Guidelines:

1. See P&ID drawings marked for common piping opened to pump and backfill (yellow). Valve configuration (opened/closed) is indicated below and should be verified. All instrumentation and dead ends must be configured for cleaning with pump & backfill.

2. Common piping pumpdown is done from the MV-159-H connection (discharge manifold). Pumpdown continues to suction via inventory control valves and bypass 2-valves installed in crossover.

3. Pressures are monitored and datalogged for:
   - C:1PTLSL and C:3PTLHP (0-50 psia) on ACNET to verify pressure below 28”Hg
   - C:1PTCLH and C:1PTDTH (0-500 psig) to verify that inventory lines are below atm
   - PI-137-H and PI-TMP1 (suction and discharge at the inventory controls)
   - PI-TMP2,3,4,5 installed in individual compressors(-30mmHg - 15 psi)

4. Initially compressor valves MV-006-H and MV-090-H are closed and only common piping is pumped via MV-159-H. . Then vacuum is checked for stability for 15 min. If no leaks detected, then compressor #4 discharge isolation MV-090-H is opened, then suction isolation MV-006-H is opened and compressor is pumped down as verified on local gauge PI-TMP2.

5. As compressor #4 is pumped down, the vacuum is checked for 15 min for stability. If no leaks are detected, then compressor #5 is pumped down, etc.

6. Fill is done from storage tank #4 (each side) via clean or dirty line and continues to discharge manifold via inventory controls valves and bypass 2-valves installed in crossover.
   - Both PV-LSL and PV-HSL are initially closed
   - MV-111-H is initially closed (to prevent shortcut to suction) and opened at the end of fill cycle
   - Crack open t EV-551 (clean line) and observe C:1PTCLH raising up to 3-5 psig; close the valve. Then operate PV-LSL to bleed the gas to the common piping.
   - Verify pressures for both ACNET devices as well as in local gauges to raise up to 1-2 psig; repeat this cycle of adding gas if necessary.

7. After fill is complete:
    - Verify each compressor for positive pressure using compound gauges PI-TMP2,3,4,5 as well as individual suction gauges in the compressor panel.
    - Verify that C:1PTLSL and C:3PTLHP are at 1-2 psig
    - Verify that PI-137-H and PI-TMP1 is at 1-2 psig
    - Blow down gas by opening the line in the purifier suction dead end MV-TMP1 and the valve from the tube trailer fill station MV-TMP2 until the pressure drops to slightly above atm as observed on C:1PTLSL and C:3PTLHP.

8. Proceed with next pumpdown. Complete 5 cycles.

DO NOT LEAVE SYSTEM UNATTENDED UNDER VACUUM. FILL SYSTEM TO 1-3 PSIG HE AFTER THIS PROCEDURE.

SYSTEM IS VERIFIED BY:		DATE	INITIALS

* INDIVIDUAL COMPRESSORS ARE CONFIGURED FOR PUMPDOWNS
* ACNET DEVICES ARE READY
* LOCAL BYPASS IS READY AND OPENED
* LOCAL VACUUM PUMP IS INSTALLED AND CONNECTED

5520.320-MD-458101

						VERIFY	NOTE
EV	550	H	EV-550-H	CYCLED->CLOSED	1/17/2013	MGG	used to fill to 1 psig
EV	551	H	EV-551-H	CYCLED->CLOSED	1/17/2013	MGG	used to fill to 1 psig
EV	570	H	EV-570-H	CLOSED	1/17/2013	MGG	
EV	571	H	EV-571-H	CLOSED	1/17/2013	MGG	
EV	580	H	EV-580-H	CLOSED	1/17/2013	MGG	
EV	581	H	EV-581-H	CLOSED	1/17/2013	MGG	
EV	590	H	EV-590-H	CLOSED	1/17/2013	MGG	
EV	591	H	EV-591-H	CLOSED	1/17/2013	MGG	
MV	534	H	MV-534-H	OPENED	1/17/2013	MGG	
MV	536	H	MV-536-H	OPENED	1/17/2013	MGG	
MV	538	H	MV-538-H	OPENED	1/17/2013	MGG	
MV	539	H	MV-539-H	CLOSED	1/17/2013	MGG	
* ALL INSTRUM. LINES ARE OPEN TO VACUUM / FILL				OPENED	1/17/2013	MGG	
* ALL PURGE VALVES TO ATM ARE CLOSED				CLOSED	1/17/2013	MGG	
* CYCLE OPEN/CLOSED ALL CAPPED STUB VALVES TO ATM				OP/CL	1/17/2013	MGG	

