

Set of Procedures on docdb and HAs

<https://seaquest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=10409>

FNAL writing a procedure:

This template refers to the recommendations from Rick, and he wants us to write a procedure in this way. Please keep in mind while writing a procedure:

1. DocDB reference printed on the first page
2. Author and date on the first page
3. Revision History table containing the following:
 - Date of revision
 - Revision No.
 - Name of the person revising the document
 - What has changed from the last version
4. Table of *all* relevant valve positions at the start of the procedure and the end of the procedure
5. Give reference to a P&ID, if necessary, in a procedure.
6. Attach pictures relevant, if necessary, to a procedure.

If the following limits are exceeded, then we will need an engineering note

Lowest Possible Temperature in procedures = -20 F

The lower bound for the pressure = 15 psig

https://www.engineersedge.com/pressure,045vessel/asme_bpvc_rules_13918.htm

Template to write a procedure: Writing procedure.docx

Link to IMPACT-tool: <https://www-esh.fnal.gov/pls/apex/f?p=129:1:12952119108779:::>

HAs

1. HA-LN2-Fill-Magnet-Shield-using-portable-dewar_final.docx
2. HA-QT-Coldheads.docx and HA-QT-Coldheads_final.pdf
3. HA-QT-Purifier.pdf
4. HA_For_Draining_LCW_at_RootsPumps.pdf
5. HA-Helium-transfer-from-Commercial-Dewar-in-cave.pdf
6. HA_LHe_transfer_to_QT_storage_dewars.pdf
7. HA_Filling_LN2_to_Purifier_with_Portable_Dewar.pdf
8. HA-Helium-transfer-from-Commercial-Dewar-in-cave_signed.pdf
9. HA 30341: MFC_SwapOut_QT_outlet.pdf
10. NMR_cable_installation_HA.pdf
11. HA: Test of Mass Flow Controller, IMPACT package #30221, [PDF](#)
12. HA: Exchange of two flow controllers on QT manifold (FC501B and FCA), IMPACT package #30801, [PDF](#), ([Procedure PDF](#))

Link to IMPACT-tool: <https://www-esh.fnal.gov/pls/apex/f?p=129:1:12952119108779:::>



Target_HA_ORC_Procedures.pdf

17 Feb 2023

DOE guide for Hazards Analysis: [DOE-HDBK-1163-2020_Integration_of_Hazard_Analysis.pdf](#)

Please follow the instructions : [How to write an FNAL Procedure](#)

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	Cryogenics on the Cryoplatform		
1	QT Purifier LN2 fill	10337	Yes (Jordan)
2	QT Liquefier Dewar level cleaning and Dewar cleaning	10401	In Progress
3	Dewar evacuation	10178	Yes, HA
4	Cold-heads warm-swap procedure	10378	Yes, HA
5	Filling Purifier LN2 space using portable LN2 Dewar	10053	Yes, HA (Jordan)
6	LHe transfer to QT storage dewars	10389	Yes, HA
7	UVA-QT Purifier Helium Space Cleaning Procedure	10404	Yes
8	UVA-QT Purifier LN2 Space Cleaning Procedure	10407	Yes
9	Helium boiloff capture procedure	10282	In Progress
10	LHe transfer using commercial LHe Dewar in the cave	9670	Yes, HA (Rick)
11	Installation of a transfer stinger to a Liquid Helium Dewar (generic)	10392	No
	QT System Non-Cryogenics		
12	QT system startup and shutdown	10364	No
13	HR3 Compressor Oil, Oil filter replacement	10320	No
	In-cave Cryogenics		
14	Magnet LHe fill	9670	Yes, ORC-2056.01
15	Magnet shield LN2 fill	10337	Yes, (Jordan)
16	Fridge LHe fill	10375	Yes, ORC-2056.01
17	Filling magnet shield with portable LN2 Dewar	10053	Yes, HA
18	Magnet pre-cool	10032	Yes, ORC-2056.01
19	Magnet cooldown	9651	Yes, ORC-2056.01
20	Magnet operations	10062	Yes, ORC-2071
21	Magnet fill from commercial LHe Dewar	10056	Yes, ORC-2056.01
22	Cold LHe Transfer	10395	No

