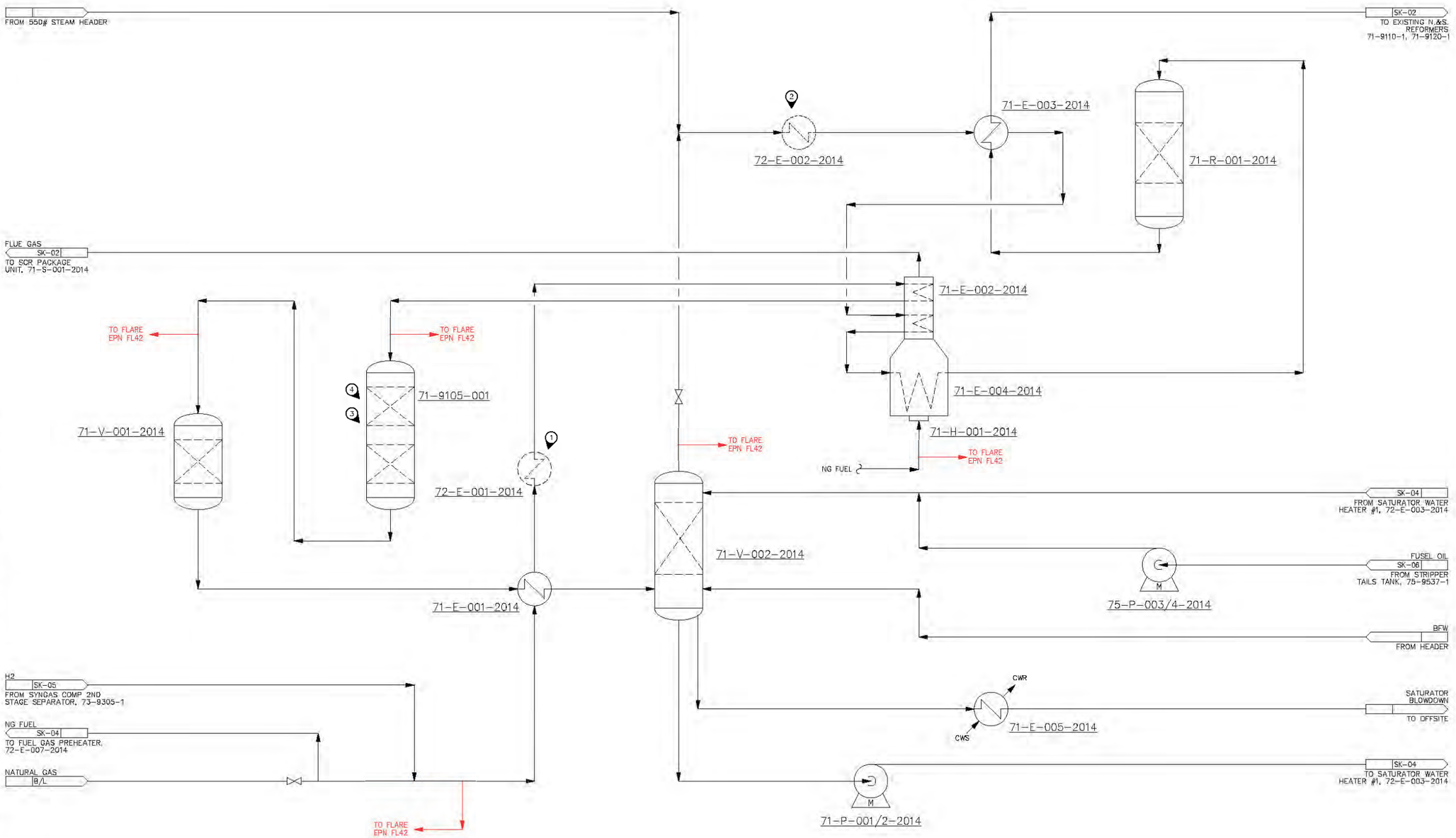
71-V-001-2014 ULTRAPURIFICATION VESSEL	71-E-001-2014 HDS INTERCHANGER	71-V-002-2014 SATURATOR	71-P-001/2-2014 SATURATOR CIRCULATION PUMPS	72-E-002-2014 MIXED FEED/REFORMED GAS INTERCHANGER	71-E-003-2014 PREREFORMER INTERCHANGER	71-R-001-2014 PREREFORMER
71-9105-001 MIXED BED DESULFURIZER ④	72-E-001-2014 NATURAL GAS/REFORMED GAS INTERCHANGER	71-E-002-2014 NATURAL GAS FEED PREHEATER	71-H-001-2014 PREREFORMER FIRED HEATER	71-E-004-2014 PREREFORMER FEED HEATER	71-E-005-2014 SATURATOR BLOWDOWN COOLER	75-P-003/4-2014 FUSEL OIL PUMPS



NOTES

1. REFORMED GAS ON SHELL SIDE; SHOWN ON SK-04.
2. REFORMED GAS ON SHELL SIDE; SHOWN ON SK-04.
3. EXISTING HYDRODESULFURIZATION VESSEL IS TO BE RERATED TO 570 PSIG AND 425°C DESIGN CONDITIONS.
4. EXISTING EQUIPMENT.

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PROCESS FLOW DIAGRAM
METHANOL PROCESS UNIT
DESULFURIZATION AND PREREFORMING

DRAWN:	SCALE: NONE	
DWG. NO.	SK-01	REV. A

P:\H1301301 OS Ammonia\0.00 SHARED\0&0 ENGINEERING\0&D1 Process Engineering\0&D1.03 Drawings\0&D1.03.01 Process Flow Diagram\EPA SK-01-EPA.DWG 06/11/13 10:33:11 EA

71-9110-1
N. REFORMER (3)

71-9115/6/7/-1
N. REFORMER WHBs (3)