4906.320-ME-483703

						VERIFY	NOTE
MV	150	H	MV-150-H	CLOSED	1/17/2013	MGG	
MV	125	H	MV-125-H	CLOSED	1/17/2013	MGG	
MV	152	H	MV-152-H	CLOSED	1/17/2013	MGG	
MV	159	H	MV-159-H	USED FOR PUMP	1/17/2013	MGG	
MV	164	H	MV-164-H	USED FOR FILL	1/17/2013	MGG	
MV	126	H	MV-126-H	CLOSED	1/17/2013	MGG	
MV	130	H	MV-130-H	CLOSED	1/17/2013	MGG	

MV	138	H	MV-138-H	CLOSED	1/17/2013	MGG	
MV	131	H	MV-131-H	CLOSED	1/17/2013	MGG	
MV	127	H	MV-127-H	OPENED	1/17/2013	MGG	
MV	128	H	MV-128-H	OPENED	1/17/2013	MGG	
MV	151	H	MV-151-H	OPENED	1/17/2013	MGG	
* ALL INSTRUM. LINES ARE OPEN TO VACUUM / FILL				OPENED	1/17/2013	MGG	
* ALL PURGE VALVES TO ATM ARE CLOSED				CLOSED	1/17/2013	MGG	
* CYCLE OPEN/CLOSED ALL CAPPED STUB VALVES TO ATM				OP/CL	1/17/2013	MGG	

4906.320-ME-484071

						VERIFY	NOTE
MV	105	H	MV-105-H	OPENED	1/17/2013	MGG	
MV	109	H	MV-109-H	OPENED	1/17/2013	MGG	
MV	107	H	MV-107-H	OPENED	1/18/2013	MGG	
PV	LSL	H	PV-LSL-H	OPENED	1/19/2013	MGG	
PV	LBL	H	PV-LBL-H	OPENED	1/20/2013	MGG	
PV	HSL	H	PV-HSL-H	OPENED	1/21/2013	MGG	
MV	101	H	MV-101-H	OPENED	1/22/2013	MGG	
MV	111	H	MV-111-H	CYCLED	1/23/2013	MGG	
MV	113	H	MV-113-H	OPENED	1/24/2013	MGG	
MV	169	H	MV-169-H	OPENED	1/25/2013	MGG	
MV	630	H	MV-630-H	OPENED	1/26/2013	MGG	
MV	631	H	MV-631-H	OPENED	1/27/2013	MGG	
MV	632	H	MV-632-H	OPENED	1/28/2013	MGG	
MV	691	H	MV-691-H	OPENED	1/29/2013	MGG	
MV	692	H	MV-692-H	OPENED	1/30/2013	MGG	
MV	157	H	MV-157-H	OPENED	1/31/2013	MGG	
MV	103	H	MV-103-H	CLOSED	2/1/2013	MGG	
MV	115	H	MV-115-H	CLOSED	2/2/2013	MGG	
MV	106	H	MV-106-H	CLOSED	2/3/2013	MGG	
MV	110	H	MV-110-H	CLOSED	2/4/2013	MGG	
* ALL INSTRUM. LINES ARE OPEN TO VACUUM / FILL				OPENED	2/5/2013	MGG	
* ALL PURGE VALVES TO ATM ARE CLOSED				CLOSED	2/6/2013	MGG	
* CYCLE OPEN/CLOSED ALL CAPPED STUB VALVES TO ATM				OP/CL	2/7/2013	MGG	

