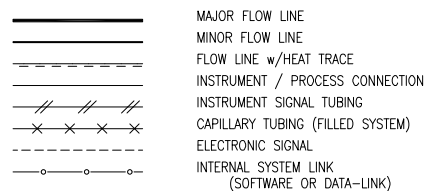
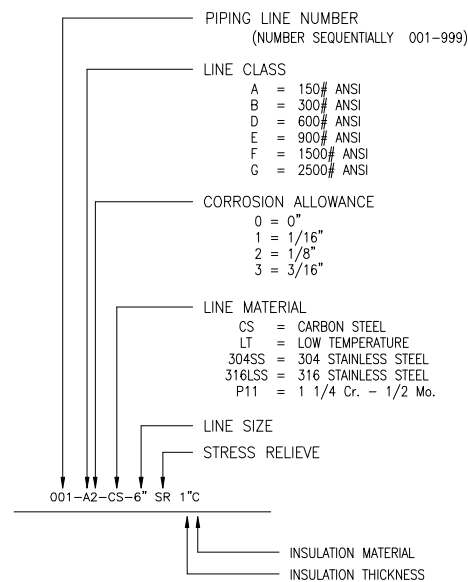


LINE TYPES



LINE DESCRIPTION



FLANGE RATING

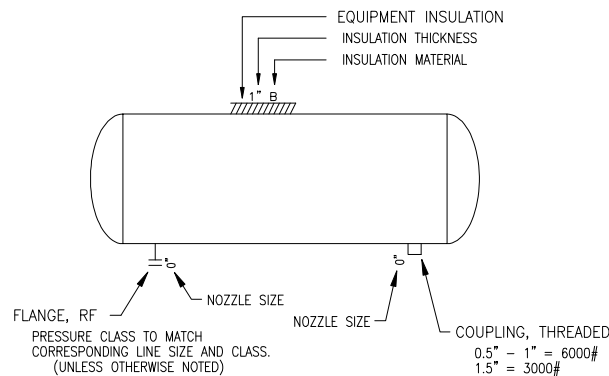
- A = 150# ANSI
- B = 300# ANSI
- D = 600# ANSI
- E = 900# ANSI
- F = 1500# ANSI
- G = 2500# ANSI

VALVE MATERIAL

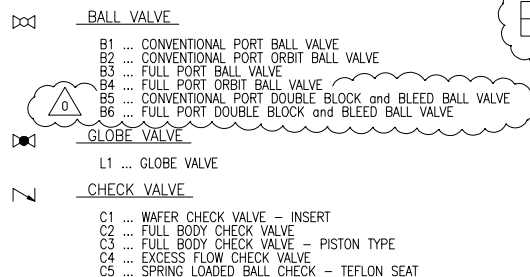
- 1 = CARBON STEEL
- 2 = LOW TEMP
- 3 = 304SS
- 4 = 316LSS
- 5 = 1 1/4 Cr. - 1/2 Mo.
- 6 = CPVC
- 7 = BRASS

INSULATION

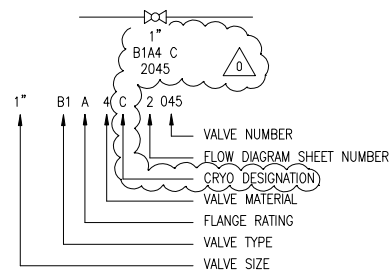
SYMBOL	SERVICE	MATERIAL
C	COLD	SEALED URETHANE, BELOW 35°F
FC	COLD	SEALED FOAMGLASS, BELOW 35°F
FCSS	COLD	SEALED FOAMGLASS (STAINLESS JACKETING)
U	HOT	UNSEALED URETHANE, 144°F TO 35°F
H	HOT	CALCIUM SILICATE, ABOVE 145°F
B	HOT	CALCIUM SILICATE, PERSONNEL PROTECTION
FB	HOT	FOAM GLASS, PERSONNEL PROTECTION
FH	HOT	UNSEALED FOAMGLASS, ABOVE 145°F
FHSS	HOT	UNSEALED FOAMGLASS (STAINLESS JACKETING)
HSS	HOT	CALCIUM SILICATE (STAINLESS JACKETING)



VALVE TYPES

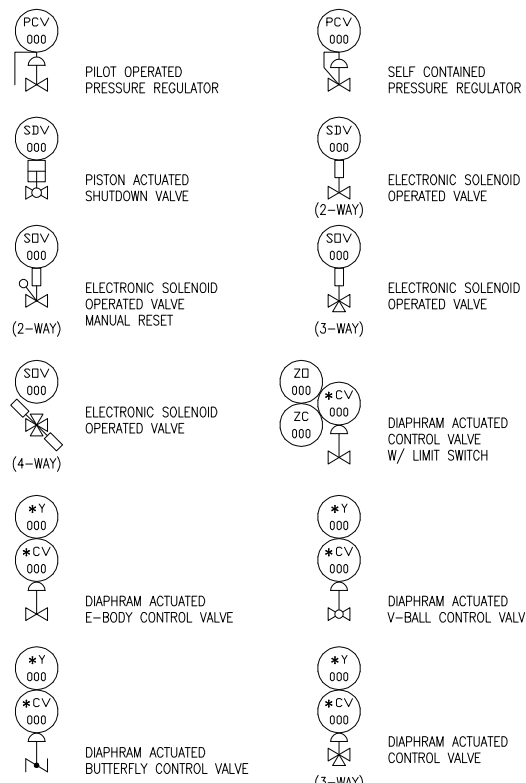


VALVE DESCRIPTION

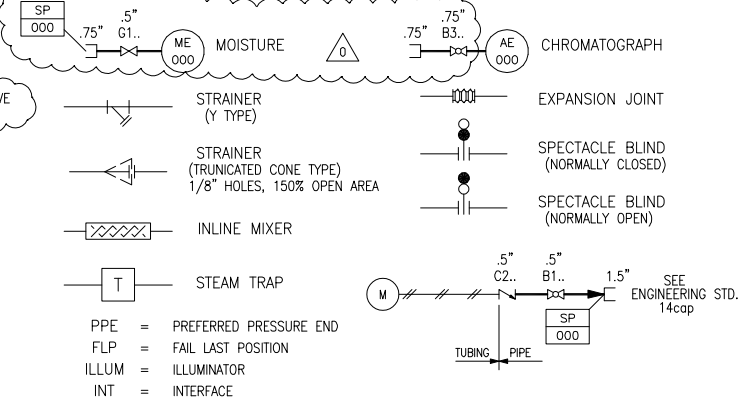


CONTROL VALVES

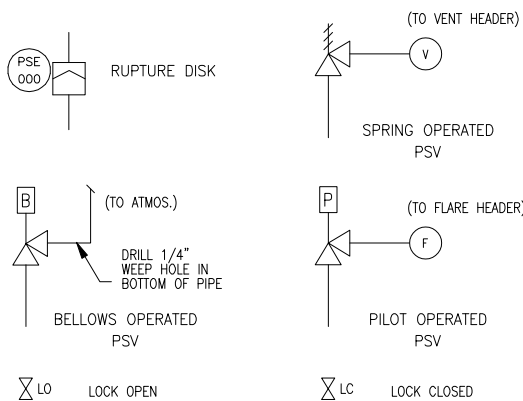
EXAMPLES: FCV, LCV, PCV, TCV, etc.
 (* DENOTES: F - FLOW, L - LEVEL, P - PRESSURE, T - TEMPERATURE)



