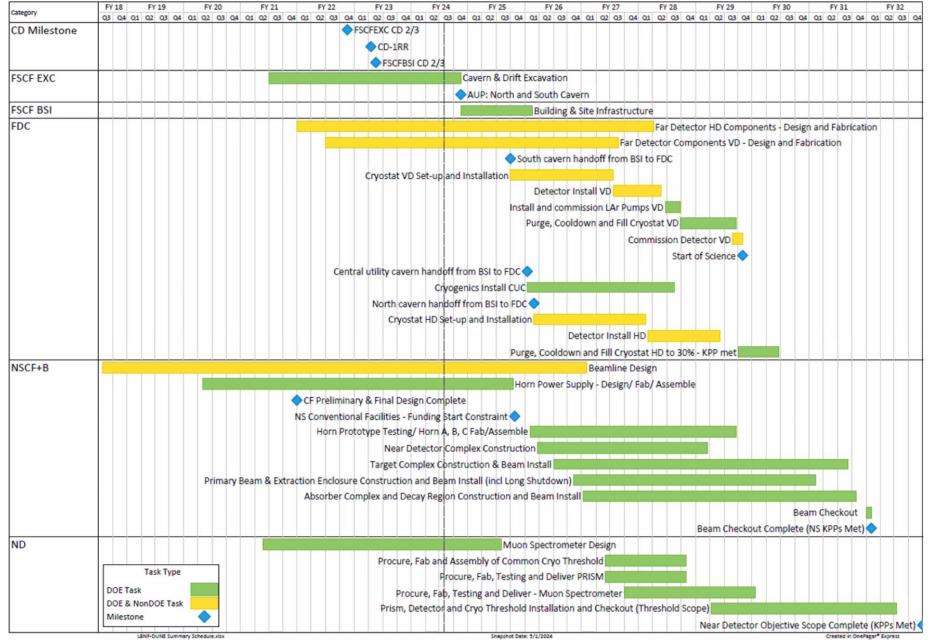
## Post-swap Horizontal Drift PDS Schedule/MOU

