THOMAS JEFFERSON NATIONAL ACCELERATOR FACILITY
12000 Jefferson Avenue
Newport News, VA 23606

HALL D PROCEDURE NO.:
D00000-18-04-P002 Rev -

TITLE: Hall D MEDCON5 Physics Resumption Plan

DATE: 05/13/2020

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Original Application:

REV.	DESCRIPTION	BY	CHK.	APP.	APP.	DATE

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Hall D Operations Resumption Plan

Hall D will be returning to a state where it will be possible to take beam and data for the GlueX experiment for a period of six weeks. In addition, The BDX parasitic experiment may also be restored to full operation. The date of resumption is floating and will be announced by JLAB management.
This plan is the reverse of the shut-down plan with which Hall D was put into an off-line status for the Covid 19 crisis, commensurate with Jlab's MedCon 6 status. This plan assumes we will be in MEDCON5 status for the duration of work covered herein and the personnel working on the equipment will be minimized. The Mechanical Group will be split into 3 teams of 2 people to accomplish this (including the Work Coordinator).
This plan will include portions of the following Hall D Procedures:

Hall D Procedure D00000-12-02-P001, Hall D Bcal/Comcal/FDC Chiller Fill/Start Procedure
Hall D Procedure D00000-16-11-P001 Rev D, Hall D Solenoid Magnet Power Supply Internal Interlock Checklist
Hall D Procedure D00000-15-00-P004 Rev, Hall D Pair Spectrometer Magnet Power Supply Maintenance Turn-on Checklist
Hall D Procedure D00000-04-00-P002 Rev, Hall D Sweep Magnet Power Supply Turn on Checklist
Hall D Vacuum Procedures D00000-10-05-P001
Hall D Sweep Magnet Power Supply OSP
Hall D Pair Spec Magnet Power Supply OSP
Hall D Solenoid Magnet Power Supply OSP
Hall D FCAL Dark Room OSP
Hall D Hot Check Out (electronic)

Current Status before Resumption
Hall D is in Restricted Access, and the CANS access doors are magnetically locked. The Solenoid superconductive magnet is "parked" at about 4 degrees Kelvin, and is ready to be powered again. There are segments of beam pipe which may be at atmospheric pressure, and will need to be pumped down. The liquid hydrogen target is warmed up and empty of hydrogen; it will need to be cooled down and refilled. All detector electronic systems and the cooling equipment for them are turned off. This procedure allows the operations of Hall D equipment to be brought to full operations under MEDCON5 status of JLAB.

Access and PPE requirements/Occupancy and Social Distancing:

Commensurate with standing instructions, Hall D equipment will be returned to full on line operation while all personnel maintain Social Distancing of at least six feet. There is no task in this plan which requires deviation from the six-foot minimum Social Distance Rule. Only one person is allowed in the Hall stairwell/entrance personnel labyrinth at a time. A hospital or cloth type face mask with ES&H approval shall be worn at all times. Disposable rubber gloves shall be worn when sharing and cleaning common tools. Other PPE may be required, depending on the task being performed, such as (but not limited to) safety glasses. No safety rules have been rescinded. If there appears to be any conflict, please discuss it with the Work Coordinator. Minimum requirements before commencing work are as follows;

Everyone is to perform the Health Self Certification Test using the JLAB provided card daily before entering JLAB property. The results must be reported to your supervisor if your supervisor is on sight. Otherwise it is the honor system

Anyone coming into Hall D must have the approval of the Hall D Group Leader, Work Coordinator or Engineer.

The COVID-19 Pandemic Controls OSP must be read and understood prior to coming to JLAB

SAF003 COVID-19 Hazard Awareness and Controls must be completed

Read and sign the general Pre-Job Check List for COVID-19 that will be posted in the counting house

Complete and sign (persons performing task and their supervisor) the Pre-job checklist from the COVID-19 OSP for each task for which there is a written procedure before starting. The signed copy is to be posted at the job site.