71-S-001-2014
SELECTIVE CATALYTIC REDUCTION (SCR) PACKAGE UNIT

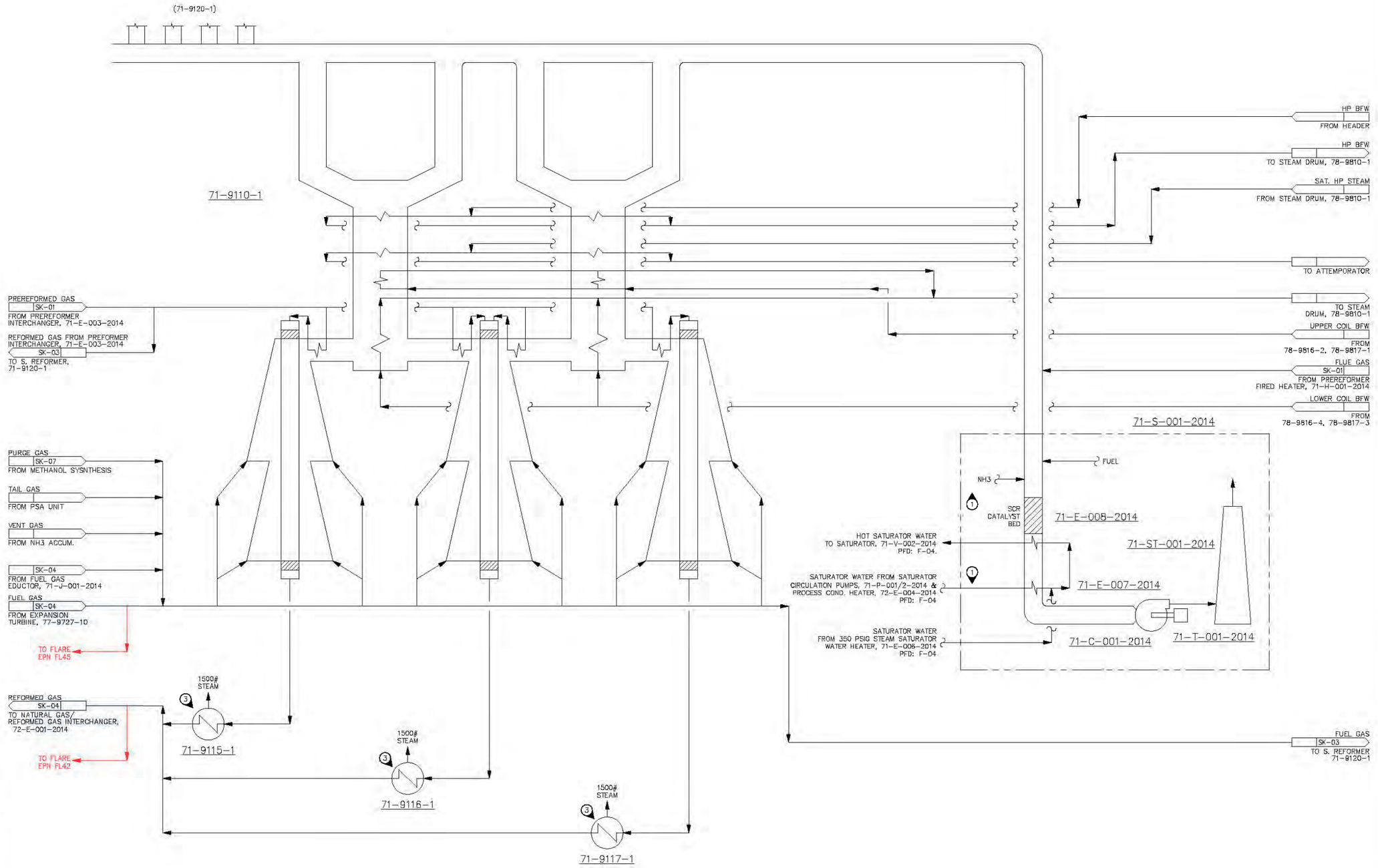
71-E-007-2014
SATURATOR WATER HEATING COIL #1

71-C-001-2014
SCR I.D. FAN

71-T-001-2014
SCR I.D. FAN TURBINE

71-ST-001-2014
FLUE GAS STACK

71-E-008-2014
SATURATOR WATER HEATING COIL #2



NOTES

1. REFER SK-04 FOR DETAILS ON LOCATION OF HEATING COILS IN SATURATOR WATER CIRCUIT.
2. DUAL DRIVE: STEAM TURBINE AND MOTOR.
3. EXISTING EQUIPMENT.

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PROCESS FLOW DIAGRAM
METHANOL PROCESS UNIT
No. 1 REFORMER & SELECTIVE CATALYTIC REDUCTION (SCR) UNIT

DRAWN:
SCALE: NONE

DWG. NO. SK-02
REV. A

P:\H1301301 OCI Ammonia\0.00 SHARED\08.0 ENGINEERING\08.01 Process Engineering\08.01.03 Drawings\08.01.03.01 Process Flow Diagram\EPA SK-02-EPA.DWG 09/10/13 14:45:10 EA

71-9120-1
S. REFORMER
(2)

71-9125/6/7-1
S. REFORMER WHBs
(2)

FLUE GAS TO N. REFORMERS DUCTS
(71-9110-1)
(1)

PREREFORMED GAS FROM PREREFORMER INTERCHANGER, 71-E-003-2014
SK-02

FUEL GAS
SK-02

71-9120-1
(2)

HP BFW FROM HEADER

HP BFW TO HP STEAM DRUM, 78-9820-1

SAT. HP STEAM FROM HP STEAM DRUM, 78-9820-1

HP STEAM TO ATTEMPORATOR

UPPER COIL BFW FROM 78-9826-2, 78-9827-1

LOWER COIL BFW FROM 78-9826-4, 78-9827-3

HP BFW/STEAM TO HP STEAM DRUM, 78-9820-1

1500# STEAM
(2)
71-9125-1

1500# STEAM
(2)
71-9126-1

1500# STEAM
(2)
71-9127-1

TO FLARE
EPN FL42

TO NATURAL GAS/REFORMED GAS INTERCHANGER, 72-E-001-2014
SK-04

NOTES

1. FUEL GAS FROM 4 DUCTS OF N. REFORMER (71-9110-1), 4 DUCTS OF S. REFORMER (71-9120-1) AND 1 DUCT FROM PREREFORMER FIRED HEATER (71-H-001-2014)TIE INTO A COMMON DUCT TO THE SCR PACKAGE. REFER TO SK-02 FOR DETAILS.
2. EXISTING EQUIPMENT.