STAGE	time	C:1PTLSL suct	C:3PTLHP disch	PI-137 suct	PI-TMP1 disch	PI-TMP2 comp 4	PI-TMP3 comp 5	PI-TMP4 comp 6	PI-TMP5 comp 7	notes
before pumpdown 1										
after pumpdown 1										
before fill 1										
after fill 1										
before pumpdown 2										
after pumpdown 2										
before fill 2										
after fill 2										
before pumpdown 3										
after pumpdown 3										
before fill 3										
after fill 3										
before pumpdown 4										
after pumpdown 4										
before fill 4										

after fill 4										
before pumpdown 5										
after pumpdown 5										
before fill 5										
after fill 5										

REV	DESCRIPTION	DRAWN	DATE
		APPROVED	DATE
A	UPDATED TO INCLUDE CMTF ADDITION	R. HIBBARD	02-16-2012

NML FRICK COMPRESSOR 5520.320 ME-458100

NML INTERCONNECT PIPING 5520.320 ME-458092

TO/FROM STORAGE TANKS

CLEAN LINE

MV-594-H

MV-595-H

MV-596-H

PT-580-H

SV-580-H 250 PSIG

MV-583-H

EV-580-H

MV-582-H

PI-580-H

GAS STORAGE #1 14,500 GALLONS RD-0006

EV-581-H

MV-584-H

PT-570-H

SV-570-H 250 PSIG

MV-573-H

EV-570-H

MV-572-H

PI-570-H

GAS STORAGE #2 10,000 GALLONS SWY-023

EV-571-H

MV-574-H

PT-560-H

SV-560-H 250 PSIG

MV-563-H

EV-560-H

MV-562-H

PI-560-H

GAS STORAGE #3 9,200 GALLONS SWY-022

EV-561-H

MV-564-H

PT-550-H

SV-550-H 250 PSIG

MV-553-H

EV-550-H

MV-552-H

PI-550-H

GAS STORAGE #4 9,200 GALLONS SWY-021

EV-551-H

MV-554-H

MV-590-H

PT-540-H

SV-540-H 250 PSIG

MV-543-H

EV-540-H

MV-545-H

MV-542-H

PI-540-H

GAS STORAGE #5 30,000 GALLONS FMS-193

EV-541-H

MV-544-H

FILL

DIRTY LINE

CLEAN LINE

CMTF INTERCONNECT PIPING 5520.320 ME-484071

MV-TMP2

ISOLATED IN BLDG.

PURIFIER COMPRESSOR SUCTION

MV-591-H

MV-534-H

MV-536-H

MV-538-H

MV-539-H

SV-539-H 250 psig

TUBE TRAILER FILL STATION

UNLESS OTHERWISE SPECIFIED	ORIGINATOR	B.DEGRAFF	08-NOV-2007
	DRAWN	J.CATALANELLO	15-NOV-2007
± + ±	CHECKED	R.SCHMITT	07-JAN-2008
1. BREAK ALL SHARP EDGES MAX.	APPROVED	R.SCHMITT	07-JAN-2008
2. DO NOT SCALE DRAWING. 3. DIMENSIONS BASED UPON ASME Y14.5M-1994 4. MAX. ALL MACH. SURFACES	USED ON		
5. DRAWING UNITS: U.S. INCH	MATERIAL		