**David Warner** 

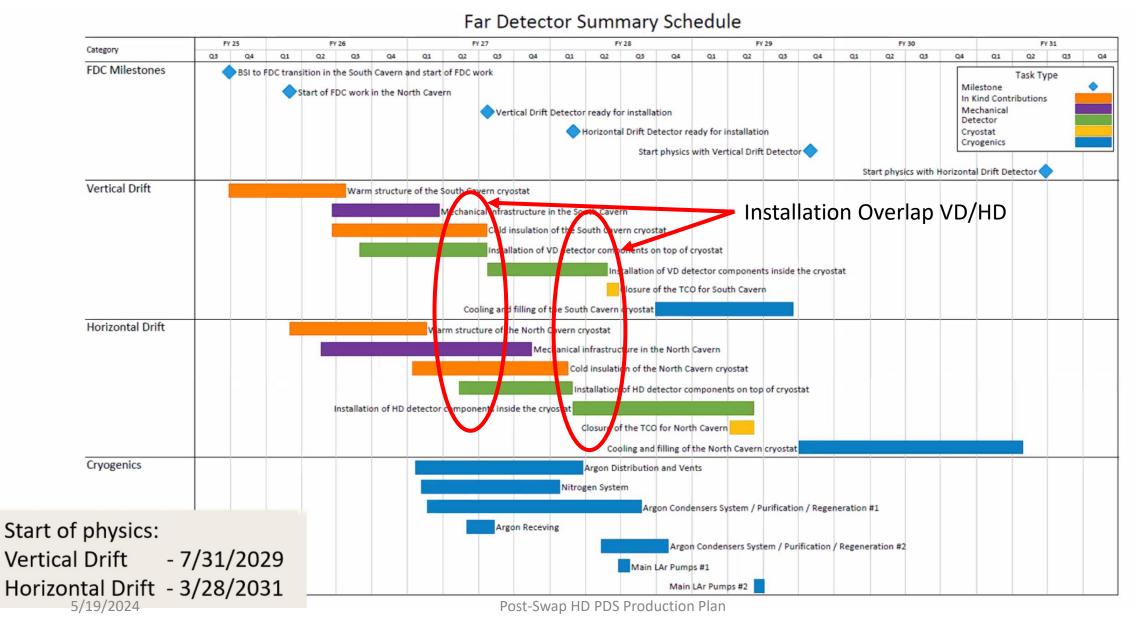
Colorado State University

May 19, 2024

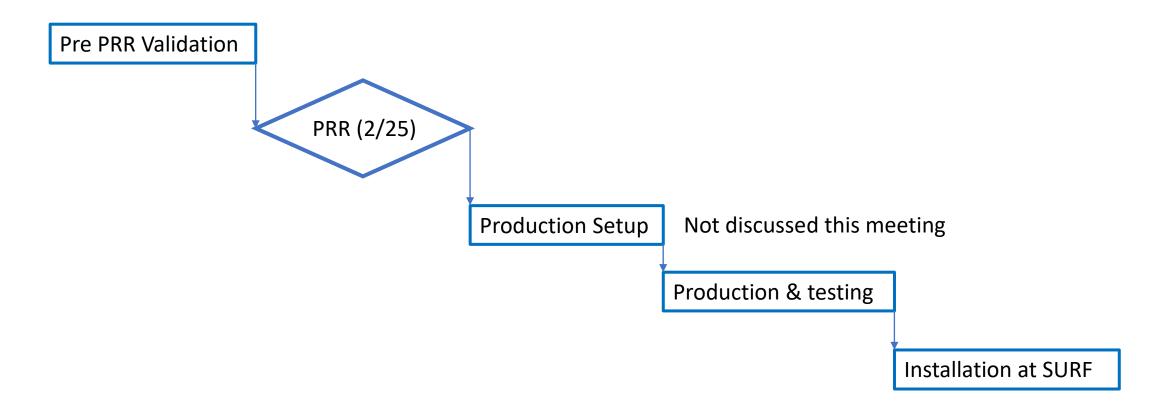
#### LBNF/DUNE Summary Schedule



#### Updated Far Detector Schedule



#### General Workflow

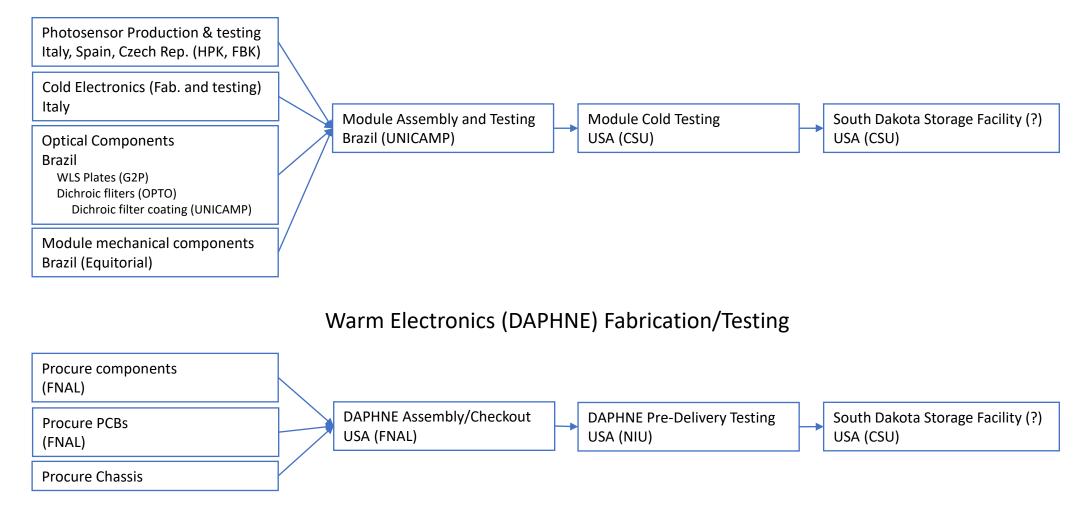


#### Updated High-Level HD PDS Schedule

T 1 N			
Task Name	<ul> <li>Duration</li> </ul>	✓ Start	Finish 🚽
Production Readiness Review Prep	201 days		Wed 2/5/25
ProtoDUNE 2 Run	109 days	Wed 5/1/24	Mon 9/30/24
Final HD PDS Photon Detection Efficiency Validation	45 days	Mon 7/1/24	Fri 8/30/24
CERN Cold Box APA Test	67 days	Thu 8/1/24	Fri 11/1/24
HD PDS PRR Prep	68 days	Mon 11/4/24	Wed 2/5/25
HD PDS PRR	0 days	Wed 2/5/25	Wed 2/5/25
▲ Production	775 days	Wed 5/1/24	Tue 4/20/27
SiPM Production (Remaining fraction)	305 days	Wed 5/1/24	Tue 7/1/25
Cold Electronics Fabrication	316 days	Sat 5/17/25	Fri 7/31/26
Optical Component Kits	441 days	Tue 6/17/25	Tue 2/23/27
Module Frame Component Kits	461 days	Tue 6/17/25	Tue 3/23/27
Assemble/Warm Test Modules	459 days	Thu 7/17/25	Tue 4/20/27
Assemble/Test Warm Electronics	555 days	Mon 2/10/25	Fri 3/26/27
Assemble/Test Monitoring System	344 days	Fri 9/26/25	Wed 1/20/27
Shipping/Reception/Installation	1183 days	Fri 9/12/25	Tue 3/26/30
Ship/Receive in US PD Modules	547 days	Fri 9/12/25	Mon 10/18/27
Install PD Modules in APAs	222 days	Thu 3/16/28	Fri 1/19/29
Monitoring System Flasher Installation	222 days	Thu 3/16/28	Fri 1/19/29
Pre-install warm electronics in north cavern	147 days	Tue 12/22/26	Wed 7/14/27
Regular monitoring of PDS During Installation and Filling	704 days	Thu 7/15/27	Tue 3/26/30
Objective KPP for PDS	0 days	Tue 3/26/30	Tue 3/26/30

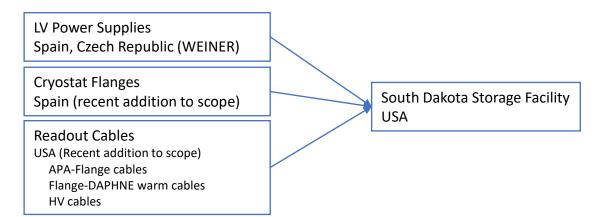
#### General HD PDS Workflow as reflected in P6 (1)

#### **Optical Module Fabrication/Testing**

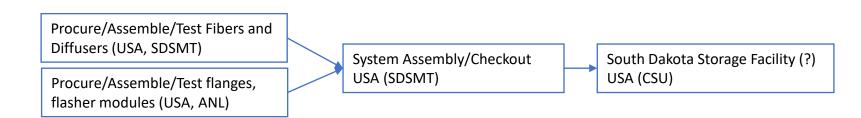


#### General HD PDS Workflow as reflected in P6, (2)

Readout Cables/Power Supplies/Flanges

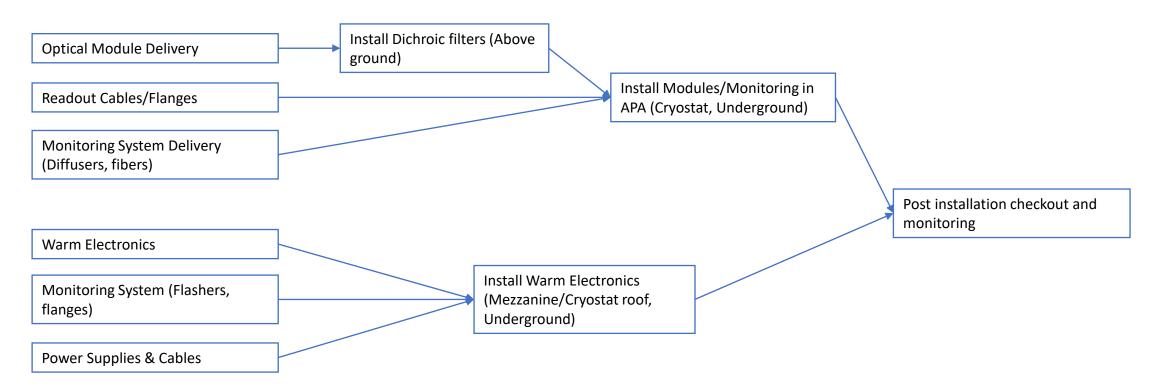


Monitoring System



#### General HD PDS Workflow as reflected in P6, (3)

Integration and Installation (I&I)



2 shifts of 4 PDS personnel, 4 days/week, Through duration

### Photosensors (Spain, Italy, Czech Republic)

- A photosensor "Kit" is the number of boards needed for 1 module (32 boards) + 5% spares.
- Testing runs May 2023 – July 2025.
- Assumes ~ 2,500 boards per month.
- Currently reporting 360 (~25%) kits complete.
- Currently uses US calendar assumptions (holidays...).
- Separate contemporaneous lines (not shown) for Spanish and Czech contributions.

	Activity Name	Start	<b>v</b> Finish		202			202			202					
			•	Q1	Q2	Q3 Q4	1 Q1	L Q2	Q3 Q4	4 Q1	Q2	Q3 Q4	4 Q1	Q		
otosensors and Acti		24-May-23	01-Jul-25			2	4-May	23 A	22-100-23	A Dhyci	icist Unc	osted - Ge	moric Ur	aiv. M		
3122.A12516	Assemble 40 PD Module Photosensor Kit #1 (40 total) - Italy	24-May-23 A	23-Jun-23 A					un-23 A			1 1 1	ist Uncoste				
3122.A12518	Assemble 40 PD Module Photosensor Kit #1 (80 total) - Italy	26-Jun-23 A	15-Sep-23 A				20-10					cist Uncos				
3122.A12520	Assemble 40 PD Module Photosensor Kit #1 (120 total) - Italy	18-Sep-23 A	29-Sep-23 A								1 1 1					
3122.A12522	Assemble 40 PD Module Photosensor Kit #1 (160 total) - Italy	02-Oct-23 A	13-Oct-23 A									sicist Unco				
.3122.A12524	Assemble 40 PD Module Photosensor Kit #1 (200 total) - Italy	16-Oct-23 A	27-Oct-23 A						1 I <b>I M</b> E		1 1 1	/sicist Unco				
3122.A12526	Assemble 40 PD Module Photosensor Kit #1 (240 total) - Italy	30-Oct-23 A	10-Nov-23 A									hysicist Un				
3122.A12528	Assemble 40 PD Module Photosensor Kit #1 (280 total) - Italy	13-Nov-23 A	28-Nov-23 A					13-INO		N 1 1 1 1		Physicist U				
3122.A12530	Assemble 40 PD Module Photosensor Kit #1 (320 total) - Italy	15-Feb-24 A	14-Apr-24 A									Apr-24 A F				
3122.A12532	Assemble 40 PD Module Photosensor Kit #1 (360 total) - Italy	17-Apr-24 A	30-Apr-24 A								5 <b>H</b>	Apr-24 A				
3122.A12534	Assemble 40 PD Module Photosensor Kit #1 (400 total) - Italy	01-May-24	17-May-24							1-May-24		7-May-24				
3122.A12536	Assemble 40 PD Module Photosensor Kit #1 (440 total) - Italy	20-May-24	31-May-24								3 <b>1 1</b> 3	81-May-24				
3122.A12538	Assemble 40 PD Module Photosensor Kit #1 (480 total) - Italy	03-Jun-24	14-Jun-24									14-Jun-24				
3122.A12540	Assemble 40 PD Module Photosensor Kit #1 (520 total) - Italy	17-Jun-24	01-Jul-24									01-Jul-24				
3122.A12542	Assemble 40 PD Module Photosensor Kit #1 (560 total) - Italy	02-Jul-24	16-Jul-24									16-Jul-2				
3122.A12544	Assemble 40 PD Module Photosensor Kit #1 (600 total) - Italy	17-Jul-24	30-Jul-24									30-Jul-				
3122.A12546	Assemble 40 PD Module Photosensor Kit #1 (640 total) - Italy	31-Jul-24	13-Aug-24									▶ <mark>∎</mark> 13-Au				
3122.A12548	Assemble 40 PD Module Photosensor Kit #1 (680 total) - Italy	14-Aug-24	27-Aug-24								1 1 1	27-A				
3122.A12550	Assemble 40 PD Module Photosensor Kit #1 (720 total) - Italy	28-Aug-24	11-Sep-24								28-Aug-24 11-Sep-24 Phy					
3122.A12552	Assemble 40 PD Module Photosensor Kit #1 (760 total) - Italy	12-Sep-24	25-Sep-24								12-Sep-	24 25	-Sep-24	Phy		
3122.A12554	Assemble 40 PD Module Photosensor Kit #1 (800 total) - Italy	26-Sep-24	09-Oct-24								26-Sep	o-24 📊 0	9-Oct-24	1 Ph		
3122.A12556	Assemble 40 PD Module Photosensor Kit #1 (840 total) - Italy	10-Oct-24	23-Oct-24									ct-24	23-Oct-2	24 P		
3122.A12558	Assemble 40 PD Module Photosensor Kit #1 (880 total) - Italy	24-Oct-24	06-Nov-24										06-Nov			
3122.A12560	Assemble 40 PD Module Photosensor Kit #1 (920 total) - Italy	07-Nov-24	20-Nov-24								07-N	Nov-24	20-No	v-24		
3122.A12562	Assemble 40 PD Module Photosensor Kit #1 (960 total) - Italy	21-Nov-24	06-Dec-24								21-	-Nov-24	06-D	ec-24		
3122.A12564	Assemble 40 PD Module Photosensor Kit #1 (1000 total) - Italy	09-Dec-24	20-Dec-24								09	9-Dec-24	20-0	)ec-24		
3122.A12566	Assemble 40 PD Module Photosensor Kit #1 (1040 total) - Italy	23-Dec-24	09-Jan-25								2	23-Dec-24	두 <sup>09</sup>	-Jan-2		
3122.A12568	Assemble 40 PD Module Photosensor Kit #1 (1080 total) - Italy	10-Jan-25	24-Jan-25									10-Jan-2	25 2	4-Jan		
3122.A12570	Assemble 40 PD Module Photosensor Kit #1 (1120 total) - Italy	27-Jan-25	07-Feb-25									27-Jan-	25	07-Fe		
3122.A12572	Assemble 40 PD Module Photosensor Kit #1 (1160 total) - Italy	10-Feb-25	21-Feb-25										b-25			
3122.A12574	Assemble 40 PD Module Photosensor Kit #1 (1200 total) - Italy	24-Feb-25	07-Mar-25									24-Fe	eb-25	07-1		
3122.A12576	Assemble 40 PD Module Photosensor Kit #1 (1240 total) - Italy	10-Mar-25	21-Mar-25									10-N	/lar-25	21		
3122.A12578	Assemble 40 PD Module Photosensor Kit #1 (1280 total) - Italy	24-Mar-25	04-Apr-25									24-1	Mar-25	<sup>0</sup>		
3122.A12580	Assemble 40 PD Module Photosensor Kit #1 (1320 total) - Italy	07-Apr-25	18-Apr-25									07	7-Apr-25	₩ 1		
3122.A12582	Assemble 40 PD Module Photosensor Kit #1 (1360 total) - Italy	21-Apr-25	02-May-25									2	21-Apr-2	5		
3122.A12584	Assemble 40 PD Module Photosensor Kit #1 (1400 total) - Italy	05-May-25	16-May-25									C	05-May-2	25		
3122.A12586	Assemble 40 PD Module Photosensor Kit #1 (1440 total) - Italy	19-May-25	02-Jun-25										19-May	-25		
3122.A12588	Assemble 40 PD Module Photosensor Kit #1 (1480 total) - Italy	03-Jun-25	16-Jun-25										03-Ju	n-25		
3122.A12590	Assemble 20 PD Module Photosensor Kit #1 (1500 total) - Italy	17-Jun-25	01-Jul-25								+		17-Ju			