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PROCESS FLOW DIAGRAM
METHANOL PROCESS UNIT
No. 2 REFORMER

DRAWN: | SCALE: NONE

DWG. NO. SK-03 | REV. A

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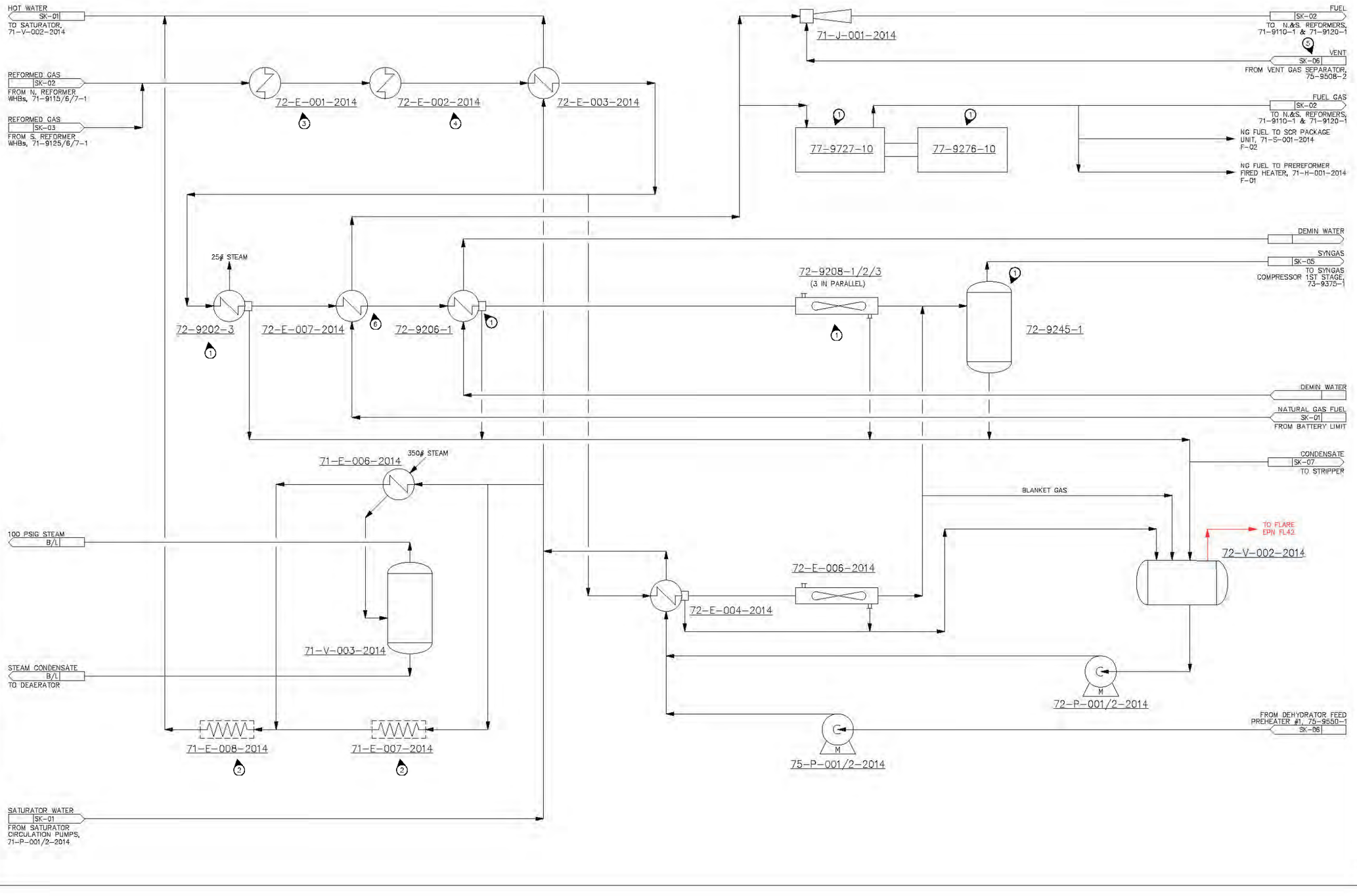
72-E-001-2014 NATURAL GAS/REFORMED GAS INTERCHANGER	71-E-007-2014 SATURATOR WATER HEATING COIL #1	72-E-002-2014 MIXED FEED/REFORMED GAS INTERCHANGER	72-E-007-2014 FUEL GAS PREHEATER (6)	72-E-003-2014 SATURATOR WATER HEATER #1	71-J-001-2014 FUEL GAS EDUCTOR	77-9727-10 EXPANSION TURBINE	77-9276-10 BFW PUMP	72-V-002-2014 PROCESS CONDENSATE COLLECTION DRUM	72-P-001/2-2014 PROCESS CONDENSATE PUMPS
72-9202-3 25 PSIG WASTE HEAT BOILER	71-E-008-2014 SATURATOR WATER HEATING COIL #2	72-9206-1 BFW HEATER	71-E-006-2014 350 PSIG STEAM SATURATOR WATER HEATER	71-V-003-2014 STEAM CONDENSATE FLASH DRUM	72-E-004-2014 PROCESS CONDENSATE HEATER	72-9208-1/2/3 SYNGAS COOLER	72-E-006-2014 SYNGAS AIR COOLER	75-P-001/2-2014 DISTILLATION WATER PUMPS	72-9245-1 SYNGAS COMPRESSOR 1ST STAGE SUCTION K.O. DRUM



NOTES

1. EXISTING EQUIPMENT.
2. HEATING COILS ARE LOCATED DOWNSTREAM OF SCR.
3. NATURAL GAS ON TUBESIDE, SHOWN ON SK-01.
4. MIXED FEED ON TUBESIDE, SHOWN ON SK-01.
5. VENT FROM SPLITTER VENT CONDENSER, 75-9502-2 IS SENT TO VENT GAS SEPARATOR (NO. SHOWN ON PFD-6452).
6. 72-9204-1 WILL BE REPLACED IN KIND WITH 72-E-007-2014 WITH INCREASED SHELL DESIGN PRESSURE OF 570 PSIG..