	Procedures related to gases		
23	Pumping and purging (generic)	10184	Yes (Rick)
24	Leak checking (generic)	10188	Yes (Rick)
25	Outside gHe tank refill	10198	Yes, (Jordan)
26	Manually vented He Gas Storage Tank to the Atmosphere	10285	No (Sent to Rick)
27	Adjusting the Parallel plate valve PSV-401-He	10333	Yes (Rick)
	Turning ON/OFF procedures		
28	UVA-NMR system shutdown, startup,tuning, and data-taking	10367	No
29	Slow Control System turn on/off	10369	No
30	Annealing System turning on/off	10372	No
31	Microwave system powering up, Operation, and shutting down	10387	No
32	Target lifter system powering up and shutting down procedure	10381	No
	HDPE Target Material Handling Related (Include Cryogenics)		
33	Handling Target material CH2/CD2 (HDPE)	10411	In Progress
34	Filling the portable handheld dewar	10358	In Progress
35	Target material dewar filling from the portable handheld dewar	10427	In Progress
36	Target insert loading/unloading procedure	10355	In Progress
	NH3/ND3 Target Material Handling (Include Cryogenics)		
37	Handling Target material NH3/ND3	10360	In Progress
38	Plans for storage and usage of Ammonia for the target	10414	In Progress
	Other Maitainance / Cable Installation procedures		
39	Procedure for draining LCW from roots pumps	10384	Yes, HA (Rick)
40	Cleaning Procedure of roots LCW regulator	10420	No
41	Oil refilling/changing for rotary vane pump	10422	No
42	Routing NMR cables	10357	Yes, HA
	Planning		
43	A Detailed description of upcoming plan	10417	In Progress

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	Procedure	Docdb ID	Previously Reviewed
	QT system Cryogenics		
1	QT Purifier LN2 fill	10337	Yes (Jordan)
2	QT Liquefier Dewar level cleaning and Dewar cleaning	10401	In Progress

3	Dewar evacuation	10178	Yes, HA
4	Cold-heads warm-swap procedure	10378	Yes, HA
5	Filling Purifier LN2 space using portable LN2 Dewar	10053	Yes, HA (Jordan)
6	LHe transfer to QT storage dewars	10389	Yes, HA
7	UVA-QT Purifier Helium Space Cleaning Procedure	10404	Yes
8	UVA-QT Purifier LN2 Space Cleaning Procedure	10407	Yes
9	Helium boiloff capture procedure	10282	In Progress
10	LHe transfer using commercial LHe Dewar in the cave	9670	Yes, HA (Rick)
	QT System Non-Cryogenics		
11	QT system startup and shutdown	10364	No
12	HR3 Compressor Oil, Oil filter replacement	10320	No
	Magnt Cryogenics		
13	Magnet LHe fill	9670	Yes, ORC-2056.01
14	Magnet shield LN2 fill	10337	Yes, (Jordan)
15	Fridge LHe fill	10375	Yes, ORC-2056.01
16	Filling magnet shield with portable LN2 Dewar	10053	Yes, HA
17	Magnet pre-cool	10032	Yes, ORC-2056.01
18	Magnet cooldown	9651	Yes, ORC-2056.01
19	Magnet operations	10062	Yes, ORC-2071
20	Magnet fill from commercial LHe Dewar	10056	Yes, ORC-2056.01
	Other Cryogenic Related (Generic)		
21	Filling the portable handheld dewar	10358	In Progress
22	Cold LHe Transfer	10395	No
23	Target material dewar filling from the portable handheld dewar	10427	In Progress
24	Target insert loading/unloading procedure	10355	In Progress
25	Installation of a transfer stinger to a Liquid Helium Dewar (generic)	10392	No
	Procedures related to gases		
26	Pumping and purging (generic)	10184	Yes (Rick)
27	Leak checking (generic)	10188	Yes (Rick)
28	Outside gHe tank refill	10198	Yes, (Jordan)
29	Manually vented He Gas Storage Tank to the Atmosphere	10285	No (Sent to Rick)
30	Adjusting the Parallel plate valve PSV-401-He	10333	Yes (Rick)
	Turning ON/OFF procedures		
31	UVA-NMR system shutdown, startup, tuning, data-taking	10367	No
32	Slow Control System turn on/off	10369	No
33	Annealing System turning on/off	10372	No
34	Microwave system powering up, Operation, and shutting down	10387	No
35	Target lifter system powering up and shutting down procedure	10381	No
	Target Material Handling Related		
36	Handling Target material CH2/CD2	10411	In Progress
37	Handling Target material NH3/ND3	10360	In Progress