One goal of this plan is to limit each worker's exposure to other people and the transmission of the Covid 19 virus. This is accomplished both with physical (Social) Distancing and time separation. Signage with maximum occupancies shall be posted as well as a sign-in board at the entrance to the counting house. All people entering the Hall D complex shall enter from the main Counting House door and sign in on the board. Deviations from this must be approved by the Work Coordinator.
The maximum number of personnel allowed in the various areas simultaneously with the caveat that they must be physically separated by a distance of at least 6 feet at all times is given below:

Hall D Counting House Meeting area – 4 (see Physics MEDCON5 Resumption Plan)
Hall D counting room – 2
Hall D Machine room – 3
Tagger Vault – 3
Hall D Proper – 5
Collimator Cave – 1
FCAL Dark Room – 1
FCAL Platform – 3
Upstream Platform – 3
Gas Shed – 1

Permission for deviating from the six-foot rule must be obtained in advance of the task from the Physics division Associate Director, and additional PPE will be required.

All tools and equipment used shall be wiped down with proper sanitizer before and after use.

There will be new "One Way" signs posted. The Counting House foyer will be the MedCon 5 entrance, and the West Emergency Exit door will be the Counting House exit. The stairwell and personnel labyrinth will be one way down into the Hall. The path under the Upstream Platform will be one way South. The personnel walkway up the Hall D truck ramp will be one way up, to the Hall D MedCon 5 exit. After exiting internal areas of Hall D you shall remove your name from the white board in the Counting House entrance (or call the Work Coordinator to do it).

Work Coordinator Phone # 757-876-3940

Critter Caution:

Hall D has long been invaded by dangerous critters, such as wasps and snakes. We discovered a Water Moccasin on the truck ramp years ago. The on-site tech saw a Worm Snake on the Hall D truck ramp in mid-May. Critters like to take up residence where there are no humans. That now includes all of Hall D and the Tagger Complex. Look before you move or especially reach under an object, and don't get bit or stung.

General Timing of work in the Hall

The Work Coordinator (or Alternate Work Coordinator) will be on site, and available for discussion. The returning personnel and associated tasks are broken down into tiers in order to comply with JLAB MEDCON5 rules. There will be a small number of individuals returning

immediately to review and prepare for the work to bring the Hall back to "Physics Ready". The First Tier personnel will begin bringing all the cooling and gas systems back on line as well as the critical computer systems. Second Tier folks will bring the vacuum systems, magnet systems, target and detectors on line. Third Tier folks will come in to help with the final Hot Check Out of all equipment to receive beam. The first few days back at Jlab will be mainly "administrative days". The work coordinator shall ensure that appropriate signage, such as "MedCon5 Max occupancy requirements" are posted at the entrance of each space, along with white boards for "sign in". Exception: The sign for "sign in" for Hall D proper shall be on the main entrance door of the counting house. After all applicable documentation is reviewed, signed and discussed, and signage is posted, work on the equipment may resume. After the mechanical items on this procedure are performed, the Mechanical Checklist from the Hot Checkout should be reviewed and performed. The Work Coordinator will direct traffic in the Hall and Vault, and act as the "Gate Keeper" of the activities and the Hot Checkout checklists.
In all cases, written procedures for the restoration of systems shall be followed, any deviation from this must be approved in advance by the Hall D Engineer or responsible Physicist.
The Work Coordinator will make the final HDLog Logbook entry that run preparations are complete, and attach initialed/signed copies of the Hot Checkout checklists.

Immediate Return: Limit two technicians physically at Jlab – Mark Stevens and Josh Foyles (Scot Spiegel, Eugene Chudakov and Tim Whitlatch may come during this time or any time thereafter)
First Few Days:

1. The Work Coordinator and another tech will review all work to be performed and ready the hall for First Tier work by getting all signage, PPE and procedures ready and covering all JLAB prerequisites.
2. Determine and obtain any cleaning supplies from the stock room

First Tier: Keith Blackburn, Bobby Bunton, Alex Somov, Sergey Furletov may return as needed and approved by management
Mechanical:

1. ComCal: Restore N2 purge to run value.
2. Restore and reactivate chiller (refer to Hall D Procedure above)
3. Detector Gas Supply argon/CO2 (service as needed)
4. Detector apparatus cooling (follow checklist(s))
   A. Turn on Microscope fan
   B. Bcal readout N2 purge – increase to run value
   C. CDC blower – turn back on
5. BCAL chillers (refill circuits and start chillers) (refer to Hall D Procedure above)

6. FDC chiller – turn back on and check proper operation (refer to Hall D Procedure above).
7. Check operation of DAQ system in Counting House machine room

Second Tier: Chris Allen, Mark Dalton, Lubomir Penchev and Beni Zihlman may return as needed and approved by management.