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PROCESS FLOW DIAGRAM
METHANOL PROCESS UNIT
SYNGAS HEAT RECOVERY

DRAWN:	SCALE: NONE	
DWG. NO.	SK-04	REV. A

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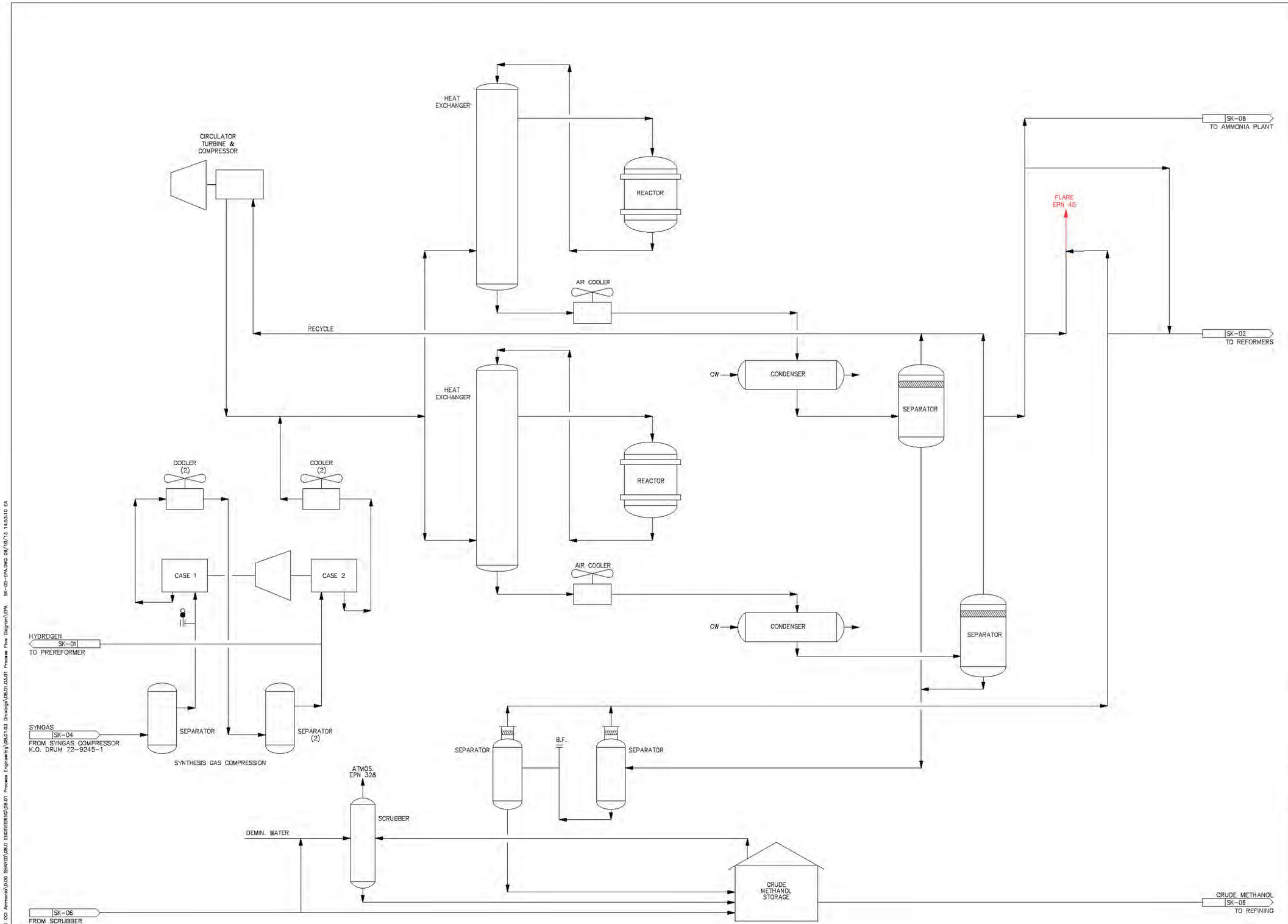

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PROCESS FLOW DIAGRAM
METHANOL PROCESS UNIT
COMPRESSION-REACTION

DRAWN:	SCALE: NONE	
DWG. NO.	SK-05	REV. A

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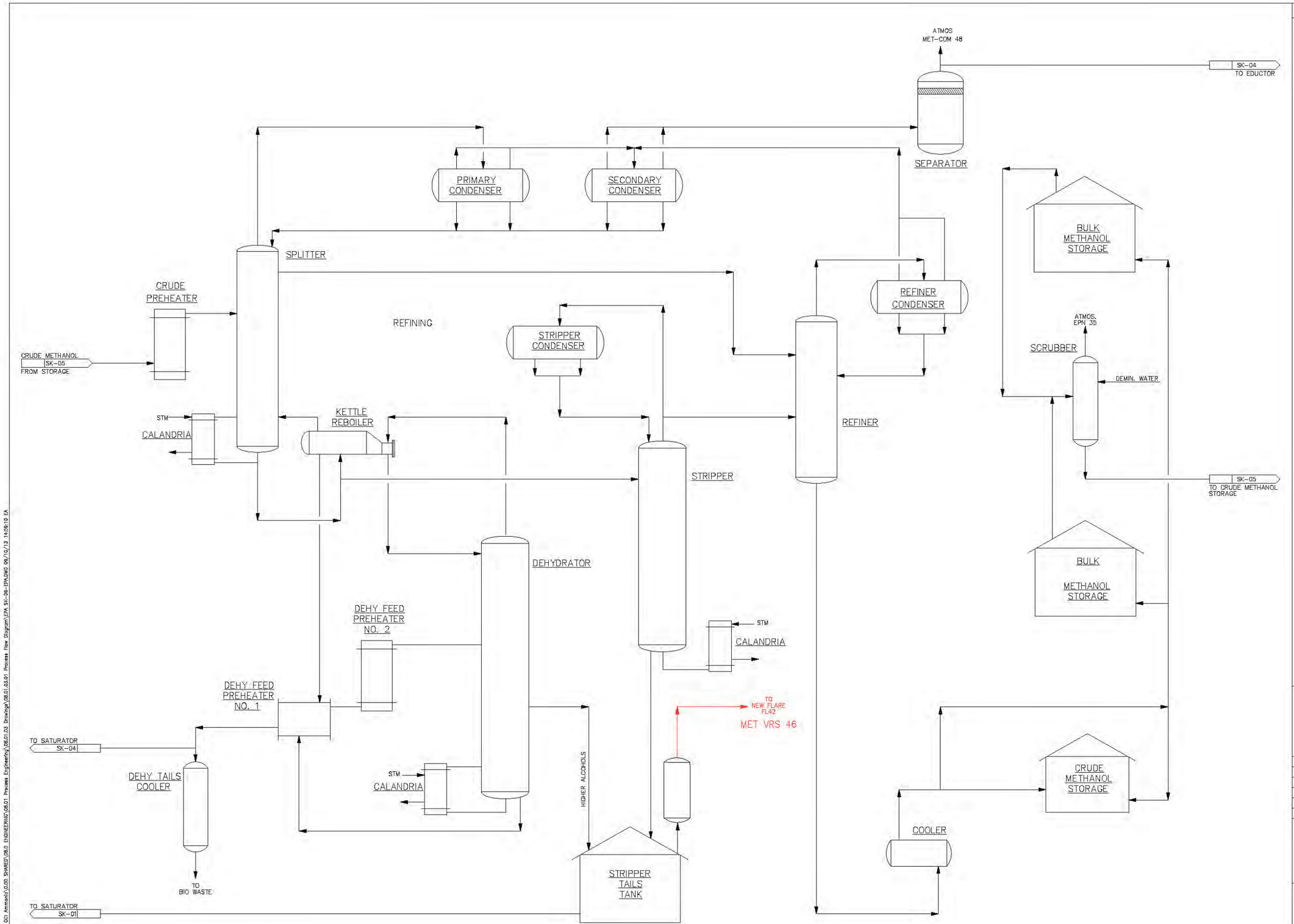

