testing

FY22 and FY23 equipment budget requests

Questions and Suggestions?



SE 2020 Equipment Counts	Jan-March 2020	July-Aug 2020	Sept-Oct 2020	Nov-Dec 2020	July-Dec 2020
All Magnets	15	7	6	13	26
All OC Cryostat	21	1	7	12	20
All Pressure/Gas	10	4	9	13	26
All BLCCR <325K	47	30	30	41	101
All BLCCR >325K	12	12	6	7	25
All TLCCR	24	6	13	13	32
	129	60	71	99	230