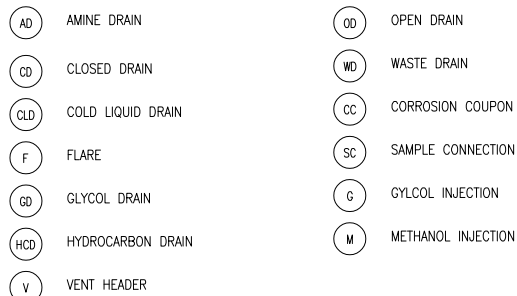
SPECIALTY ITEMS



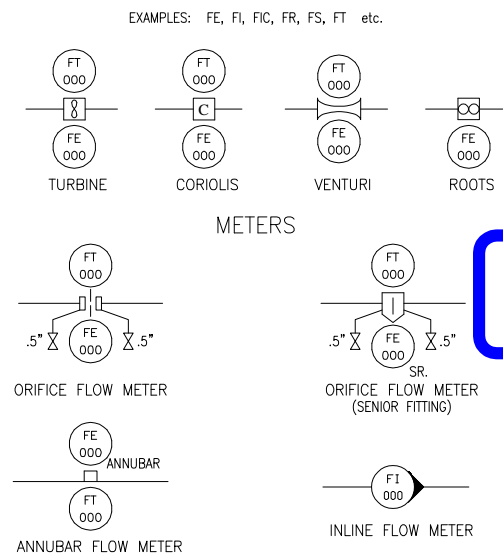
SAFETY ITEMS



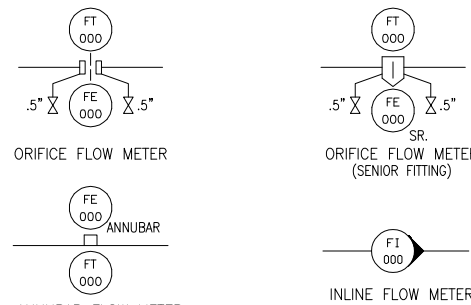
DRAINS & VENT DESCRIPTIONS



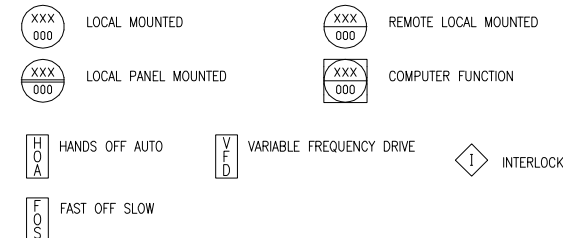
FLOW INSTRUMENTS



METERS

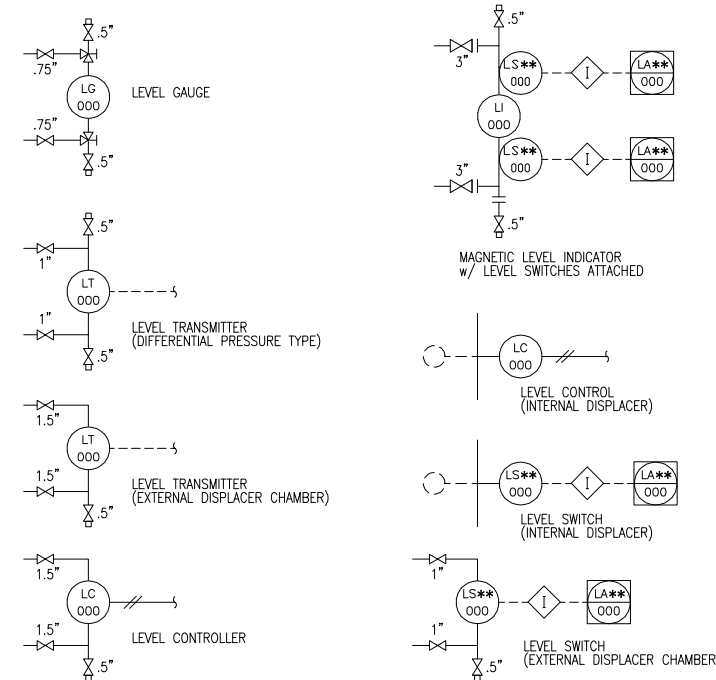


INSTRUMENT FUNCTION SYMBOLS



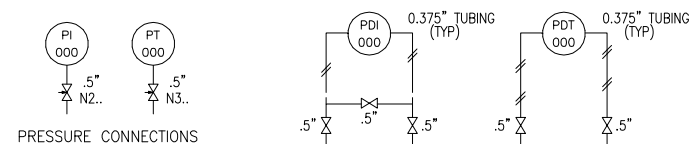
LEVEL INSTRUMENTS

EXAMPLES: LG, LI, LC, LT, LSH, LSHH, LSL, LSSL, etc.
 * DENOTES: H - HIGH or HH - HIGH/HIGH, L - LOW or LL - LOW/LOW

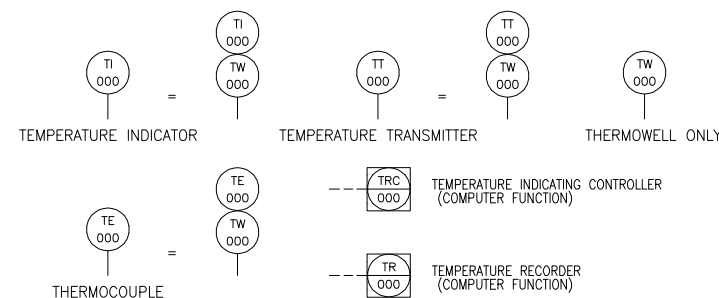


PRESSURE INSTRUMENTS

EXAMPLES: PC, PI, PT, PDI, PDT, PSH, PSL, etc.



TEMPERATURE INSTRUMENTS



NOTES:

- INSTRUMENT LETTER DESIGNATIONS PER ANSI/ISA-S5.1 (LATEST EDITION).
- FOR BLOCK VALVES - USE BALL OR GATE VALVES UP TO 275°F DESIGN TEMPERATURES AND GATE VALVES FOR HIGHER DESIGN TEMPERATURES.
- ALL DRAIN PIPING TO BE FREE DRAINING.
- ALL PIPING TO AND FROM PSV'S TO BE FREE DRAINING.
- HIGH POINT VENTS ARE 0.5" COUPLINGS w/ PLUGS, AND LOW POINT DRAINS ARE 0.75" GATE VALVES w/ PLUGS.
- ALL EQUIPMENT AND INSTRUMENTS WILL HAVE AN "*" IN PLACE OF THE PLANT NUMBER.

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 7960 S. Wynn, Suite 210
 Tulsa, Oklahoma 74114
 Phone: 918-481-5882
 Fax: 918-481-7424

STANDARD 60MM CRYO PLANT MECHANICAL FLOW DIAGRAM LEGEND SHEET

DATE	BY	APP'D	DATE	BY	APP'D
10/7/16	JTG		10/7/16	JTG	
12/09/14	TKF		12/09/14	TKF	
8/29/13	TKF		8/29/13	TKF	

ISSUED *APPROVED FOR CONSTRUCTION*
 B NO CHANGE
 A NO CHANGE

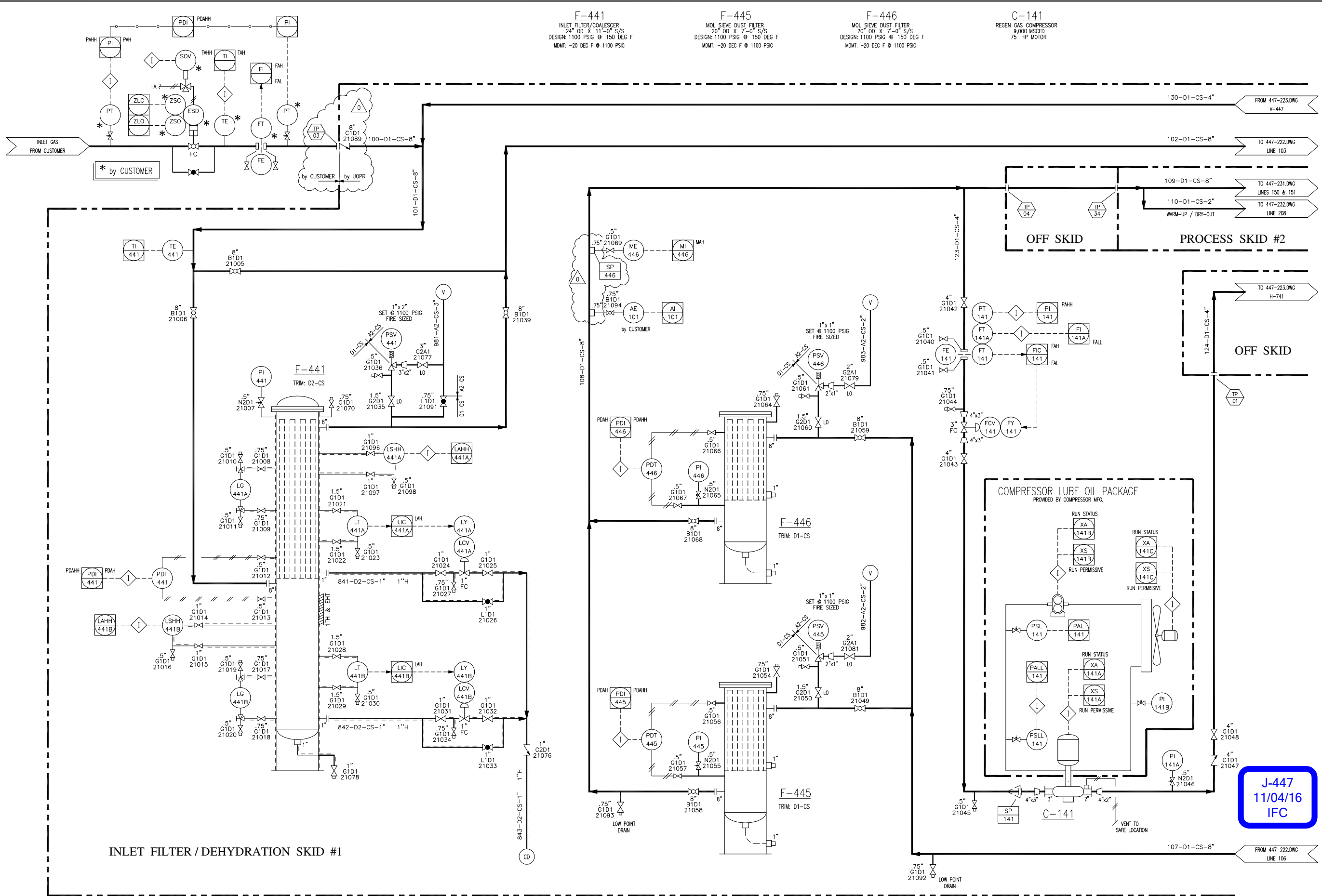
OK P.E.F. 4327

SCALE: NONE

DATE: 10-7-2016

447-200

J-447
11/04/16
IFC



F-441
 INLET FILTER/COALESCE
 24" OD X 11'-0" S/S
 DESIGN: 1100 PSIG @ 150 DEG F
 MOMT: -20 DEG F @ 1100 PSIG

F-445
 MOL SIEVE DUST FILTER
 20" OD X 7'-0" S/S
 DESIGN: 1100 PSIG @ 150 DEG F
 MOMT: -20 DEG F @ 1100 PSIG

F-446
 MOL SIEVE DUST FILTER
 20" OD X 7'-0" S/S
 DESIGN: 1100 PSIG @ 150 DEG F
 MOMT: -20 DEG F @ 1100 PSIG

C-141
 REGEN GAS COMPRESSOR
 9,000 MSCFD
 75 HP MOTOR

J-447
 11/04/16
 IFC

INLET FILTER / DEHYDRATION SKID #1

COMPRESSOR LUBE OIL PACKAGE
 PROVIDED BY COMPRESSOR MFG.