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PROCESS FLOW DIAGRAM
METHANOL PROCESS UNIT
REFINING–STORAGE

DRAWN:	SCALE: NONE	
DWG. NO.	SK–06	REV. A

MET VRS 46

PROCESS CONDENSATE
SK-04
25 PSIG STEAM
#2 CRUDE PREHEATER
#1 KILL CONDENSER
25 PSIG CONDENSATE HEADER
LP CONDENSATE HEADER
FROM FLASH TANK (DWG #700305)
FROM DRIP LEGS
SYN GAS HOTWELL
#2 KILL CONDENSER
1150 P1C
1150PV
VACUUM BREAKER
1148 P1C
1148PV
1115LT
1115 LC
1115LV
CO2 STRIPPER 77-9701-5
CONDENSATE FLASH TANK
CONDENSATE STORAGE TANK 77-9702-1
WASTE TO DITCH
1151 P1C
1151PV
1147 P1C
1147F
1147LV
TO POWDEX TANK
CONDENSATE PUMPS
FROM POWDEX TANK
DEMINERALIZED WATER CONNECTIONS
CONDENSATE FROM AMMONIA
2611T
BFW PREHEATER (DWG #700308)
FG PREHEATER
CTW
SAMPLE DRAIN
929 LTC
929LV
929LT
929LSL
OXYGEN SCAVANGER TANK
OXYGEN SCAVANGER
O2 SCAVENGER
TO WEST REACTOR STEAM DRUM
TO EAST REACTOR STEAM DRUM
DEAERATOR 77-9725-1
934 P1C
934PC
934PV
25 PSIG STEAM
DEAERATOR STORAGE TANK
3302PV
BCP GLAND LEAKOFF
3100 P1C
B/D
3300PT
3300PV
3300PV1
1600/850 PRV
PHOSPHATE
TO NORTH REFORMER
TO SOUTH REFORMER
927 P1C
927PT
931PT
TO 100 PSIG WHB
TO 25 PSIG WHB
650 P1C
650PT
FUEL GAS
650PV
650PV
FUEL GAS
927PV1
937 P1C
937FV
940 P1C
940FV
942 P1C
942FV
RO
927PV
#1 HP BFW
#2 HP BFW
#3 HP BFW
LP BFW
LP BFW
25 PSIG STEAM
350 PSIG STEAM
CTW
SAMPLE DRAIN
TO PHOSPHATE TANK
2500# PHOSPHATE TANK
DRAIN
1500# PHOSPHATE TANK
HP PHOSPHATE PUMPS
DRAIN
TO 100 PSIG WHB
LP PHOSPHATE PUMPS
TO 25 PSIG WHB
100#/25# PHOSPHATE TANK
DRAIN
TO CAUSTIC PUMP
TO POWDEX
EQUALIZING LINE
626PT
FROM MIXED BED TANK
FROM DEMINERALIZED TRAINS
625 LTC
625LV
625LT
625F
DEMINERALIZED WATER STORAGE TANK 77-9710-1
DIESEL
FLUSHING LINE

P:\H13X1301 DCI Ammonia\0.00 SHARED\0&A 0 ENGINEERING\1.08.01 Process Engineering\1.08.01.03 Drawings\1.08.01.03.01 Process Flow Diagram\EPA SK-07-EPA.DWG 09/11/13 07:16:11 EA

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METHANOL PROCESS UNIT
WATER TREATMENT

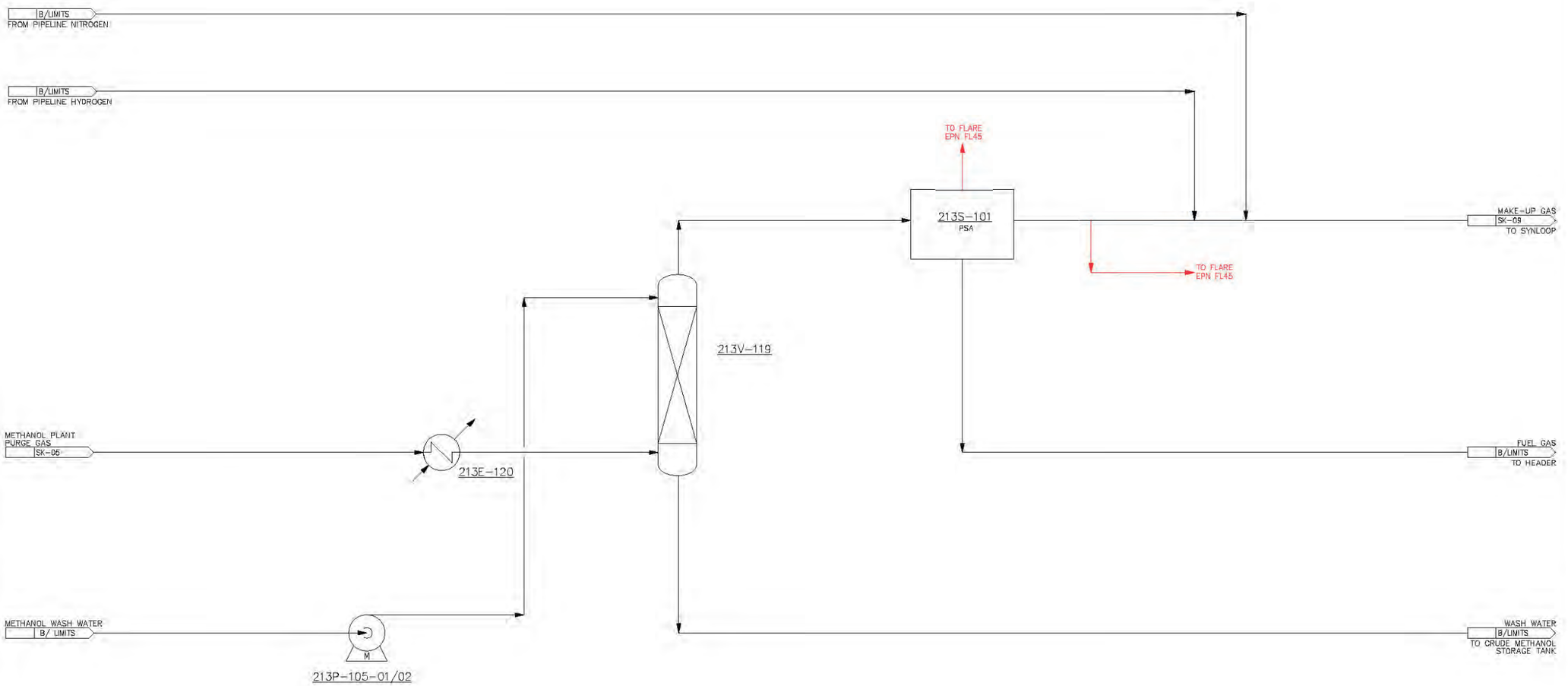
DRAWN:	SCALE: NONE	
DWG. NO.	SK-07	REV. A