	Other Maintenance / Cable Installation procedures		
38	Procedure for draining LCW from roots pumps	10384	Yes, HA (Rick)
39	Cleaning Procedure of roots LCW regulator	10420	No
40	Oil refilling/changing for rotary vane pump	10422	No
41	Routing NMR cables	10357	Yes, HA
	Planning		
42	A Detailed description of upcoming plan	10417	In Progress
43	Plan for the usage of Ammonia for the target	10414	In Progress

Updated on 03 Feb 2023

	Procedure	Docdb ID	Previously Reviewed	Source file available?	Not a procedure
1	QT system startup and shutdown	10364	No	Yes	
2	Pumping and purging (generic)	10184	Yes (Rick)	Yes	
3	Leak checking (generic)	10188	Yes (Rick)	Yes	
4	Dewar evacuation	10178	Yes, HA	Yes	
5	QT Purifier LN2 fill	10337	Yes (Jordan)	Yes	
6	Magnet pre-cool	10032	Yes, ORC-2056.01	Yes	
7	Magnet cooldown	9651	Yes, ORC-2056.01	Yes	
8	Magnet operations	10062	Yes, ORC-2071	Yes	
9	Magnet fill from commercial LHe Dewar	10056	Yes, ORC-2056.01	Yes	
10	Magnet LHe fill	9670	Yes, ORC-2056.01	Yes	
11	Magnet shield LN2 fill	10337	Yes, (Jordan)	Yes	

12	Outside gHe tank refill	10198	Yes, (Jordan)	Yes	
13	Routing NMR cables	10357	Yes, HA	Yes	
14	UVA-NMR system shutdown, startup, tuning, data-taking	10367	No	Yes	10308
15	Slow Control System turn on/off	10369	No	Yes	
16	Annealing System turning on/off	10372	No	Yes	
17	Adjusting the Parallel plate valve PSV-401-He	10333	Yes (Rick)	Yes	
18	Fridge LHe fill	10375	Yes, ORC-2056.01	Yes	
19	Filling magnet shield with portable LN2 Dewar	10053	Yes, HA	Yes	
20	Manually vented He Gas Storage Tank to the Atmosphere	10285	No (Sent to Rick)	Yes	
21	Leak Checking in the Cave (Target Magnet)	10308	Yes, (Rick)	Yes	No
22	HR3 Compressor Oil, Oil filter replacement	10320	No	Yes	
23	Helium boiloff capture procedure	10282	In Progress	Yes	
24	Handling Target material NH3/ND3	10360	In Progress	Yes	
25	Filling the portable handheld dewar	10358	In Progress	Yes	
26	Cold-heads warm-swap procedure	10378	Yes, HA	Yes	
27	Target lifter system powering up and shutting down procedure	10381	No	Yes	
28	Filling Purifier LN2 space using portable LN2 Dewar	10053	Yes, HA (Jordan)	Yes	
29	Procedure for draining LCW from roots pumps	10384	Yes, HA (Rick)	No (scanned from HA)	
30	LHe transfer using commercial LHe Dewar in the cave	9670	Yes, HA (Rick)	No (scanned from HA)	
31	Microwave system powering up, Operation, and shutting down	10387	No	Yes	
32	LHe transfer to QT storage dewars	10389	Yes, HA	No (scanned from HA)	
33	Installation of stinger into a Liquid Helium dewar	10392	No	Yes	
34	Cold LHe Transfer with QT-transfer line	10395	No	Yes	
35	QT Liquefier Dewar level cleaning and Dewar cleaning	10401	In Progress	Yes	
36	UVA-QT Purifier Helium Space Cleaning Procedure	10404	Yes	Yes	
37	UVA-QT Purifier LN2 Space Cleaning Procedure	10407	Yes	Yes	
38	Handling Target material CH2/CD2	10411	In Progress	Yes	
39	A Detailed description of upcoming plan	10417	In Progress	Yes	
40	Plan for the usage of Ammonia for the target	10414	In Progress	Yes	
41	Target insert loading/unloading procedure	10355	In Progress	Yes	
42	Cleaning Procedure of roots LCW regulator	10420	No	Yes	
43	Oil refilling/changing for rotary vane pump	10422	No	Yes	
44	Target material dewar filling from the portable handheld dewar	10427	Yes	Yes	