LAST VALVE NUMBER USED: 21098

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REV	DATE	BY	APP'D	DATE	DESCRIPTION
0	10/7/16	JTG			ISSUED *APPROVED FOR CONSTRUCTION*
1	12/09/14	TRF			ADD TP-03/04/08/34
2	8/28/13	TRF			ADD LSHH-441A, F-441 INS
3	8/28/13	TRF			ADD PSV, ADD LSHH-441A, F-441 INS

OK P.E.F. 4327

UOP Russell
 7950 S. Wynn, Suite 210
 Tulsa, Oklahoma 74126
 Phone: 918-481-5882
 Fax: 918-481-5822

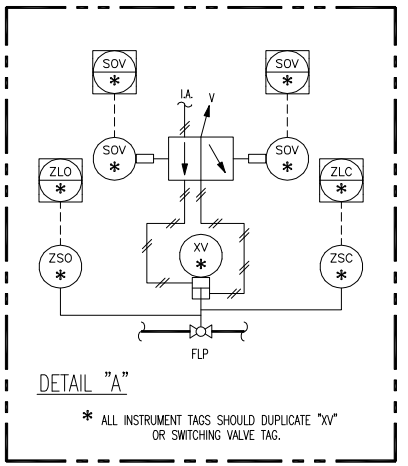
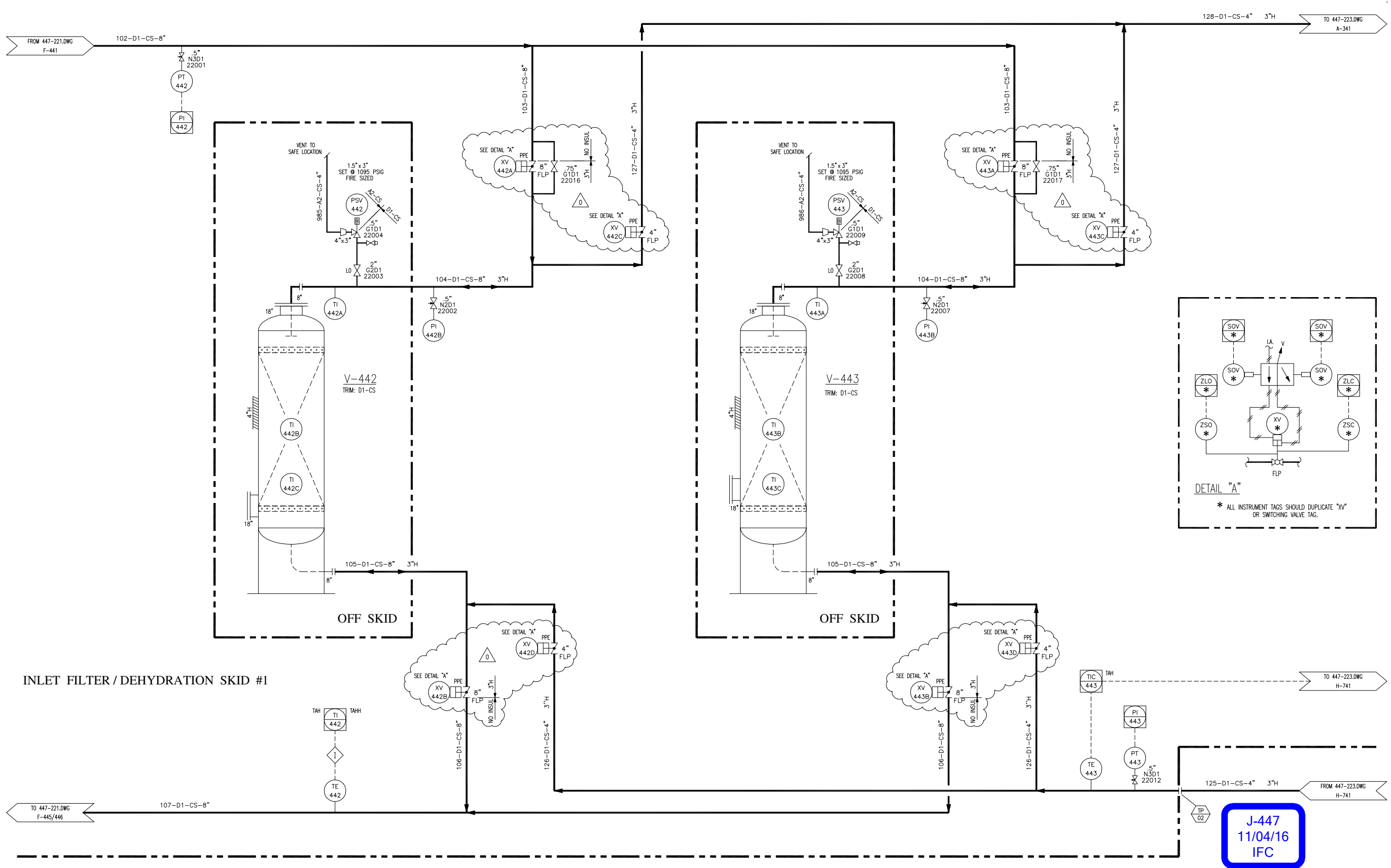
STANDARD 60MM CRYO PLANT
 MECHANICAL FLOW DIAGRAM
 INLET FILTRATION / MOL SIEVE DUST FILTERS / REGEN GAS COMPRESSOR

SCALE: NONE
 DRAWN BY: JTG
 CHECKED BY: BJ
 DATE: 8-28-2013
 DATE: 8-28-2013
 DATE: 10-7-2016

REV: 0
 447-221

V-442
MOL SIEVE DEHYDRATOR
78" ID X 24'-0" S/S
DESIGN: 1095 PSIG @ 600 DEG F
MOMT: -20 DEG F @ 1095 PSIG

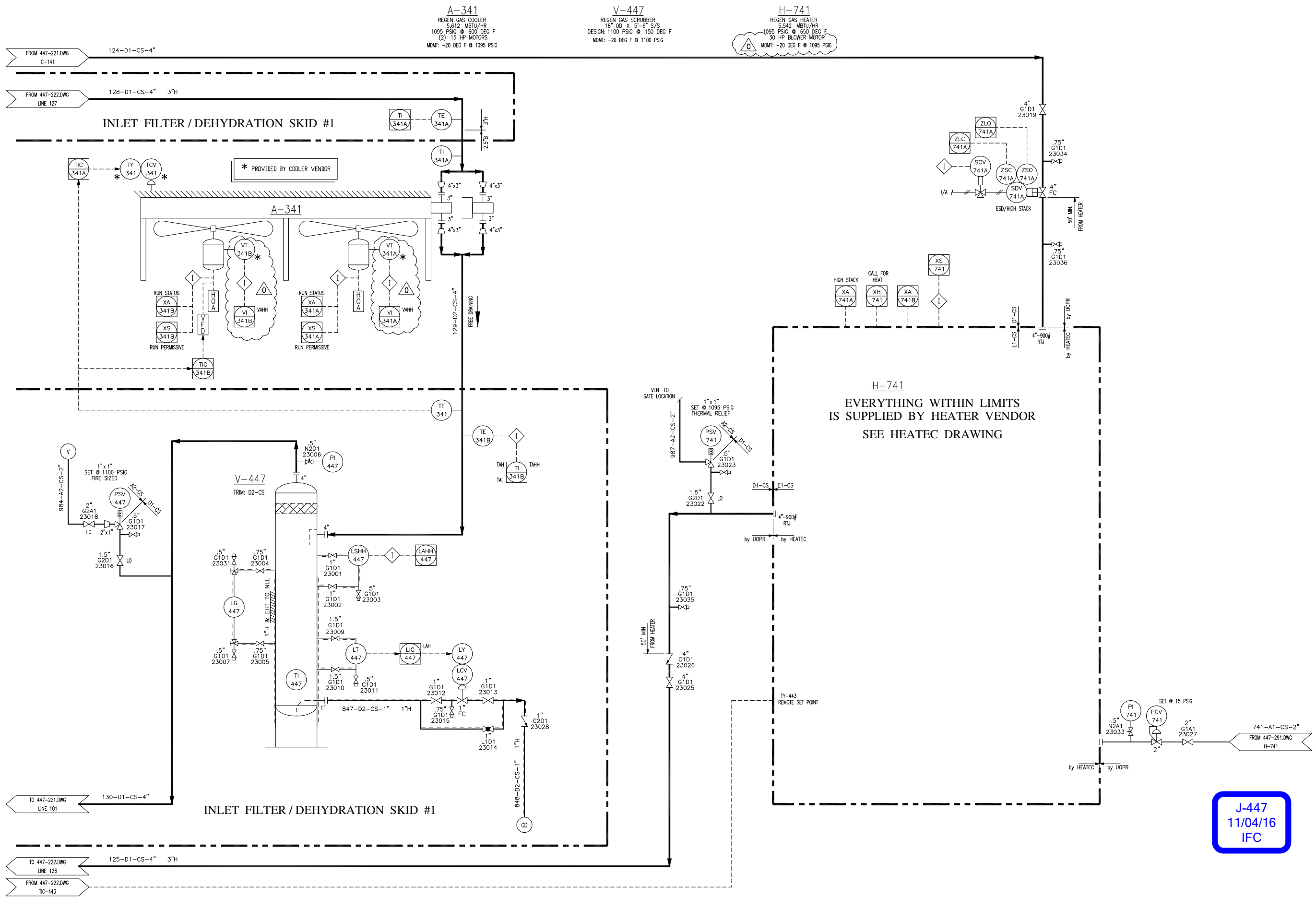
V-443
MOL SIEVE DEHYDRATOR
78" ID X 24'-0" S/S
DESIGN: 1095 PSIG @ 600 DEG F
MOMT: -20 DEG F @ 1095 PSIG