#### HD Cold Electronics (Italy)

- Cold electronics include 1,500 cold amplifiers and 6,000 signal Routing Boards boards (+10% spares).
- Production and testing currently starts July 2025, ends July 26.
  - It is understood that this will need to be moved earlier to meet the INFN funding profile (Procurement line must occur in 2024).
  - Will require additional PRR to accommodate this schedule.

D	Activity Name	Start	<b>v</b> Finish			2026								
-		start	*	Q1	Q2	Q3	Q4	Q1	Q2	Q3				
FD1.020511.0003P	Ship to Brazil pilot lot cold amplifiers (210 amplifiers)	02-Jul-25	16-Jul-25		02-Jul-25									
FD1.020511.0004MS	T6 MS - Pilot lot cold amplifiers complete	17-Jul-25	17-Jul-25		17-Jul-25	🖌 17-Ju	-25							
FD1.020511.0005	20511.0005 Procure production cold amplifiers (1440 amplifiers) 17-Jul-25 09-Oct-25		17-Jul-25							1				
FD1.020511.0006	Test/Evaluate 0-25% cold amplifiers (360 amplifiers)	10-Oct-25												
FD1.020511.0007	Ship to Brazil 0-25% cold amplifiers (360 amplifiers)	09-Dec-25	22-Dec-25			09-	Dec-25	22-Dec-2	5					
FD1.020511.0008MS	T6 MS - 25% production cold amplifiers complete (360 amplifiers)	23-Dec-25	23-Dec-25					23-Dec-2						
FD1.020511.0009	Test/Evaluate 26-50% cold amplifiers (360 amplifiers)	23-Dec-25	23-Feb-26			23	B-Dec-25							
FD1.020511.0010	Ship to Brazil 26-50% cold amplifiers (360 amplifiers)	24-Feb-26	09-Mar-26					eb-26						
FD1.020511.0011MS	T6 MS - 50% production cold amplifiers complete (360 amplifiers)	10-Mar-26	10-Mar-26				10-1	Var-26	10-Mar-26					
FD1.020511.0012	Test/Evaluate 51-75% cold amplifiers (360 amplifiers)	10-Mar-26	04-May-26				10-1	Var-26		/lay-26				
FD1.020511.0013	Ship to Brazil 51-75% cold amplifiers (360 amplifiers)	05-May-26	18-May-26					i i i	26 18					
FD1.020511.0014MS	T6 MS - 75% production cold amplifiers complete (360 amplifiers)	19-May-26	19-May-26					1 1 1	/-26 19					
FD1.020511.0015	Test/Evaluate 76-100% cold amplifiers (360 amplifiers)	19-May-26	16-Jul-26					19-May	/-26					
FD1.020511.0016	Ship to Brazil 76-100% cold amplifiers (360 amplifiers)	17-Jul-26	30-Jul-26							30-Ju				
FD1.020511.0017MS	T6 MS - 100% production cold amplifiers complete (360 amplifiers)	31-Jul-26	31-Jul-26						31-Jul-2	6 📊 31-Ju	uļ-			

### Optical Components (UNICAMP)

- An optical component "Kit" includes the WLS bars and coated dichroic filters for a single module
- Fabrication occurs June 2025 February 2027
- Maximum required production rate of 4 kits/day

