GAS TURBINE MODEL MS7001EA & HELPER MOTOR (20MW)

MCL1404 LP + MCL1003 MP MR COMPRESSORS

PIPING & INSTRUMENTS DIAGRAMS

CUSTOMER : INPEX Operations Australia Pty Ltd.
PLANT LOCATION : Blaydin Point in Darwin, Northern Territory (AUSTRALIA)
PLANT : ICHTHYS ONSHORE LNG FACILITIES
JOB : 1607070÷71/1102980÷81
ITEM : BASE SOLUTION LP+MP MR COMPRESSOR TRAIN

INSTRUMENT TAG NUMBERS RULE

THE INSTRUMENTS ON THE P&ID ARE TAGGED AS FOR EXAMPLE BELOW:

602 XV 2001A — TAG ON THE NAME PLATE MUST BE AS FOLLOW:

L-602-XV-2001-A

602: FOR TRAIN 2 (160.7070/110.2980)
601: FOR TRAIN 1 (160.7071/110.2981)
SYSTEM CODE
SUFFIX (IF NECESSARY)
UNIQUE IDENTIFICATION NUMBER (#2001 TO #2999)
INSTRUMENT FUNCTION CODE

NOTE: P&I DIAGRAM SHOWS TRAIN-2 TAGS ONLY. FOR THE TRAIN-1 REFER TO TAGGING RULE ABOVE.

EQUIPMENT TAG NUMBERS RULE

MAIN EQUIPMENT:

THE MAIN EQUIPMENTS ON THE P&ID ARE TAGGED AS FOR EXAMPLE BELOW:

KT-002 FOR GAS TURBINE

TAG ON THE NAME PLATE MUST BE AS FOLLOW:

L-602-KT-002

602: FOR TRAIN 2 (160.7070/110.2980)
601: FOR TRAIN 1 (160.7071/110.2981)
SYSTEM CODE
MECHANICAL FUNCTION CODE
UNIQUE IDENTIFICATION NUMBER

AUXILIARY EQUIPMENT:

THE AUXILIARY EQUIPMENTS ON THE P&ID ARE TAGGED AS FOR EXAMPLE BELOW:

KT-002_V-01-A TAG ON THE NAME PLATE MUST BE AS FOLLOW:

L-602-KT-002_V-01-A

602: FOR TRAIN 2 (160.7070/110.2980)
601: FOR TRAIN 1 (160.7071/110.2981)
SYSTEM CODE
SUFFIX (IF NECESSARY)
IDENTIFICATION NUMBER
MECHANICAL FUNCTION CODES
MAIN EQUIPMENT NUMBER

NOTE: P&I DIAGRAM SHOWS TRAIN-2 TAGS ONLY. FOR THE TRAIN-1 REFER TO TAGGING RULE ABOVE.

MANUAL VALVES TAG NUMBERS RULE

THE MANUAL VALVES ON THE P&ID ARE TAGGED AS FOR EXAMPLE BELOW:

MV-7000-A TAG ON THE NAME PLATE MUST BE AS FOLLOW:

L-602-MV-7000-A

602: FOR TRAIN 2 (160.7070/110.2980)
601: FOR TRAIN 1 (160.7071/110.2981)
SYSTEM CODE
SUFFIX (IF NECESSARY)
VALVE FUNCTION CODE
MV - FOR MANUAL VALVE
CHV - FOR CHECK VALVE
UNIQUE IDENTIFICATION NUMBER (#7000 TO #9499)

NOTE: P&I DIAGRAM SHOWS TRAIN-2 TAGS ONLY. FOR THE TRAIN-1 REFER TO TAGGING RULE ABOVE.

DISCIPLINE	(Issue 0) BDR	(Issue 1)
System Eng.	Federica Gorini	Federica Gorini
Mech. Eng. - Pack.	Damiano Agostini / Stefano Miniotti	Damiano Agostini / Stefano Miniotti
Mech. Eng. - Plant	Damiano Agostini / Stefano Miniotti	Damiano Agostini / Stefano Miniotti
Mech. Eng. - Duct&Filter	Roberto Pucci.	Roberto Pucci
Instrument Eng.	Riccardo Bruni	Riccardo Bruni / Salvatore Cadone
Control Eng.	Salvatore Conte	Salvatore Conte
Electrical Eng.	Massimiliano Terzani	Massimiliano Terzani
Rotating Eng.	Nicola Mitaritonna / Giuseppe Stringano	Nicola Mitaritonna / Giuseppe Stringano

LOCAL CONTROL PANEL TAG NUMBERS RULE

THE LOCAL CONTROL PANELS ON THE P&ID ARE TAGGED AS FOR EXAMPLE BELOW:

KT-002_EC-01 TAG ON THE NAMEPLATE MUST BE AS FOLLOW:

L-602-KT-002_EC-01

602: FOR TRAIN 2 (160.7070/110.2980)
601: FOR TRAIN 1 (160.7071/110.2981)
SYSTEM CODE
UNIQUE IDENTIFICATION NUMBER
MAIN EQUIPMENT NUMBER
MECHANICAL FUNCTION CODES

NOTE: P&I DIAGRAM SHOWS TRAIN-2 TAGS ONLY. FOR THE TRAIN-1 REFER TO TAGGING RULE ABOVE.

TABLE OF CONTENTS

TITLE	SHEET NUM.
LP+MPMR - FUNCTIONAL SCHEMATIC DIAGRAM COCE (P&ID)	1
SYMBOLS & LEGEND P&I DIAGRAM	2
LUBE OIL AUXILIARY SYSTEM P&I DIAGRAM	3
LUBE OIL TURBINE SYSTEM P&I DIAGRAM	4
OIL VAPOUR SEPARATOR SYSTEM P&I DIAGRAM	5
CONTROL OIL SYSTEM P&I DIAGRAM	6
HYDRAULIC OIL SYSTEM P&I DIAGRAM	7
IGV SYSTEM P&I DIAGRAM	8
COOLING AND SEALING AIR SYSTEM P&I DIAGRAM	9
FUEL GAS SCRUBBER SYSTEM P&I DIAGRAM	10
FUEL GAS SYSTEM P&I DIAGRAM	11
FUEL GAS SYSTEM P&I DIAGRAM	12
FUEL GAS SYSTEM P&I DIAGRAM	13
PURGE GAS SYSTEM P&I DIAGRAM	14
STARTING MEANS SYSTEM P&I DIAGRAM	15
CONTROL DEVICE SYSTEM P&I DIAGRAM	16
BEARING AND PROTECTION SYSTEM P&I DIAGRAM	17
WASHING WATER SYSTEM P&I DIAGRAM	18
COOLING WATER SYSTEM P&I DIAGRAM	19
FILTER HOUSE SYSTEM P&I DIAGRAM	20
VENTILATION SYSTEM P&I DIAGRAM	21
FIRE FIGHTING PACKAGE SYSTEM P&I DIAGRAM	22
FIRE FIGHTING SKID SYSTEM P&I DIAGRAM	23
HELPER MOTOR SYSTEM P&I DIAGRAM	24
LUBE OIL COMPRESSOR SYSTEM P&I DIAGRAM	25
MCL1404 LP COMPRESSOR SEAL GAS SYSTEM P&I DIAGRAM	26
MCL1003 MP COMPRESSOR SEAL GAS SYSTEM P&I DIAGRAM	27
PURIFIER AND LUBE OIL FILL SYSTEM P&I DIAGRAM	28

ICHTHYS ONSHORE LNG FACILITIES
JKC — JKC AUSTRALIA LNG PTY LTD — INPEX
Darwin, Australia

VENDOR ISSUE PURPOSE: ☐ FA ☐ FR ☐ FI ☐ FC ☒ AB ☐ CA
CTR RESULT CODE: ■ A ☐ B ☐ N ☐ F
NEXT STATUS: ☐ FA ☐ FR ☐ FI ☐ FC ☐ AB ■ NA
VENDOR RESUB / NEXTSUB DATE:

Approval or review hereunder shall not be construed to relieve Vendor / Subcontractor of his responsibilities and liability under the Contract.

CTR ORGANIZATION	DEPT. NAME	SIGNATURE
PJ DEPT.		
RESPONSIBLE DEPT.	ROT	M.T / T.O
RELATED DEPT.	INST	K.K / H.Y
	ELEC	Y.K / K.J

CTR REVIEW DATE: 23 - July - 2015

JOB. NO.	0-6037-2	REVIEW CLASS	3
CPY DOC. NO.	SYSTEM NO. - CLASS/DISC. - TYPE - SERIAL NO.		REV.
	L 290 - DP - SCM - 0002.001		12
CTR DOC. NO.	PURCHASER ORDER NO. - SERIAL NO.		
	V- 2158 - 201 - A - 2011		

Supplier's name	:	**Nuovo Pignone**
Company's name	:	**INPEX Operations Australia Pty Ltd**
Plant location	:	**Darwin, Australia**
PURCHASER's name	:	**JKC Joint Venture**
Project name	:	**ICHTHYS ONSHORE LNG FACILITIES Project**
Purchase Order no.	:	**800190**
Equipment/Material name and Item/Tag number	:	**L-602/1-K-002/003 (LP+MP MR COMPRESSORS TRAIN)**

Isolation valves around TV-2029 provided by JKC were changed to LO from CSO, see sheet 19.

GE Oil & Gas

TITLE LP+MPMR - FUNCTIONAL SCHEMATIC DIAGRAM COCE (P&ID)	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION: REVISED SHEETS 3, 5, 7, 9, 11, 16, 18÷21, 24 WHERE SHOWN <15>	REVISION DATE 29-Jun-15	APPROVED Electronically Stored; CHECKED Electronically Stored; DRAWN SIMP
SECURITY CODE N		
SCALE N/A	REPLACES/DERIVED BY N/A	1st EXECUTION 30-Dec-11
ORIGINAL JOB 1607070÷71/1102980÷81	SIZE 1	LANGUAGE A
SHEET 1 of 28		

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED

REVISE WITH PidXp ONLY

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

IDRA 23-JUL-2015 AS BUILT

-Electronically Approved Drawing-Checked: Gorini F.; Approved: Caramia F.-Internal DT-'N'

VALVES

- GENERIC VALVE
- NEEDLE VALVE
- BALL VALVE
- GLOBE VALVE
- GATE VALVE
- BUTTERFLY VALVE
- DIAPHRAGM VALVE
- PINCH VALVE
- CHECK VALVE
- CHECK STOP VALVE
- CHECK VALVE WITH ORIFICE
- SPRING LOADED CHECK VALVE
- AIR PURGE VALVE
- GENERIC THREE WAY VALVE
- GENERIC FOUR WAY VALVE
- KNIFE VALVE
- PLUG VALVE
- GENERIC ANGLE VALVE
- PRESSURE RELIEF/SAFETY VALVE
- BLEEDER VALVE (2)
- RUPTURE DISC
- FLANGED ORIFICE

CONTROL VALVE ACTUATOR

- DIAPHRAGM
- PRESSURE BALANCED DIAPHRAGM
- CYLINDER/PISTON
- SPRING LOADED PISTON TYPE
- SINGLE SOLENOID
- SERVOVALVE
- MOTOR OPERATED
- ELECTRO HYDRAULIC OPERATED
- MANUAL OPERATED

PIPING SPECIALTY ITEMS

- Y-TYPE STRAINER
- CONE STRAINER
- CONE TEMPORARY STRAINER
- T-TYPE STRAINER
- BASKET TYPE STRAINER
- FLAME ARRESTOR
- STEAM TRAP
- IN LINE SILENCER
- VENT SILENCER
- REMOVABLE SPOOL
- FLEXIBLE HOSE
- EXPANSION JOINT
- BREATHER
- FILTER
- VENT COVER
- CONDENSATE TRAP
- FIRE - FIGHTING SYSTEM NOZZLE
- OIL DRAIN ABOVE OIL LEVEL/ EQUALIZED TO TANK PRESSURE
- OIL DRAIN BELOW OIL LEVEL
- FLOW LIMITER (2)

PIPING FITTINGS

- NOZZLE
- FLANGED CONNECTION
- FLANGED THERMOWELL
- SCREWED THERMOWELL
- PLUG
- CAP
- CONCENTRIC (OR GENERIC) REDUCER
- ECCENTRIC REDUCER
- OPEN FIGURE 8 BLIND
- CLOSED FIGURE 8 BLIND
- BLIND FLANGE
- HOSE CONNECTION
- SPACER
- BLANK
- ORIFICE TUBE TYPE
- EJECTOR

MISCELLANEOUS

- SLOPE
- REVISION INDEX
- NOTE REFERENCE SYMBOL
- SAMPLE CONNECTION
- SELECTOR
- ALARM (HORN)
- WARNING LIGHT
- PUSH BUTTON
- POINT OF CHANGE
- CORIOLIS FLOW METER (1)

MISCELLANEOUS EQUIPMENT

- TANK PRESSURIZED PULSATION SUPP. DEVICE
- TANK ATMOSPHERIC
- SEPARATOR CYCLON
- SEPARATOR DEMISTER CLOSED/OPEN
- SEPARATOR VANE PACK CLOSED/OPEN
- FUEL GAS FILTER / HEATER
- AIR COOLED EXCHANGER
- AIR COOLED EXCHANGER WITH LOUVERS
- PLATE AND FRAME EXCHANGER
- SHELL AND TUBE EXCHANGER
- AC ELECTRIC MOTOR
- DC ELECTRIC MOTOR
- CENTRIFUGAL FAN
- AXIAL FAN
- CENTRIFUGAL SUMP PUMP (2)
- CENTRIFUGAL PUMP
- GEAR/SCREW PUMP
- HYDRAULIC PUMP
- HYDRAULIC STARTING MOTOR-REVERSIBLE, VARIABLE FLOW
- HYDRAULIC STARTING PUMP-REVERSIBLE, VARIABLE FLOW
- STORED BOTTLE
- DAMPER
- ELECTRIC HEATER
- STEAM HEATER

DRAIN CONNECTORS

- XXXXX / YYY / P&ID N. — CONNECTOR NUMBER / DESTINATION LINE / SERVICE CODE — OPEN DRAIN
- XXXXX / YYY / P&ID N. — CONNECTOR NUMBER / DESTINATION LINE / SERVICE CODE — CLOSED DRAIN
- YYY — DESTINATION LINE / SERVICE CODE — OPEN DRAIN (NO P&ID)
- YYY — DESTINATION LINE / SERVICE CODE — CLOSED DRAIN (NO P&ID)

CONNECTORS

- SERVICE DESCRIPTION / XXX / P&ID N. / ORIGIN/DESTINATION — OFF-PLOT CONNECTOR
- SERVICE DESCRIPTION / XXX / SHEET N. / ORIGIN/DESTINATION — PRIMARY/SECONDARY LINES AND INSTRUMENT SIGNAL CONNECTOR
- XXXXX — UTILITY CONNECTOR
- T / XXX — ON-SHEET CONNECTOR

(2) LIMIT OF SUPPLY

- CUSTOMER / NUOVO PIGNONE — BETWEEN CUSTOMER AND NUOVO PIGNONE
- NUOVO PIGNONE / SUBSUPPLIER — BETWEEN NUOVO PIGNONE AND SUBSUPPLIER
- PACKAGER / NUOVO PIGNONE — BETWEEN NUOVO PIGNONE PACKAGER AND NUOVO PIGNONE

INSTR. LINES SYMBOL

- INSTRUMENT SUPPLY OR CONNECTION TO PROCESS
- PNEUMATIC SIGNAL
- ELECTRIC SIGNAL
- HYDRAULIC SIGNAL
- CAPILLARY TUBE
- HEAT TRACED LINE
- SOFTWARE LINK
- MECHANICAL LINK
- INSULATED LINE
- INSULATED & HEAT TRACED LINE

CONTROL LOGIC LEGEND

MEDIAN	MIDDLE OF
MEAN	AVERAGE
XooX	VOTING LOGIC "x" OUT OF "x"

GENERAL INSTRUMENTS

- FIELD MOUNTED INSTRUMENT
- GB — INSTRUMENT MOUNTED ON GAUGE BOARD
- LP — INSTRUMENT MOUNTED ON LOCAL PANEL
- SGP — INSTRUMENT MOUNTED ON SEAL GAS PANEL
- LOGIC CONTROLLER (MARK VIe)
- FF — LOGIC CONTROLLER (FIRE FIGHTING SYSTEM BY NUOVO PIGNONE)
- B.N. — LOGIC CONTROLLER (BENTLY NEVADA BY NUOVO PIGNONE)
- (1) — SHARED DISPLAY, SHARED CONTROL (MARK VI HMI)
- PCS — SHARED DISPLAY, SHARED CONTROL (PCS) (12)
- SIS — LOGIC CONTROLLER (MARK VIes)
- VFD — LOGIC CONTROLLER (VARIABLE FREQUENCY DRIVER BY NUOVO PIGNONE)
- I, I1, I2, I* — INTERLOCK (11)
- MCC — MCC (CUSTOMER SCOPE OF SUPPLY) (1)
- DCP — LOGIC CONTROLLER DIRECT CURRENT PANEL

INSTRUMENT IDENTIFICATION LETTERS

	FIRST LETTER		SUCCEEDING LETTERS		
	MEASURED OR INITIATING VARIABLE	MODIFIER	READOUT OR PASSIVE FUNCTION	OUTPUT FUNCTION	MODIFIER
A	ANALYSIS		ALARM		
B	BURNER, FLAME, COMBUSTION		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
C	USER'S CHOICE (TYPICALLY CONDUCTIVITY - ELECTRICAL)			CONTROL	CLOSED
D	USER'S CHOICE (TYPICALLY DENSITY OR SPEC. GRAVITY)	DIFFERENTIAL			DIVERT
E	VOLTAGE		SENSOR (PRIMARY ELEMENT)		
F	FLOW RATE	RATIO (FRACTION)			
G	USER'S CHOICE OR GAUGING (DIMENSIONAL)		GLASS VIEWING DEVICE		
H	HAND				HIGH
I	CURRENT (ELECTRICAL)		INDICATE		
J	POWER	SCAN			
K	TIME, TIME SCHEDULE	TIME RATE OF CHANGE		CONTROL STATION	
L	LEVEL		LIGHT		LOW
M	USER'S CHOICE (TYPICALLY MOISTURE OR HUMIDITY)	MOMENTARY			MIDDLE INTERMEDIATE
N	USER'S CHOICE		USER'S CHOICE	USER'S CHOICE	USER'S CHOICE
O	USER'S CHOICE		ORIFICE RESTRICTION		
P	PRESSURE - VACUUM		POINT (TEST CONNECTION)		
Q	QUANTITY OR HEAT DUTY	INTEGRATE, TOTALIZE			
R	RADIATION		RECORD		
S	SPEED, FREQUENCY	SAFETY		SWITCH	
T	TEMPERATURE			TRANSMIT	THROUGH
U	MULTIVARIABLE		MULTIFUNCTION	MULTIFUNCTION	MULTIFUNCTION
V	VIBRATION, MECHANICAL ANALYSIS			VALVE DAMPER LOUVER	
W	WEIGHT, FORCE		WELL		
X	UNCLASSIFIED	X AXIS	UNCLASSIFIED	UNCLASSIFIED	UNCLASSIFIED
Y	EVENT, STATE OR PRESENCE	Y AXIS		RELAY, COMPUTE, CONVERT	
Z	POSITION, DIMENSION	Z AXIS		DRIVER, ACT. UNCLASSIFIED	

NOTES

(1) WHITE-FILLED VALVE MEAN NORMALLY OPEN (E.G.:) BLACK-FILLED VALVE MEAN NORMALLY CLOSED (E.G.:)

(2) TERMINAL POINT (TP) ARE PURCHASER CONNECTIONS WHERE A PROCESS CONNECTION IS REQUIRED.
MAINTENANCE POINT (MP) ARE PURCHASER CONNECTIONS WHERE A PROCESS CONNECTION IS NOT REQUIRED.
BATTERY LIMITS (BL) ARE CONNECTIONS INCLUDED IN GE-NP SCOPE OF SUPPLY : IT'S LIMITS OF SKID OR FUNCTIONAL GROUP (IF ANY).