Previous version

	Procedure	Docdb ID
1	QT system startup and shutdown	10364
2	Pumping and purging (generic)	10184
3	Leak checking (generic)	10188
4	Dewar evacuation	10178
5	QT Purifier LN2 fill	10337
6	Magnet pre-cool	10032
7	Magnet cooldown	9651
8	Magnet operations	10062
9	Magnet fill from commercial LHe Dewar	10056
10	Magnet LHe fill	9670
11	Magnet LN2 fill	10337
12	Target material change	3043
13	Outside gHe tank refill	10198
14	Routing NMR cables	10357
15	UVA-NMR system shutdown, startup, tuning, data-taking	10367
16	Handling Target material NH3/ND3	10360
17	Slow Control System	10369
18	Annealing System	10372
19	Adjusting the Parallel plate valve PSV-401-He	10333
20	Fridge LHe fill	10375
21	Filling magnet shield with portable LN2 Dewar	10053
22	Manually vented He Gas Storage Tank to the Atmosphere	10285
23	Leak Checking in the Cave (Target Magnet)	10308
24	HR3 Compressor Oil, Oil filter replacement	10320
25	QT Transfer line temperature before Cool down phase	10328
26	Helium boiloff capture procedure	10282

27	Handling Target material	10360
28	Filling the portable handheld dewar	10358
29	Cold-heads warm-swap procedure	10378
30	Target lifter system powering up and shutting down procedure	10381
31	Filling Purifier LN2 space using portable LN2 Dewar	10053
32	Procedure for draining LCW from roots pumps	10384
33	LHe transfer using commercial LHe Dewar in the cave	9670
34	Microwave system powering up, Operation, and shutting down	10387
35	LHe transfer to QT storage dewars	10389
36	Installation of a transfer stinger to a Liquid Helium Dewar (generic)	10392
37	Cold LHe Transfer	10395
38	QT Liquefier Dewar cleaning	10401
39	QT Liquefier Dewar level sensor tubes cleaning	10401
40	UVA-QT Purifier Helium Space Cleaning Procedure	10404
41	UVA-QT Purifier LN2 Space Cleaning Procedure	10407
42	Handling Target material CH ₂ /CD ₂ (HDPE)	10411

1. Pumping and purging (generic) procedure: <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=10184>
2. Leak checking procedure: <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=10188>
3. Dewar evacuation procedure: <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=10178>
4. Cooldown procedure: <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=9651>
5. Target Superconducting Magnet Operations Procedure: <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=10062>
6. Fill from Commercial LHe Dewar Procedure: <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=10056>
7. Liquid Helium fill procedure: <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=9670>
8. Liquid Nitrogen fill procedure: <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=10053>
9. Target magnet pre-cool procedure: <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=10032>
10. Target change procedure: <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=3043>
11. gHe filling procedure (outside tanks): <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=10198>
12. LN2 filling (to Purifier and to the Magnet shield) using outside LN2 tank : <https://sequest-docdb.fnal.gov/cgi-bin/sso/ShowDocument?docid=10337>

Not yet on docdb

1. QT system shutdown and restart procedure: [Shut Down and Restart Procedures](#)
2. Slow control rack shutdown and restart procedure: <https://confluence.its.virginia.edu/display/twist/Slow+Controls>
3. Magnet rack shutdown and restart procedure: <https://confluence.its.virginia.edu/display/twist/Magnet+Rack>
4. Target computer shutdown and restart procedure: <https://confluence.its.virginia.edu/display/twist/Target+Computer+setup+at+NM4>
5. [Insulation Vacuum \(IVC\) pump down procedure](#)