



# 2x2 Schedule

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ND-LAr General Consortium Meeting

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# Schedule updates

- Large uncertainties on:
  - AC distribution upgrade work timeline (contractor)
  - ODH fan upgrade work timeline (FESS/ISD prioritization)
  - ~~Cryomech condenser system rework completion (external company)~~
    - Target shipping date June 5, 2023 (expect delivery ~1 week later)
  - Controls system completion (procurement delays)

# Schedule

Not yet final (need firm dates for AC distribution work and ODH fan upgrade work), but cryo system completion now in end of July

We will not be able to collect beam data before the shutdown begins on July 9<sup>th</sup>.

But still plan to complete installation and do commissioning this summer, to be fully prepared for beam return in Fall 2023

3) Cryogenic Systems	12/1/22	158	7/24/23	
3.1) Receive Demaco system (except spool 23)	3/8/23	3/8/23		
3.2) Receive Demaco spool 23	4/7/23	4/7/23		
3.3) Internal cryogenics	12/1/22	88d	4/12/23	
3.3.1) Procure piping & flex hoses	12/1/22	48d	2/13/23	
3.3.2) Complete engineering design and prints for piping and stand	12/1/22	48d	2/15/23	
3.3.3) Purify Monitor/Combined Feedthroughs	12/1/22	78d	3/29/23	
3.3.3.1) Finalize design & create BOM, prints	12/1/22	58d	3/1/23	
3.3.3.2) Procure combined feedthrough & PHM components	3.3.3.1	3/2/23	15d	3/22/23
3.3.3.3) Fabricate FTs in FNAL machine shop	3.3.3.2	3/23/23	2d	3/24/23
3.3.3.4) Pressure/leak testing of PHM/Combined FTs	2.3,	3/27/23	2d	3/28/23
3.3.3.5) Install PHM/Combined FTs	3.3.3.4	3/29/23	1d	3/29/23
3.3.4) Fabricate internal piping (1 bushing missing, Mike will give to them next week)	3.3.1,	2/16/23	30d	3/29/23
3.3.5) Bench test and install internal piping and pump in cryostat (1 mech tech + 1 welder)	2.3,	3/30/23	10d	4/12/23
3.3.6) Install conduit and wiring for combined FT	3.3.3.4	3/29/23	3d	3/31/23
3.3.7) Pump and internal piping installation completed	3.3.5,	4/12/23		4/12/23
	3.3.3.4,			
	3.3.6			
3.4) Condenser and VJ Transfer Lines	3/13/23	74d	6/26/23	
3.4.1) Receive Cryotech reworked system and documentation	6/12/23	6/12/23		
3.4.2) Design VJ transfer lines and generate BOM and machine shop prints (Gary will work on this after vent layout)	3.1.02	3/13/23	10d	3/24/23
3.4.3) Procure piping/tubing components	3.4.2	3/27/23	5d	3/31/23
3.4.4) Fabricate VJ transfer lines (drain & boil-off)	3.4.3	4/3/23	20d	4/28/23
3.4.5) Field fit transfer lines, construct pipe stands, etc.	3.4.4	5/1/23	15d	5/19/23
3.4.6) Install condenser on cryostat access platform	2.3,	6/12/23	5d	6/16/23
	2.6.4,			
	3.4.1			
3.4.7) Install & pressure/leak test of LAr drain transfer line	3.4.4,	6/20/23	5d	6/26/23
	3.4.5			
3.4.8) Install & pressure/leak test of boil-off line	3.4.4,	6/20/23	5d	6/26/23
	3.4.6			
3.4.9) Condenser system installation complete	3.4.7,	6/26/23		6/26/23
	3.4.8			
3.5) Install/interface with Demaco system	12/1/22	137	6/22/23	
3.5.1) Purchase components for regen system at LArTF	12/1/22	5d	12/7/22	
3.5.2) Install Demaco filter & lower transfer lines	3.1	3/8/23	10d	3/21/23
3.5.3) Regenerate Demaco filter	3.5.2,	3/22/23	5d	3/28/23
	3.5.1			
3.5.4) Install Demaco upper transfer lines	3.5.2,	6/1/23	15d	6/22/23
	4.14.9			
3.5.5) Demaco system installation complete	3.5.2,	6/22/23		6/22/23
	3.5.4			
3.6) Gas Analyzer System	12/1/22	147	7/7/23	
3.6.1) Design distribution/sampling system	12/1/22	40d	2/3/23	
3.6.2) Acquire valves (ordered but not delivered yet), hoses (hoses), tubing (PO exists...), fittings (need new Swagelok order), etc.	3.6.1-10	1/23/23	40d	3/17/23
	d			
3.6.3) Move MicroBoONE gas analyzer rack and panel (need permission, and afternoon of Mike and helper's time (can be Jen))	3.6.1+4	4/3/23	2d	4/4/23
	0d			
3.6.4) Install analyzer system tubing, instruments, panel, etc. (2 techs + welder)	3.5.4SS	6/8/23	20d	7/7/23
	+5d,			
	3.6.3			
3.6.5) Gas analyzer system complete	3.6.4,	7/7/23		7/7/23
	3.6.3			
3.7) Cryostat vacuum system	12/2/22	95d	4/24/23	
3.8) Other feedthrough work	12/1/22	125	6/5/23	
	d			
3.9) Controls	12/1/22	158	7/24/23	
3.9.1) Complete ODH design documentation	3.9.3SS	5/1/23	20d	5/26/23
	+100d			
3.9.2) Design review of ODH controls	3.9.1	5/30/23	10d	6/12/23
3.9.3) Modify/expand existing controls rack	12/1/22	110	5/12/23	
	d			
3.9.4) Complete cryo controls documentation	3.9.3SS	2/20/23	50d	4/28/23
	+50d			
3.9.5) Design review of cryo controls system	3.9.4	5/1/23	10d	5/12/23
3.9.6) Move cryo controls rack underground	3.9.3,	5/15/23	1d	5/15/23
	3.9.5			
3.9.7) Field wiring to instruments (can start doing parts as each subsystem is completed, then one last thing at end)	3.3.7,	6/15/23	10d	6/29/23
	3.4.6SS			
	+2d,			
	3.5.4SS			
	+10d,			
	3.6.4SS,			
	3.7.5			
3.9.8) Procure & receive cryocooler power supplies	3/21/23	63d	6/16/23	
3.9.9) Cryo controls ORC	3.9.7,	6/30/23	1d	6/30/23
	3.9.8			
3.9.10) Test PLC programming and HMI development	3.9.9	7/3/23	10d	7/17/23
3.9.11) Cryo controls checkout	3.9.10	7/18/23	5d	7/24/23
3.9.12) Controls system installation complete (this probably needs extra presence from cryo side — gas purge? etc? Ask MZ)	3.9.11	7/24/23		7/24/23
3.9.13) Instrument Air system	4/24/23	21d	5/22/23	
3.9.14) LAr Fill Manifold	3/13/23	45d	5/12/23	
3.10) Cryostat & misc venting and ODH (non-FESS)	12/1/22	101	5/1/23	
	d			
3.11) Water cooling system	2/20/23	40d	4/14/23	