(3) PIPING MATERIAL ARE PROVIDED BY GE-NP FOR INSIDE OF BL.

(4) FOR MATERIALS AND LINES SPECIFICATIONS SEE "LINE SPECIFICATION" DWG SOK2308640 (V-2158-201-A-2150, L290-AX-SPC-0037). (1) (2)

(5) EXTERNAL HOT SURFACES WILL BE MAINTAINED AT MAX. 60 °C FOR PERSONNEL PROTECTION BY MEANS OF INSULATION. (3) (1)

(6) INSTRUMENT MANIFOLDS ARE NOT SHOWN ON THIS P&ID. FOR DETAILS SEE "PRIMARY & PNEUMATIC HOOK-UP" DWG SOM6634426 (V-2158-201-A-2600, L600-DM-HUD-10001.001). (1) (2)

(7) DURING PLANT COMMISSIONING AND START-UP ACTIVITIES, SUCTION TEMPORARY STRAINER(S) PRESSURE DROP TREND HAS TO BE CAREFULLY MONITORED BY A PDT AND IT'S STRONGLY RECOMMENDED AN AUTOMATIC NORMAL SHUT-DOWN WHEN TRIP THRESHOLD IS ACHIEVED.
PARTICULAR ATTENTION TO DEFINE TRIP VALUE FOR LOW PRESSURE SUCTION COMPRESSOR: PRESSURE LOSS INTRODUCED BY TEMPORARY STRAINER SHALL NOT CAUSE A SUCTION PRESSURE LOWER THAN MIN. ALLOWABLE STATED ON COMPRESSOR DATA SHEET.
WITHOUT ABOVE PRECAUTIONS, GE OIL&GAS DOESN'T RECOMMEND TO PROCEED WITH COMPRESSOR START-UP.
ONCE ALL POSSIBLE PROCESS CONFIGURATIONS (ON RECYCLE, ON LINE, IN SERIES, IN PARALLEL, ETC) AT MAXIMUM FLOW HAVE BEEN EXPLORED DURING COMMISSIONING, THE STRAINER SHALL BE REMOVED TO LIMIT THE RISK OF COMPRESSOR INGESTION OF MATERIALS COMING FROM STRAINER ITSELF. (3) (6)

FLOW CHARACTERISTICS

FLOW RATE (- m3/h, - Nm3/h, - Sm3/h, - kg/h) — XXXX / XXXX -XXXX — PRESSURE (bar) — TEMPERATURE (°C)

ACTUATOR DESCRIPTION

FO	FAIL OPEN ACTION
FC	FAIL CLOSE ACTION
LO	LOCKED OPEN
LC	LOCKED CLOSED
TSO	TIGHT SHUT-OFF
CSO	CAR SEALED OPEN
CSC	CAR SEALED CLOSED

PIPING AND INSTRUMENT DIAGRAM SYMBOLOGY IS ACCORDING TO "PROCESS INDUSTRY PRACTICES" PIP PIC001 NOV. 98

(THE PRESENT TABLE SHOWS AN ABSTRACT OF THIS DIAGRAM DOCUMENTATION CRITERIA)

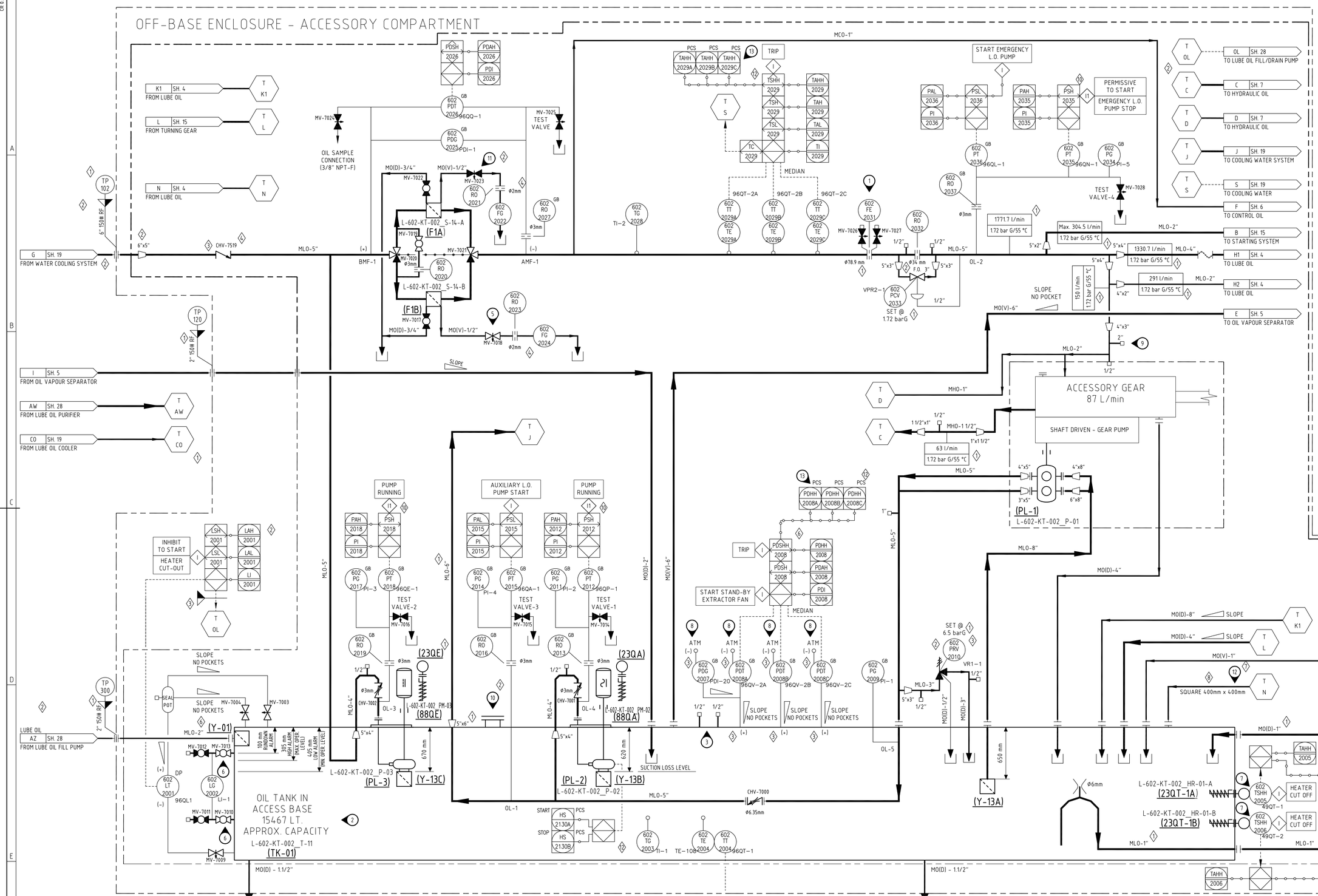
GE Oil & Gas	TITLE SYMBOLS & LEGEND P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 2 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED

REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

1. TEST ORIFICE AND RELATED PRESSURE TAPS LOCATE ON TOP OF TANK.
2. RETENTION TIME IS 5 min. APPROX.
3. SPARE CONNECTIONS
4. ALL T/C IN THIS SHEET ARE "K" TYPE.
5. CLOSE VENT VALVE BEFORE SWITCH-OVER.
6. ISOLATING VALVE SUPPLIED INTEGRATED WITH LEVEL INDICATOR PERMIT THE DISASSEMBLING OF GLASS PART ONLY.
   TO REMOVE THE BODY OF LEVEL INDICATOR AND AVOID THE EMPTYING OF OIL TANK, DEDICATED ISOLATING VALVES SHALL BE PROVIDED.
7. TSHH ARE INCLUDED IN HEATERS.
   HH MEANS HEATER CUT-OUT, NOT GAS TURBINE STOP.
8. ATMOSPHERIC CONNECTION LOCATED OUTSIDE AUXILIARY ENCLOSURE.
9. PROVISION ONLY FOR TEMPERATURE SENSOR WHEN VTR-1 IS CAPILLARY TYPE.
10. MAN HOLE / INSPECTION ACCES; No. 3 TOTAL.
11. VENT VALVE OF F1A SHOULD BE OPEN BEFORE SWITCH-OVER.
12. MATERIAL CARBON STEEL INTERNALLY COATED WITH SPECIFIC CYCLE FOR OIL CONTACT ACCORDING TO PAINTING SPECIFICATION SOM6631470 (V-2158-201-A-0111, L290-AB-SPC-0017).
13. INDIVIDUAL ALARMS.

L-602-KT-002_P-01
(PL-1)
SERVICE : MAIN LUBE OIL PUMP
FLOW (AT P/T) : 2362 l/min
OPERATING PRES./TEMP. : 6.5 bar G/20÷90 °C

L-602-KT-002_P-02
(PL-2)
SERVICE : AUXILIARY LUBE OIL PUMP
FLOW (AT P/T) : 2126 l/min
OPERATING PRES./TEMP. : 6.5 bar G/20÷90 °C

L-602-KT-002_P-03
(PL-3)
SERVICE : EMERGENCY LUBE OIL PUMP
FLOW (AT P/T) : 1240 l/min
OPERATING PRES./TEMP. : 2 bar G/20÷90 °C

L-602-KT-002_PM-02
(88QA)
SERVICE : AUXILIARY LUBE OIL PUMP MOTOR
POWER SUPPLY : 400 V/50 Hz/3 Ph
NAMEPLATE POWER : 37 kW

L-602-KT-002_PM-03
(88QE)
SERVICE : EMERGENCY LUBE OIL PUMP MOTOR
POWER SUPPLY : 110 Vdc
NAMEPLATE POWER : 13.2 kW

L-602-KT-002_S-14-A/B
(F1A/B)
SERVICE : LUBE OIL DUPLEX FILTER
FILTRATION DEGREE : 12 μ B(12)>1000 (10 μ B(10)>500)
FLOW RATE : 1771.7 l/min
DESIGN PRES./TEMP. : 14 bar G/100 °C
OPERATING PRES./TEMP. : 6.2 bar G/55÷70 °C
MAX DIFF. PRESSURE : Element collapse 10 bar
MAX DELTA P CLEAN/ALLOWABLE DIRTY : 0.3 bar/1.7 bar

L-602-KT-002_T-11
(TK-01)
SERVICE : LUBE OIL RESERVOIR TANK
DESIGN PRESS. & TEMP. : 150 mmH2O/100 °C
OPERATING PRESS. & TEMP. : -20 to 50 mmH2O/20 to 95 °C
MATERIALS OF CONSTR. : PAINTED CARBON STEEL
CHARGE CAPACITY : 15467 L

(23QA)
SERVICE : AUXILIARY PUMP MOTOR ANTICONDENSATION HEATER
DESIGN DUTY : 0.1 kW
ELECTRIC SUPPLY : 230 V/50 Hz/1 Ph

L-602-KT-002_HR-01-A/B
(23QT-1A/B)
SERVICE : LUBE OIL TANK HEATER
DESIGN DUTY : 10 kW
ELECTRIC SUPPLY : 400 V/50 Hz/3 Ph

(23QE)
SERVICE : EMERGENCY PUMP MOTOR ANTICONDENSATION HEATER
DESIGN DUTY : 0.05 kW
ELECTRIC SUPPLY : 230 V/50 Hz/1 Ph

GE Oil & Gas	TITLE LUBE OIL AUXILIARY SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION REVISED WHERE SHOWN <15>		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070÷71/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 3 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED

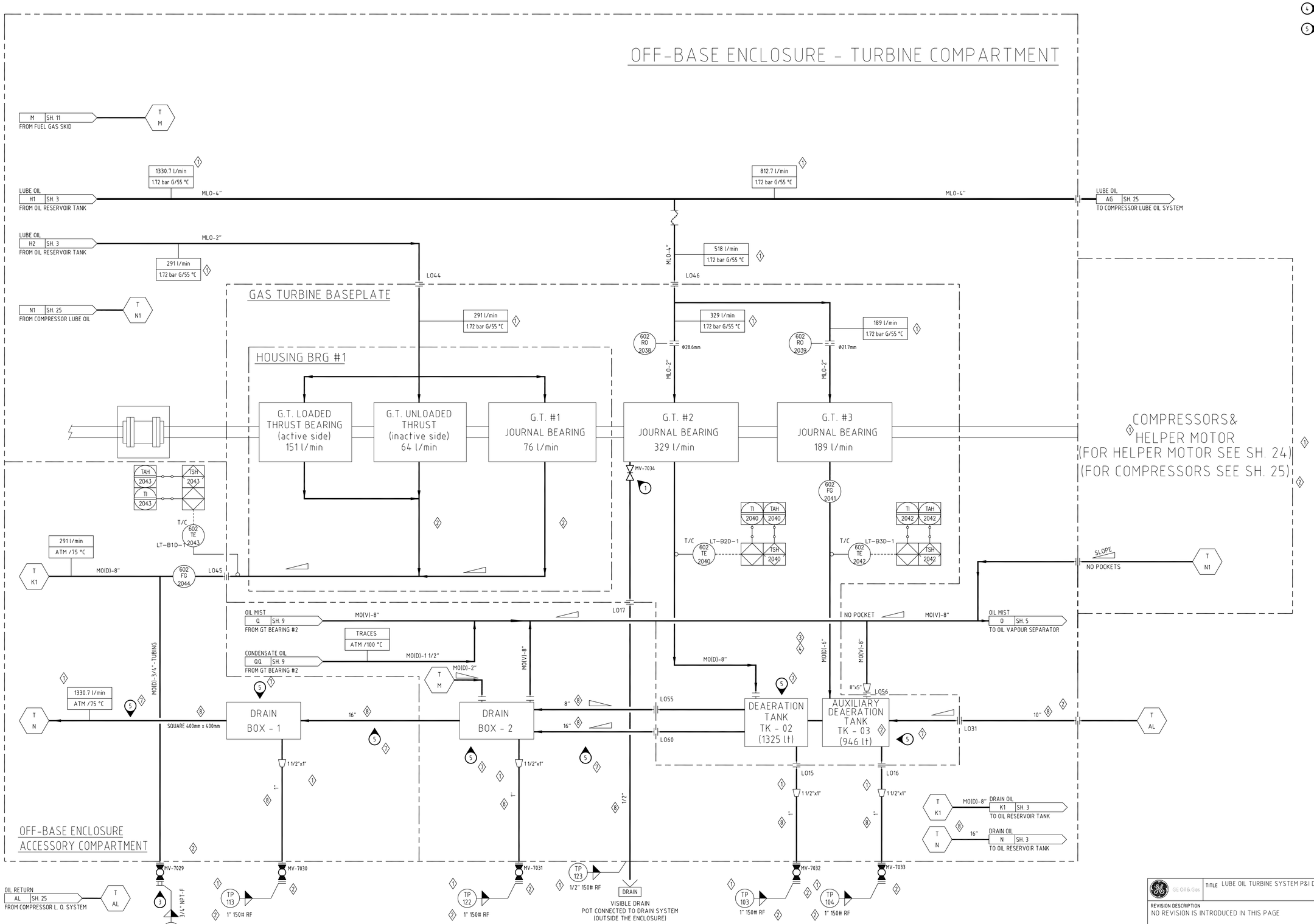
REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

NOTES:

1. VALVE SHALL BE ALWAYS IN THE NORMALLY OPEN POSITION (TELL TALE DRAIN).
2. ALL T/C IN THIS SHEET ARE "K" TYPE DOUBLE THERMOCOUPLE. (2)
3. SAMPLING POINT.
4. DELETED. (4) (3)
5. MATERIAL CARBON STEEL INTERNALLY COATED WITH SPECIFIC CYCLE FOR OIL CONTACT ACCORDING TO PAINTING SPECIFICATION SOM6631470 (V-2158-201-A-0111, L290-AB-SPC-0017). (5)



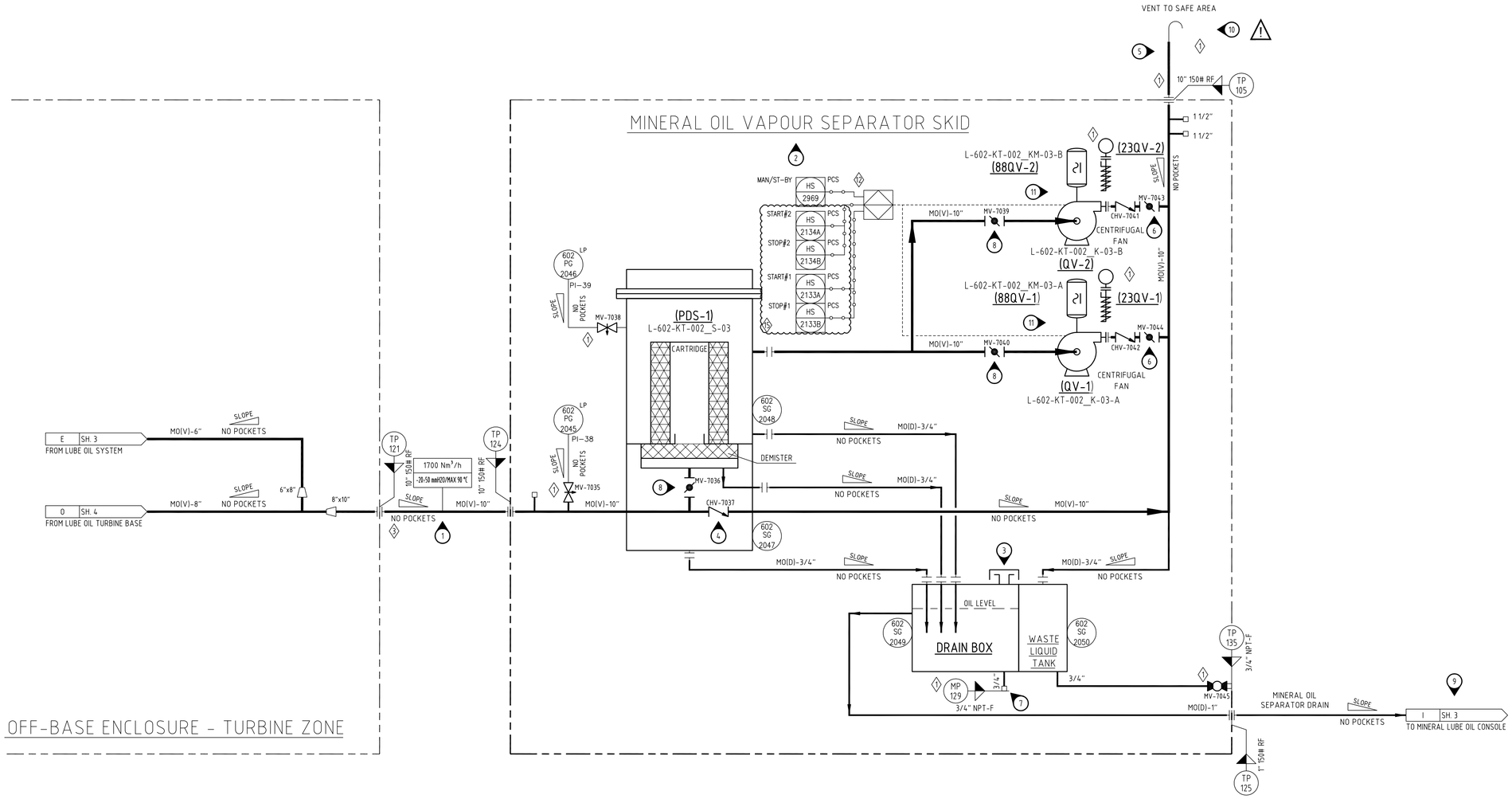
GE Oil & Gas	TITLE LUBE OIL TURBINE SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 4 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED

REVISE WITH PidXp ONLY

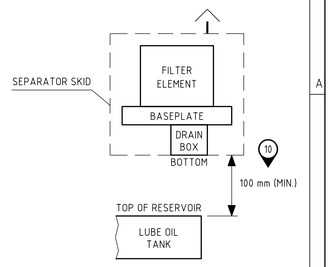
IDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

1. OIL RESERVOIR INTERNAL PRESSURE TO BE: -25mmH2O. THE INTERCONNECTING PIPING SHALL HAVE A MAX. PRESSURE DROP OF 0.001 bar (10mmH2O) AND SHALL BE MADE IN CONTINUOS SLOPE NO POCKETS. (1)
2. THE SEPARATOR SKID MUST BE PLACED IN THE PLANT AS FOLLOWS:



3. DRAIN BOX FILLING TAP. THE DRAIN BOX MUST BE FILLED WITH LUBE OIL BEFORE RUNNING THE SYSTEM. (FAILED FILLING WILL RESULT IN OIL MIST RECIRCULATION ACROSS THE DRAIN PIPING NETWORK).
4. THE MAX. ACCEPTABLE TOTAL PRESSURE DROP OF THE ENTIRE MINERAL OIL VAPOUR SEPARATOR SKID (BETWEEN TP124 AND TP105), WHEN IT IS IN BY-PASS CONDITION, MUST BE 0.002 bar (20mmH2O). (1)
5. OIL VAPOUR SEPARATOR TO BE OPERATING FROM START-UP TO THE TURBOCOMPRESSOR STOP. THE MAX. ACCEPTABLE BACKPRESSURE = 0.001 bar (1) (10mmH2O). OIL VAPOUR DISCHARGED BY THE SEPARATOR SHALL BE VENTED TO THE ATMOSPHERE IN SAFE AREA, SHALL NOT ENTER INTO TURBINE THROUGH INTAKE FILTER OR AIR INLET DUCT AND SHALL NOT BE DELIVERED TO HAZARDOUS AREAS WHERE SPARKS CAN IGNITE IT.
6. VALVE TO BE ADJUSTED WHILE THE FAN MOTOR IS OPERATING, TO REACH ABOUT MINUS 0.002 bar (1) (20 mmH2O) (PI-38) NEGATIVE PRESSURE INSIDE THE OIL TANK AND LOCK THE VALVE AFTER REGULATION. (1)
7. DRAIN BOX TAP.
8. MAINTENANCE VALVE.
9. IN ANY CASE THE OIL RETURN PIPE TO LUBE OIL TANK MUST BE WITH CONTINUOS SLOPE WITHOUT POCKETS.
10. LOCATE FAR FROM PASSAGES TO AVOID SLIPPERY SURFACES. RESIDUAL OIL CONTENT IN THE VENT OUTLET : 5mg/Nm3 IN THE WHOLE FLOW RANGE.
11. 2X100% EXTRACTION FANS (ONE RUNNING,ONE STAND-BY)

L-602-KT-002_S-03
(PDS-1)
(1) (3) SERVICE : MINERAL OIL VAPOUR SEPARATOR
DESIGN PRESS. & TEMP. : ±0.2 bar G/100 °C
OPERATING PRESS. & TEMP. : -20÷50 mmH2O/55÷90 °C
MATERIALS OF CONSTR. : STAINLESS STEEL

L-602-KT-002_KM-03-A/B
(88QV-1/2)
SERVICE : FAN EXTRACTOR MOTOR
POWER SUPPLY : 400 V /50 Hz /3 Ph
NAMEPLATE POWER : 7.5 kW (1)

L-602-KT-002_K-03-A/B
(QV-1/2)
SERVICE : VAPOUR EXTRACTOR
CAPACITY : UP TO 1700 Nm³/h/
POWER REQ. : 5.53 kW

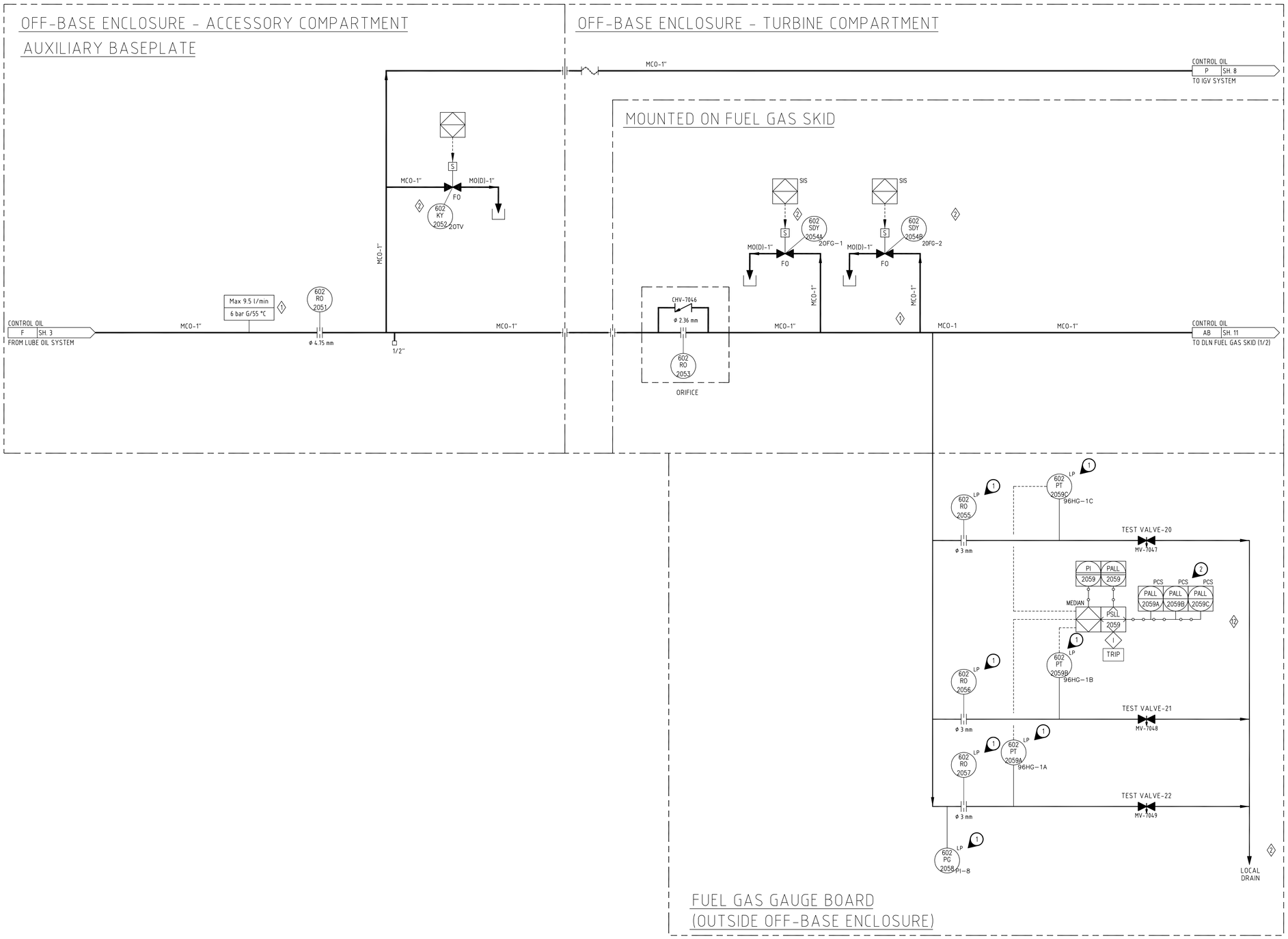
(23QV-1/2) (1)
SERVICE : FAN EXTRACTOR MOTOR ANTICONDENSATION HEATER
DESIGN DUTY : 0.025 kW
ELECTRIC SUPPLY : 230 V/50 Hz/1 Ph

GE Oil & Gas	TITLE OIL VAPOUR SEPARATOR SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION REVISED WHERE SHOWN <15>		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070÷71/1102980÷81 — SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. . ALL RIGHTS RESERVED			SHEET 5 of 28

REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

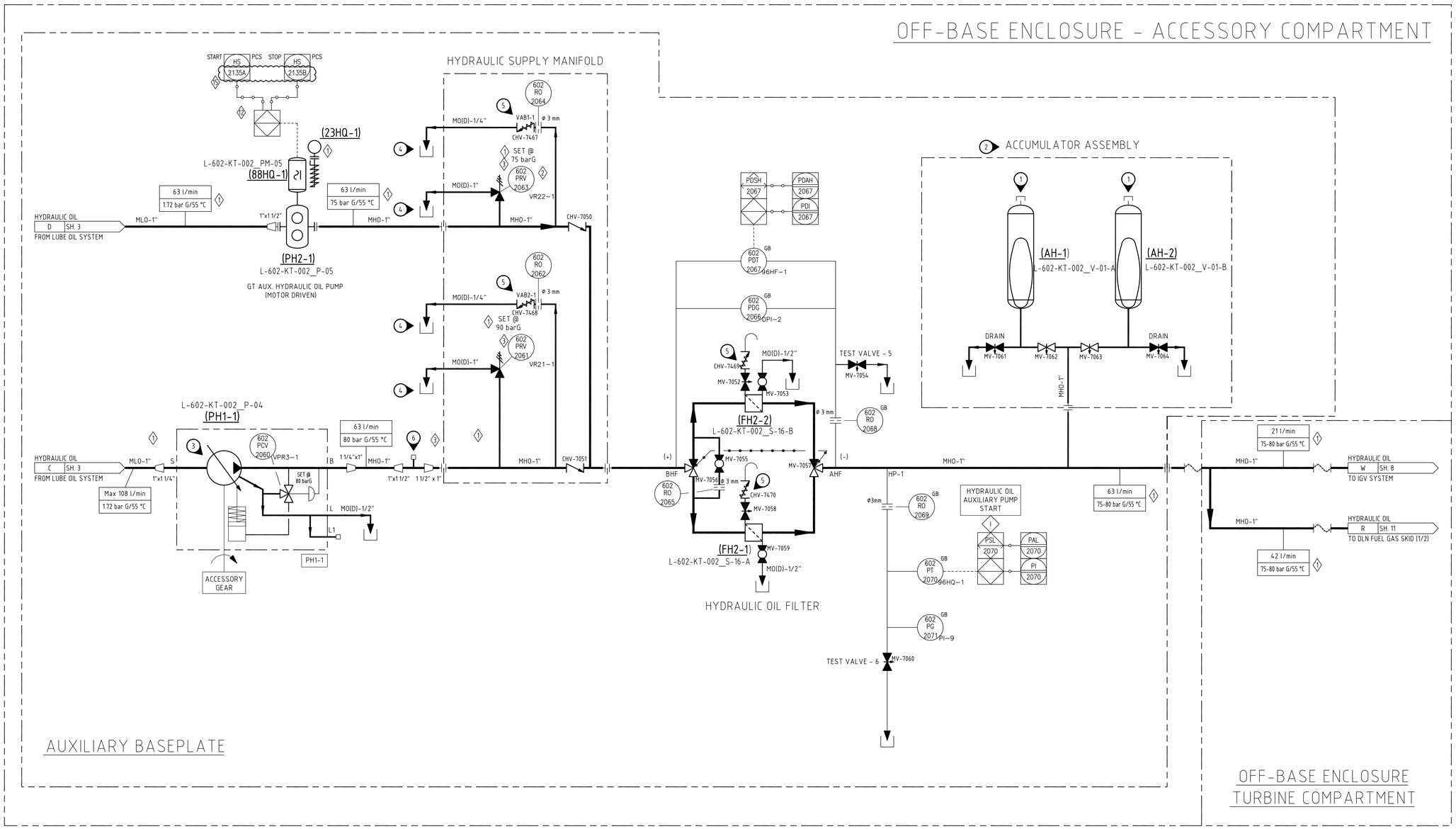
1. LP MEANS LOCAL PANEL (FUEL GAS GAUGE BOARD). LOCAL PANEL MUST BE VISIBLE DURING NORMAL OPERATION.
2. INDIVIDUAL ALARMS.

GE Oil & Gas	TITLE CONTROL OIL SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/1102980-81 / SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. . ALL RIGHTS RESERVED			SHEET 6 of 28

REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

1. N2 FILLING CONNECTION (5/8" 18UNF-2A).
2. ACCUMULATOR AH-1/2 ARE WORKING IN PARALLEL. PRECHARGED @ 65 barG.
3. PUMP CASING MUST BE FILLED AT FIRST START-UP.
4. DIRECT DRAIN.
5. AUTOMATIC AIR BLEED VALVE.
6. PROVISION FOR TEMPORARY INSTRUMENT TO SET MAIN HP OIL PUMP WELD ON SITE AFTER PUMP SETTING.

L-602-KT-002_P-05
(PH2-1)
SERVICE : AUXILIARY HYDRAULIC OIL PUMP
FLOW (AT P/T) : 63 l/min
DISCHARGE PRESSURE : 75 bar G
OPERATING PRES./TEMP. : 75 bar G/55 °C

L-602-KT-002_PM-05
(88HQ-1)
SERVICE : AUXILIARY HYDR. OIL PUMP MOTOR
POWER SUPPLY : 400 /50 Hz /3 Ph.
NAMEPLATE POWER : 15 kW

L-602-KT-002_P-04
(PH1-1)
SERVICE : HYDR. OIL MAIN PUMP
FLOW (AT P/T) : 63 l/min.
DISCHARGE PRESSURE : 80 barG

L-602-KT-002_S-16-A/B
(FH2-1/2)
SERVICE : HYDRAULIC OIL FILTERS
FILTRATION DEGREE : 5 µ
FLOW RATE : 63 l/min
DESIGN PRES./TEMP. : 100 bar G/100 °C
MAX DELTA P CLEAN/ALLOWABLE DIRTY : 0.5 - 10 bar

L-602-KT-002_V-01-A/B
(AH-1/2)
SERVICE : HYDRAULIC OIL ACCUMULATOR
TYPE : HV10-120
DESIGN PRES./TEMP. : 120 bar G/100 °C
CAPACITY : 10 L

(23HQ-1)
SERVICE : AUXILIARY HYDR OIL PUMP MOTOR ANTICONDENSATION HEATER
DESIGN DUTY : 0.025 kW
ELECTRIC SUPPLY : 230 V/50 Hz/1 Ph

REVISE WITH PidXp ONLY

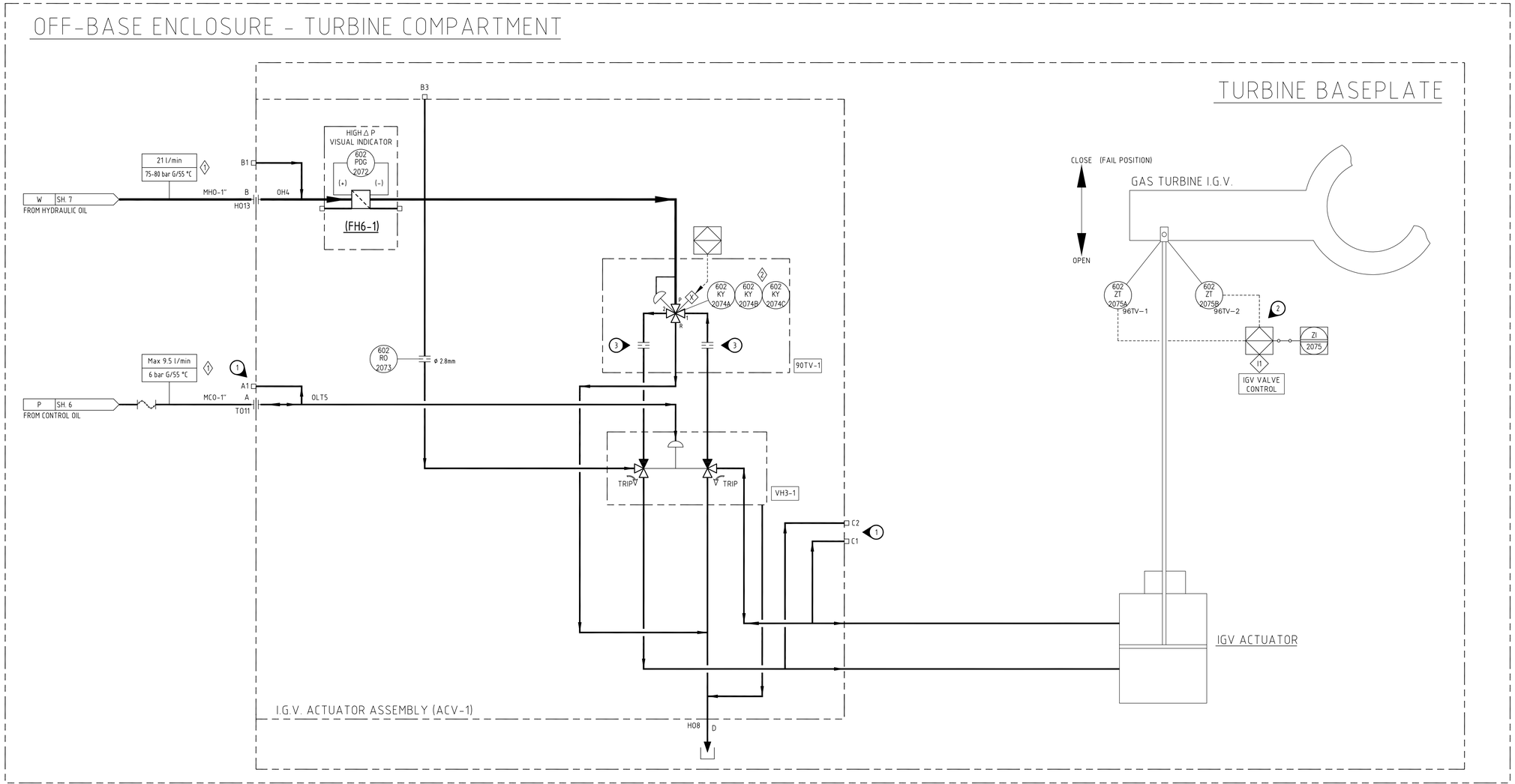
GE Oil & Gas	TITLE HYDRAULIC OIL SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION REVISED WHERE SHOWN <15>		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070÷71/1102980÷81 / SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED			SHEET 7 of 28

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

NOTES:

1. A1, B1, B3, C1 & C2 ARE PLUGGED CONNECTION.
2. DEVIATION OVER THE EXPECTED POSITION WILL GIVE AN ALARM OR AN ABORT TO START. IF THE IGV CLOSE BELOW THE MINIMUM ALLOWABLE POSITION THE MACHINE WILL TRIP.
3. ORIFICES INTEGRATED INTO THE BODY OF THE VALVE.