213E-120
METHANOL PURGE GAS COOLER

213P-105-01/02
WATER WASH TOWER WATER PUMP

213V-119
METHANOL PURGE GAS WATER WASH TOWER

213S-101
PSA SYSTEM



NOTES

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PROCESS FLOW DIAGRAM
1,000 STPD AMMONIA PLANT
MEOH PURGE GAS

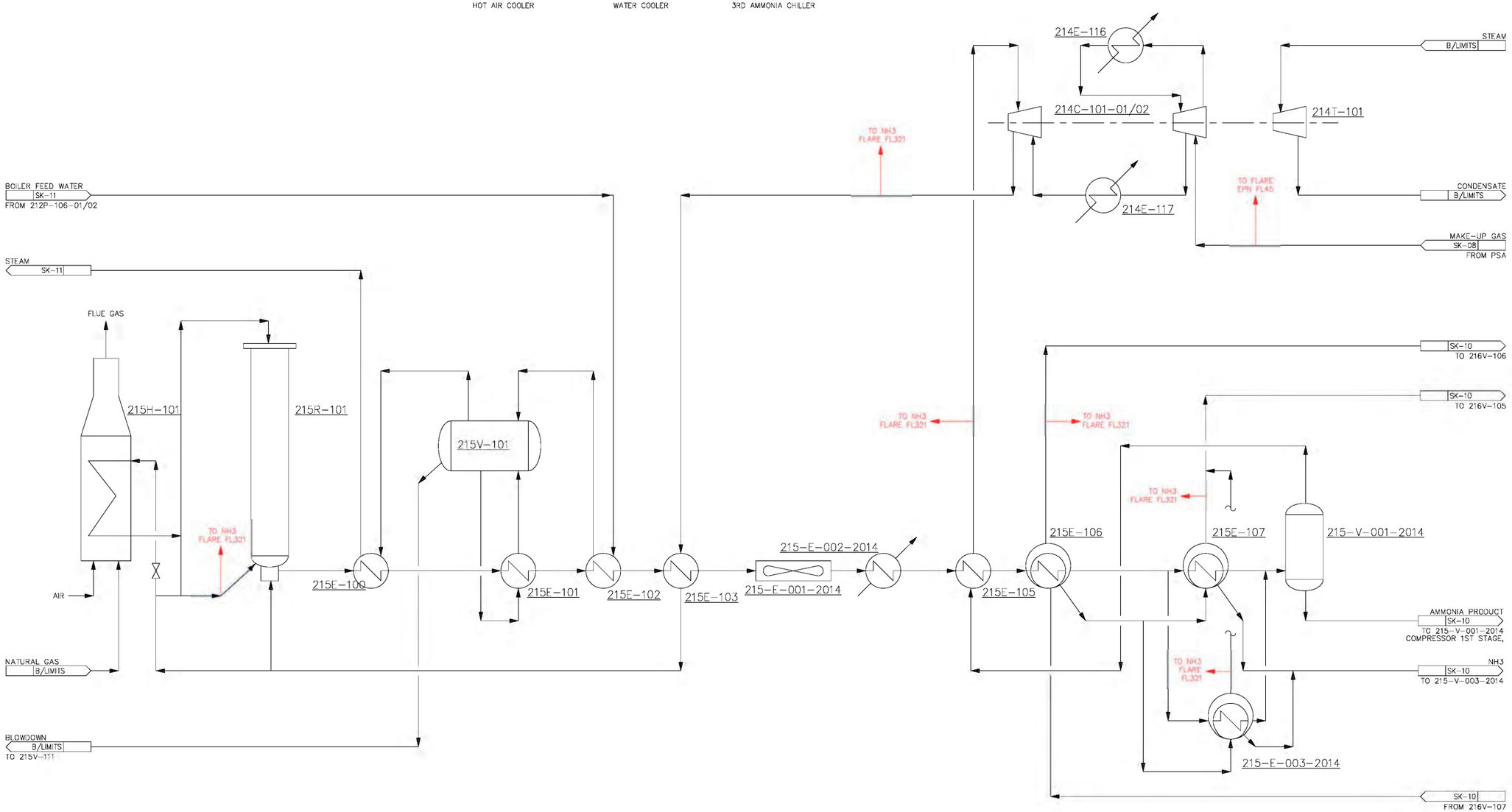
DRAWN: | SCALE: NONE

DWG. NO. SK-08 | REV. A

P:\H1301301 OCI Ammonia\0.00 SHARED\08.0 ENGINEERING\08.01 Process Engineering\08.01.03 Drawings\08.01.03.01 Process Flow Diagram\EPA SK-08-EPA.DWG 09/10/13 15:12:10 EA

215H-101	215R-101	215E-100	215V-101	215E-101	215E-102	215E-103	215E-105	215E-106	215E-107	214C-101-01/02	215-V-001-2014	214E-116	214E-117	214T-101
START-UP HEATER	AMMONIA SYNTHESIS CONVERTER	STEAM SUPERHEATER	STEAM DRUM	STEAM GENERATOR	BFW PREHEATER	HOT HEAT EXCHANGER	COLD HEAT EXCHANGER	1ST AMMONIA CHILLER	2ND AMMONIA CHILLER	SYN GAS COMPRESSOR AFTERCOOLER	AMMONIA SEPARATOR	SYNGAS COMPRESSOR INTERCOOLER #1	SYNGAS COMPRESSOR INTERCOOLER #2	STEAM TURBINE DRIVE FOR 214C-101