tivity ID	ID Activity Name		Finish		2025			2	2026		
-		Start	•	Q1 Q2	Q3	Q4	Q1	Q2	Q3	Q4	Q1
✓ Optical Components (Filt	ter Plates, WLS Bars) production	17-Jun-25	23-Feb-27								
13122.A12596	SVT: Assemble 40 PD Optical Component Kits #1 (40 total) - UNICAMP	17-Jun-25	16-Jul-25	17-Jun-25							
13122.A14664	Assemble 40 PD Optical Component Kits #1 (80 total) - UNICAMP	17-Jun-25	16-Jul-25			-Jul-25 M&S	S Standard v	vith Base '	/ear FY21,	Physicist Ur	ncosted
RT-131-FDC-FD-238	Risk Hook ID=RT-131-FDC-FD-238	17-Jun-25	17-Jun-25	17-Jun-25							
RT-131-FDC-FD-271	Risk Hook ID=RT-131-FDC-FD-271	17-Jun-25	17-Jun-25	17-Jun-25							
13122.A14666	Assemble 40 PD Optical Component Kits #1 (120 total) - UNICAMP	17-Jul-25	13-Aug-25			13-Aug-25					
13122.A14668	Assemble 40 PD Optical Component Kits #1 (160 total) - UNICAMP	14-Aug-25	11-Sep-25		0 0 15 7	11-Sep-2					
13122.A14670	Assemble 40 PD Optical Component Kits #1 (200 total) - UNICAMP	12-Sep-25	09-Oct-25		i li li l	▶ 09-00				- P - i - i	
13122.A14672	Assemble 40 PD Optical Component Kits #1 (240 total) - UNICAMP	10-Oct-25	06-Nov-25		8 8 8 8	-25					
13122.A14674	Assemble 80 PD Optical Component Kits #1 (320 total) - UNICAMP	07-Nov-25	08-Dec-25		07-N	lov-25	_08-Dec-25	M&S St	andard wit	h Base Year	FY21,
13122.A14676	Assemble 80 PD Optical Component Kits #1 (400 total) - UNICAMP	09-Dec-25	09-Jan-26			09-Dec-25					
13122.A14678	Assemble 80 PD Optical Component Kits #1 (480 total) - UNICAMP	12-Jan-26	09-Feb-26							ard with Ba	
13122.A14680	Assemble 80 PD Optical Component Kits #1 (560 total) - UNICAMP	10-Feb-26	09-Mar-26							andard with	
13122.A14682	Assemble 80 PD Optical Component Kits #1 (640 total) - UNICAMP	10-Mar-26	06-Apr-26			10-	Mar-26	6-Apr	-26 M&S	Standard w	/ith Bas
13122.A14684	Assemble 80 PD Optical Component Kits #1 (720 total) - UNICAMP	07-Apr-26	04-May-26				07-Apr-26	• 04-	May-26 N	//&S Standa	rd with
13122.A14686	Assemble 80 PD Optical Component Kits #1 (800 total) - UNICAMP	05-May-26	02-Jun-26				05-May	26	02-Jun-26	M&S Stan	dard w
13122.A14688	Assemble 80 PD Optical Component Kits #1 (880 total) - UNICAMP	03-Jun-26	01-Jul-26				03-J	un-26	01-Jul-2	26 M&S St	andard
13122.A14690	Assemble 80 PD Optical Component Kits #1 (960 total) - UNICAMP	02-Jul-26	30-Jul-26					02-Jul-26	30-J	ul-26 M&S	S Stand
13122.A14692	Assemble 80 PD Optical Component Kits #1 (1040 total) - UNICAMP	31-Jul-26	27-Aug-26					31-Jul-	26 🖌 🔤 2	27-Aug-26	M&S S
13122.A14694	Assemble 80 PD Optical Component Kits #1 (1120 total) - UNICAMP	28-Aug-26	25-Sep-26					28-A	ug-26	25-Sep-2	26 M8
13122.A14696	Assemble 80 PD Optical Component Kits #1 (1200 total) - UNICAMP	28-Sep-26	23-Oct-26					2	8-Sep-26	23-00	ct-26
13122.A14698	Assemble 80 PD Optical Component Kits #1 (1280 total) - UNICAMP	26-Oct-26	20-Nov-26						26-Oct-2	26 20	J-Nov-2
13122.A14700	Assemble 80 PD Optical Component Kits #1 (1360 total) - UNICAMP	23-Nov-26	22-Dec-26						23-No	ov-26	22-De
13122.A14702	Assemble 80 PD Optical Component Kits #1 (1440 total) - UNICAMP	23-Dec-26	26-Jan-27						23	3-Dec-26	2
13122.A14704	Assemble 60 PD Optical Component Kits #1 (1500 total) - UNICAMP	27-Jan-27	23-Feb-27							27-Jan-2	1

#### Module Frame Components (UNICAMP)

- A frame component "Kit" includes the mechanical components for a single module
- Fabrication occurs June 2025 March 2027
- Maximum required production rate of 4 kits/day

ivity ID		Activity Name	Start	<b>Finish</b>	2025	2026				
				•	Q1 Q2 Q3 Q4	Q1	Q2	Q3	Q4	Q1
~	PD Module Frame Compone	nt (G-10) Production	17-Jun-25	23-Mar-27						
	13122.A14830	Assemble 40 PD Frame Component Kits #1 (40 total) - UNICAMP	17-Jun-25	16-Jul-25	17-Jun-25 Mec					_
	13122.A14832	Assemble 40 PD Frame Component Kits #1 (80 total) - UNICAMP	17-Jul-25	13-Aug-25	17-Jul-25					
	13122.A14834	Assemble 40 PD Frame Component Kits #1 (120 total) - UNICAMP	14-Aug-25	11-Sep-25	14-Aug-25					
	13122.A14836	Assemble 40 PD Frame Component Kits #1 (160 total) - UNICAMP	12-Sep-25	09-Oct-25						niv, Mechanic
	13122.A14838	Assemble 40 PD Frame Component Kits #1 (200 total) - UNICAMP	10-Oct-25	06-Nov-25						c Univ, Mecha
	13122.A14840	Assemble 40 PD Frame Component Kits #1 (240 total) - UNICAMP	07-Nov-25	08-Dec-25						neric Univ, Me
	13122.A14842	Assemble 80 PD Frame Component Kits #1 (320 total) - UNICAMP	09-Dec-25	09-Jan-26	09-Dec-25					
	13122.A14844	Assemble 80 PD Frame Component Kits #1 (400 total) - UNICAMP	12-Jan-26	09-Feb-26				51 SL SL		ın - Generic U
	13122.A14846	Assemble 80 PD Frame Component Kits #1 (480 total) - UNICAMP	10-Feb-26	09-Mar-26	10-Fe	-26	09-Mar-26	Mechan	nical Techn	nician - Gener
	13122.A14848	Assemble 80 PD Frame Component Kits #1 (560 total) - UNICAMP	10-Mar-26	06-Apr-26	10-	Mar-26	06-Apr-	26 Mech	nanical Tec	chnician - Ger
	13122.A14850	Assemble 80 PD Frame Component Kits #1 (640 total) - UNICAMP	07-Apr-26	04-May-26		07-Apr-26	04-N	Иау-26 🛛 🛛	<i>A</i> echanica	I Technician -
	13122.A14852	Assemble 80 PD Frame Component Kits #1 (720 total) - UNICAMP	05-May-26	02-Jun-26		05-May-	26	)2-Jun-26	Mechani	ical Technicia
	13122.A14854	Assemble 80 PD Frame Component Kits #1 (800 total) - UNICAMP	03-Jun-26	01-Jul-26		03-J	un-26	01-Jul-2	26 Mecha	anical Technic
	13122.A14856	Assemble 80 PD Frame Component Kits #1 (880 total) - UNICAMP	02-Jul-26	30-Jul-26			02-Jul-26	30-Ji	ul-26 Me	echanical Tec
	13122.A14858	Assemble 80 PD Frame Component Kits #1 (960 total) - UNICAMP	31-Jul-26	27-Aug-26			31-Jul-2	26	27-Aug-26	Mechanica
	13122.A14860	Assemble 80 PD Frame Component Kits #1 (1040 total) - UNICAMP	28-Aug-26	25-Sep-26			28-Au	ıg-26 <b>→</b>	25-Sep-	26 Mechan
	13122.A14862	Assemble 80 PD Frame Component Kits #1 (1120 total) - UNICAMP	28-Sep-26	23-Oct-26			28	3-Sep-26	23-0	Oct-26 Mecl
	13122.A14864	Assemble 80 PD Frame Component Kits #1 (1200 total) - UNICAMP	26-Oct-26	20-Nov-26				26-Oct-2	26 2	20-Nov-26 N
	13122.A14866	Assemble 80 PD Frame Component Kits #1 (1280 total) - UNICAMP	23-Nov-26	22-Dec-26				23-No	ov-26	22-Dec-26
	13122.A14868	Assemble 80 PD Frame Component Kits #1 (1360 total) - UNICAMP	23-Dec-26	26-Jan-27				23	3-Dec-26	26-Jar
	13122.A14870	Assemble 80 PD Frame Component Kits #1 (1440 total) - UNICAMP	27-Jan-27	23-Feb-27					27-Jan-	27
	13122.A14872	Assemble 60 PD Frame Component Kits #1 (1500 total) - UNICAMP	24-Feb-27	23-Mar-27					24-F	eb-27

### Module Assembly (UNICAMP)

- Modules assembled at UNICAMP
- 2 modules/day initially, 4 modules per day for second half of production
- Production occurs July 25 through April 27.