J-447
11/04/16
IFC

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<p>UOP Russell 7550 S. Vesper, Suite 210 Lubbock, Texas 79424 Phone: 818-481-5882 Fax: 818-481-7424</p>	<p>OK P.E.F. 4327 WY COM 00745-00 TY P.E.F. F-7531</p>
<p>STANDARD 60MM CRYO PLANT MECHANICAL FLOW DIAGRAM MOL SIEVE DEHYDRATORS</p>	<p>DATE: 10-7-2016 DRAWN BY: BJ CHECKED BY: BJ</p>
<p>DATE: 8-28-2013 DATE: 8-28-2013 DATE: 8-28-2013</p>	<p>DATE: 10-7-2016 DATE: 8-28-2013 DATE: 8-28-2013</p>
<p>SCALE: NONE</p>	<p>DATE: 10-7-2016</p>
<p>REV: 0</p>	<p>DATE: 10-7-2016</p>

LAST VALVE NUMBER USED: 22017



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REV.	DATE	BY	DATE	APP'D	DATE
0	10/7/16	JTG	10/7/16		
1	12/09/14	TKF	12/09/14		
2	8/28/13	TKF	8/28/13		

OK P.E.F. 4327

WY COM 00745-00
 TX P.E.F. F-7531

UOP Russell
 7560 S. Voss, Suite 210
 Tulsa, Oklahoma 74116
 Phone: 918-481-5882
 Fax: 918-481-1921

REV.	DATE	BY	DATE	APP'D	DATE
0	10-7-2016	BU			
1	8-28-2013	TKF	8-28-2013		
2	8-28-2013	TKF	8-28-2013		

STANDARD 60MM CRYO PLANT
 MECHANICAL FLOW DIAGRAM
 REGEN GAS COOLER / SCRUBBER / HEATER

SCALE: NONE

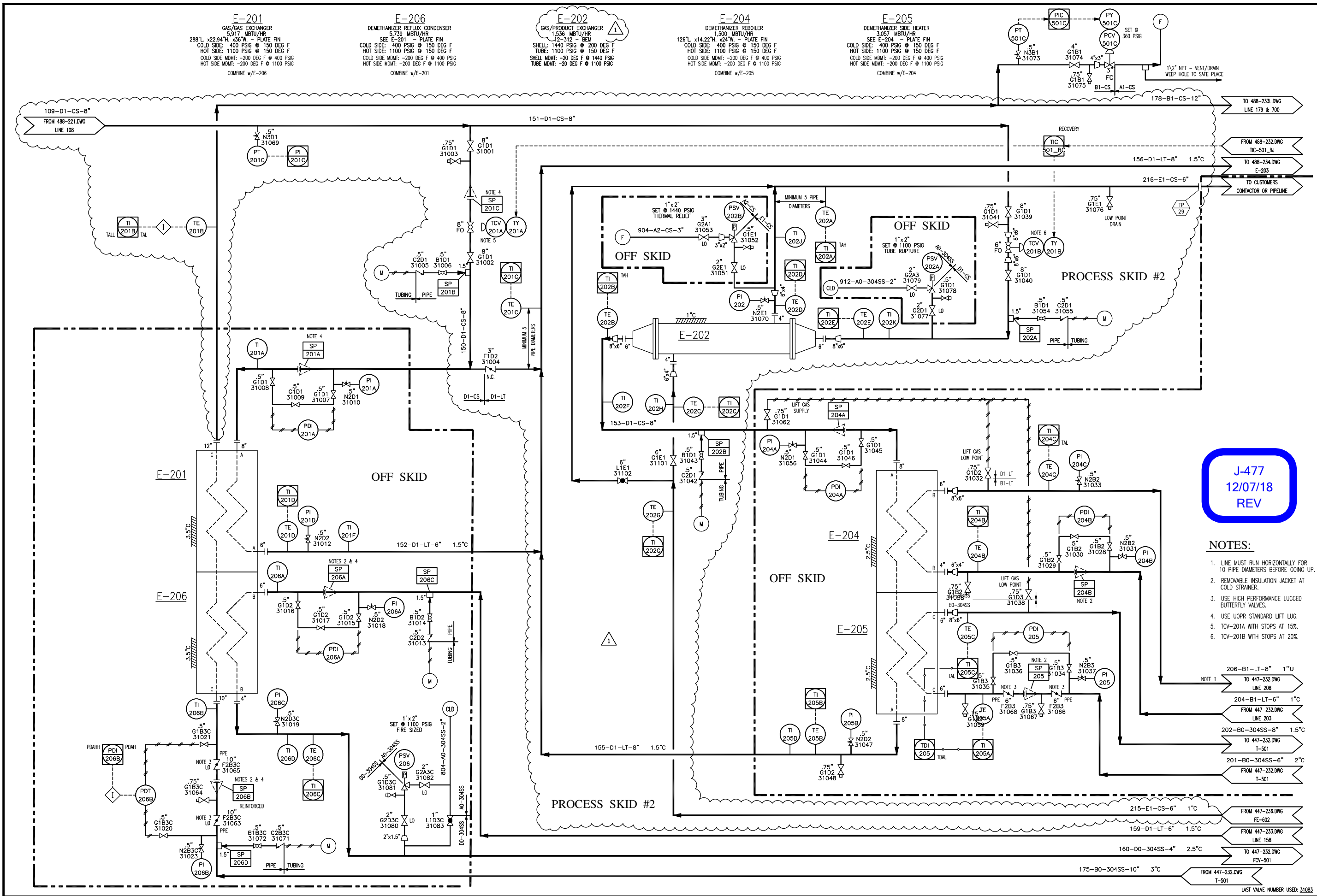
DATE: 8-28-2013

DATE: 8-28-2013

DATE: 10-7-2016

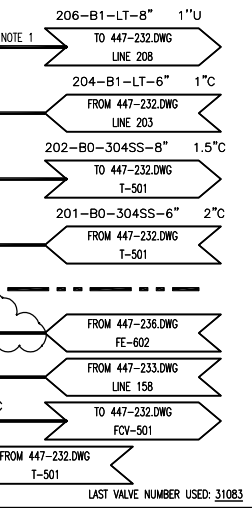
0 447-223

LAST VALVE NUMBER USED: 23036



J-477
12/07/18
REV

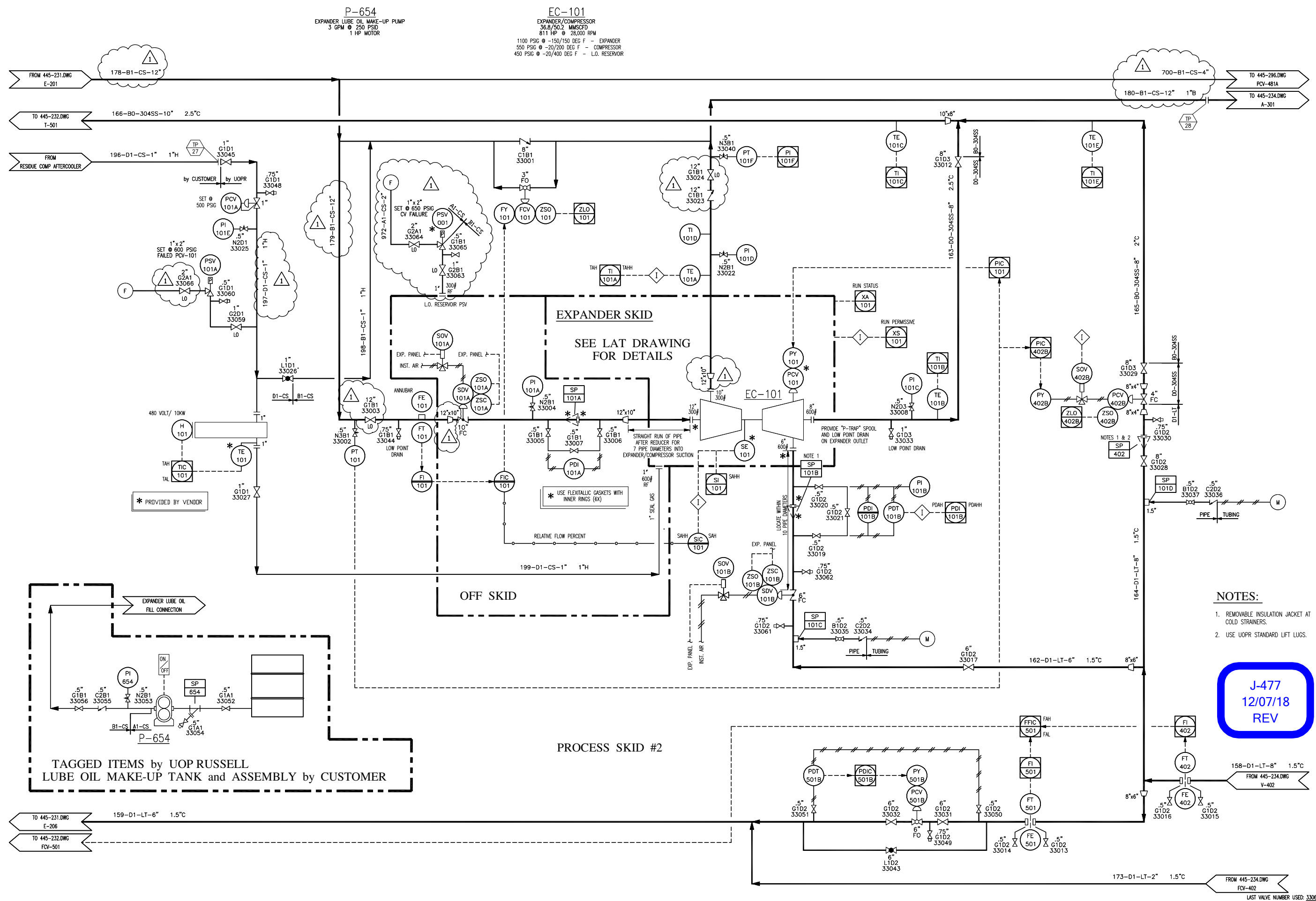
- NOTES:**
1. LINE MUST RUN HORIZONTALLY FOR 10 PIPE DIAMETERS BEFORE GOING UP.
 2. REMOVABLE INSULATION JACKET AT COLD STRAINER.
 3. USE HIGH PERFORMANCE LUGGED BUTTERFLY VALVES.
 4. USE UOPR STANDARD LIFT LUG.
 5. TCV-201A WITH STOPS AT 15%.
 6. TCV-201B WITH STOPS AT 20%.