215-E-001-2014	215-E-002-2014	215-E-003-2014
HOT AIR COOLER	WATER COOLER	3RD AMMONIA CHILLER



NOTES

1. NO GAS LOOSES FORSEEN FOR SYNSTHESIS GAS COMPRESSOR. 214C-101-01/02

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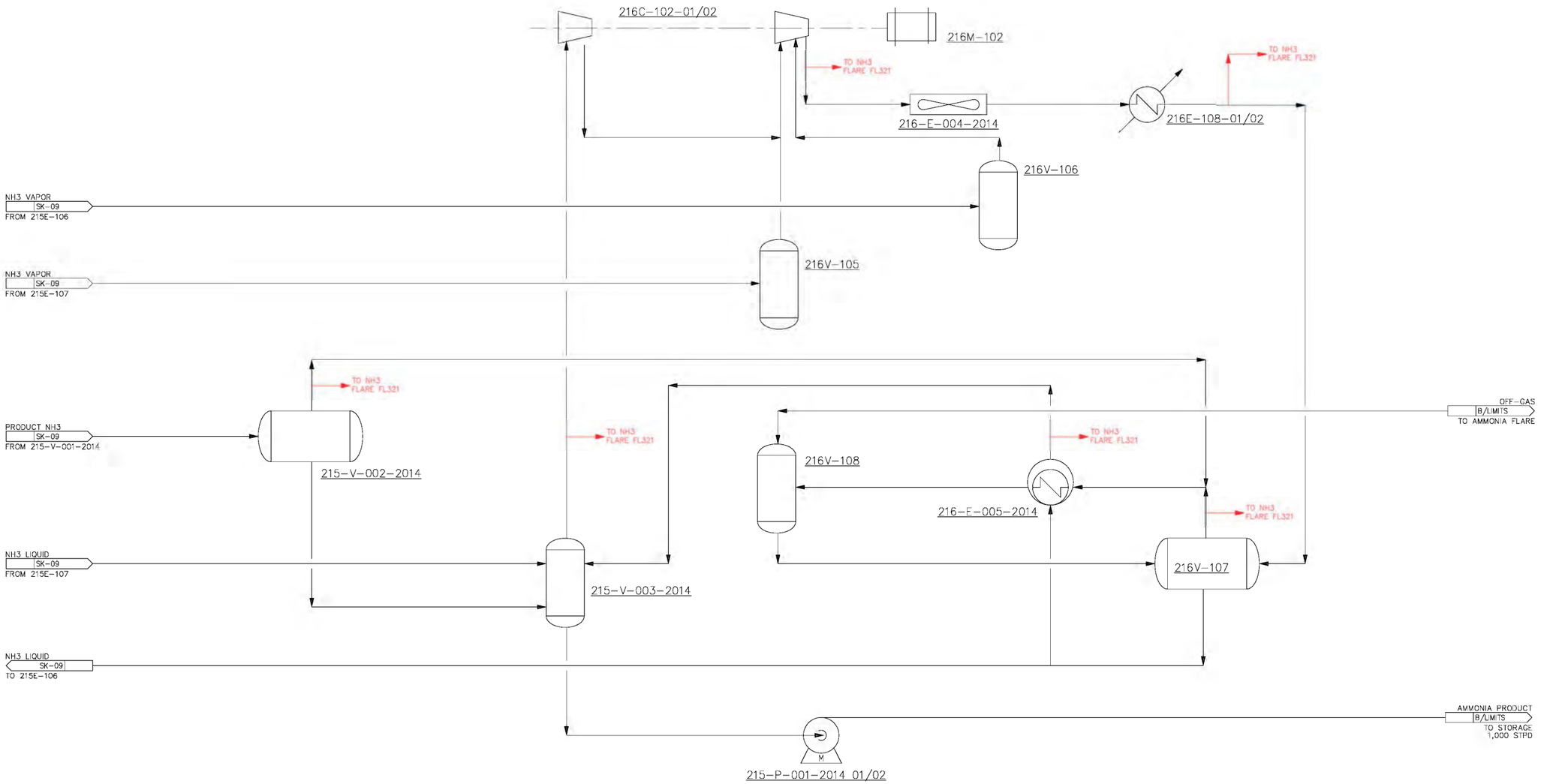
PROCESS FLOW DIAGRAM
1,000 STPD AMMONIA PLANT
AMMONIA SYNTHESIS LOOP

DRAWN: | SCALE: NONE

DWG. NO. SK-09 | REV. A

P:\H1-301301 OCI Ammonia\0.00 SHARED\08.0 ENGINEERING\08.01 Process Engineering\08.01.03 Drawings\08.01.03.01 Process Flow Diagram\EPA SK-09-EPA.DWG 09/17/13 14:46:17 CHL

216V–105	215–V–002–2014	215–V–003–2014	215–P–001–2014 01/02	216C–102–01/02	216–E–005–2014	216–E–004–2014	216E–108–01/02	216V–107	216V–108	216V–106	216M–102
AMMONIA REFRIG. COMPRESSOR KNOCK–OUT DRUM #1	AMMONIA 1ST STAGE LETDOWN DRUM	AMMONIA 2ND STAGE LETDOWN DRUM	AMMONIA PRODUCT RUNDOWN PUMP	AMMONIA REFRIGERATION	AMMONIA ACCUMULATOR VENT GAS CHILLER	AMMONIA AIR COOLER	AMMONIA CONDENSER	AMMONIA ACCUMULATOR	AMMONIA ACCUMULATOR VENT GAS SEPARATOR	AMMONIA REFRIG. COMPRESSOR KNOCK–OUT DRUM #2	MOTOR DRIVER FOR AMMONIA COMPRESSOR



NOTES

1. IF VALVES DIFFER IN COLD PRODUCT AND WARM PRODUCT CASES, THE COLD PRODUCT VALVES ARE THE BOTTOM OF THE STACKED VALVES.

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PROCESS FLOW DIAGRAM
1,000 STPD AMMONIA PLANT
AMMONIA REFRIGERATION

DRAWN: | SCALE: NONE

DWG. NO. SK–10 | REV. A

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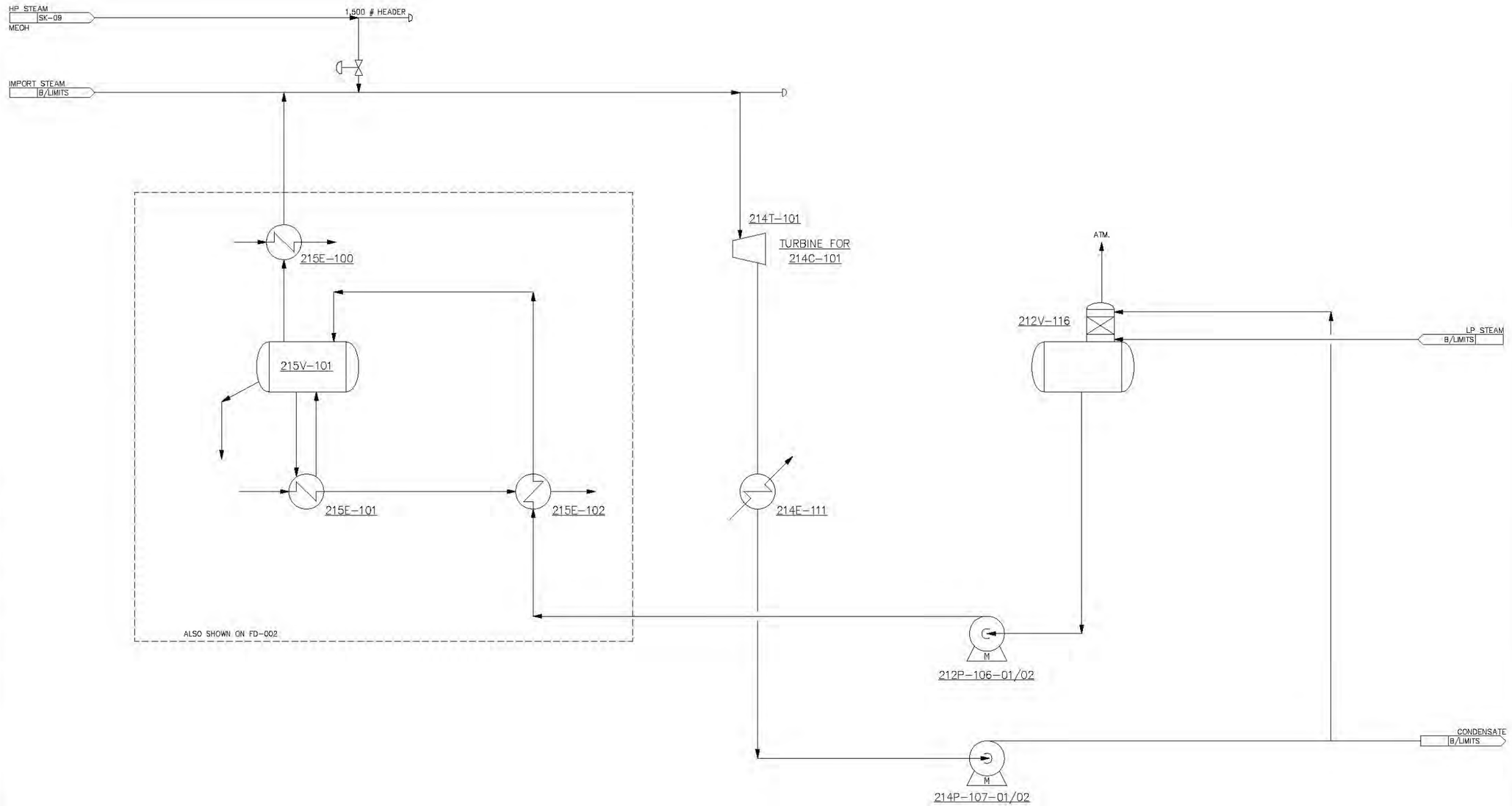
214T-101	214E-111	214P-107-01/02	212P-106-01/02	212V-116
SYNTHESIS GAS COMPRESSOR STEAM TURBINE	STEAM TURBINE EXHAUST CONDENSER	STEAM TURBINE CONDENSATE PUMP	BOILER FEED WATER PUMP	DEAERATOR