Start	▼ Finish	2025 2026
	•	Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1
17-Jul-25	20-Apr-27	
17-Jul-25	13-Aug-25	17-Jul-25, 13-Aug-25 Mechanical Technician - Generic Univ, Mechanical Eng
14-Aug-25	11-Sep-25	14-Aug-25 11-Sep-25 Mechanical Technician - Generic Univ, Mechanical
14-Aug-25	14-Aug-25	14-Aug-25
12-Sep-25	09-Oct-25	12-Sep-25
10-Oct-25	06-Nov-25	10-Oct-25 Mechanical Technician - Generic Univ, Mech
07-Nov-25	08-Dec-25	07-Nov-25, L08-Dec-25 Mechanical Technician - Generic Univ, M
23-Dec-25	26-Jan-26	23-Dec-25
12-Jan-26	09-Feb-26	12-Jan-26, <u>09-Fe</u> b-26 Mechanidal Technidian - Generic I
10-Feb-26	09-Mar-26	10-Feb-26
10-Mar-26	06-Apr-26	10-Mar-26
07-Apr-26	04-May-26	07-Apr-26, mechanical Technician
05-May-26	02-Jun-26	05-May-26
03-Jun-26	01-Jul-26	03-Jun-26
02-Jul-26	30-Jul-26	02-Jul-26 Mechanica Te
31-Jul-26	27-Aug-26	31-Jul-26
28-Aug-26	25-Sep-26	28-Aug-26
28-Sep-26	23-Oct-26	28-Sep-26
26-Oct-26	20-Nov-26	26-Oct-26
23-Nov-26	22-Dec-26	23-Nov-26
23-Dec-26	26-Jan-27	23-Dec-26
27-Jan-27	23-Feb-27	27-Jah-27
24-Feb-27	23-Mar-27	24-Feb-27
24-Mar-27	20-Apr-27	24-Mar-27
		24-Mar-2720-Apr-27Post-Swap HD PDS Production Plan

Warm Electronics (Spain, Czech Republic, Fermilab, NIU, U Michigan, CSU)

• Includes multiple activities associated with warm-side readout

- Flanges, power supplies (Spain, Czech Republic)
- Power Supply Testing (U of Michigan)
- Warm cables (CSU)
- DAPHNE Fabrication (FNAL)
- DAPHNE testing (NIU)

y ID	Activity Name	Start	<b>v</b> Finish	2025 2026
y io		Start	V TIMSH	Q4 Q1 Q2 Q3 Q4 Q1 Q2 Q3 Q4 Q1
✓ Warm Electronics Assem	bly and Testing	10-Feb-25	26-Mar-27	
13122.A15528	Fabricate/Test Cables (APA Top to Warm Electronics) 1-25 - UNICAMP	10-Feb-25	31-Mar-25	10-Feb-25 31-Mar-25 Mechanical Technician - Colorado, Undergrad Student - Colorado, M
13122.A15530	Cryostat flange fabrication 1-25 UNICAMP	10-Feb-25	20-May-25	10-Feb-25 20-May-25 Undergrad Student - Colorado, M&\$ Pass-Thru with Base Year
13122.A15534	Procure DAPHNE LV Power Supplies - UNICAMP	10-Feb-25	16-Jun-25	10-Feb-25 16-Jun-25 Undergrad Student - Colorado, M&S Pass-Thru with Base Yea
13122.A368661	Fabricate/test Cables (APA top to Warm Electronics) 26-50 APAs - UNICAMP	01-Apr-25	14-Jul-25	01-Apr-25 14-Jul-25 Mechanical Technician - Colorado, Undergrad Student - Co
13122.A368711	Cryostat Flange Fabrication 26-50 - UNICAMP	20-May-25	02-Sep-25	20-May-25 Undergrad Student - Colorado, M&S Pass-Thru with
13122.A15536	Test DAPHNE LV power Supplies - US - U of Michigan	17-Jun-25	23-Oct-25	17-Jun-29
13122.A372802	Test DAPHNE LV power Supplies - Brazil - UNICAMP	17-Jun-25	23-Oct-25	17-Jun-29, 23-Oct-25. Electrical Engineer - Generic Univ
13122.A368671	Fabricate/test Cables (APA top to Warm Electronics) 51-75 APAs - UNICAMP	14-Jul-25	22-Oct-25	14-Jul-25
13122.A368721	Cryostat Flange Fabrication 51-75 - UNICAMP	02-Sep-25	12-Dec-25	02-Sep-25 12-Dec-25 Undergrad Student - Colorado, M&S Pa
13122.A368681	Fabricate/test Cables (APA top to Warm Electronics) 76-100 APAs - UNICAMP	22-Oct-25	09-Feb-26	22-Oct-25
13122.A372372	Ship DAPHNE LV Power Supplies - FNAL	24-Oct-25	13-Nov-25	24-Oct-25 13-Nov-25 M&S Standard with Base Year FY23, Electri
RO-131-FDC-FD-354	Risk Hook ID=RO-131-FDC-FD-354	07-Nov-25	07-Nov-25	07-Nov-25
13122.L370253	Labor for the assembly of 160 DAPHNE Modules #1 - Chasis - FNAL	07-Nov-25	09-Feb-26	07-Nov-25
13122.A368731	Cryostat Flange Fabrication 76-100 - UNICAMP	15-Dec-25	31-Mar-26	15-Dec-28
13122.A368691	Fabricate/test Cables (APA top to Warm Electronics) 101-125 APAs - UNICAMP	10-Feb-26	20-May-26	10-Feb-26, 20-May-26 Mechanical Technicia
13122.A368741	Cryostat Flange Fabrication 101-125 - UNICAMP	31-Mar-26	13-Jul-26	31-Mar-26
13122.A368701	Fabricate/test Cables (APA top to Warm Electronics) 126-150 APAs - UNICAMP	20-May-26	01-Sep-26	20-May-20
13122.A368751	Cryostat Flange Fabrication 126-150 - UNICAMP	13-Jul-26	21-Oct-26	13-Jul-26
13122.A12744	Assemble and test 32 DAPHNE Modules #1 (64 total) - NIU	06-Aug-26	13-Oct-26	06-Aug-26
13122.A12746	Assemble and test 32 DAPHNE Modules #1 (96 total) - NIU	14-Oct-26	30-Nov-26	14-Oct-26 30-Nov-26
13122.A372392	Ship flanges and cables to SURF UNICAMP	22-Oct-26	04-Dec-26	22-Dct-26
13122.A15532	T6 MS - First DAPHNE Modules delivered at site		30-Nov-26	T6 MS Firs
13122.A12748	Assemble and Test 32 DAPHNE Modules #1 (128 total) - NIU	01-Dec-26	20-Jan-27	01-Déc-26
13122.A12750	Assemble and Test 32 DAPHNE Modules #1 (160 total) - NIU	21-Jan-27	05-Mar-27	21-Jan-27
13122.A372352	Ship Assembled DAPHNE Modules to SURF (160 Total) - NIU	08-Mar-27	26-Mar-27	D8-Mar-27
13122.A15538	T6 MS - 100% of DAPHNE Modules Assembled/Tested/Delivered to SURF		26-Mar-27	

Monitoring System (ANL, SDSMT)

- Includes 192 diffuser/fiber assemblies (+20 spares, SDSMT) and 20 Light source modules (ANL)
- Production occurs September 2025 through January 2027.

vity ID	Activity Name	Start 🔻 Finish		2025	2026
,			*	Q1 Q2 Q3 Q4 Q1	Q2 Q3 Q4 (
✓ Photon Detector Monit	toring System Assembly and Testing	26-Sep-25	20-Jan-27		
13122.A14954	SVT: Place order for components for 20 light source modules (ANL)	26-Sep-25	02-Oct-25	26-Sep-25 02-Oct-25	
13122.A455708	SVT: Place order for components for 192 Diffuser Assemblies (SDSMT)	26-Sep-25	02-Oct-25	26-Sep-25 02-Oct-25	
13122.A14964	SVT: Vendors fabricate components for 20 light source modules (ANL)	03-Oct-25	02-Jan-26	03-Oct-25	
13122.A455718	SVT: Vendors fabricate components for 192 Diffuser Assemblies (SDSMT)	03-Oct-25	02-Jan-26	03-Oct-25	
13122.A455698	Vendor delivers components for 20 light source modules (ANL)	05-Jan-26	05-Jan-26	05-Jan-26 → 05-Jan-26	M&S Pass-Thru with Base Year F
13122.A455728	Vendor delivers components for 192 Diffuser Assemblies (SDSMT)	05-Jan-26	05-Jan-26	05-Jan-26	M&S Standard with Base Year F
13122.A12772	Assemble, and Test 5 Light Source Modules #1 - ANL (Part 1 of 4)	06-Jan-26	31-Mar-26	06-Jan-26	31-Mar-26 Electrical Engineer Sr
13122.A12764	Assemble, and Test 48 Diffuser Assemblies #1 - SDSMT (Part 1 of 4)	06-Jan-26	31-Mar-26	06-Jan-26	31-Mar-26 Mechanical Technicia
13122.A14912	Assemble, and Test 48 Diffuser Assemblies #1 - SDSMT (Part 2 of 4)	01-Apr-26	25-Jun-26	01-Apr-26	25-Jun-26 Mechanical
13122.A14918	Assemble, and Test 5 Light Source Modules #1 - ANL (Part 2 of 4)	01-Apr-26	25-Jun-26	01-Apr-26	25-Jun-26 Electrical En
13122.A14914	Assemble, and Test 48 Diffuser Assemblies #1 - SDSMT (Part 3 of 4)	26-Jun-26	21-Sep-26	26-J	un-26 21-Sep-26 N
13122.A14920	Assemble, and Test 5 Light Source Modules #1 - ANL (Part 3 of 4)	26-Jun-26	21-Sep-26	26-J	un-26 El
13122.A14916	Assemble, and Test 48 Diffuser Assemblies #1 - SDSMT (Part 4 of 4)	22-Sep-26	16-Dec-26		22-Sep-26
13122.A14922	Assemble, and Test 5 Light Source Modules #1 - ANL (Part 4 of 4)	22-Sep-26	16-Dec-26		22-Sep-26
13122.A372362	Ship Light Source Modules to SURF #1 - ANL FY24Q4	17-Dec-26	20-Jan-27		17-Dec-26