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REV	DATE	BY	APP'D	DATE	DESCRIPTION
1	11/05/18	JMS			REVISED SKID 2
2	10/27/18	JMS			ISSUED APPROVED FOR CONSTRUCTION
3	12/09/18	KAH			REVISED VALVES 31079, 31080; ADDED TPs
4	12/09/18	JMS			ADDED TPs
5	12/09/18	JMS			ADDED TPs
6	12/09/18	JMS			ADDED TPs

STANDARD 60MM CRYO PLANT
 MECHANICAL FLOW DIAGRAM
 EXCHANGERS
 UOP RUSSELL
 7050 S. York, Suite 210
 Tulsa, Oklahoma 74136
 Phone: 918-481-5885
 Fax: 918-481-7827
 Email: russell@uopr.com
 File Name: 447-231.DWG
 Date: 07/2018 - 823.m



- NOTES:**
1. REMOVABLE INSULATION JACKET AT COLD STRAINERS.
 2. USE UOPR STANDARD LIFT LUGS.

J-477
12/07/18
REV

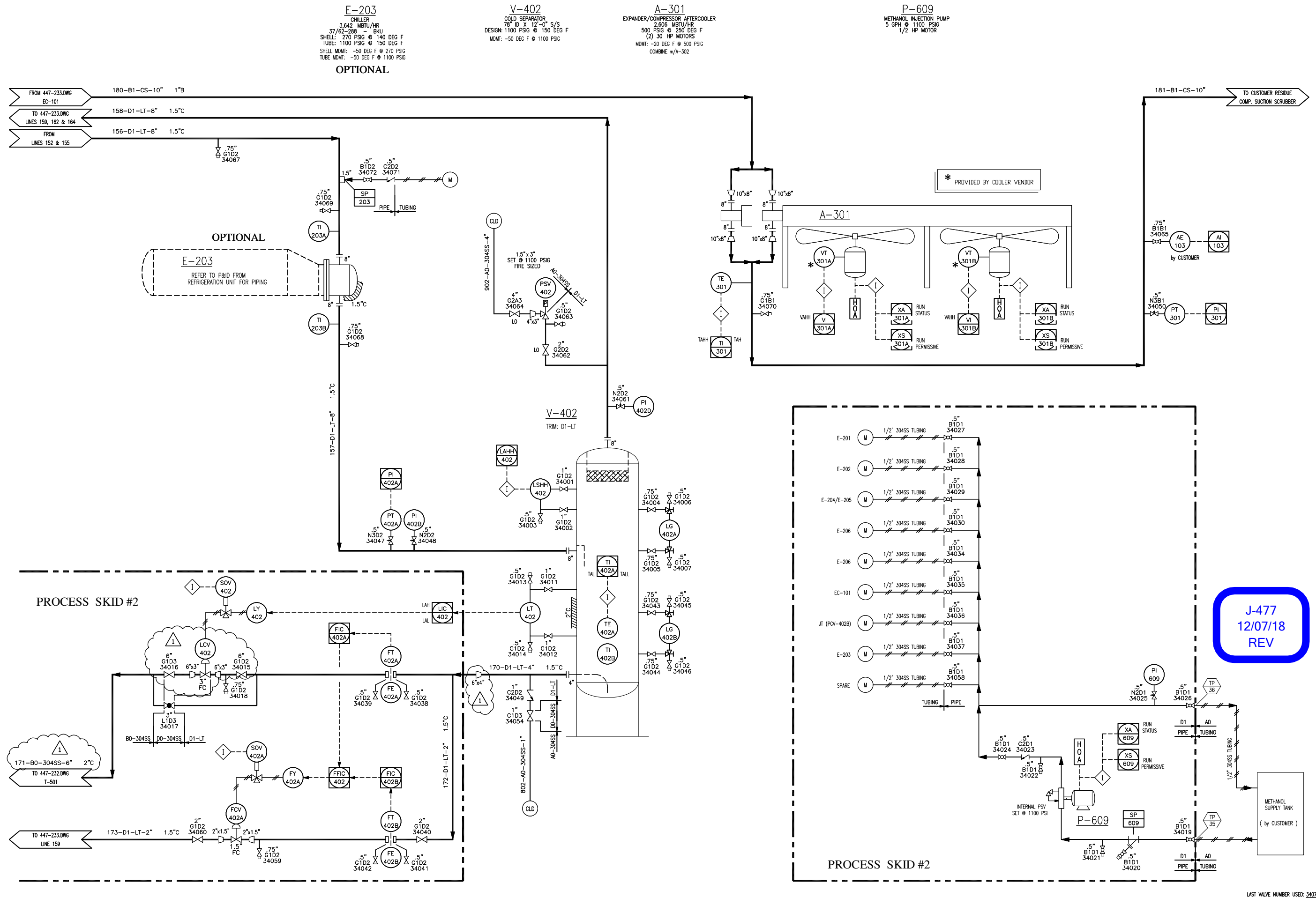
UOP RUSSELL
 7950 S. Yale, Suite 210
 Tulsa, Oklahoma 74136
 Phone: 918-481-9885
 Fax: 918-481-7827
 WWW.UOPR.COM
 TX P.E. F-753

REVISIONS		
NO.	DATE	DESCRIPTION
1	12/5/18	ADDED PSV-001 & REDUCERS, REVISED LINE & VALVE SIZES.
0	10/7/16	ISSUED "APPROVED FOR CONSTRUCTION."
A	9/28/16	LA TURBINE SPECIFIC

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STANDARD 60MM CRYO PLANT
 MECHANICAL FLOW DIAGRAM
 EXPANDER/COMPRESSOR
 DRAWN BY: NONE
 CHECKED BY: JMS
 DATE: 9-28-2016
 FILE: 9-28-2016
 DATE: 12-5-2018
 FILE: 12-5-2018
 C:\Users\j235418\appdata\local\temp\appdata000

DRAWING NO: 447-233L
 DATE: 07/2018 - 823.3m
 LAST VALVE NUMBER USED: 33066



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REV.	DATE	BY	APP'D	DATE	DESCRIPTION
1	12/07/18	JMS			ISSUED FOR CONSTRUCTION
2	12/07/18	JMS			ISSUED FOR CONSTRUCTION
3	12/07/18	KAH			ADDED TP--35/36
4	12/07/18	Judi			A PSV'S, V-402 INS

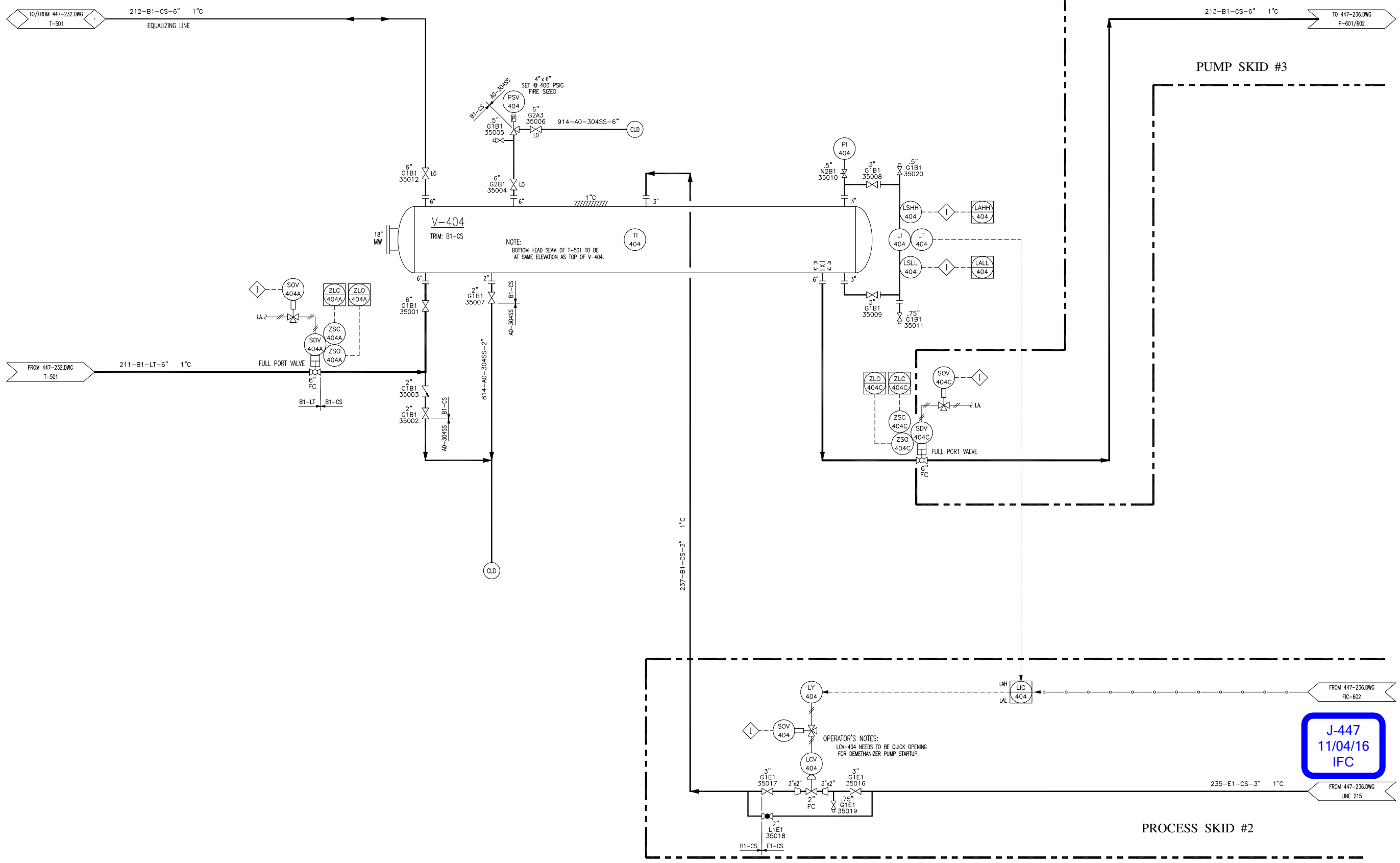
UOP Russell
7900 S. Yale, Suite 210
Tulsa, Oklahoma 74136
Phone: 918-481-9885
Fax: 918-481-7827