NOTES

1. IF VALVES DIFFER IN COLD PRODUCT AND WARM PRODUCT CASES, THE COLD PRODUCT VALVES ARE THE BOTTOM OF THE STACKED VALVES.

* STEAM RATE TO BE COMFIRMED BY SUPPLIER.

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PROCESS FLOW DIAGRAM
1,000 STPD AMMONIA PLANT
STEAM BALANCE

DRAWN:	SCALE: NONE	
DWG. NO.	SK-11	REV. A

74-V-001-2014
FLARE KNOCK OUT DRUM

74-P-001/2-2014
FLARE KNOCK OUT DRUM PUMPS

74-B-001-2014
FLARE

RELIEF FROM PSVs ON NATURAL GAS SUPPLY LINE

RELIEF FROM PSVs ON UNTRAPURIFICATION VESSEL, 71-V-001-2014

RELIEF FROM PSVs ON MIXED BED DESULFURIZER, 71-9105-001

VENT/RELIEF FROM SATURATOR, 71-V-002-2014

VENT/RELIEF FROM FIRE HEATER AREA, 71-H-001-2014

VENT/RELIEF FROM PROCESS CONDENSATE COLLECTION DRUM, 71-V-002-2014

NORTH & SOUTH REFORMERS HOT VENT (EPN VNT-42)

REFORMERS COLD VENT (EPN VNT-42)

STRIPPER TAILS TANK

EPN FL42

74-B-001-2014

74-V-001-2014

B/L

M

74-P-001/2-2014

NOTES

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PROCESS FLOW DIAGRAM
METHANOL PROCESS UNIT
FLARE SYSTEM (NEW)

DRAWN: CHL	SCALE: NONE	
DWG. NO.	SK-12	REV. A

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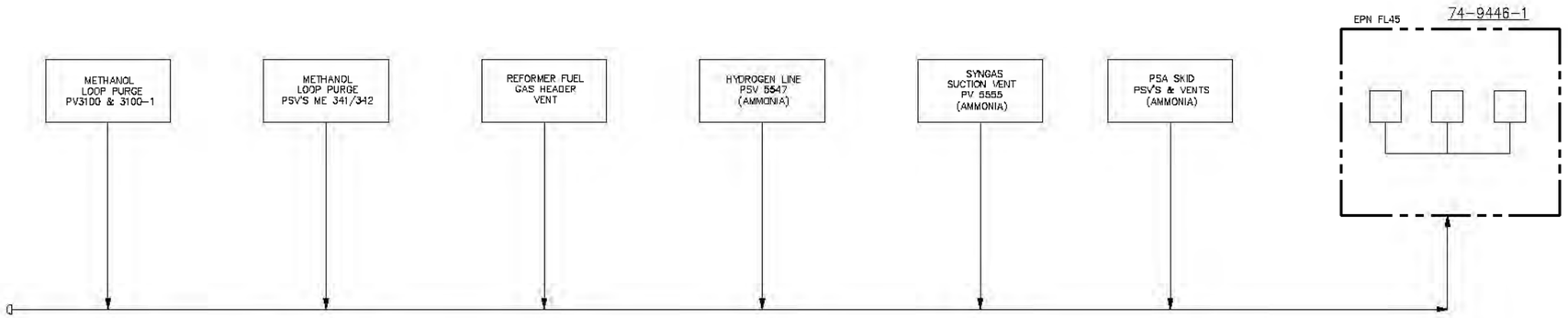
74-9446-1
FLARE (FL45)



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PROCESS FLOW DIAGRAM
METHANOL PROCESS UNIT
FLARE SYSTEM (EXISTING)

DRAWN: CHL	SCALE: NONE	
DWG. NO.	SK-13	REV. A

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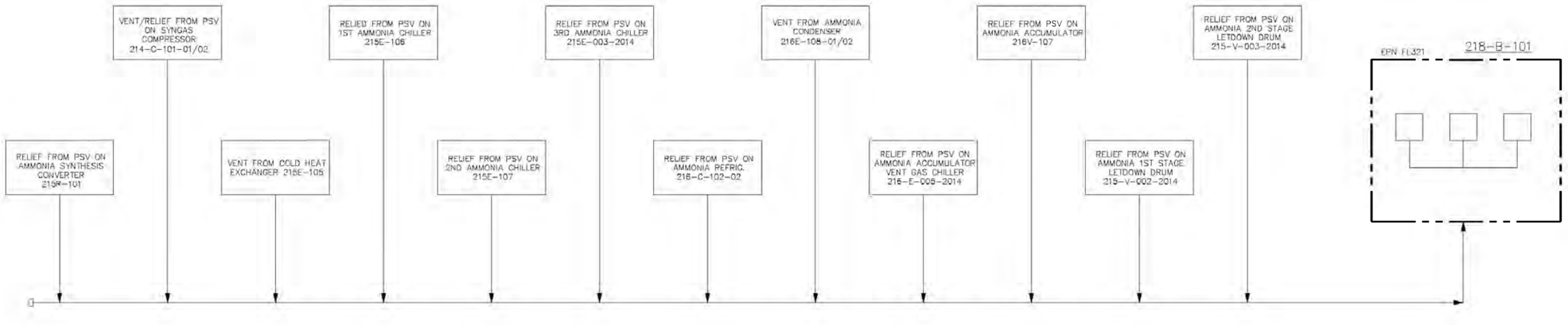
218-B-101
AMMONIA FLARE



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EST. NO.		JOB NO. H1204101			

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PROCESS FLOW DIAGRAM
1,000 STPD AMMONIA PLANT
AMMONIA FLARE SYSTEM (EXISTING)

DRAWN: CHL | SCALE: NONE

DWG. NO. SK-14 | REV. A