FERMI NATIONAL ACCELERATOR LABORATORY
UNITED STATES DEPARTMENT OF ENERGY

ILCTA LAB B PIPING AND INSTRUMENT DIAGRAM ILCTA GAS STORAGE

SCALE	DRAWING NUMBER	SHEET	REV
	5520.320-MD-458101	1 OF 1	A

CREATED WITH : Ideas12NXSeries | GROUP: ACCELERATOR CRYOGENICS

REV.	DESCRIPTION	DRAWN	DATE
		APPROVED	DATE
A			

KINNEY VACUUM PUMP DWG #TBD

ICW RETURN — W,2,P,S40-CS

ICW SUPPLY — W,2,P,S40-CS

MV-174-H

MV-714-W

10" ICW DRAIN

W,4,P,S40-CS — ICW RETURN — ICW SUPPLY — SECOND STAGE — FIRST STAGE — COMPRESSOR 1

W,4,P,S40-CS — ICW RETURN — ICW SUPPLY — SECOND STAGE — FIRST STAGE — COMPRESSOR 2

W,4,P,S40-CS — ICW RETURN — ICW SUPPLY — SECOND STAGE — FIRST STAGE — COMPRESSOR 3

W,4,P,S40-CS — ICW RETURN — ICW SUPPLY — SECOND STAGE — FIRST STAGE — COMPRESSOR 4

W,4,P,S40-CS — ICW RETURN — ICW SUPPLY — SECOND STAGE — FIRST STAGE — COMPRESSOR 5

W,4,P,S40-CS — ICW RETURN — ICW SUPPLY — SECOND STAGE — FIRST STAGE — COMPRESSOR 6

W,4,P,S40-CS — ICW RETURN — ICW SUPPLY — SECOND STAGE — FIRST STAGE — PURIFIER COMPRESSOR 7

MV-141-H

10"

MV-150-H

MV-125-H

MV-151-H

MV-127-H

CV 128-H

MV-128-H

HP BYPASS

MV-152-H

MV-126-H

MV-175-H — MV-176A-H — FE CHP-H — MV-176C-H

PT-CHP-H

MV-176B-H

FT-CHP-H

H,3,P,S10

SV-142-H 6 PSIG

MV-143-H

H,10,P,S10 — CT1 COMP LP

CT1 COMP HP

SV-137-H 6 PSIG

MV-138-H

H,10,P,S10 — LINDE COMP LP

CMTF
INTERCONNECT PIPING
DWG 5520.320-ME-484071

PURGE
MV-TMP1

PT-PSUC-H — PI-129-H — MV-129-H

SV-129-H 10 PSIG

MV-132-H — MV-130-H — MV-131-H

L1003 — 3400 FNAL LKT — LINDE ROK ADS REGEN

H,6,P,S10 — PURIFIER

PURIFIER COMP HP — LINDE COMP HP

H,2,P,S10

BUFFER TANK CONNECTION

MV-133-H

TBD

LOW PRESSURE HELIUM

PT-PHP-H — PI-153-H — MV-153-H — MV-154A-H — FE PHP-H — MV-154C-H — MV-154B-H — FT-PHP-H

2"

VACUUM pump

MV-159

3"

HE DUMP

10" ICW SUPPLY

10" CMTF ICW SUPPLY

MV-700-W — MV-701-W — MV-710-W — S-710-W — MV-711-W

MV-712-W — FT-712-W

PI-704-W — PI-706-W — PT-WSUP-W — MV-709-W — PI-709-W

PS-705-W

MV-702-W — MV-703-W — MV-704-W — MV-706-W — MV-707-W — MV-708-W

ADAMS FILTER

2" ICW FILTER BACKWASH DRAIN

HIGH PRESSURE HELIUM

MV-159-H

MV-164-H

CAP

CAP

WRONG LOCATION

MV-160-H

FT-SBL-H — MV-161B-H — MV-161A-H — FE SBL-H — MV-161C-H

L1001 — CV2251 PV-SBL-H — DN10

10"

L1001 PT2160 — PT-LHP-H — MV-165-H — MV-166A-H — FE LHP-H — MV-166C-H — MV-166B-H — FT-LHP-H

NOTES:

1. ALL SYMBOLS CONFORM TO ANSI/ISA S5.1-1984(R1992) STANDARDS UNLESS OTHERWISE SPECIFIED.
2. LINE DEFINITION
   ------ FUTURE ADDITION
3. REFERENCE TO LINDE DRAWINGS, AS FOLLOWS:
   L1001 = P-FP.1001
4. PIPE INTERFACE NAME DESIGNATIONS:
   F,S,C,W-M
   F - FLUID: H=HELIUM, N=NITROGEN, ETC.
   S - SIZE IN INCHES, NOMINAL
   C - COMPONENT: P=PIPE, T=TUBE
   W - WEIGHT: S10=SCHEDULE 10, 0.35=0.035" WALL
   M - MATERIAL: DEFAULT SS, CU=COPPER, ETC.

UNLESS OTHERWISE SPECIFIED	ORIGINATOR	DALESANDRO/C.JOHNSON	15-AUG-2011
	DRAWN	P.LAMBERTZ	15-AUG-2011
± ± ±	CHECKED	A.DALESANDRO	13-JUL-2012
1. BREAK ALL SHARP EDGES MAX.	APPROVED	A.KLEBANER	13-JUL-2012
2. DO NOT SCALE DRAWING	USED ON		
3. DIMENSIONING & TOLERANCING PER ASME Y14.5M-1994			
4. MAX. ALL MACH. SURFACES ✓	MATERIAL		
5. DRAWING UNITS: U.S. INCH			