GE Oil & Gas	TITLE IGV SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 8 of 28

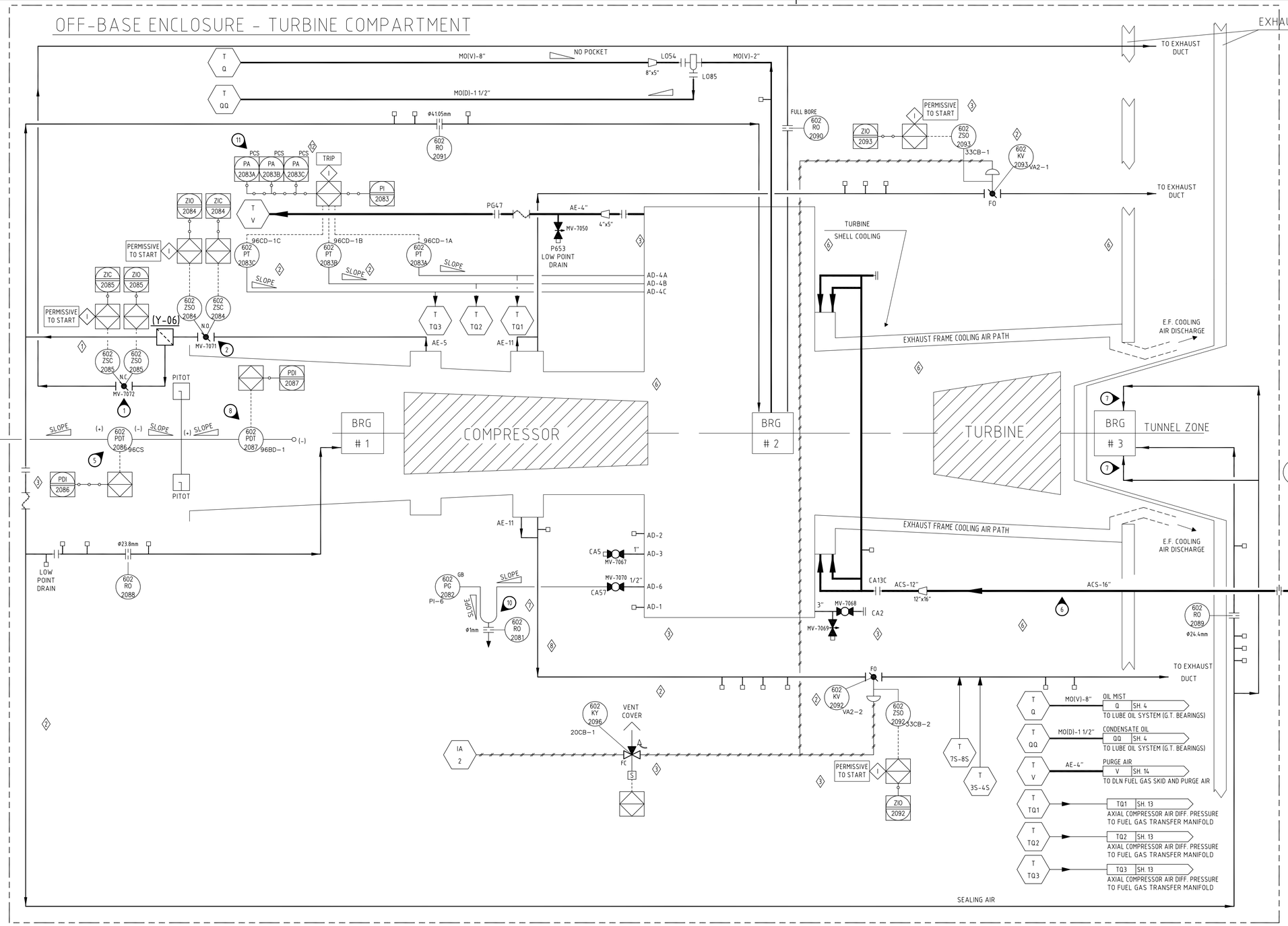
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED

REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

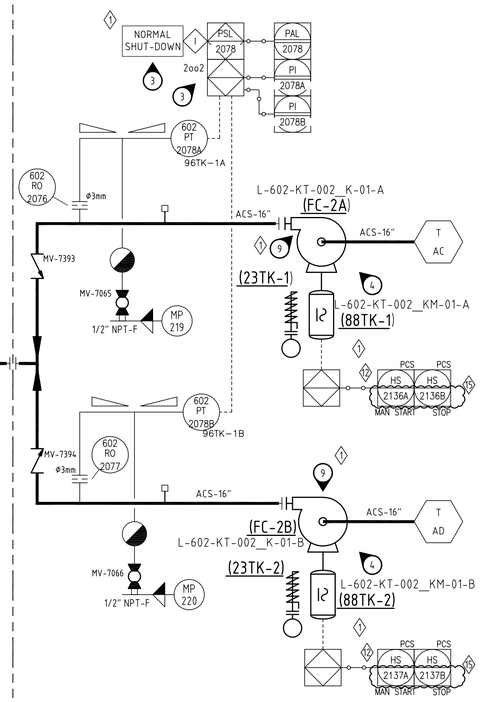
QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

OFF-BASE ENCLOSURE - TURBINE COMPARTMENT



NOTES:

1. BEARING SEALING AIR DIRT SEPARATOR BLOW DOWN VALVE IS TO BE OPEN FOR ALL ABRASIVE CLEANING OPERATION AND IS TO BE CLOSED ALL OTHER TIMES. FOR CLEANING INTERVALS SEE THE INSTRUCTION MANUAL.
2. VALVE SHALL BE ALWAYS FULLY OPEN EXCEPT DURING OFF-LINE WASHING PHASE.
3. 1oo2 VOTING GENERATES ONLY AN ALARM.
   2oo2 VOTING GENERATES ALARM WITH TURBINE NORMAL SHUT-DOWN IN NORMAL OPERATION BOTH BLOWERS ARE IN SERVICE.
4. IN NORMAL OPERATION BOTH BLOWERS ARE IN SERVICE.
   REQUIRED FLOW // STATIC PRESSURE AT ISO CONDITIONS:
   - 2 FANS RUNNING: 13932 m3/h // 1500 mm H2O
   - 1 FANS RUNNING: 10364 m3/h // 1150 mmH2O
5. TOTAL PRESSURE VALUE.
   THIS PARAMETER IS REQUIRED FOR PRESSURE COMPRESSOR RATIO CONTROL.
6. THE TOTAL ALLOWABLE PRESSURE DROP OF THE INTERCONNECTING PIPING FROM THE EXHAUST FRAME BLOWER SKID TO CA13C CONNECTION AT THE TURBINE BASE IS :
   220 mm H2O WITH TWO FANS RUNNING
   AND
   140 mm H2O WITH ONE FAN RUNNING .
7. VIBRATION SENSOR COOLING AIR FLOW THROUGH BLEEDING HOLES IN EACH COVER.
8. DIFF. PRESSURE BELL MOUTH IS REQUIRED FOR PERFORMANCE MONITORING.
9. THE DESIGN OF THE FAN INCLUDES GUILLOTINE ISOLATION UPSTREAM AND DOWNSTREAM OF THE FAN.
10. GOOSE NECK LOCATED ON GAUGE BOARD ON AUXILIARY SKID.
11. INDIVIDUAL ALARMS.



CLEAN AIR
AC | SH. 20
FROM AIR INTAKE FILTER SYSTEM
→ T AC

CLEAN AIR
AD | SH. 20
FROM AIR INTAKE FILTER SYSTEM
→ T AD

HOT AIR BLEEDING
7S-8S | SH. 16
FROM CONTROL DEVICE
→ T 7S-8S

HOT AIR BLEEDING
3S-4S | SH. 16
FROM CONTROL DEVICE
→ T 3S-4S

IA2 | SH. 11
I.A. FROM I.A. SUPPLY SOURCE
→ IA 2

L-602-KT-002_KM-01-A/B
(88TK-1/2)
SERVICE : EXHAUST FRAME COOLING BLOWER MOTOR
POWER SUPPLY : 400 V/50 Hz /3 Ph.
NAMEPLATE POWER : 90 kW

L-602-KT-002_K-01-A/B
(FC-2A/B)
SERVICE : EXHAUST FRAME COOLING BLOWER

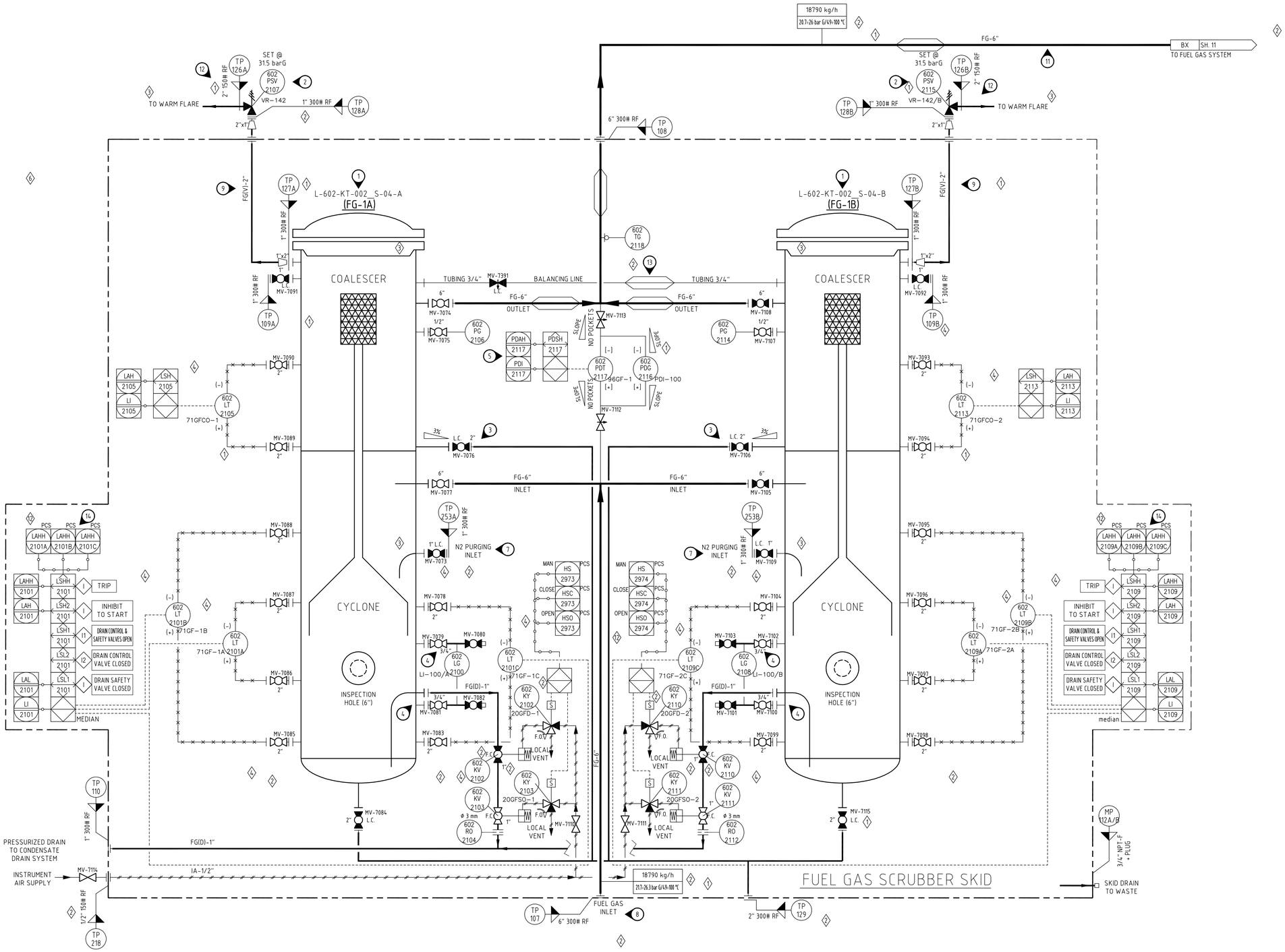
(23TK-1/2)
SERVICE : EXHAUST FRAME COOLING BLOWER MOTOR SPACE HEATER
DESIGN DUTY : 0.1 kW
ELECTRIC SUPPLY : 230 V /50 Hz /1 Ph.

REVISE WITH PidXp ONLY

GE Oil & Gas	TITLE COOLING AND SEALING AIR SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION REVISED WHERE SHOWN <15>		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 9 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED

INDRA 23-JUL-2015 AS BUILT



NOTES:

1. TWO STAGES FUEL GAS SCRUBBER (LIQUID PLUS SOLID TYPE).
2. SAFETY VALVES SIZING FOR FIRE CONDITION. VALVE SUPPLIED LOOSE.
3. UPPER SECTION LOW POINT DRAIN (MANUAL).
4. ISOLATING VALVE SUPPLIED INTEGRATED WITH LEVEL INDICATOR PERMITS THE DISASSEMBLING OF GLASS PART ONLY.
   TO REMOVE THE BODY OF LEVEL INDICATOR DEDICATED ISOLATING VALVES SHALL BE PROVIDED.
5. MAX ALLOWABLE PRESSURE DROP INLET-OUTLET IS 1 bar (INCLUDING PIPING AND VALVES LOSSES)
6. DELETED.
7. N2 PURGE INLET CONNECTION SHALL BE DESIGNED IN ORDER TO AVOID NITROGEN DIRECT IMPACT ON CARTRIDGES.
8. THE FUEL GAS PRESSURE SUPPLY MUST NOT EXCEED THE PRESSURE SAFETY VALVE, SIZING FOR FIRE PROTECTION, SET POINT.
9. THE MAXIMUM PRESSURE DROP BETWEEN THE PRESSURE VESSEL AND THE PRESSURE SAFETY VALVE DOES NOT EXCEED 3% OF PSV SET PRESSURE (ACC. TO API-STD 520).
   PSV FLOW ABOUT 1400 kg/h.
10. DELETED.
11. MAX ALLOWABLE PRESSURE DROP BETWEEN TP 108 AND TP 100 IS 0.1 bar.
12. NORMAL FLARE BACK-PRESSURE: 2 barG
    MAX. FLARE BACK PRESSURE: 10 barG.
13. INSULATION FOR PERSONNEL PROTECTION.
14. INDIVIDUAL ALARMS.

L-602-KT-002_S-04-A

(FG-1A)

TYPE: TWO STAGES SCRUBBER (MAIN)
DESIGN P / T : 35 barG / 120°C
SEPARATION EFFICIENCY (SOLID) :
100% for Dp > 3 µm - 99.5% for 0.5 µm < Dp < 3 µm
SEPARATION EFFICIENCY (LIQUID) :
100% for Dp > 8 µm - 99.5% for 0.5 µm < Dp < 8 µm
FILTER PRESSURE DROP: 0.3 bar (CLEAN)

L-602-KT-002_S-04-B

(FG-1B)

TYPE: TWO STAGES SCRUBBER (STAND-BY)
DESIGN P / T : 35 barG / 120°C
SEPARATION EFFICIENCY (SOLID) :
100% for Dp > 3 µm - 99.5% for 0.5 µm < Dp < 3 µm
SEPARATION EFFICIENCY (LIQUID) :
100% for Dp > 8 µm - 99.5% for 0.5 µm < Dp < 8 µm
FILTER PRESSURE DROP: 0.3 bar (CLEAN)

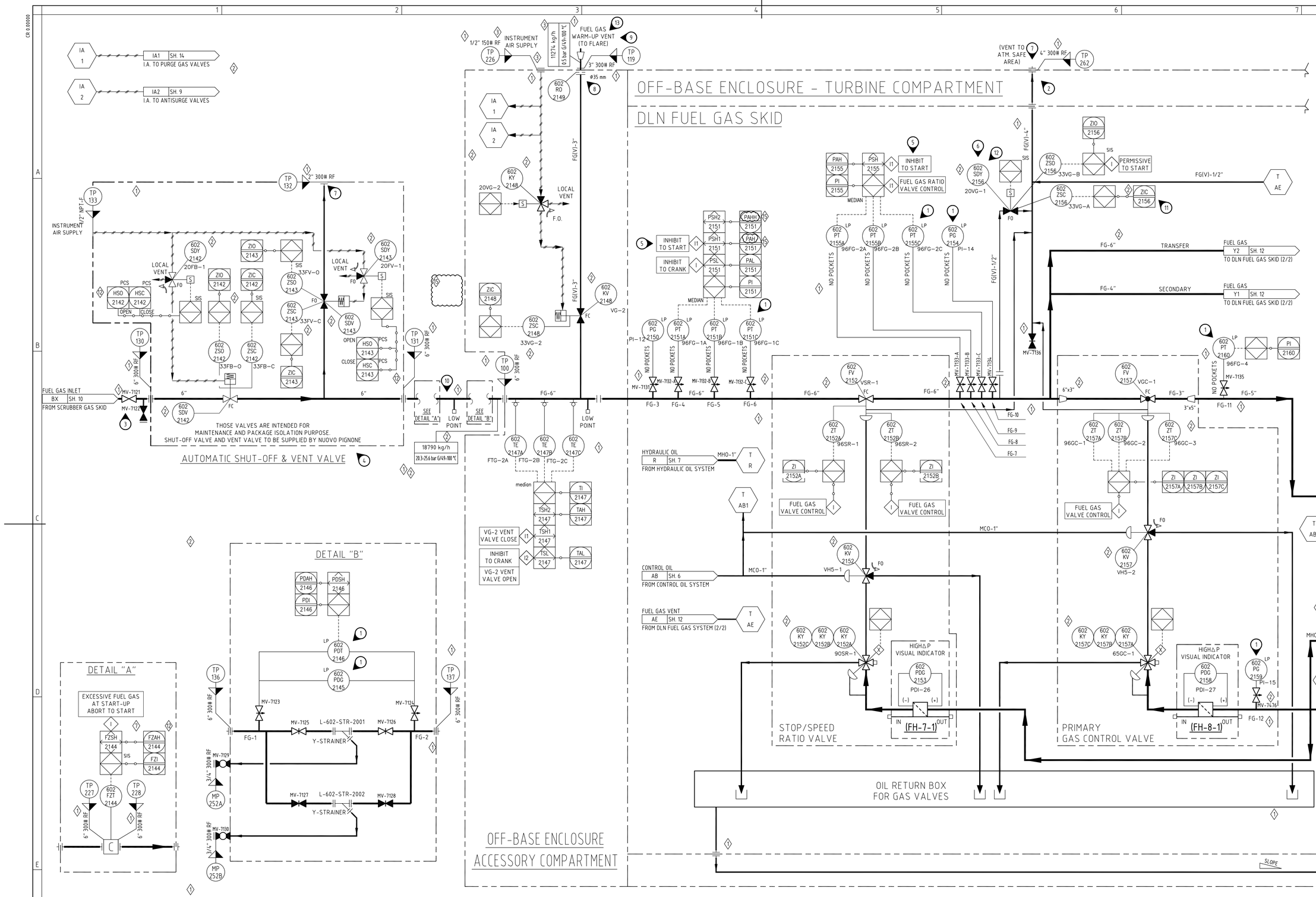
GE Oil & Gas	TITLE FUEL GAS SCRUBBER SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070÷71/11002980÷81 / SIZE 1	LANGUAGE A
			SHEET 10 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED

REVISE WITH PidXp ONLY

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

INDRA 23-11-2015 AS BUILT



NOTES:

1. LP MEANS LOCAL PANEL (FUEL GAS GAUGE BOARD).LOCAL PANEL MUST BE VISIBLE DURING NORMAL OPERATION.
2. MAX BACK PRESSURE ACCEPTABLE: 100mmH2O.
3. MANUAL ISOLATION EQUIPMENT MUST BE PROVIDED.
4. ISOLATION AND VENT VALVES TO BE LOCATED OUTSIDE TURBINE ENCLOSURE AND NEAR AS MUCH AS POSSIBLE TO THE ENCLOSURE.
   ISOLATION VALVE SHALL BE FIRE PROOF, CLASS VI, FAILURE CLOSED.
   VENT VALVE SHALL BE FIRE PROOF, CLASS VI, FAILURE OPEN AND SHALL ENSURE DEPRESSURIZATION OF ALL PIPING BETWEEN ISOLATION VALVE AND OFF-BASE ENCLOSURE IN LESS THAN 150 sec.
   EXTERNAL VALVES POSITION SHALL NOT AFFECT INLET AIR FILTER CLASSIFICATION.
5. ALARM FOR FUEL GAS PIPING PRESSURIZED WITH UNIT STOPPED, ENABLED 180 sec. AFTER LINE DEPRESSURIZATION COMMAND.
6. VENT VALVE SHALL ENSURE DEPRESSURIZATION OF PIPING BETWEEN STOP/SPEED RATIO AND CONTROL VALVES IN LESS THAN 150 sec.
7. GAS VENT SHALL NOT BE JOINTED TO EACH OTHER OR TO ANY OTHER VENT SYSTEM.
   THIS VENT IS TO BE PIPED DIRECTLY TO ATMOSPHERE IN SAFE AREA AND HAVE PROVISIONS TO PREVENT THE ENTRY OF WATER, DIRT AND OTHER CONTAMINANTS.
   ALL PIPING SHALL BE STAINLESS STEEL.
   TRAPS IN THE SYSTEM ARE NOT RECOMMENDED.
8. ORIFICE DIAMETER MUST BE CALCULATED FOR A FLOW BETWEEN 40% AND 70% OF FULL SPEED FULL LOAD FLOW, BASED ON TOTAL VOLUME TO BE VENTED.
9. VENT TO BE USED FOR HEATING THE FUEL GAS PIPING BEFORE OPENING OF FUEL GAS SHUT OFF VALVE.
   VENT OPENING TIME DEPEND ON INITIAL FUEL GAS CONDITION AND ARRANGEMENT OF FUEL GAS PIPING;
   MAX ALLOW. BACK PRESSURE IS 5 barG.
   PROVISION TO PREVENT THE ENTRY OF WATER, DIRT AND OTHER CONTAMINANTS MUST BE PROVIDED.
10. FUEL GAS INTERCONNECTING PIPING SHALL BE IN STAINLESS STEEL AS PER GEI041040.
11. FOR 20VG-1 MAX FUEL GAS ALLOWABLE TEMPERATURE IS 150°C (DUE TO 20VG-1 ATEX CERTIFICATE LIMITATION)
12. LOSS OF ZSL DURING NORMAL FUEL GAS OPERATION CAUSE ALARM FOR 20VG-1 VALVE FAILURE OPEN.
13. NORMAL FLARE BACK-PRESSURE: 0.1 barG.
    MAXIMUM FLARE BACK-PRESSURE: 5 barG.
    PIPING SLOPE TOWARD FLARE; CONNECTION TO BE ON THE TOP OF FLARE PIPE TO AVOID LIQUID FLOWBACK TO SEAL SYSTEM.

GE Oil & Gas	TITLE FUEL GAS SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION REVISED WHERE SHOWN <15>		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/1102980-81 / SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED			SHEET 11 of 28

REVISE WITH PidXp ONLY

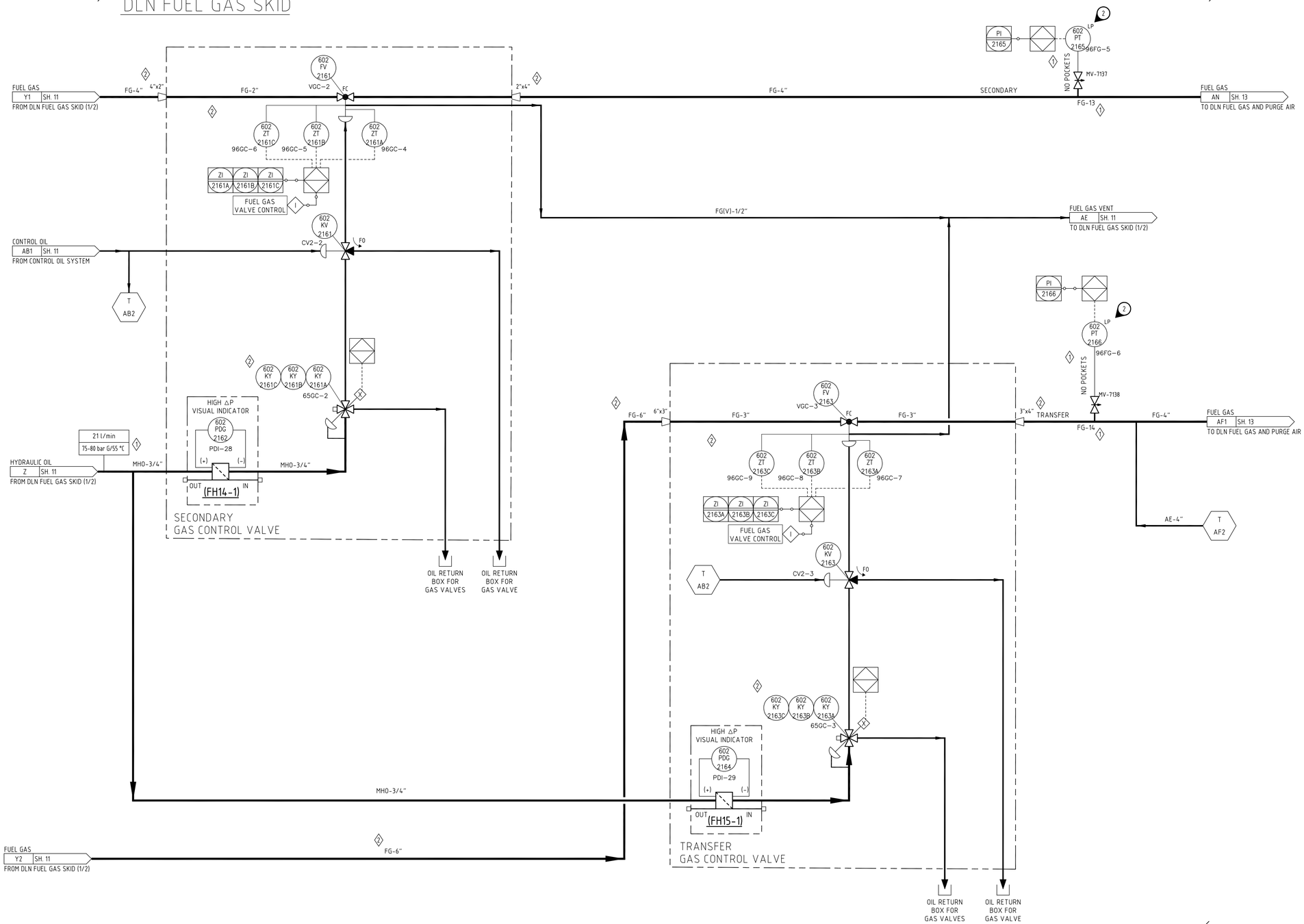
QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

INDRA 23-JUL-2015 AS BUILT

CR 0.00000

OFF-BASE ENCLOSURE - TURBINE COMPARTMENT

DLN FUEL GAS SKID



NOTES:

1. VALVE INTERNAL CONNECTIONS ARE NOT PIPE BUT INTERNAL CAVITIES AND THEREFORE LINES DATA ARE NOT AVAILABLE.
2. LP MEANS LOCAL PANEL (FUEL GAS GAUGE BOARD).LOCAL PANEL MUST BE VISIBLE DURING NORMAL OPERATION.

PURGE AIR
AF2 SH. 14
FROM DLN FUEL GAS AND PURGE AIR
AE-4"
T AF2

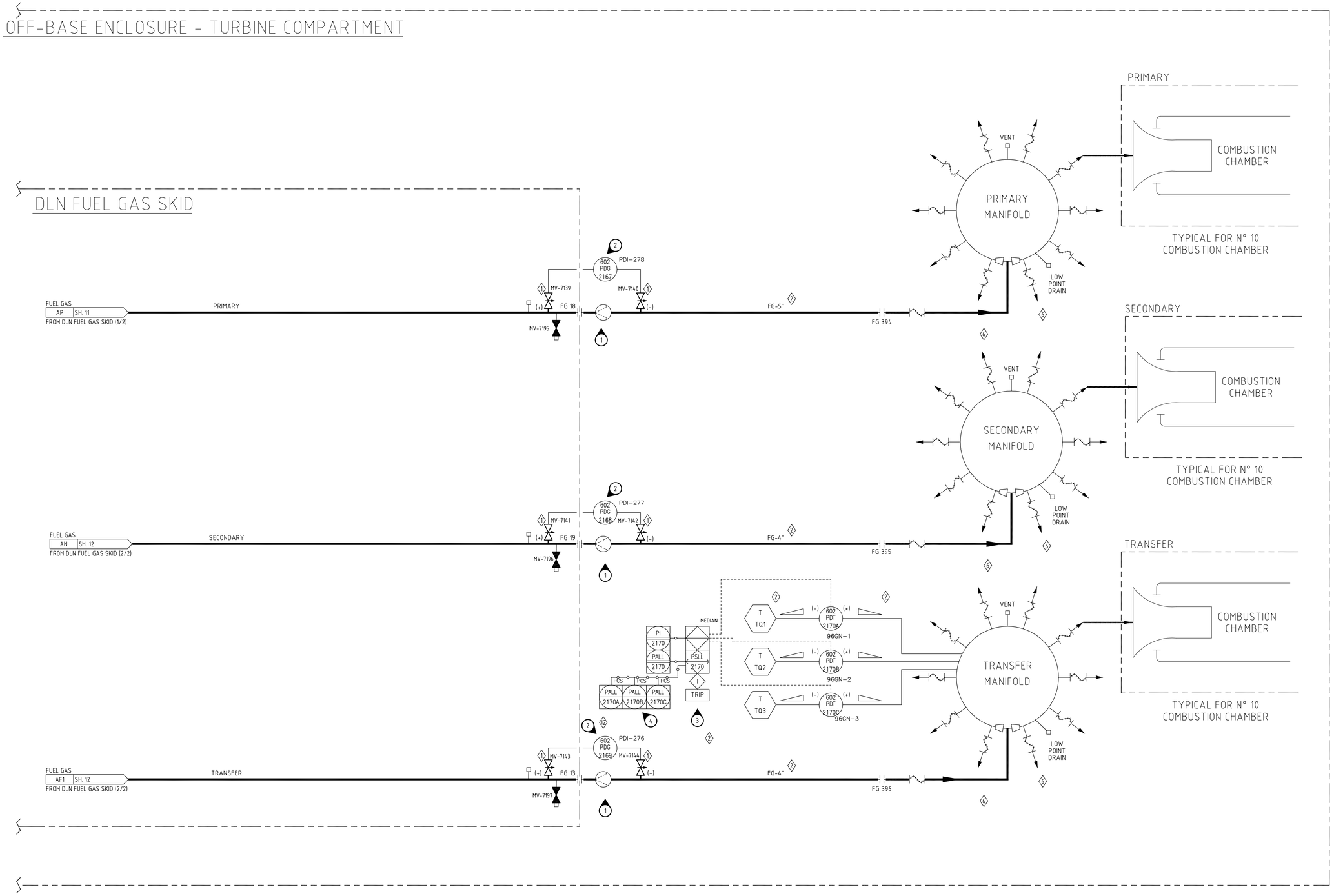
GE Oil & Gas	TITLE FUEL GAS SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 16070701/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 12 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED

REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

1. TEMPORARY CONE FILTER TO BE REMOVED AFTER COMMISSIONING ACTIVITIES.
2. FOR COMMISSIONING ONLY; CONNECTION TO BE PLUGGED WHEN PDI'S REMOVED.
3. THE LL THRESHOLD IS A VARIABLE VALUE DEPENDING ON THE COMPRESSOR DISCHARGE PRESSURE.
4. INDIVIDUAL ALARMS.

GE Oil & Gas	TITLE FUEL GAS SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 13 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED

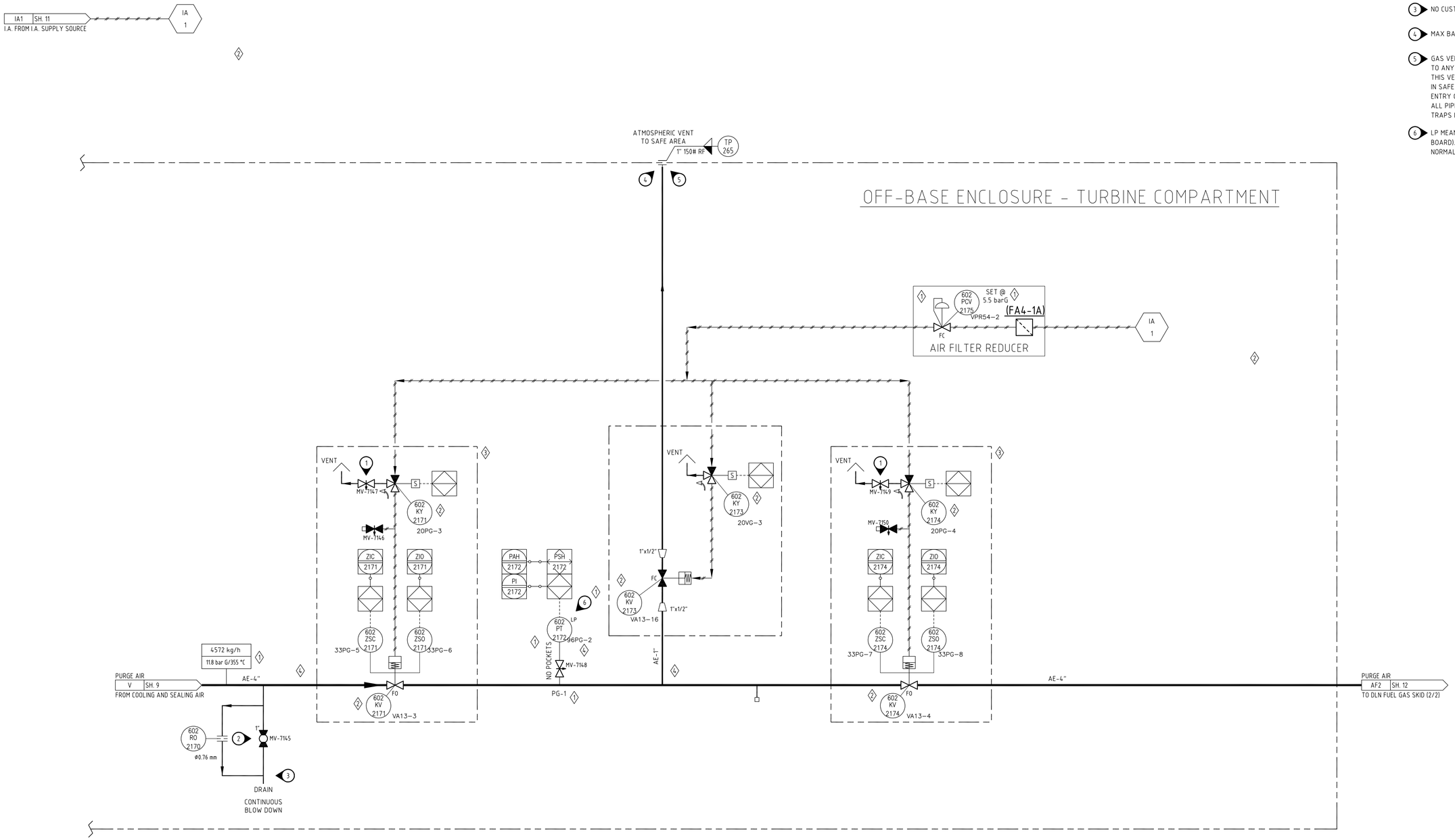
REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

NOTES:

1. VARIABLE ORIFICE SET TO OPEN VA13 VALVES IN 35 +/- 5 SECONDS, CLOSE IN 10 SECONDS MAXIMUM. (3)
2. VALVE NORMALLY CLOSED. OPEN DURING OFF-LINE WATER WASH ONLY.
3. NO CUSTOMER CONNECTION IS REQUIRED.
4. MAX BACK PRESSURE ACCEPT 100mmH2O. (1)
5. GAS VENT SHALL NOT BE JOINTED TO EACH OTHER OR TO ANY OTHER VENT SYSTEM.
   THIS VENT IS TO BE PIPED DIRECTLY TO ATMOSPHERE IN SAFE AREA AND HAVE PROVISIONS TO PREVENT THE ENTRY OF WATER, DIRT AND OTHER CONTAMINANTS.
   ALL PIPING SHALL BE STAINLESS STEEL.
   TRAPS IN THE SYSTEM ARE NOT RECOMMENDED.
6. LP MEANS LOCAL PANEL (FUEL GAS GAUGE BOARD).LOCAL PANEL MUST BE VISIBLE DURING NORMAL OPERATION. (1)



GE Oil & Gas	TITLE PURGE GAS SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 16070701/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 14 of 28