STANDARD 60MM CRYO PLANT
MECHANICAL FLOW DIAGRAM
EXPANDER/COMPRESSOR AFTERCOOLER - COLD SEPARATOR
FILE NAME: 447-234.DWG
DATE: 8-28-2013
SCALE: NONE
DRAWN BY: JMS
CHECKED BY: JMS
DATE: 12-5-2018
BU: BU

1 447-234
Dec 07, 2018 - 8:23am

LAST VALVE NUMBER USED: 34022

V-404
 PRODUCT SURGE TANK
 109.346' OD X 65'-5" GAL
 DESIGN: 400 PSIG @ 200 DEG F
 MOMT: -20 DEG F @ 400 PSIG



NOTE:
 BOTTOM HEAD SEAM OF T-501 TO BE
 AT SAME ELEVATION AS TOP OF V-404.

OPERATOR'S NOTES:
 LCV-404 NEEDS TO BE QUICK OPENING
 FOR DEMETHANIZER PUMP STARTUP.

J-447
 11/04/16
 IFC

STANDARD 60MM CRYO PLANT MECHANICAL FLOW DIAGRAM PRODUCT SURGE TANK		DATE	10-7-2016	BY	BJ
SCALE	NONE	DATE	8-28-2013	DATE	8-28-2013
NO. VALVE	447-235	DATE	10-7-2016	DATE	10-7-2016
REV.	0	DATE		DATE	

NO.	DESCRIPTION	DATE	BY
0	ISSUED *APPROVED FOR CONSTRUCTION*	10/7/16	JMS
1	NO CHANGE	12/09/14	KAH
2	PSV's, V-404 INS. T-501 BITUMS LT SPEC BREAK	8/28/13	TKF

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UOP Russell
 7550 S. Vesper, Suite 210
 Tulsa, Oklahoma 74119
 Phone: 918-481-5882
 Fax: 918-481-9221

LAST VALVE NUMBER USED: 35020

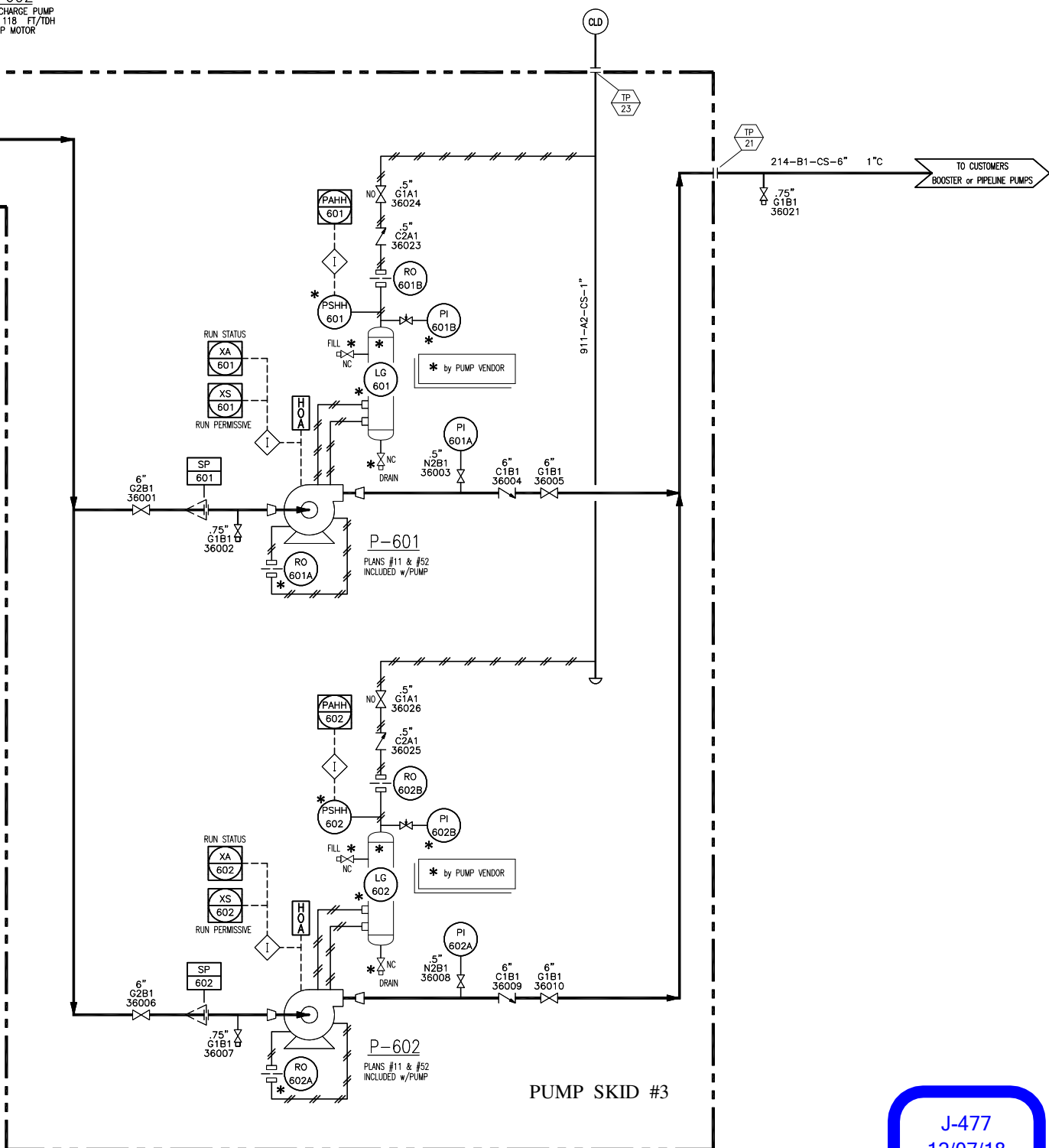
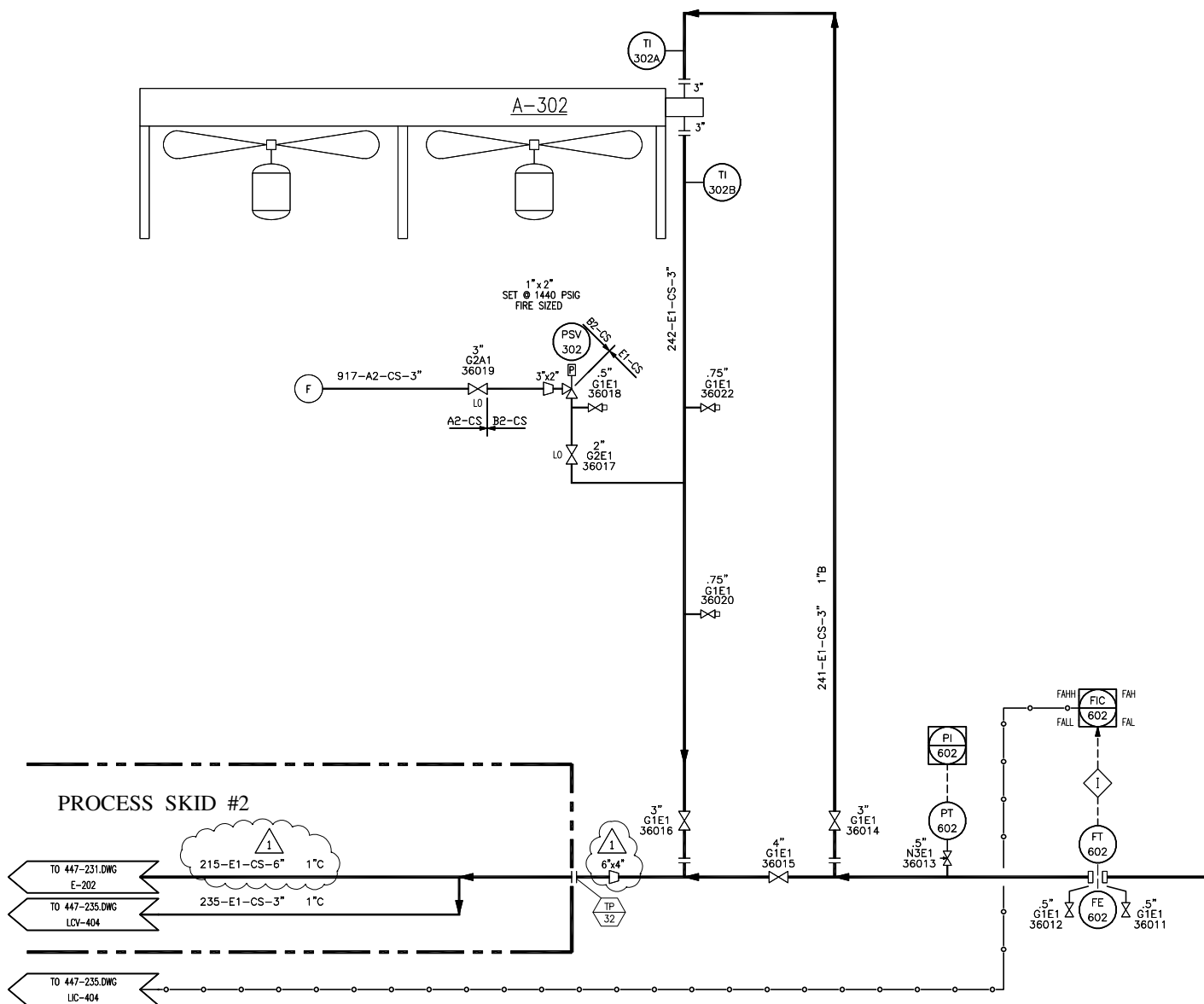
A-302
 NGL PRODUCT COOLER
 600 MBTU/HR
 1440 PSIG @ 200 DEG F
 MDMT: -20 DEG F @ 1440 PSIG
 COMBINE w/ A-301