FERMI NATIONAL ACCELERATOR LABORATORY
UNITED STATES DEPARTMENT OF ENERGY

CMTF
PIPING AND INSTRUMENT DIAGRAM
WARM COMPRESSOR SYSTEM

SCALE	DRAWING NUMBER	SHEET	REV
	4906.320-ME-483703	1 OF 1	A

CREATED WITH: Ideas12NXSeries | GROUP: ACCELERATOR CRYOGENICS

REV	DESCRIPTION	DRAWN	DATE
A		APPROVED	DATE

FROM LINDE WCS DISCHARGE V2106

L1002

MV-190-H

FNAL 2300 LKT

FNAL 2320 LKT

V2201

HE-2300 -DN100

HE-2120 -DN25

SUB-ATM SUCTION

SUCTION VENT

WARM VACUUM COMPRESSOR DWG# P-FP-1002

CW SUPPLY

CW RETURN

LP DISCHARGE

HE-2250 -DN100

SUB-ATM SUCTION

KINNEY VACUUM PUMP DWG# TBD

LP DISCHARGE

H.6.P.S10

H.4.P.S10

CV2200

V2370

NV2370

LKT 2305 FNAL

LKT 2390 FNAL

MV-134-H

L1013

SV2700 15 PSIG

2710 LKT FNAL

LKT FNAL 2790

W.1-1/4.P.S10-CU

CW SUPPLY

CW RETURN

WVC WATER CHILLER DWG # TBD

LINDE WATER CHILLER DWG # TBD

CW SUPPLY

CW RETURN

W.1-1/2.P.S10-CU

H.1/2.T.065

TUBE TRAILER FILL STATION

GAS STORAGE AND TUBE TRAILERS DWG# MC-458101

CLEAN

DIRTY

H.2.P.S10

L1001

PT2170 PT-CLN

PI-CLN

MV-123-H

MV-124-H

PT-STR

PI-STR

MV-105-H

MV-109-H

MV-106-H

MV-110-H

PV-LSL-H

PV-HSL-H

MV-107-H

CV2160

CV2150

PV-LSC-H

MV-108-H

PV-HSC-H

FILL

PV-LBL-H

CV2250

MV-113-H

PV-LBC-H

MV-114-H

MV-121-H

FE-LBL-H

MV-117-H

MV-122-H

FE-LBC-H

MV-118-H

MV-103-H

MV-119-H

MV-115-H

MV-104-H

MV-120-H

MV-116-H

PURGE

FLANGE

MV-101-H

FT-LBL-H

MV-111-H

CYCLED CLOSE/OPEN

MV-102-H

FT-LBC-H

MV-112-H

0-50 psia C:IPTLSL

PI-142-H

PT-LSC-H

PI-137-H

L1001

PT2240 PT-LSL-H

MV-142-H

MV-146-H

MV-137-H

MV-147-H

TP-136-H

PURIFIER COMP LP

WARM COMPRESSOR SYSTEM DWG # 4906.320-ME-483703

PURIFIER COMP HP

CTI COMP LP H.10.P.S10

LINDE COMP LP H.10.P.S10

CTI COMP HP H.3.P.S10

LINDE COMP HP H.3.P.S10

CTI LP

LINDE LP

CTI HP

LINDE HP

H.10.P.S10

H.3.P.S10

CW SUPPLY

CW RETURN

LINDE SUB-ATM

TEST AREA SUB-ATM

HI-BAY PIPING AND PIT TL DWG# ME-484519

LN TL

MV-169-H

MV-170-H

MV-171-H

PI-170-H

MV-180-H

MV-181-H

PI-179-H

MV-601-H

MV-602-H

MV-603-H

MV-604-H

MV-600-H

MV-691-H

MOBILE ADSORBER SUPPLY

MV-157-H

FLEX HOSES

ARC CELL 1

ARC CELL 2

ARC CELL 3

ARC CELL 4

ARC CELL 5

ARC CELL 6

MV-631-H

MV-633-H

MV-634-H

MV-632-H

MV-605-H

MV-692-H

MOBILE ADSORBER RETURN

MV-630-H

PV-PBUF-H

MV-619-H

BUFFER TANK CONNECTION

MV-610-H

MV-620-H

SOUTH ADSORBER DWG # TBD

NORTH ADSORBER DWG # TBD

HE

FF FINAL FILTER

MV-606-H

MV-611-H

CV-611-H

MV-607-H

MV-621-H

CV-621-H

H.2.P.S10

N.1.P.S10

GN2

LN2

L1001

V2106

FNAL 2106 LKT

V2107

1" KF

RV2106 3 PSI

PI-2108

V2108

GUARD GAS

FNAL 2320 LKT

HE-2120-DN25

TO WVC SUCTION VENT

C:3PTLHP 0-50psia

PI-TMP1 -30"-15psi

AC#4

LN2 TL

LN2 DISTRIBUTION SYSTEM DWG# ME-483852

N2 VENT

NOTES:

1. ALL SYMBOLS CONFORM TO ANSI/ISA S5.1-1984(R1992) STANDARDS UNLESS OTHERWISE SPECIFIED.
2. REFERENCE TO LINDE DRAWINGS, AS FOLLOWS:
   L1001 = P-FP.1001
3. PIPE INTERFACE NAME DESIGNATIONS CONFORM TO DOCUMENT "PIPE INTERFACE DESIGNATION LEGEND" AVAILABLE ON CRYO SHAREPOINT.
4. LINE DEFINITION
   ---------- FUTURE ADDITION
5. PIPE INTERFACE NAME DESIGNATIONS:
   F.S.C.W-M
   F - FLUID: H=HELIUM, N=NITROGEN, ETC.
   S - SIZE IN INCHES, NOMINAL
   C - COMPONENT: P-PIPE, T-TUBE
   W - WEIGHT. S10=SCHEDULE 10, 0.35=0.035" WALL
   M - MATERIAL: DEFAULT SS, CU-COPPER, ETC.