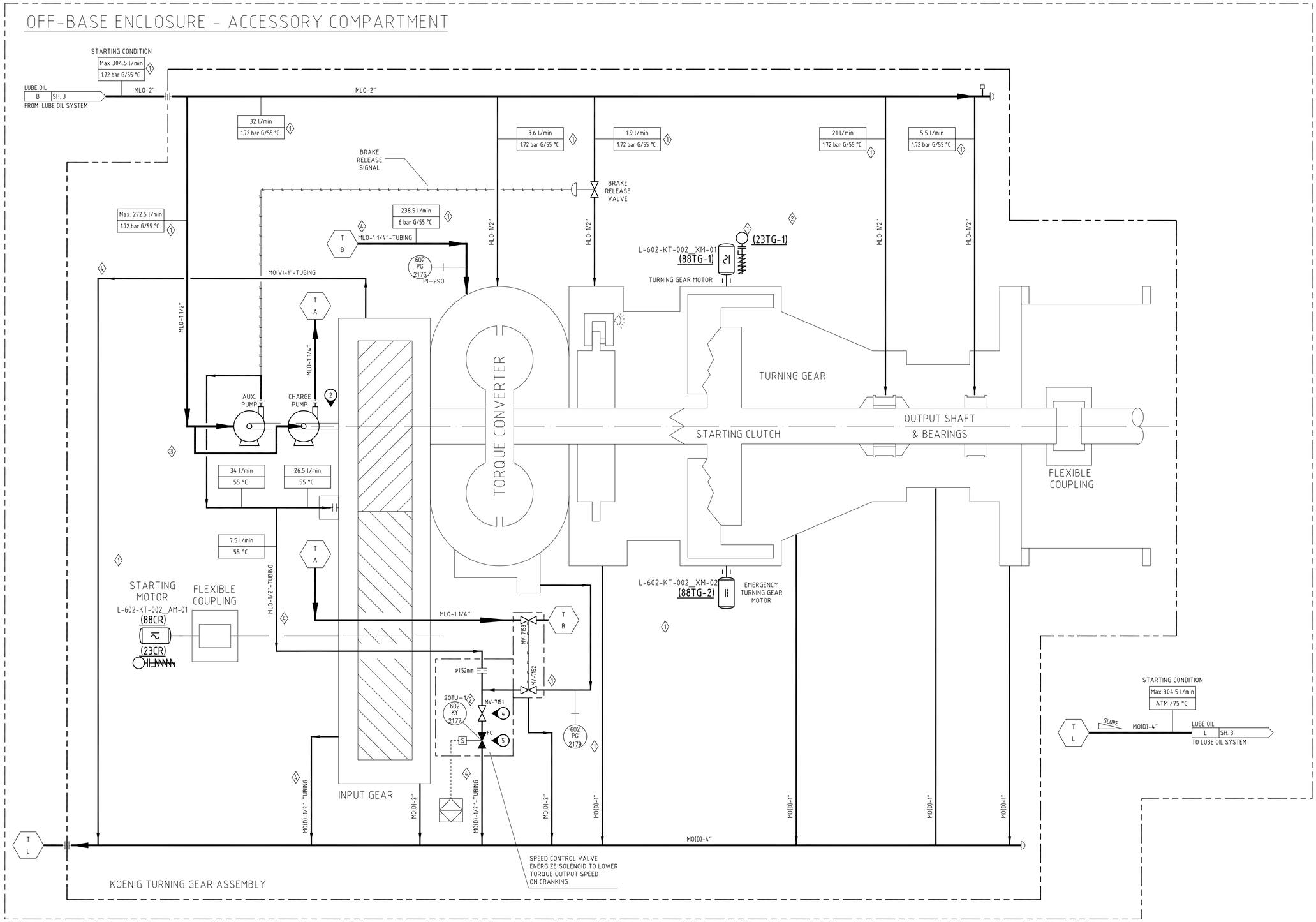
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED

REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

OFF-BASE ENCLOSURE - ACCESSORY COMPARTMENT



NOTES:

1. TURNING GEAR SYSTEM ON THIS PAGE IS A PACKAGE EQUIPMENT.
2. COAXIAL PUMPS ACTION BY STARTING MOTOR. (1)
3. DELETED.
4. FIELD ADJUSTABLE ORIFICE ON FIRST START-UP.
5. WHILE THE MACHINE IS RUNNING, SOLENOID VALVE IS DE-ENERGIZED AND VALVE ITSELF IS CLOSED. THE VALVE IS ENERGIZED DURING STARTING SEQUENCE.

L-602-KT-002_AM-01)
(88CR)
SERVICE : STANDARD STARTING MOTOR
POWER SUPPLY : 6.6 kV/50 Hz /3 Ph
NAMEPLATE POWER : 935 kW (3)

(23CR)
SERVICE : STARTING MOTOR SPACE HEATER
DESIGN DUTY : 0.5 kW
ELECTRIC SUPPLY : 230 V /50 Hz /1 Ph. (1)

L-602-KT-002_XM-01
(88TG-1)
(1) SERVICE : TURNING GEAR MOTOR
POWER SUPPLY : 400 V /50 Hz /3 Ph.
NAMEPLATE POWER : 11 kW

L-602-KT-002_XM-02
(88TG-2)
SERVICE : EMERGENCY TURNING GEAR MOTOR
POWER SUPPLY : 110 Vdc
NAMEPLATE POWER : 1.5 kW (2)

(23TG-1)
SERVICE : MAIN TURNING GEAR MOTOR SPACE HEATER
DESIGN DUTY : 0.025 kW
ELECTRIC SUPPLY : 230 V /50 Hz /1 Ph. (2)

GE Oil & Gas	TITLE STARTING MEANS SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070+71/1102980+81 / SIZE 1	LANGUAGE A
			SHEET 15 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED

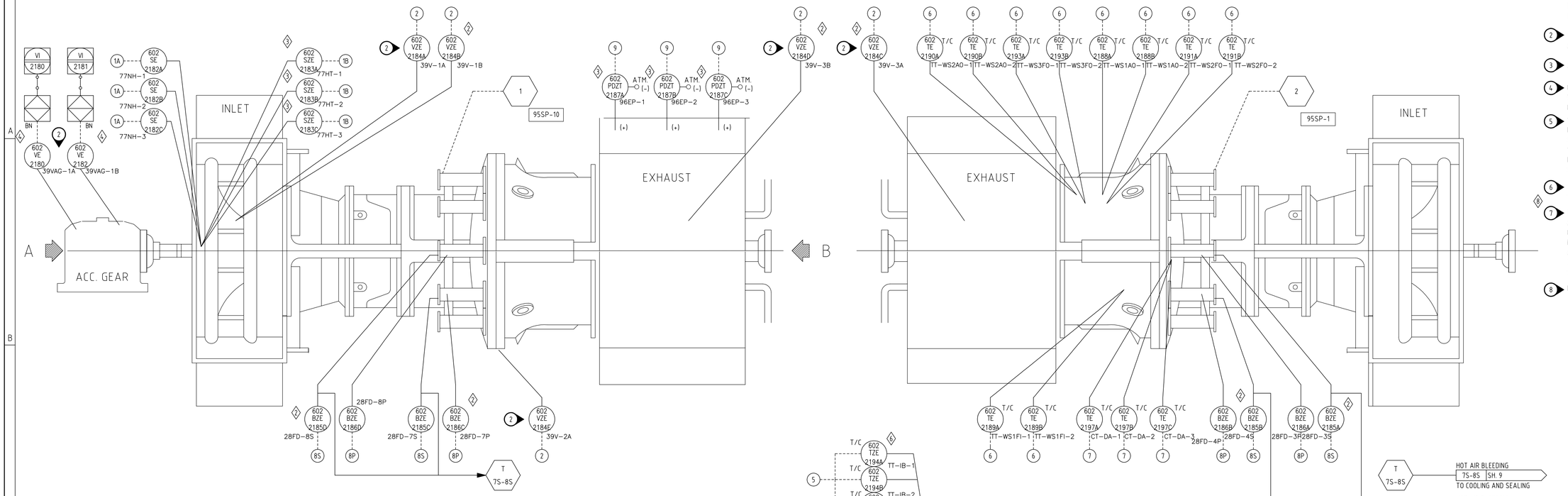
REVISE WITH PidXp ONLY

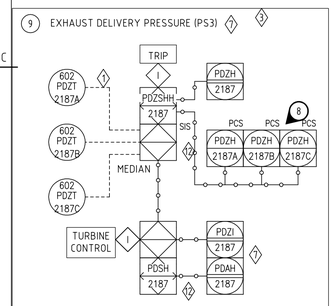
INDRA 23-JUL-2015 AS BUILT

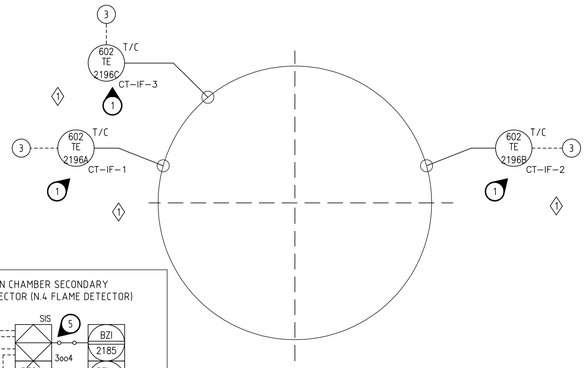
QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

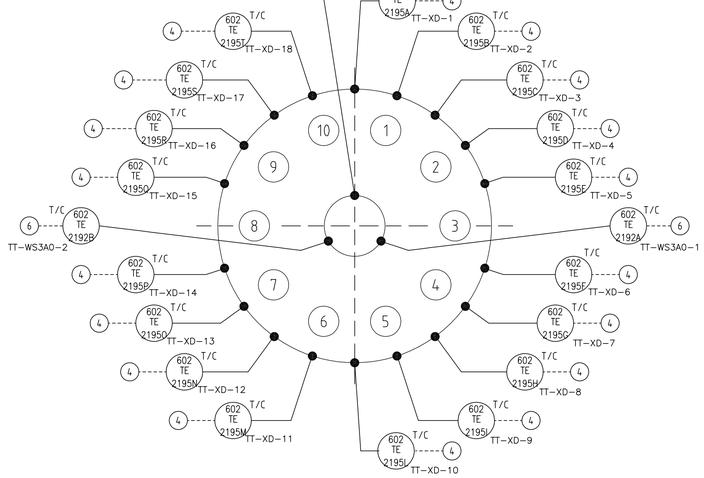
NOTES:

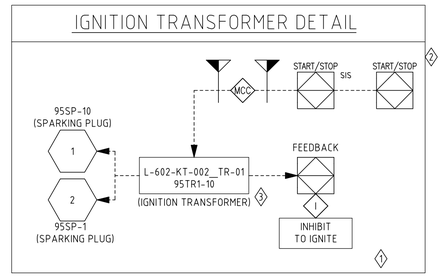
1. A DEVIATION ALARM OF 5.5°C IS APPLIED BETWEEN HIGHEST AND LOWEST MEASURED VALUE IF TEMPERATURE DIFFERENCE EXCEEDS THIS THEN THE TURBINE READY TO START IS BLOCKED.
2. SEISMIC PROBE ARE INSTALLED ON CASING OF ACCESSORY GEAR AND GAS TURBINE.
3. ALL T/C IN THIS SHEET ARE "K" TYPE.
4. EXHAUST TEMPERATURES IS A SOFTWARE BLOCK WHICH GENERATES CONTROL, ALARM AND TRIP FUNCTIONS.
5. "FLAME DETECTED" SIGNAL IN CASE 2 SENSORS INDICATING FLAME PRESENCE ON PRIMARY OR SECONDARY.
   "LOSS OF FLAME" SIGNAL AND TRIP IF 3 SENSORS INDICATING NO FLAME BOTH ON PRIMARY AND SECONDARY ZONES.
6. CUMULATIVE HARDWIRED TRIP SIGNAL FROM BN SYSTEM TO SIS.
7. TRIP IF 1oo5 SEISMIC ELEMENTS IS ABOVE "HH" LEVEL AND AT LEAST ONE OF ALL THE OTHER SEISMIC ELEMENTS IS ON ALARM LEVEL "H".
   NORMAL SHUTDOWN WHEN 1oo2 IS IN FAULT 39V-1A/1B AND 39V-3A/3B.
   39V-2A STAND ALONE WILL GENERATE NORMAL SHUTDOWN IN CASE OF FAULT.
8. INDIVIDUAL ALARMS.

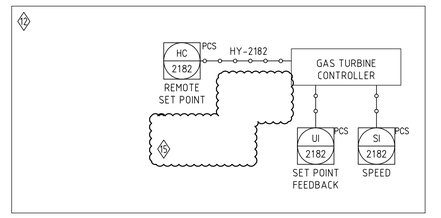


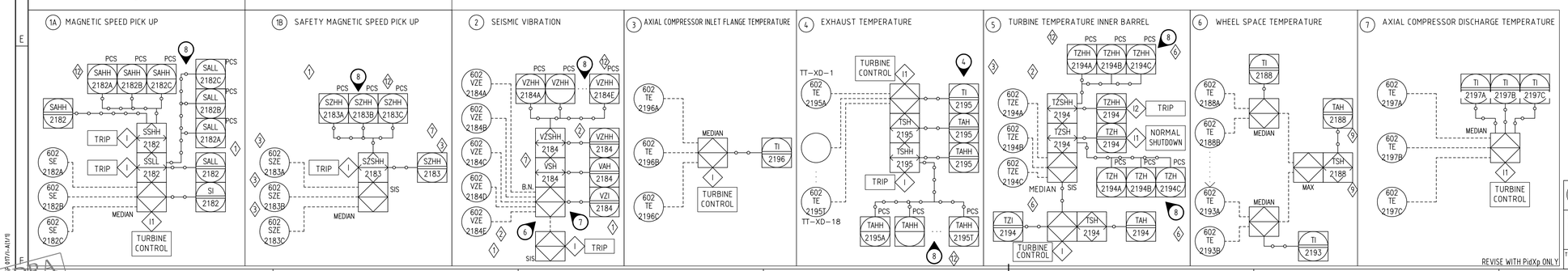












GE Oil & Gas	TITLE CONTROL DEVICE SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION REVISED WHERE SHOWN <15>		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 16 of 28

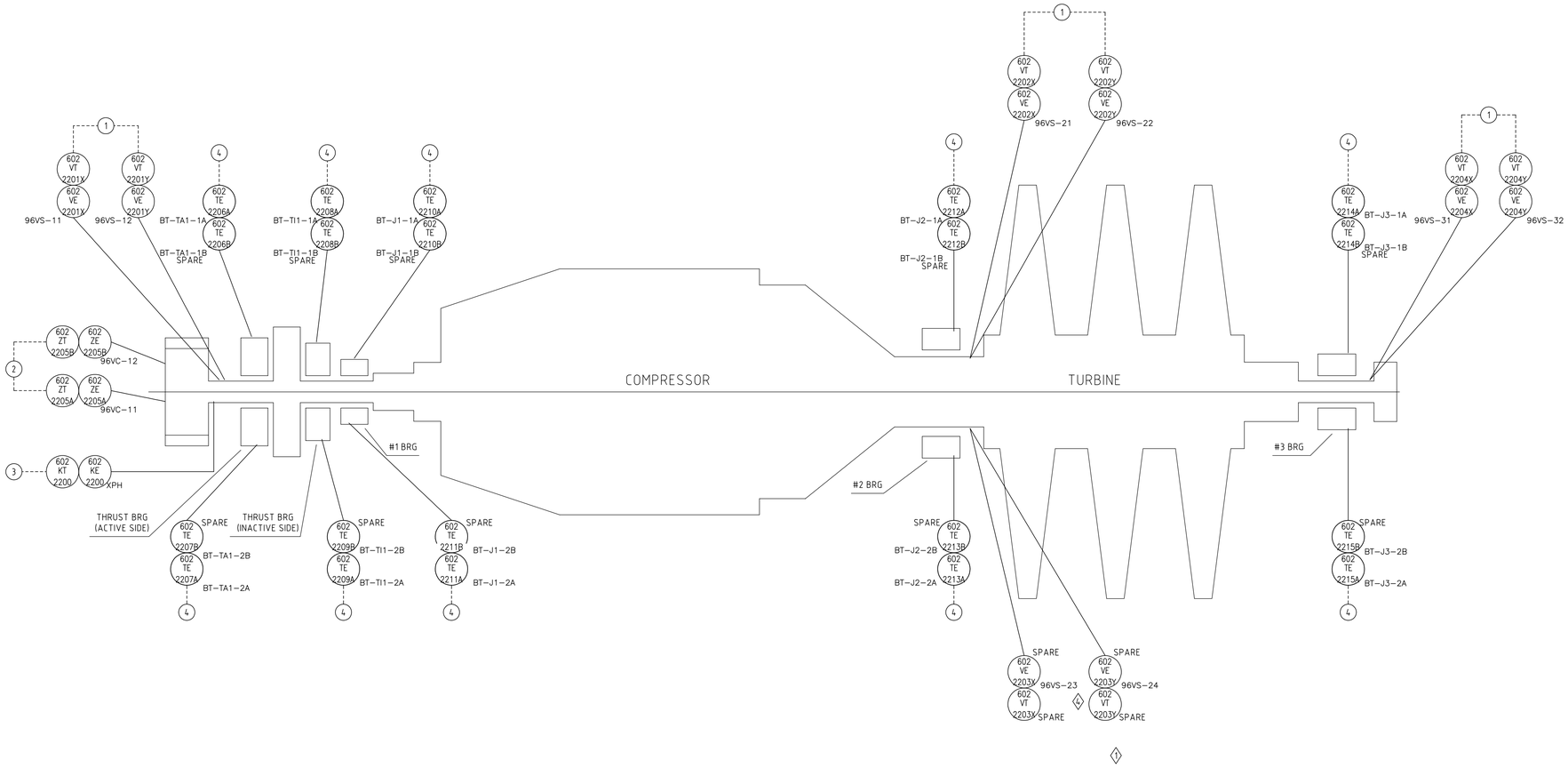
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED

INDRA 23-03-2015 AS BUILT

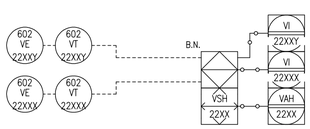
QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

NOTES:

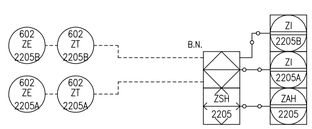
1. ALL T/C IN THIS SHEET ARE "K" TYPE DOUBLE THERMOCOUPLE.