P-601
 PRODUCT CHARGE PUMP
 247 GPM @ 118 FT/TOH
 10 HP MOTOR

P-602
 PRODUCT CHARGE PUMP
 247 GPM @ 118 FT/TOH
 10 HP MOTOR

FROM 447-235.DWG V-404 213-B1-CS-6" 1°C

214-B1-CS-6" 1°C TO CUSTOMERS BOOSTER or PIPELINE PUMPS



J-477
 12/07/18
 REV

TO 447-231.DWG E-202
 TO 447-235.DWG LCV-404
 TO 447-235.DWG LIC-404

UOP Russell
 7900 S. Yale, Suite 210
 Tulsa, Oklahoma 74136
 Phone: 918-481-5885
 Fax: 918-481-7827

REV	DATE	BY	APP'D	DATE	DESCRIPTION
1	12/07/18	JMS	JMS	12/07/18	ISSUED FOR CONSTRUCTION
2	12/07/18	JMS	JMS	12/07/18	ISSUED FOR CONSTRUCTION
3	12/09/14	KAH	KAH	12/09/14	REVISED CLD
4	08/28/13	Judi	Judi	08/28/13	SEAL POT HEADER
5	08/28/13	Judi	Judi	08/28/13	SEAL POT HEADER

REVISIONS

STANDARD 60MM CRYO PLANT
 MECHANICAL FLOW DIAGRAM
 PRODUCT CHARGE PUMPS

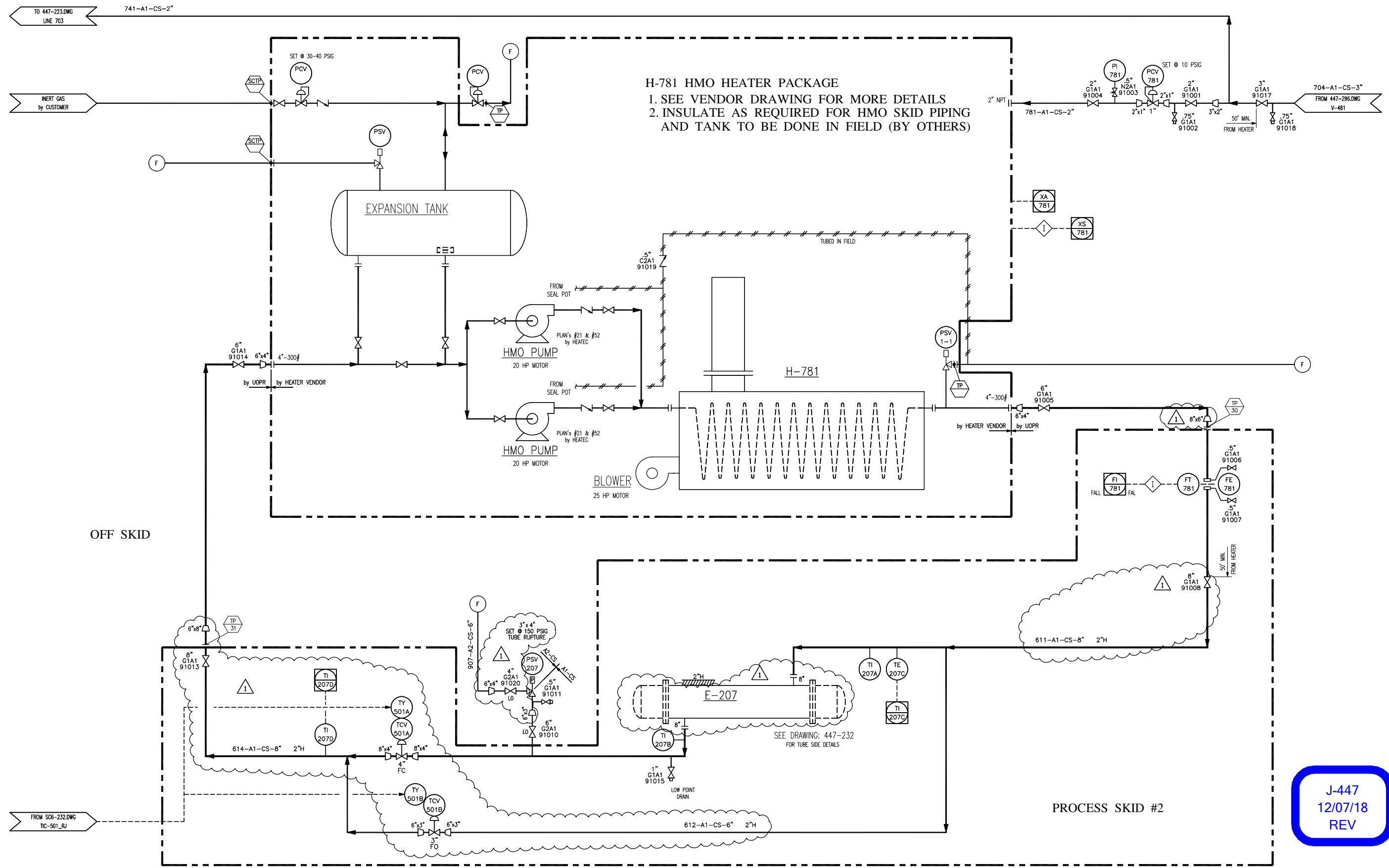
Scale: NONE
 Date: 8-28-2013
 File Name: 447-235.DWG
 Dec 07, 2018 - 8:23am

LAST VALVE NUMBER USED: 36026

E-207
 DEMETHANIZER TRIM REBOILER
 10,000 MBTU/HR
 19-192" I.D.M
 SHELL: 150 PSIG @ 400 DEG F
 TUBE: 400 PSIG @ 200 DEG F
 SHELL MDMT: -20 DEG F @ 150 PSIG
 TUBE MDMT: -20 DEG F @ 400 PSIG

H-781
 HMO HEATER
 6,180 MBTU/HR
 150 PSIG @ 400 DEG F
 25 HP BLOWER MOTOR
 MDMT: -20 DEG F @ 150 PSIG

H-781 HMO HEATER PACKAGE
 1. SEE VENDOR DRAWING FOR MORE DETAILS
 2. INSULATE AS REQUIRED FOR HMO SKID PIPING AND TANK TO BE DONE IN FIELD (BY OTHERS)



STANDARD 60MM CRYO PLANT MECHANICAL FLOW DIAGRAM HMO SYSTEM		DWG NO: 447-291 SCALE: NONE DATE: 12/07/18	DESIGNED BY: JUD APPROVED BY: TKF DATE: 8-28-2013	CHECKED BY: BU DATE: 12-5-2018
FILE NAME: 447-291.DWG Z:\100 - 447-291.DWG		PROJECT: 018-481-588 DRAWING: 447-291		
REVISIONS				
NO.	DATE	BY	DESCRIPTION	DATE
1	12/07/18	JUD	ISSUED FOR CONSTRUCTION	12/07/18
2	12/07/18	JUD	REVISED SKID 2	12/07/18
3	12/07/18	JUD	ISSUED APPROVED FOR CONSTRUCTION	12/07/18
4	12/09/14	TKF	ADDED TP-30/31; PSV TO FLARE	12/09/14
5	08/28/13	TKF	PSV'S	08/28/13