### Module Reception/Testing/Storage

- Following assembly and initial warm testing at UNICAMP, Modules are shipped to the US module reception facility at CSU for cold testing and repair, then storage
  - 60 day shipping UNICAMP CSU
  - Modules tested at a rate of 10/day
  - 5 day shipping CSU SURF
- Reception/Inspection starts 9/25, Ends 10/27

	Activity Name	Start	▼ Finish	2025				2026				2027	
	· · · · · · · · · · · · · · · · · · ·		· ·	Q2 Q3	Q4	<b>Q</b>	1 Q	2 Q3	Q4	Q1	Q2	Q3	Q4
' PD Module Shipping to	US Reception Facility	12-Sep-25	18-Oct-27										18-Oct-27
13122.A12778	Ship Modules to PD Reception Facilty (80 Modules) #1 - UNICAMP	12-Sep-25	08-Dec-25	12-Sep-25	1 1 1	08-De							, Mechanical Te
13122.A12780	Reception Inspection (80 Modules) #1 - CSU	09-Dec-25	09-Mar-26	09	Dec-25						1		ed - Colorado, N
13122.A12784	Ship Modules to PD Reception Facilty (160 Modules) (240 total) #1 - UNICAMP	27-Jan-26	20-Apr-26		27-Jan-	26	2	0-Apr-26	Physicist - G	eneric Univ,	Mechani	cal Technici	an - Generic Un
13122.A12782	Deliver to Storage (80 Modules) #1 - CSU	10-Mar-26	16-Mar-26		10-1	Mar-26	▶∎ 16-№	<u>ar-2</u> 6 Gra	d Student Ui	ncosted - Co	olorado, F	Physicist Un	costed - Colora
RT-131-FDC-FD-243	Risk Hook ID=RT-131-FDC-FD-243	10-Mar-26	10-Mar-26		10-1	Mar-26	🖬 10-м	ar-26					
13122.A12786	Reception Inspection (160 Modules) (240 total) #1 - CSU	21-Apr-26	16-Jul-26			21-A	pr-26	16	Jul-26 Phy	sicist Uncos	ted - Col	orado, Post	Doc Uncosted
13122.A12790	Ship Modules to PD Reception Facilty (320 Modules) (560 total) #1 - UNICAMP	05-May-26	30-Jul-26			05-1	Vay-26		0-Jul-26 Pl	ysicist - Gei	neric Univ	v, Mechanic	al Technician - (
13122.A12788	Deliver to Storage (160 Modules) (240 total) #1 - CSU	17-Jul-26	23-Jul-26				17-J	ul-26 🔒 2	3-Jul-26 Gr	ad Student l	Jncosted	- Colorado	, Physicist Unco
13122.A12792	Reception Inspection (320 Modules) (560 total) #1 - CSU	31-Jul-26	23-Oct-26				31	Jul-26	23	Oct-26 Phy	ysicist Un	icosted - Co	lorado, Post Do
13122.A12796	Ship Modules to PD Reception Facilty (320 Modules) (880 total) #1 - UNICAMP	28-Aug-26	20-Nov-26					8-Aug-26		20-Nov-26	Physicist	t - Generic l	Jniv, Mechanica
13122.A12794	Deliver to Storage (320 Modules) (560 total) #1 - CSU	26-Oct-26	30-Oct-26					26-0	t-26 <mark>▶ </mark> 30	Oct-26 Gr	ad Stude	nt Uncoster	d - Colorado, Ph
13122.A12798	Reception Inspection (320 Modules) (880 total) #1 - CSU	23-Nov-26	23-Feb-27					23	Nov-26	2	3-Feb-27	Physicist	Uncosted - Colo
13122.A12802	Ship Modules to PD reception Facilty (320 Modules) (1200 total) #1 - UNICAMP	23-Dec-26	23-Mar-27						23-Dec-26		23-Ma	r-27 Physic	cist - Generic Ur
13122.A12800	Deliver to Storage (320 Modules) (880 total) #1 - CSU	24-Feb-27	02-Mar-27						24-	eb-27	02-Mar-2	7 Grad Stu	udent Uncosted
13122.A12804	Reception Inspection (320 Modules) (1200 total) #1 -CSU	24-Mar-27	16-Jun-27						2	4-Mar-27		16-Jun-2	27 Physicist Un
13122.A12808	Ship Modules to PD Reception Facilty (300 Modules) (1500 total) #1 - UNICAMP	21-Apr-27	16-Jul-27							21-Apr-2	1	16-Ju	ul-27 Physicist
13122.A12806	Deliver to Storage (320 Modules) (1200 total) #1 - CSU	17-Jun-27	24-Jun-27							17	-Jun-27	24-Jun-	27 Grad Stude
13122.A12810	Reception Inspection (300 Modules) (1500 total) #1 - CSU	19-Jul-27	11-Oct-27								19-Jul-	27	11-Oct-27
151/21.21/221024	Deliver to Storage (300 Modules) (1500 total) #1 - CSU	Post-Swyadoat-byd Pi	DS Prochastion Plan									12-Oct-27	7 1 68-Oct-27

### Installation and Integration

13122.A12862

13122.A12864

Install PD Monitoring in Detector #1 Slices 23-24 - SDSM

Install PD Monitoring in Detector #1 Slices 25 - SDSM

- I&I activities occur at SURF site in Lead SD
- Warm Electronics installation occurs Dec. 26 through July 27 (with availability of cryostat roof)
- Light detector and monitoring installation occurs March 28 – January 29
- 2 4-person crews for modules, 12person crew for flashers/diffusers