UNLESS OTHERWISE SPECIFIED			ORIGINATOR	A.DALESANDRO	23-SEP-2011
			DRAWN	P.LAMBERTZ	23-SEP-2011
±	±	±	CHECKED	A.DALESANDRO	13-JUL-2012
1. BREAK ALL SHARP EDGES MAX.			APPROVED	A.KLEBANER	13-JUL-2012
2. DO NOT SCALE DRAWING. 3. DIMENSIONS BASED UPON ASME Y14.5M-1994 4. MAX. ALL MACH. SURFACES			USED ON		
5. DRAWING UNITS: U.S.INCH			MATERIAL		

FERMI NATIONAL ACCELERATOR LABORATORY
UNITED STATES DEPARTMENT OF ENERGY

CMTF
PIPING AND INSTRUMENT DIAGRAM
CMTF INTERCONNECT PIPING

SCALE	DRAWING NUMBER	SHEET	REV
	5520.320-ME-484071	1 OF 1	A

CREATED WITH Ideas12NXSeries | GROUP: ACCELERATOR CRYOGENICS

REV	DESCRIPTION	DRAWN	DATE
		APPROVED	DATE

CMTF WARM COMPRESSOR SYSTEM
4906-320-ME-483703

COMP #2 | COMP #3 | COMP #4 | COMP #5 | COMP #6 | COMP #7

COMMON SUCTION

VACUUM

MV-159-H

CL/OPN

MV-006-H

PS-003-H

MV-003-H

PI-003-H

CV-008-H

STR-008-H

MV-009-H

-30"-15psig

MV-008-H

PI-TMP 2,3,4,5

LI-013-H

MV-012-H

MV-014-H

VT-11-E

MV-013-H

PT-12-H

PI-012-H

MV-059-0

LOAD

CV-059-0

UNLOAD

CV-058-0

MV-058-0

XI-058-0

C-2

C-1
He 2016C-61

M1
400 HP
460 VAC
3600 RPM

XI-056-0

EV-058-0

CV-057-0

MV-057-0

CV-056-0

MV-056-0

EV-056-0

MANIFOLD

PI-055-0

MV-055-0

P1-052-0

EDPT-052-0
SET±20PSID
S/D

DPS-052-0

MV-052-0

MV-054-0

DPI-053-0

PT-13-H

MV-022-H

PI-022-H

TP-13-H

TI-023-H

PS-024-H
SET@30PSIG
S/D

TS-029-H
SET@140°F
S/D

SV-078-H
325 PSIG

PI-078-H

MV-078-H

AFTERCOOLER
AC-1

(FUTURE)
MV-031-0

MV-029-0

MV-031-0

MV-030-0

LT-031-0

S-2

MV-032-0

HEATER-HTR-1

MV-033-0

TI-031-0

SV-043-0
75 PSID

DPCV-043-0

MV-043-0

MV-044-0

F4

FILTER

MV-051-0

50 gpm

FI-051-0

MV-048-0

MV-045-0

F3

FILTER

TP-12-0

TS-051-0
SET@140°F
S/D

MV-049-0

MV-046-0

DPI-046-0

PT-14-0

PI-042-0

MV-042-0

OP-1
OIL PUMP

M2
7.5 HP
460 VAC
1750 RPM

CV-041-0

STR-037-0

MV-039-0

PI-036-0

MV-036-0

MV-034-0
(LOCKED OPEN)

TP-11-0

HX-1
OIL COOLER

TO AC-1

PVICW

TI-068-W

MV-067-W

OIL SYSTEM CONFIGURATION
FOR COMPRESSORS #4, 5 & 6

TO OIL FILTERS

DPCV-043-0

SV-043-0
75 PSID

OP-1
OIL PUMP

STR-037-0

MV-037-0

HX-1
OIL COOLER

M2
7.5 HP
460 VAC
1750 RPM

MV-039-0

PI-066-W
200 PSI

MV-064-W

MV-061-W

H2O
RETURN

MV-069-W
(LOCKED OPEN)