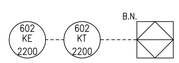
1 NO CONTACT PROBE - RADIAL VIBRATION



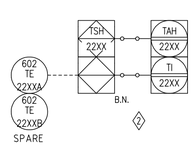
2 NO CONTACT PROBE - AXIAL DISPLACEMENT



3 KEY PHASOR



4 BEARING TEMPERATURE (DOUBLE THERMOCOUPLE)

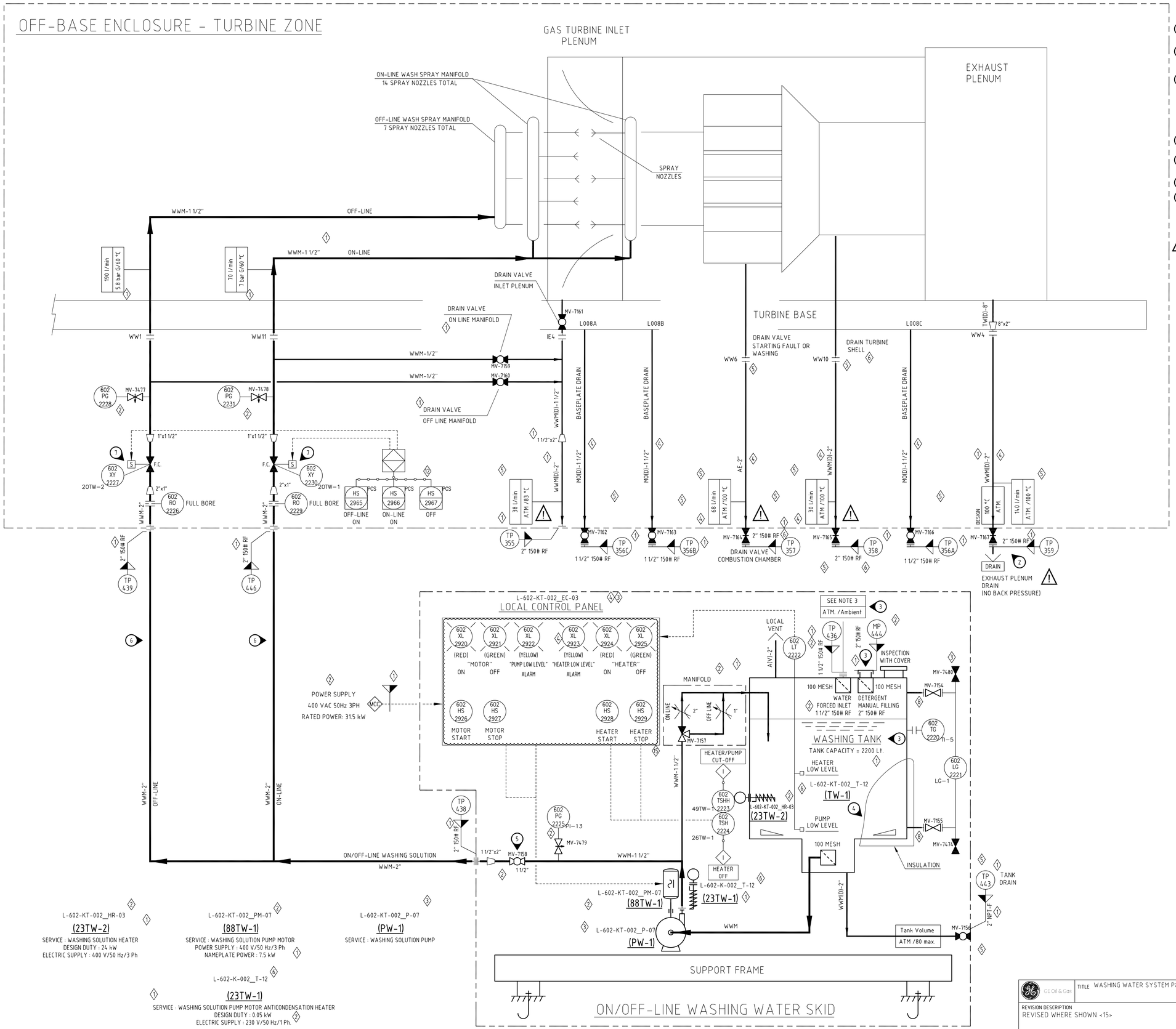


REVISE WITH PidXp ONLY

GE Oil & Gas	TITLE BEARING AND PROTECTION SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070÷71/1102980÷81 / SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED			SHEET 17 of 28

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

1. DELETED.
2. HIGH TEMPERATURE LINE: ROUTE DRAIN PIPE TO AN OPEN DRAIN TO AVOID ANY INJURY OR DAMAGE.
3. WATER: ABOUT 80% TANK VOLUME.
   CHEMICAL ADDITIVES: ABOUT 20% TANK VOLUME.
   THE PERCENTAGE HAS TO BE CONFIRMED BY CHEMICAL ADDITIVES SUPPLIER. FOR A MORE EFFECTIVE RINSE DURING OFF-LINE WASHING, IT IS SUGGESTED TO PERFORM RINSING CYCLE TWO TIMES.
4. WASHING TANK INSULATION SUPPLIED WITH SKID.
5. MANUAL ISOLATION VALVE (FULL BORE).
6. MAX PRESSURE DROP 0.3 bar.
7. ENERGIZED (OPEN) WHEN PERMISSIVE TO AXIAL COMPRESSOR WASHING.

⚠ WARNING : TO BE DRAINED OR VENTED SEPARATELY TO AVOID ANY DAMAGE OR INJURY.

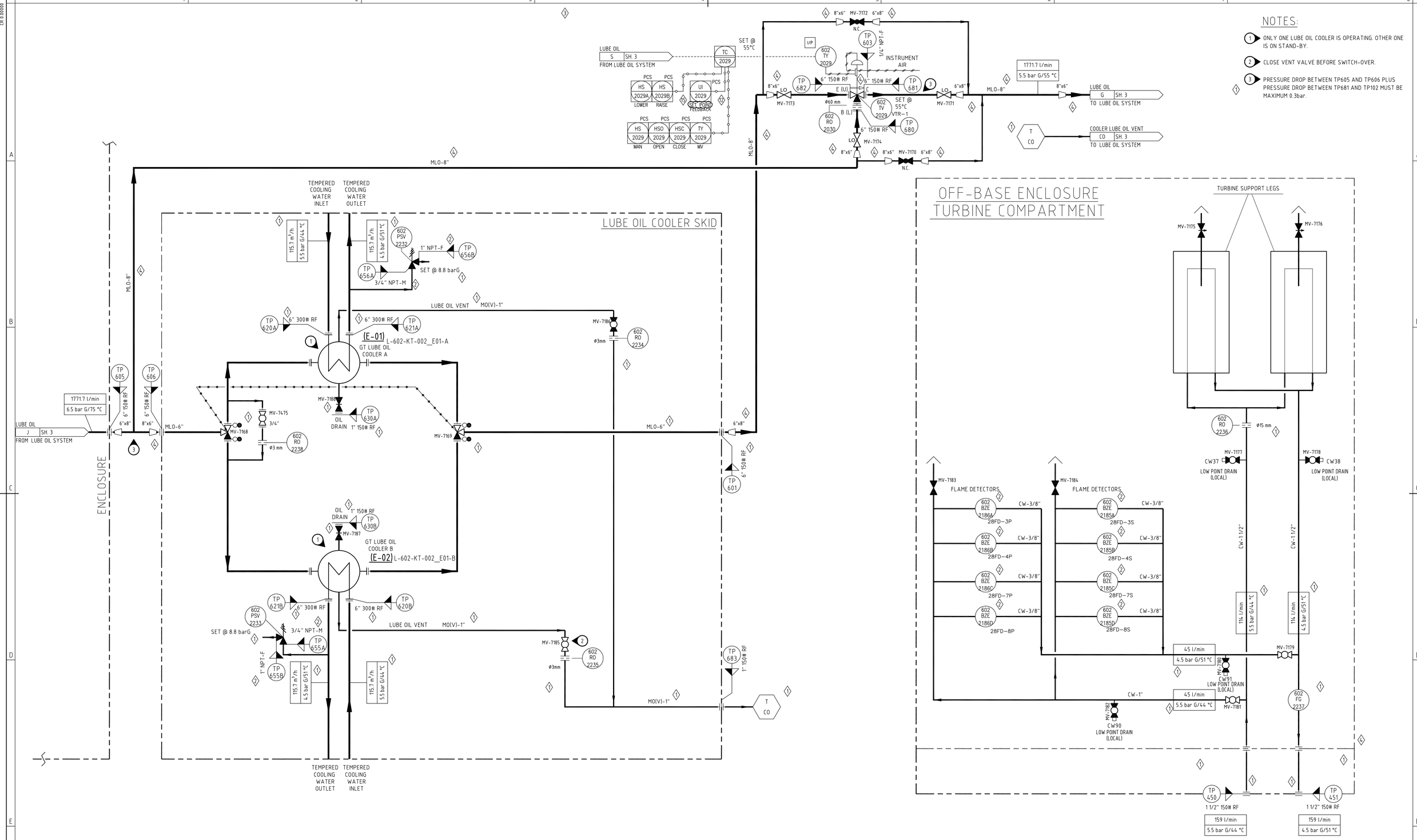
GE Oil & Gas	TITLE WASHING WATER SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION REVISED WHERE SHOWN <15>		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070÷71/1102980÷81 / SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED			SHEET 18 of 28

REVISE WITH PidXp ONLY

CR 0.00000

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

1. ONLY ONE LUBE OIL COOLER IS OPERATING. OTHER ONE IS ON STAND-BY.
2. CLOSE VENT VALVE BEFORE SWITCH-OVER.
3. PRESSURE DROP BETWEEN TP605 AND TP606 PLUS PRESSURE DROP BETWEEN TP681 AND TP102 MUST BE MAXIMUM 0.3bar.

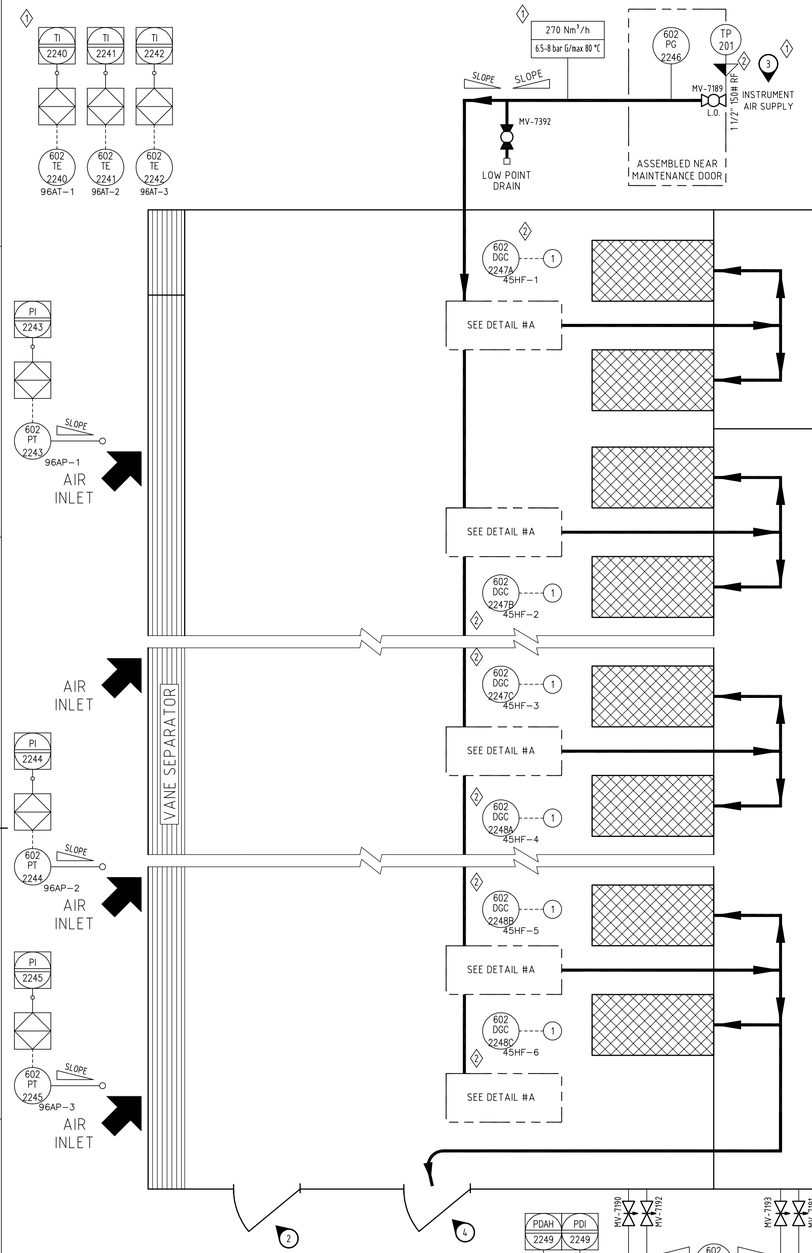
GE Oil & Gas	TITLE COOLING WATER SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION REVISED WHERE SHOWN <15>		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/11002980-81 / SIZE 1	LANGUAGE A
			SHEET 19 of 28

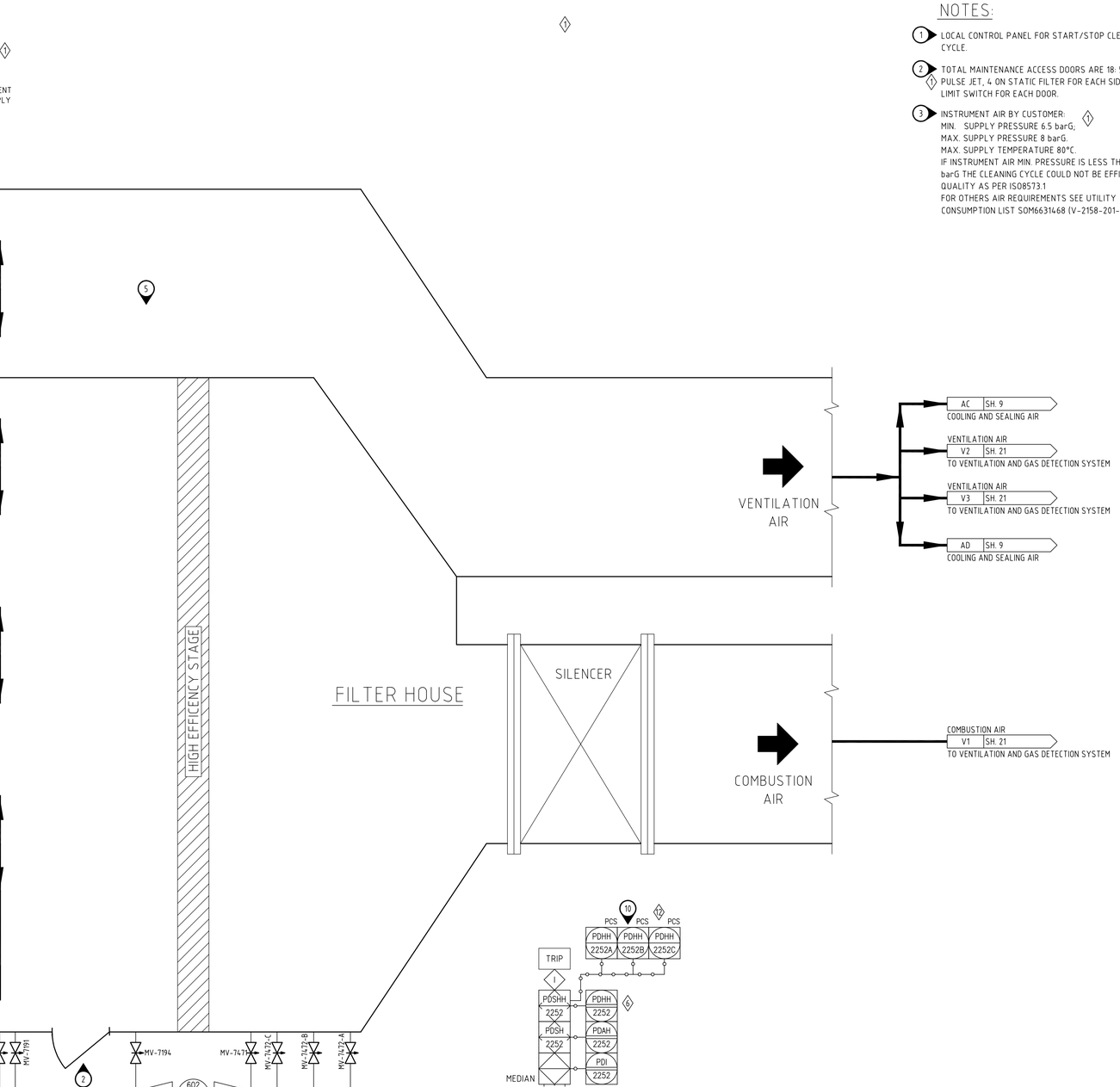
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED

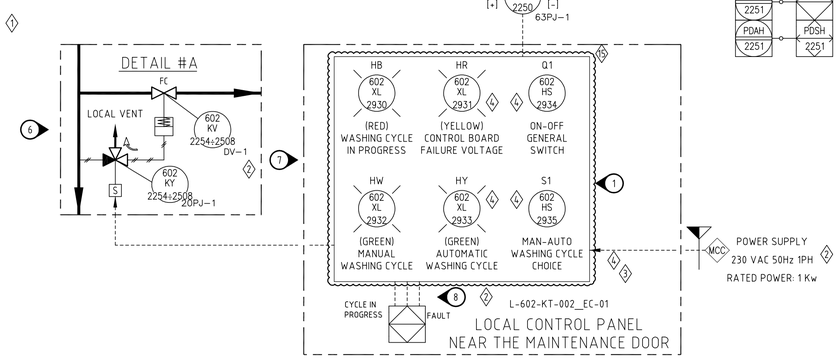
REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

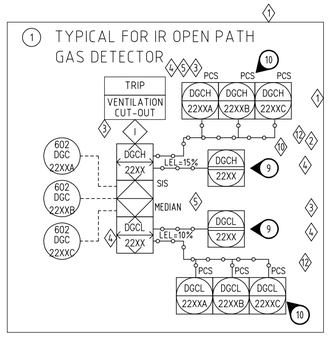


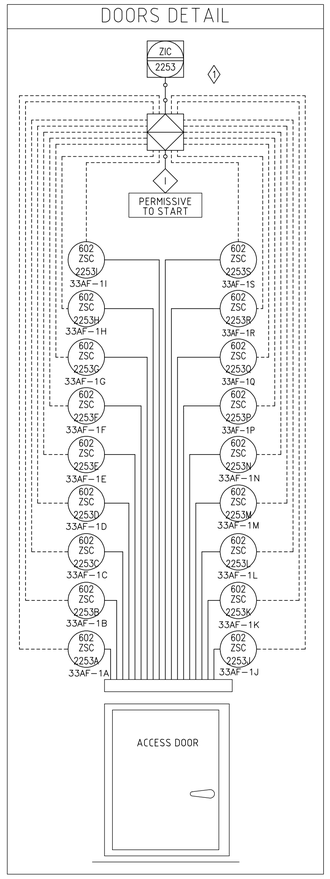




NOTES:

1. LOCAL CONTROL PANEL FOR START/STOP CLEANING CYCLE.
2. TOTAL MAINTENANCE ACCESS DOORS ARE 18: 5 ON PULSE JET, 4 ON STATIC FILTER FOR EACH SIDE. ONE LIMIT SWITCH FOR EACH DOOR.
3. INSTRUMENT AIR BY CUSTOMER:
   MIN. SUPPLY PRESSURE 6.5 barG;
   MAX. SUPPLY PRESSURE 8 barG.
   MAX. SUPPLY TEMPERATURE 80°C.
   IF INSTRUMENT AIR MIN. PRESSURE IS LESS THAN 6.5 barG THE CLEANING CYCLE COULD NOT BE EFFICIENT.
   QUALITY AS PER ISO8573.1
   FOR OTHERS AIR REQUIREMENTS SEE UTILITY CONSUMPTION LIST SOM66314468 (V-2158-201-A2760).
4. HOPPER TO BE AUTOMATICALLY OPENED DURING CLEANING CYCLE .
5. DIFFERENTIAL PRESSURE INSTRUMENT NOT REQUIRED: SPECIFIC FLOW OF VENTILATION-SIDE CARTRIDGES IS LOWER THAN SPECIFIC FLOW OF COMBUSTION-SIDE CARTRIDGES.
6. NO. 255 PULSE JET VALVES
   NO. 255 ON/OFF VALVES.
   NO. 255 SOLENOID VALVES
7. AUTOMATIC INHIBIT P.J. CLEANING FUNCTIONALITY AND AUTOMATIC PERIODICAL (DAILY) INJECTION FOR P.J. CLEANING FUNCTIONALITY ARE PRESENT ON UCP.
8. FOR SIGNALS TAG REFER TO UCS I/O LIST SOM6752722 (V-2158-201-A-2608).
9. INDIVIDUAL ALARM FOR EACH GAS DETECTOR (A, B AND C) TO BE ANNUNCIATED AT DGCH AND DGCA LEVELS ON UCP HMI AND PCS (VIA MODBUS).
10. INDIVIDUAL ALARMS.