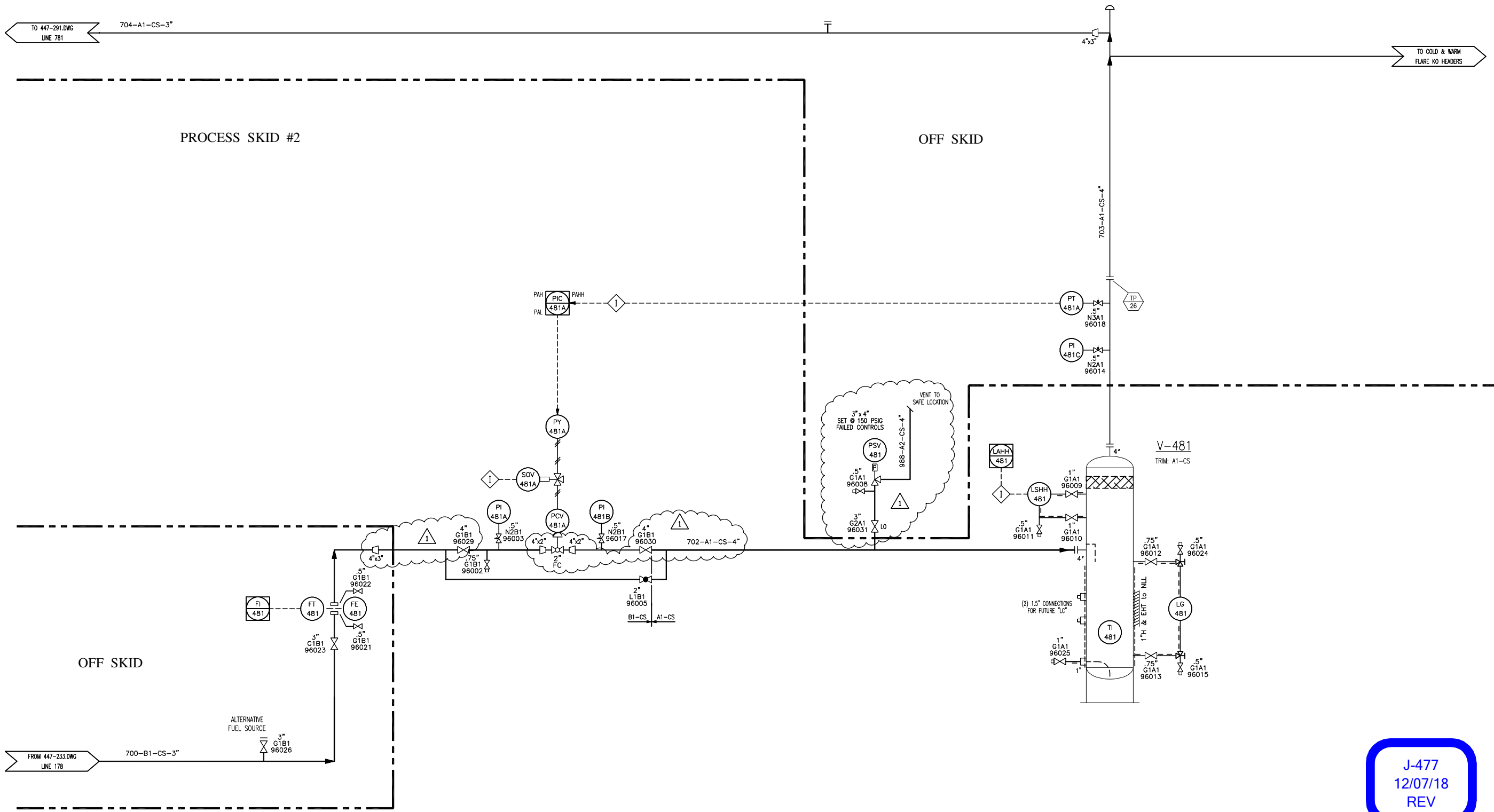
J-447
 12/07/18
 REV

LAST VALVE NUMBER USED: 91020

UOP Russell
 7050 S. Yale, Suite 210
 Tulsa, Oklahoma 74136
 Phone: 918-481-5888
 Fax: 918-481-7827

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V-481
 FUEL GAS SCRUBBER
 24" OD X 6'-0" S/S
 DESIGN: 150 PSIG @ 150 DEG F
 MDMT: -20 DEG F @ 150 PSIG



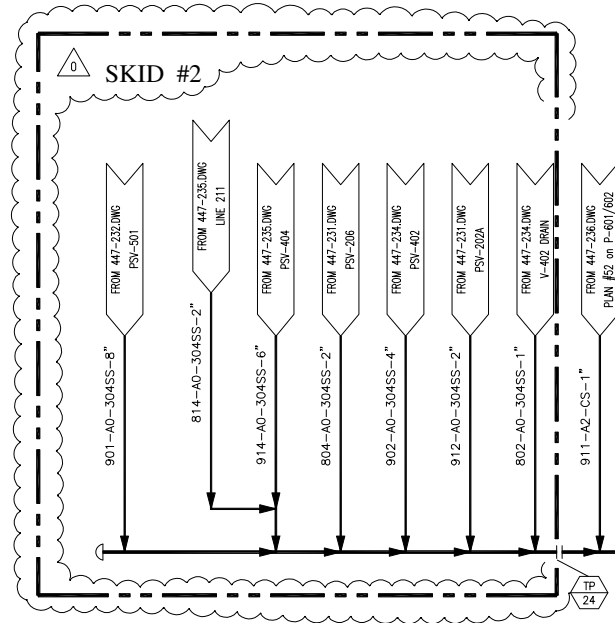
J-477
 12/07/18
 REV

STANDARD 60MM CRYO PLANT MECHANICAL FLOW DIAGRAM FUEL GAS SYSTEM		UOP Russell 7000 S. Yale, Suite 210 Tulsa, Oklahoma 74136 Phone: 918-481-5888 Fax: 918-481-7827	
REV	DATE	BY	DESCRIPTION
1	4-47-296	NONE	
REVISIONS			
1	12/5/18	JMS	REVISED SKID 2.
2	10/7/18	JTG	ISSUED APPROVED FOR CONSTRUCTION.
3	12/09/14	TKF	ADDED TP-26; REMOVED LINES 741/771
4	8/28/13	TKF	ADDED PSV's
5	8/28/13	TKF	ADDED PSV's
6	8/28/13	TKF	ADDED PSV's
7	8/28/13	TKF	ADDED PSV's
8	8/28/13	TKF	ADDED PSV's
9	8/28/13	TKF	ADDED PSV's
10	8/28/13	TKF	ADDED PSV's
11	8/28/13	TKF	ADDED PSV's
12	8/28/13	TKF	ADDED PSV's
13	8/28/13	TKF	ADDED PSV's
14	8/28/13	TKF	ADDED PSV's
15	8/28/13	TKF	ADDED PSV's
16	8/28/13	TKF	ADDED PSV's
17	8/28/13	TKF	ADDED PSV's
18	8/28/13	TKF	ADDED PSV's
19	8/28/13	TKF	ADDED PSV's
20	8/28/13	TKF	ADDED PSV's

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Dec 07, 2018 - 824am
 LAST VALVE NUMBER USED: 96031

V-492
 COLD DRAIN TANK
 72" O.D. X 24'-0" S/S
 DESIGN: 150 PSIG @ 150 DEG F
 MDMT: -200 DEG F @ 150 PSIG

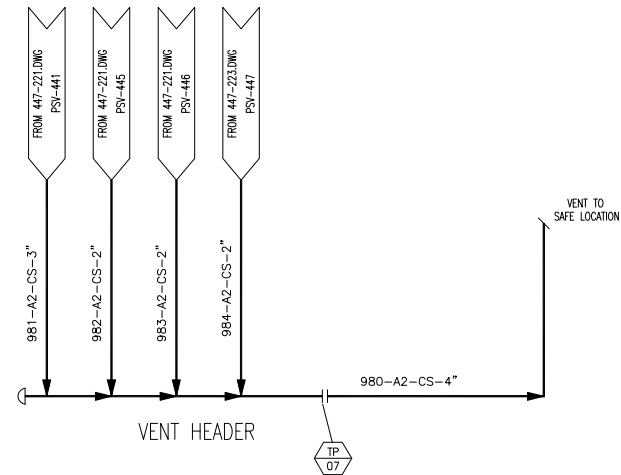
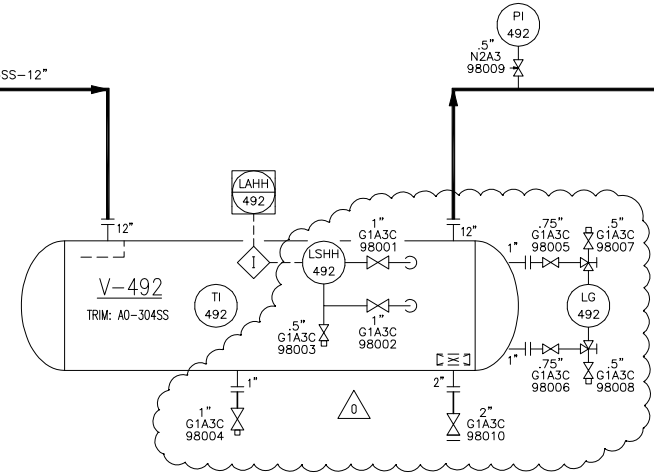


988-A0-304SS-10"

989-A0-304SS-12"

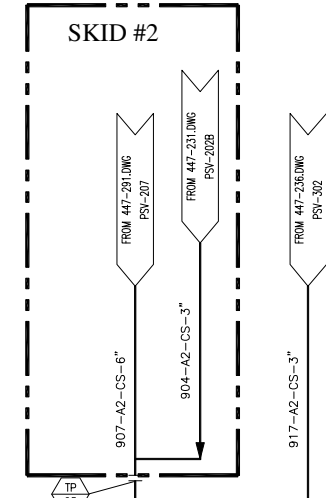
990-A0-304SS-12"

COLD FLARE HEADER



980-A2-CS-4"

VENT TO SAFE LOCATION



920-A2-CS-8"

WARM FLARE HEADER

PURGE (by CUSTOMER)

J-447
 11/04/16
 IFC

LAST VALVE NUMBER USED: 99010

STANDARD 60MM CRYO PLANT MECHANICAL FLOW DIAGRAM COLD DRAIN TANK AND DRAINS		OK P.E.F. 437		WY COM 00745-00 TX P.E.F. F-751	
REV.	DATE	BY	DATE	DESCRIPTION	REVISIONS
0	8-28-2013	Jud	8-28-2013	ISSUED *APPROVED FOR CONSTRUCTION.*	0
1	10-7-2016	BJ	10-7-2016	ADDED TP; ADD CD TO HDR; REV LINES 988, 907, 990	B
2	8-28-2013	TKF	8-28-2013	ADDED VENT & WARM HEADER	A
3	8/28/13	TKF	8/28/13	ADD VENT & WARM HEADER	A
4	12/09/14	TKF	12/09/14	ADD VENT & WARM HEADER	B
5	10/7/16	JTG	10/7/16	ISSUED *APPROVED FOR CONSTRUCTION.*	0

UOP Russell
 7560 S. Vasa, Suite 210
 Littleton, Colorado 80120
 Phone: 818-481-5882
 Fax: 818-481-1921

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