Beamline Vacuum: (Use procedure referenced above)

1. Turn on or verify normal operation of Goniometer pump
2. Turn on or verify normal operation of Tagger vacuum pump

3. Turn on or verify normal operation of 10" beam pipe (between Tagger Vault and Collimator Cave)
4. Turn on or verify normal operation of Collimator Cave vacuum pumps
5. Turn on or verify normal operation of Upstream Platform beamline vacuum pumps
6. Fcal (downstream) Platform beam pipe – reconnect pump and pump down

Magnets:

1. Accomplish the Hall D Solenoid Magnet Interlock Checklist,
2. Accomplish the Hall D Pair Spectrometer Magnet Power Supply Maintenance Turn-on Checklist
3. Accomplish the Hall D Sweep Magnet Power Supply Turn on Checklist
4. Turn on and ramp up Pair Spec magnet power supply, ramp to full current, soak for 5 minutes per procedure, then ramp to zero amps
5. Turn on and ramp up Sweep magnet power supply, ramp to full current, soak for 5 minutes per procedure, then ramp to zero amps
6. After obtaining permission from the HallD Engineer, turn on and ramp up Solenoid Power Supply to 800 amps at .1 amps/sec ramp rate, soak for 15 minutes, then ramp to zero amps

DIRC:

1. Check N2 purge rate to Bar Boxes
2. Reduce Optical Box purge to run values. Restart the DIRC water cart. Refill both Optical Boxes with purified water, adding new water to the system as required. Follow written procedure. Obtain water samples as directed. Get RadCon to release all water samples from the Hall.

3. Turn on DIRC Optical Box blowers (before the PMT electronics are turned on).

MISC:

1. Electronics crates and Detector HV and LV can be turned on at the Physicist's discretion
2. Fill Target
3. Begin recording PXI data
4. Check Hall environmental settings (especially temperature)
5. Restore alcohol bubblers, increase FDC and CDC gas flow to run values, check gas log and maintenance log for proper entries

Third Tier: Remaining Scientists and Users can come in according to the Physics Resumption of Operations Plan and management approval

Electrical :

1. Ensure all run/data acquisition computers are running properly
2. Turn on all necessary crates
3. Extend retracted devices as required
4. Ensure the following items are in their correct run positions:
   A. Radiators
   B. Profiler
   C. Collimator
   D. TPOL converter extended
   E. P.S. converter extended (if needed)
   F. ComCal in correct position, electronics running if needed
   G. TAC in position, electronics running if needed

5. Detector electronics: Cognizant person will go through all HCO items for each system
   a. BCAL: LV, Bias
   b. CDC: LV, HV
   c. DIRC: HV, LV
   d. FCAL: HV, L V
   e. CCAL
   f. FDC: HV, LV
   g. GEM/TRD: HV, LV

h. PS, PSC
i. TAGH
j. TAGM
k. TOF: HV, LV
l. ST: Bia, LV
m. Beam line Voltages: Active, Target, TAC, halo
n. TPOL
o. Verify still on/running:
    1. All computers, switches, control modules
    2. Accelerator crates (US1-1, US1-2)
p. Turn on Crate power:
    1. DAQ crates: VXS, VME Hall D
    2. DAQ crates, VXS, VME Tagger Building/Vault
    3. Record status in log book.

The Hot Checkout Checklists will be signed off by the Hall D Work Coordinator, after all the above is accomplished. Work Coordinator will ensure all Hot Checkout Checklists are signed off and logged. Work Coordinator will toggle the mechanical Hot Checkout System items.

The following items may be addressed with management approval:

1. TEDF Cleanroom: (if directed by responsible Physicist) The lights may be turned back on, and work may be resumed as needed, as long as the OSP is reviewed and Social Distancing can be maintained, and face masks and rubber gloves are worn.
2. BDX tent (if directed by responsible Physicist): Turn on Bertha, air conditioner and crate power.