ID	Activity Name	Start	Finish			027					028	
			•	Q1	Q2	Q3	(	Q4 Q	1	Q2	Q3	Q4
✓ PD Module Integration		16-Mar-28	19-Jan-29								20.0	10.1
13122.A14534	Install Modules in Detector Slices 1-2 (120 Modules total) #1 - Italy	16-Mar-28	12-Apr-28					16-Mar-2			-28 Grad	
13122.A14536	Install Modules in Detector Slices 3-4 (240 Modules total) #1 - Italy	13-Apr-28	03-May-28						or-28		May-28 (	
13122.A14538	Install Modules in Detector Slices 5-6 (360 Modules total) #1 - Italy	04-May-28	24-May-28								4-May-28	
13122.A14540	Install Modules in Detector Slices 7-8 (480 Modules total) #1 - Italy	25-May-28	15-Jun-28					2:			15-Jun-2	
13122.A14542	Install Modules in Detector Slices 9-10 (600 Modules total) #1 - Italy	16-Jun-28	10-Jul-28								10-Jul	
13122.A14544	Install Modules in Detector Slices 11-12 (720 Modules total) #1 - Italy	11-Jul-28	31-Jul-28								■ 31	
13122.A14546	Install Modules in Detector Slices 13-14 (840 Modules total) #1 - Italy	01-Aug-28	29-Aug-28						0			29-Aug-
13122.A14548	Install Modules in Detector Slices 15-16 (960 Modules total) #1 - Italy	30-Aug-28	20-Sep-28								ug-28	
13122.A14550	Install Modules in Detector Slices 17-18 (1080 Modules total) #1 - Italy	21-Sep-28	11-Oct-28								-Sep-28	
13122.A14552	Install Modules in Detector Slices 19-20 (1200 Modules total) #1 - Italy	12-Oct-28	01-Nov-28								12-Oct-28	
13122.A14554	Install Modules in Detector Slices 21-22 (1320 Modules total) #1 - Italy	02-Nov-28	22-Nov-28								02-Nov	
13122.A14556	Install Modules in Detector Slices 23-24 (1440 Modules total) #1 - Italy	27-Nov-28	21-Dec-28									lov-28
13122.A14558	Install Modules in Detector Slice 25 (1500 Modules total) #1 - Italy	26-Dec-28	19-Jan-29								2	6-Dec-2
	N	/lonitoring										
	N	/lonitoring										
	Activity Name	/Ionitoring start	▼ Finish	Q1	2( Q2	027 Q3		Q4 Q		20 Q2	028 Q3	Q4
	Activity Name	<b>Ŭ</b>	Finish	Q1			(	Q4 Q	1		1	Q4
PD Monitoring System Ins 13122.A12840	Activity Name	Start	•	Q1			(	16-Mar-2	8	<b>Q2</b> 12-Apr	Q3	
	Activity Name	Start 16-Mar-28	19-Jan-29	Q1			(	16-Mar-2		<b>Q2</b> 12-Apr	Q3	d Studer
13122.A12840	Activity Name Itallation Install PD Monitoring in Detector #1 Slices 1-2 - SDSMT	Start           16-Mar-28           16-Mar-28	<b>19-Jan-29</b> 12-Apr-28	Q1				16-Mar-2 13-Ap 04-N	8 97-28 Vay-28	Q2 12-Apr 03-N 24	<b>Q3</b> 28 Gra	d Studer Grad Stu
13122.A12840 13122.A12842	Activity Name Itallation Install PD Monitoring in Detector #1 Slices 1-2 - SDSMT Install PD Monitoring in Detector #1 Slices 3-4 - SDSMT	Start           16-Mar-28           16-Mar-28           13-Apr-28	<b>19-Jan-29</b> 12-Apr-28 03-May-28	Q1				16-Mar-2 13-Ap 04-N	8 pr-28 May-28 5-May-2	Q2 12-Apr 03-N 24	Q3 28 Grai May-28 ( 4-May-28 15-Jun-2	d Studer Grad Stu Grad S
PD Monitoring System Ins 13122.A12840 13122.A12842 13122.A12842 13122.A12844	Activity Name tallation Install PD Monitoring in Detector #1 Slices 1-2 - SDSMT Install PD Monitoring in Detector #1 Slices 3-4 - SDSMT Install PD Monitoring in Detector #1 Slices 5-6 - SDSMT	Start           16-Mar-28           16-Mar-28           13-Apr-28           04-May-28	19-Jan-29           12-Apr-28           03-May-28           24-May-28	Q1				16-Mar-2 13-Ap 04-N	8 pr-28 May-28 5-May-2	Q2 12-Apr 03-N 24	Q3 28 Grai May-28 ( 4-May-28 15-Jun-2	d Studer Grad Stu Grad S 28 Grad
13122.A12840 13122.A12842 13122.A12844 13122.A12844	Activity Name tallation Install PD Monitoring in Detector #1 Slices 1-2 - SDSMT Install PD Monitoring in Detector #1 Slices 3-4 - SDSMT Install PD Monitoring in Detector #1 Slices 5-6 - SDSMT Install PD Monitoring in Detector #1 Slices 7-8 - SDSMT	Start           16-Mar-28           16-Mar-28           13-Apr-28           04-May-28           25-May-28	19-Jan-29           12-Apr-28           03-May-28           24-May-28           15-Jun-28	Q1				16-Mar-2 13-Ap 04-N	8 or-28 May-28 5-May-2 16-Jur 11	Q2 12-Apr 03-N 24 8 -28 -Jul-28	Q3 28 Grad May-28 ( 4-May-28 15-Jun-2 10-Jul 31-	d Studer Grad Stu Grad S 8 Grac I-28 Gr
<ul> <li>PD Monitoring System Ins 13122.A12840</li> <li>13122.A12842</li> <li>13122.A12844</li> <li>13122.A12846</li> <li>13122.A12848</li> </ul>	Activity Name tallation Install PD Monitoring in Detector #1 Slices 1-2 - SDSMT Install PD Monitoring in Detector #1 Slices 3-4 - SDSMT Install PD Monitoring in Detector #1 Slices 5-6 - SDSMT Install PD Monitoring in Detector #1 Slices 7-8 - SDSMT Install PD Monitoring in Detector #1 Slices 9-10 - SDSMT	Start           16-Mar-28           16-Mar-28           13-Apr-28           04-May-28           25-May-28           16-Jun-28	19-Jan-29           12-Apr-28           03-May-28           24-May-28           15-Jun-28           10-Jul-28	Q1				16-Mar-2 13-Ap 04-N	8 or-28 May-28 5-May-2 16-Jur 11	Q2 12-Apr 03-N 24 8 -128 -Jul-28 11-Aug-2	Q3 -28 Grad May-28 Grad 4-May-28 15-Jun-2 10-Jul 31- 28	d Studer Grad Stu Grad S 28 Grad I-28 Gr Jul-28 29-Aug-
PD Monitoring System Ins 13122.A12840 13122.A12842 13122.A12844 13122.A12846 13122.A12848 13122.A12850	Activity Name tallation Install PD Monitoring in Detector #1 Slices 1-2 - SDSMT Install PD Monitoring in Detector #1 Slices 3-4 - SDSMT Install PD Monitoring in Detector #1 Slices 5-6 - SDSMT Install PD Monitoring in Detector #1 Slices 7-8 - SDSMT Install PD Monitoring in Detector #1 Slices 9-10 - SDSMT Install PD Monitoring in Detector #1 Slices 11-12 - SDSMT	Start           16-Mar-28           16-Mar-28           13-Apr-28           04-May-28           25-May-28           16-Jun-28           11-Jul-28	19-Jan-29           12-Apr-28           03-May-28           24-May-28           15-Jun-28           10-Jul-28           31-Jul-28	Q1				16-Mar-2 13-Ap 04-N	8 or-28 May-28 5-May-2 16-Jur 11	Q2 12-Apr 03-N 24 8 -128 -Jul-28 11-Aug-2	Q3 28 Grad May-28 ( 4-May-28 15-Jun-2 10-Jul 31-	d Studer Grad Stu Grad S 28 Grad I-28 Gr Jul-28 29-Aug-
13122.A12840 13122.A12842 13122.A12844 13122.A12846 13122.A12848 13122.A12850 13122.A12852	Activity Name tallation Install PD Monitoring in Detector #1 Slices 1-2 - SDSMT Install PD Monitoring in Detector #1 Slices 3-4 - SDSMT Install PD Monitoring in Detector #1 Slices 7-8 - SDSMT Install PD Monitoring in Detector #1 Slices 9-10 - SDSMT Install PD Monitoring in Detector #1 Slices 11-12 - SDSMT Install PD Monitoring in Detector #1 Slices 13-14 - SDSMT	Start           16-Mar-28           16-Mar-28           13-Apr-28           04-May-28           25-May-28           16-Jun-28           11-Jul-28           01-Aug-28	19-Jan-29           12-Apr-28           03-May-28           24-May-28           15-Jun-28           10-Jul-28           31-Jul-28           29-Aug-28	Q1				16-Mar-2 13-Ap 04-N	8 or-28 May-28 5-May-2 16-Jur 11	Q2 12-Apr 03-N 24 8 -1ul-28 11-Aug-2 30-Au	Q3 -28 Grad May-28 Grad 4-May-28 15-Jun-2 10-Jul 31- 28	d Studer Grad Stu Grad Stu S Grad S 28 Grac I-28 Gr Jul-28 29-Aug- 20-Se
13122.A12840 13122.A12842 13122.A12844 13122.A12846 13122.A12848 13122.A12850 13122.A12852 13122.A12854	Activity Name tallation Install PD Monitoring in Detector #1 Slices 1-2 - SDSMT Install PD Monitoring in Detector #1 Slices 3-4 - SDSMT Install PD Monitoring in Detector #1 Slices 5-6 - SDSMT Install PD Monitoring in Detector #1 Slices 7-8 - SDSMT Install PD Monitoring in Detector #1 Slices 9-10 - SDSMT Install PD Monitoring in Detector #1 Slices 11-12 - SDSMT Install PD Monitoring in Detector #1 Slices 13-14 - SDSMT Install PD Monitoring in Detector #1 Slices 15-16 - SDSMT	Start           16-Mar-28           16-Mar-28           13-Apr-28           04-May-28           25-May-28           16-Jun-28           11-Jul-28           01-Aug-28           30-Aug-28	19-Jan-29           12-Apr-28           03-May-28           24-May-28           15-Jun-28           10-Jul-28           31-Jul-28           29-Aug-28           20-Sep-28	Q1				16-Mar-2 13-Ap 04-N	8 or-28 May-28 5-May-2 16-Jur 11	Q2 12-Apr 03-N 24 28 -128 -Jul-28 11-Aug-2 30-Au 21	Q3 28 Grad May-28 G 4-May-28 15-Jun-2 10-Jul 31- 28  28  28	Grad Stu Grad S 28 Grad I-28 Gra Jul-28 29-Aug- 20-Se 11-
13122.A12842 13122.A12844 13122.A12846 13122.A12848 13122.A12850 13122.A12852 13122.A12854 13122.A12856	Activity Name tallation Install PD Monitoring in Detector #1 Slices 1-2 - SDSMT Install PD Monitoring in Detector #1 Slices 3-4 - SDSMT Install PD Monitoring in Detector #1 Slices 5-6 - SDSMT Install PD Monitoring in Detector #1 Slices 9-10 - SDSMT Install PD Monitoring in Detector #1 Slices 11-12 - SDSMT Install PD Monitoring in Detector #1 Slices 13-14 - SDSMT Install PD Monitoring in Detector #1 Slices 15-16 - SDSMT Install PD Monitoring in Detector #1 Slices 15-16 - SDSMT Install PD Monitoring in Detector #1 Slices 15-16 - SDSMT Install PD Monitoring in Detector #1 Slices 15-16 - SDSMT Install PD Monitoring in Detector #1 Slices 15-16 - SDSMT Install PD Monitoring in Detector #1 Slices 15-16 - SDSMT	Start           16-Mar-28           16-Mar-28           13-Apr-28           04-May-28           25-May-28           16-Jun-28           11-Jul-28           01-Aug-28           30-Aug-28           21-Sep-28	19-Jan-29           12-Apr-28           03-May-28           24-May-28           15-Jun-28           10-Jul-28           31-Jul-28           29-Aug-28           20-Sep-28           11-Oct-28	<u>Q1</u>				16-Mar-2 13-Ap 04-N	8 or-28 May-28 5-May-2 16-Jur 11	Q2 12-Apr 03-N 24 28 -128 -Jul-28 11-Aug-2 30-Au 21	Q3 -28 Gra- May-28 ( 4-May-28 15-Jun-2 10-Jul 31- 28 -3ep-28 -Sep-28 12-Oct-28	d Studen Grad Stu Grad Stu I-28 Grad Jul-28 Gri Jul-28