CMTF WARM COMPRESSOR SYSTEM
4906-320-ME-483703

H2O
SUPPLY

MV-082-H

PI-083-H

MV-083-H

MV-081-H

MV-084-H

S/D
LI-081-0

COALESCER#1

COALESCER#2

ENLT-081-0

PI-079-H

CV-080-H

FI-080-0

MV-080-0

EV-080-0

FI-081-0

FI-083-0

MV-081-0

MV-083-0

EV-081-0

EV-083-0

TI-079-H

CV-081-0

CV-083-0

CV-080-0

MANIFOLD

MV-082-0

CV-084-0

MV-086-0

MV-090-H

CV-090-H

CL/OPN

CMTF WARM COMPRESSOR SYSTEM
4906-320-ME-483703

COMP #2 | COMP #3 | COMP #4 | COMP #5 | COMP #6 | COMP #7

VENT OUTDOORS

PI-085-H

MV-086-H

SV-087-H
350 PSIG

COALESCER#3

CHARCOAL ABSORBER

MV-087-H

MOLECULAR SIEVE

MV-089-H

FINAL FILTER

FI-085-0

MV-085-0

MV-088-H

OIL REMOVAL SKID ASSEMBLY

SUCT PRESS PI-003-H	INTER PRESS PI-012-H	DISCH PRESS PI-022-H
SEPAR DISCH PRESS PI-078-H	SYST DISCH PRESS PI-079-H	LUBE PUMP INLET PRESS PI-036-0
LUBE PUMP DISCH PRESS PI-042-0	LOCAL PANEL GAUGES	OIL MANIFOLD PRESS PI-055-0
SYST DELTA P DPI-053-0		FILTER DELTA P DPI-046-0

COMPRESSOR #1

NOTES:

1) ALL SEVEN COMPRESSORS ARE FUNCTIONALLY IDENTICAL.
2) COMPRESSORS #1, 2, 3 & 7 HAVE OIL COOLER UPSTREAM OF OIL PUMP; #4, 5 & 6 HAVE OIL COOLER LOCATED DOWNSTREAM OF OIL PUMP.
3) MANUAL VALVES AND LOCAL GAUGES ARE TAGGED IDENTICAL FOR EACH COMPRESSOR, E.G. CV-080-H OR PI-024-H.
4) CONTROL VALVES ARE TAGGED UNIQUELY FOR EACH COMPRESSOR, E.G. PVICW, PV2CW.
5) TRANSDUCERS ARE TAGGED UNIQUELY FOR EACH COMPRESSOR, E.G. TD-11-0, TD-21-0

REMOTE DEVICES

VT-11-E SHAFT SENSOR (C:2VT11)
LT-11-0 OIL LEVEL (NOT INSTALLED) (C:2LT11)
PT-11-H SUCTION PRESSURE(NOT INSTALLED) (C:2PT11)
PT-12-H INTERSTAGE PRESSURE (C:2PT12)
PT-13-H DISCHARGE PRESSURE (C:2PT13)
PT-14-0 LUBE DISCHARGE PRESSURE (C:2PT14)
TP-11-0 OIL COOLER EXIT TEMPERATURE (C:2PT11)
TP-12-0 OIL MANIFOLD TEMPERATURE (C:2PT12)
TP-13-H COMPRESSOR DISCHARGE TEMPERATURE (C:2PT13)

SYSTEMS

-H- HELIUM
-O- OIL
-W- WATER
-E- ELECTRICAL OR SENSING LINES

UNLESS OTHERWISE SPECIFIED	ORIGINATOR	A.MARTINEZ	28-FEB-2012
	DRAWN	R.HIBBARD	28-FEB-2012
+ + +	CHECKED		
1. BREAK ALL SHARP EDGES MAX	APPROVED		
2. DO NOT SCALE DRAWING. 3. DIMENSIONS BASED UPON	USED ON		
4. MAX. ALL MACH. SURFACES	MATERIAL		
5. DRAWING UNITS:			

FERMI NATIONAL ACCELERATOR LABORATORY
UNITED STATES DEPARTMENT OF ENERGY

CMTF
PIPING & INSTRUMENTATION DIAGRAM
TYPICAL MYCOM COMPRESSOR

SCALE	DRAWING NUMBER	SHEET	REV
	5520.320-ME-483897	1 OF 1	

CREATED WITH Ideas12NXSeries | GROUP: ACCELERATOR CRYOGENICS