#### Light Detector



Activity ID	Activity Name		Finish	2026	2027
·····,	······	· •		Q3 Q4	Q1 Q2
✓ PD Warm Electronics/UV fl	asher Installation/Checkout	22-Dec-26	14-Jul-27	, pr	
13122.A15540	Install LV Power Supplies (US) - MICH	22-Dec-26	27-Jan-27	22-Dec-26	27-Jan-27 Electric
13122.A15542	Install LV Power Supplies (UNICAMP)	22-Dec-26	27-Jan-27	22-Dec-26	27-Jan-27 Electric
13122.A372342	Install/Checkout Monitoring System Flashers - SDSMT - ANL	21-Jan-27	10-Feb-27	21-Jan- <u>27</u>	▶ 10-Feb-27 Grad
13122.A12866	Install/Checkout Warm Electronics Detector #1 - Colombia	29-Mar-27	22-Jun-27	29	Mar-27
13122.A15522	PD Warm Electronics System DAQ Interface Checkout - FNAL	23-Jun-27	14-Jul-27		23-Jun-27
13122.A372382	T6 MS - 100% of PD Warm Electronics System Installation Complete		14-Jul-27		<b>₩</b>
	Post-Swap HD PDS Production Plan			1	7

#### Warm Electronics

27-Nov-28

26-Dec-28

21-Dec-28

19-Jan-29

#### Horizontal Drift Photon Detector System MOU

Subsystem	Description	Quantity (FD1)	Contributing Institutions	Funding Agencies	Subsystem	Description	Quantity (FD1)	Contributing Institutions	Funding Agencies
Light Collector Modules	X-Arapuca modules (10 per APA); frames, filters, and assembly	1,500	Unicamp, CTI, Unifal, UFABC, LNLS, Unifesp, ITA	FAPESP	CE	Photosensor passive (X6) and active (X8) ganging circuit (1 board per	1,500	INFN Milano Bicocca, INFN Laboratori Nazionali del Sud, INFN Milano	INFN-Italy
Photosensors	6x6 mm <sup>2</sup> SiPM, (192 for each of 1,500 modules); post-fabrication	192,000	INFN Bologna, INFN Milano Bicocca, INFN Laboratori Nazionali del Sud,	INFN-Italy		module <u>);</u> post-fabrication testing in both warm and cold			
	testing in both warm and cold		University of Insubria and INFN, INFN Ferrara, INFN		CE	Post-fabrication testing in both warm and cold		CIEMAT, JEIC	MCIN
Photosensors	6x6 mm <sup>2</sup> Silicon Photomultipliers (SiPM), (192 for each of 1,500	96,000	Milano, INFN Naples CIEMAT, IFIC, UGR	MCIN	- Warm Electronics	DAPHNE warm readout boards (1 per APA); post-fabrication testing	150	Fermilab, University of Michigan	Fermilab LBNF/DUNE- US project (DOE)
	modules); post- fabrication testing in both warm and cold				Calibration and Monitoring system	Pulsed ultraviolet (UV) flashers with Cathode Plane Assembly	204 diffusers, 18 control	ANL, SDSMT	Fermilab LBNF/DUNE- US project (DOE)
Photosensors	Post-fabrication testing in both		CAS, CTU	MEYS		(CPA) mounted diffusers	modules		
5/1	warm and cold			Post-Swap -	Detector Infrastructure	Module support rails, electrical connectors, and readout cables (1	150	Colorado State University	Fermilab LBNF/DUNE- US project (DOE)

#### Items not currently explicitly covered in MOU

- LV Power supplies
- Flanges
- Readout cables
  - While the intention was that the warm cables and APAflange cold cables would be made in Brazil, the existing MOU text can be read to include those cables so no edits are needed

Subsystem	Description	Quantity (HD PDS)	Contributing Nation	Funding Agency
LV Power Supplies	WEINER power supplies and crates for DAPHNE and monitoring flashers	150 channels + 10% spares	Spain, Cz. Republic	
Cryostat Flanges	Flanges for HD PDS signal/calibration cryostat penetration	75 flanges + 10% spares	Spain (Grenada)	

# Other MOU/scope changes (resulting from this meeting

Subsystem	Description	Quantity (HD PDS)	Contributing Nation	Funding Agency

#### Backup

#### HD/VD Overlap topics

- Resource utilization is not monitored carefully across HD/VD PDS boundaries.
- Shared human resources and facilities need to be carefully evaluated to ensure resource utilization duplication is avoided.
- Particular examples include:
  - SiPM fabrication/testing HD vs. VD. HD and VD fabrication and testing share amy share CACTUS testing sites and operators, and definitely share vendors for fabrication.
  - Dichroic filters: While HD and VD use separate vendors for dichroic filters mitigating overlap, there may be competition for pTP coating facilities. P6 includes separate HD and VD sites, but the risk of overlapping resources needs to be monitored.
  - WLS plates: Both HD and VD PDS plan to use the same vendor (Glass to Power) for wavelength shifting plates. Care must be taken to overtax this vendor.
  - DAPHNE: While HD and VD DAPHNE production is conducted at separate sites in Europe and the US, intellectual leadership of the effort is provided by the same teams. This possibility exists for resource conflict at FNAL primarily, however care must be taken to manage intra-European responsibilities for the VD PDS.
  - ~3 months explicit I&I HD and VD overlap exists in P6, which will need to be managed.
  - + resource overlaps with multiple different tasks at the same institution.
    - Several institutions are involved in hardware tasks for both HD and VD PDS.
    - Additionally, some are involved in HD fabrication during VD I&I.
- This potential interference may be mitigated by:
  - Involving more groups in some tasks.
  - Shifting the P6 schedule to better "Load level" resource utilization.