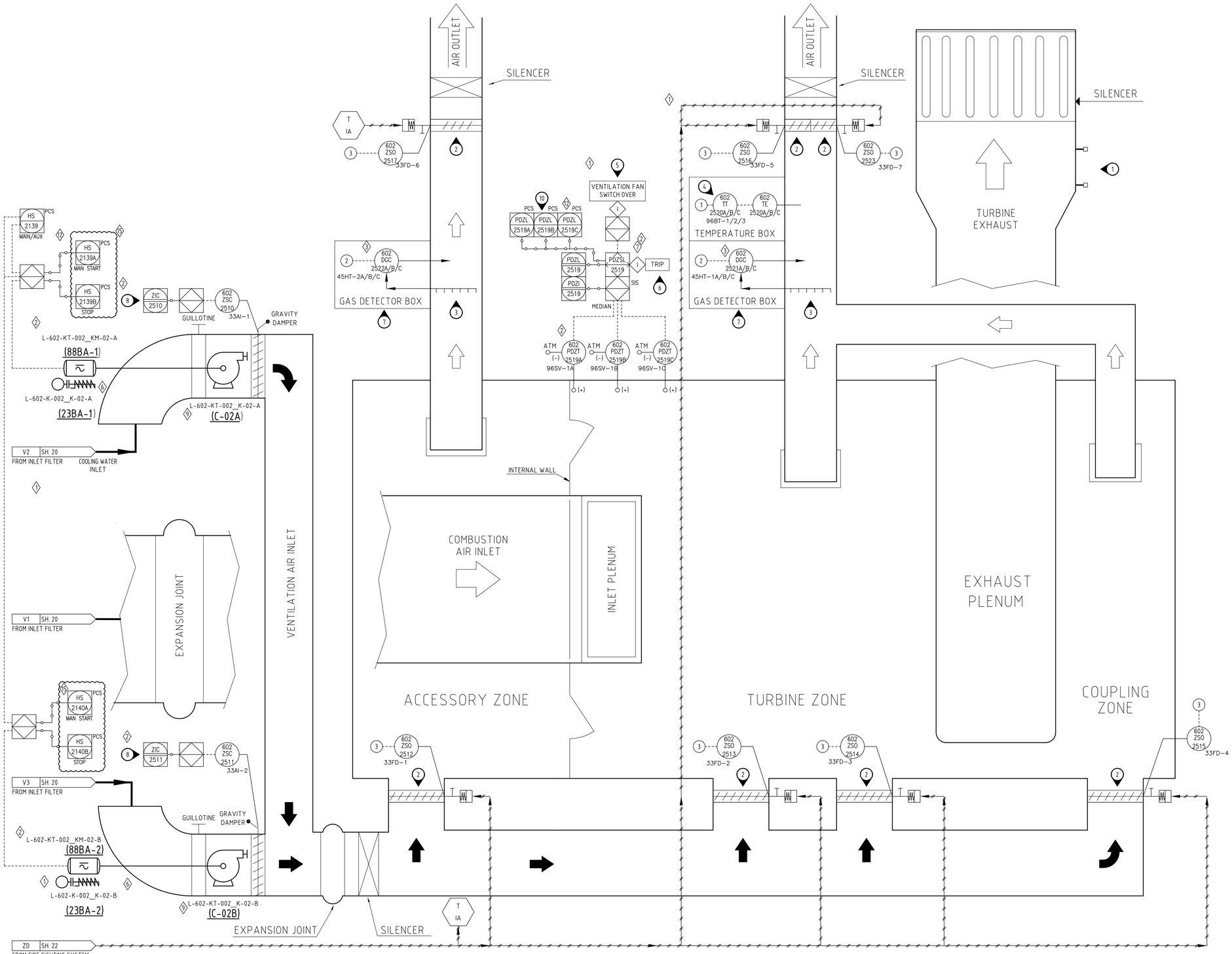


GE Oil & Gas	TITLE FILTER HOUSE SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION REVISED WHERE SHOWN <15>		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070÷71/1102980÷81 / SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED			SHEET 20 of 28

REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

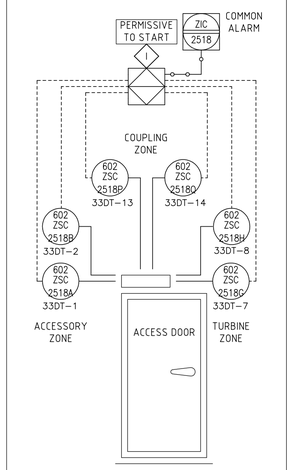
QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

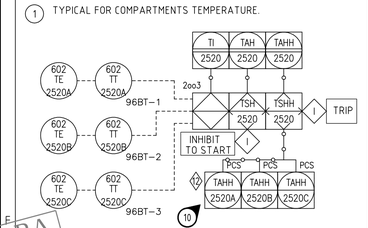
1. No. 7 TEMPERATURE SAMPLE POINT 1/4" NPT 3000 + PLUG
   No. 10 PRESSURE SAMPLE POINT 1/2" NPT 3000 + PLUG
2. FIRE DAMPERS CLOSED BY FIRE FIGHTING SYSTEM RELEASE. MANUAL RELOADED IS REQUIRED.
3. DRILLED SAMPLE PIPE.
4. LOCATE IN COLD ZONE.
5. SWITCH OVER DISABLED IF ACCES DOOR IS OPEN AND IN CASE OF LOSS OF AC POWER SUPPLY.
6. TRIP (30" DELAYED).
   7. TRIP IS BYPASSED FOR A LIMITED TIME (8 HOURS) IN CASE OF "ENCLOSURE ADMISSION PROCEDURE" ACTIVATED.
7. N°3 GAS DETECTOR BOX (ONE FOR EACH SENSOR UNIT).
8. ALARM ONLY IF DAMPER IS NOT TOTALLY CLOSED FOR SELECTED STAND-BY FAN.
9. INDIVIDUAL ALARM FOR EACH GAS DETECTOR (A, B AND C) TO BE ANNUNCIATED AT DGCH AND DGCA LEVELS ON UCP HMI AND PCS (VIA MODBUS).
10. INDIVIDUAL ALARMS.

DOORS DETAIL

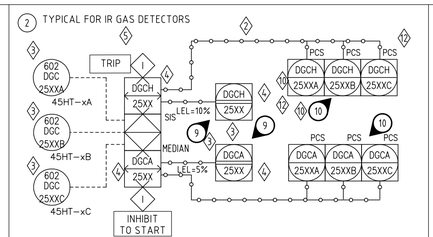


No. 6 ACCESS DOORS:
- no.2 FOR ACCESS TO ACCESSORY ZONE
- no.2 FOR ACCESS TO TURBINE ZONE
- no.2 FOR ACCESS TO COUPLING ZONE

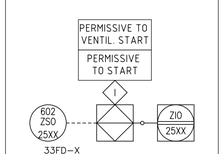
1 TYPICAL FOR COMPARTMENTS TEMPERATURE.



2 TYPICAL FOR IR GAS DETECTORS



3 TYPICAL FOR DAMPERS LIMIT SWITCH



L-602-KT-002_KM-02-A/B
(88BA-1/2)
SERVICE : VENTILATION FAN MOTOR
POWER SUPPLY : 6.6 kV/50 Hz/3 Ph
NAMEPLATE POWER : 250 kW

L-602-K-002_K-02-A/B
(23BA-1/2)
SERVICE : ANTICONDENSATION HEATER
DESIGN DUTY : 0.1 kW
ELECTRIC SUPPLY : 230 V/50 Hz/1 Ph

L-602-KT-002_K-02-A/B
(C-02A/B)
SERVICE : VENTILATION FAN

REVISE WITH PidXp ONLY

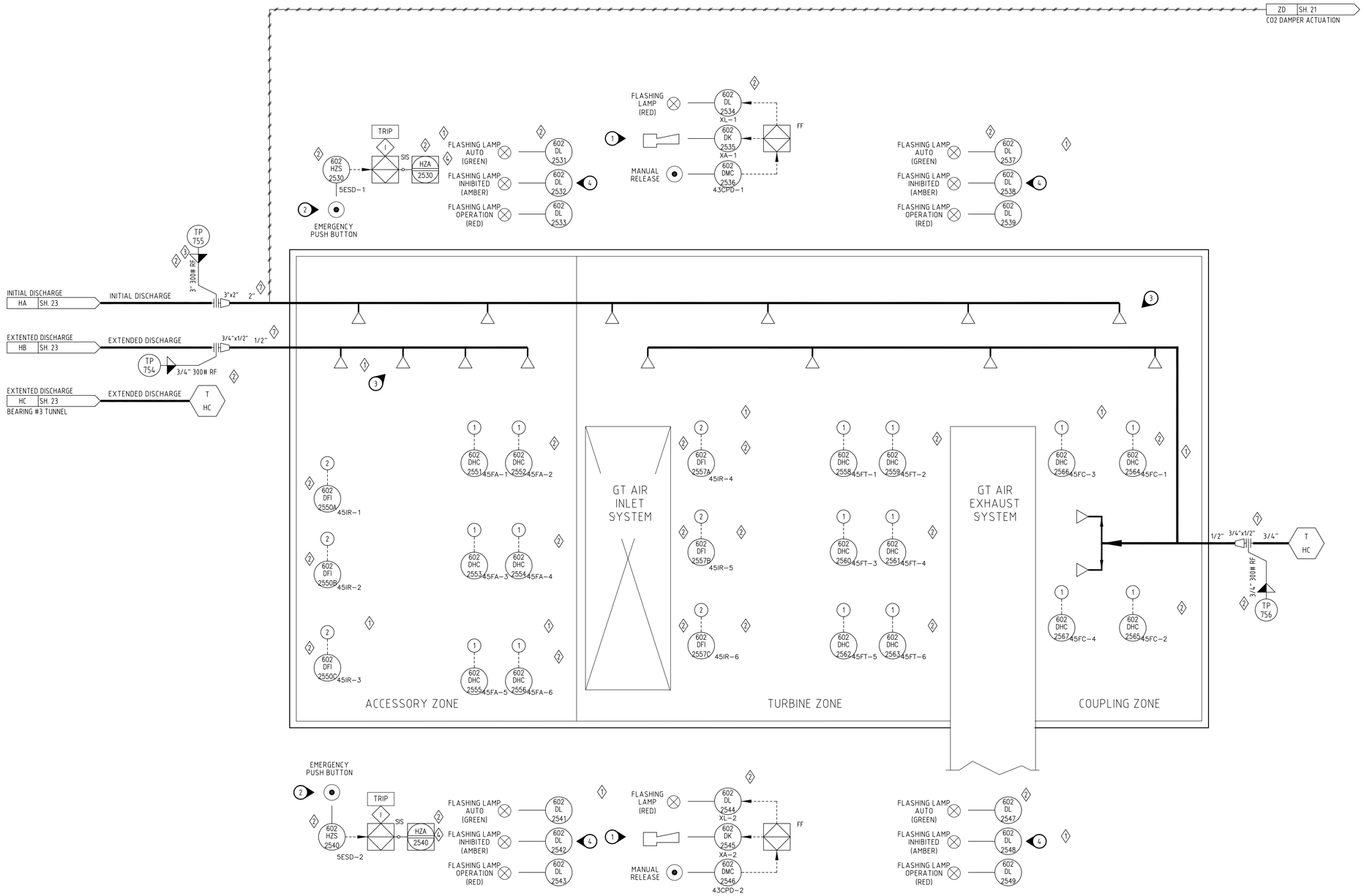
GE Oil & Gas	TITLE VENTILATION SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION REVISED WHERE SHOWN <15>		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070÷71/1102980÷81 / SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED			SHEET 21 of 28

INDRA 23-JUL-2015 AS BUILT

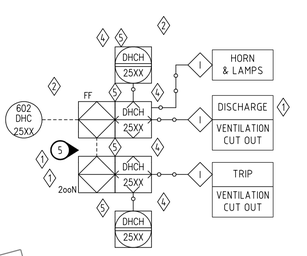
QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

NOTES:

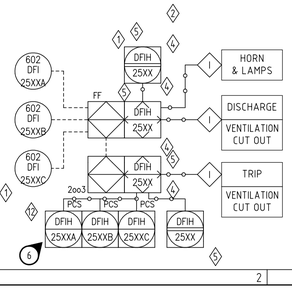
1. ONE FLASHING LAMP, ONE AUDIBLE ALARM AND ONE MANUAL RELEASE PUSH BUTTON WILL BE SUPPLIED WITH ESTINGUISHING SKID FOR EACH LONG SIDE OF THE PACKAGE (TOTAL 2).
2. ONE EMERGENCY PUSH BUTTON WILL BE SUPPLIED NEAR THE ACCESS DOORS OF ACCESSORY COMP.'T (TOTAL 2 - NOT INCLUDED IN FIRE FIGHTING SKID SCOPE OF SUPPLY).
3. NOZZLES POSITION AND QUANTITY ARE INDICATIVE ONLY (NOT REPRESENTATIVE).
4. - GREEN PILOT LIGHT FOR "AUTO" STATUS (PROPER DETECTOR OPERATION WILL INITIATE ALL OUTPUT SIGNALS).
   - AMBER PILOT LIGHT FOR "INHIBITED" STATUS (LOCK-OUT VALVE IS CLOSED).
   - RED PILOT LIGHT FOR "OPERATION" STATUS (CO2 RELEASE IS ON-GOING).
5. CUMULATIVE HARDWIRED TRIP SIGNAL FROM FF SYSTEM TO MARK-VIe SYSTEM.
6. INDIVIDUAL ALARMS



1 TYPICAL FOR HEAT RISE DETECTORS



2 TYPICAL FOR IR3 FIRE DETECTORS

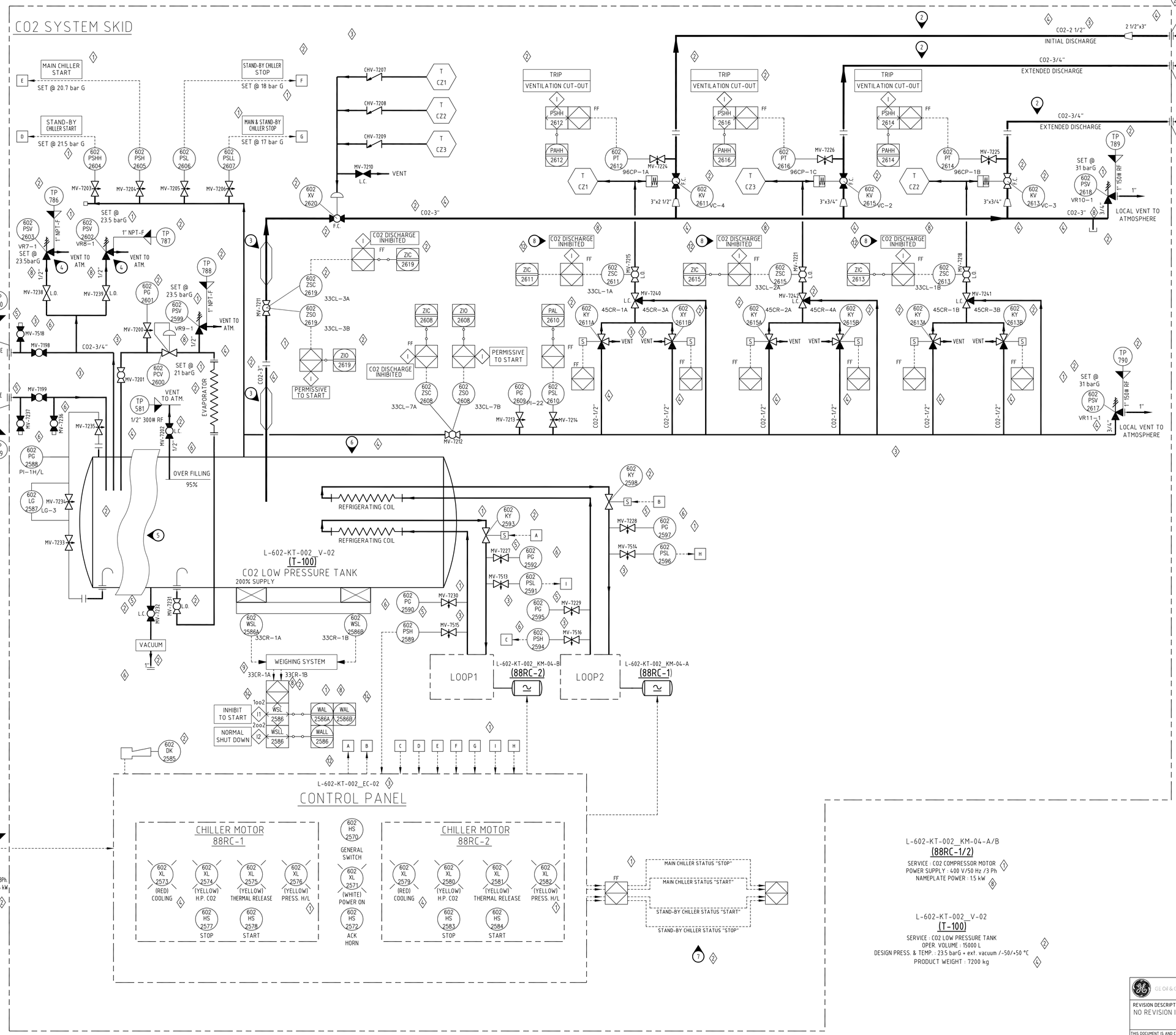


GE Oil & Gas	TITLE FIRE FIGHTING PACKAGE	DOCUMENT CODE S0M5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-711/1102980-81 / SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED			SHEET 22 of 28

REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

1. DELETED.
2. DISCHARGE TIME:
   QUICK DISCHARGE : 1 MINUTES
   EXTENDED DISCHARGE :
   - 20 MINUTES FOR AUXILIARY COMPARTMENT;
   - 50 MINUTES FOR TURBINE COMPARTMENT.
3. INSULATED LINE.
4. PSV OUTLET SHALL BE EXTENDED JUST ABOVE ROOF.
5. TANK SHALL BE INSULATED (BY GE O&G SUPPLIER).
6. ROOF SHALL BE SUPPLIED (BY GE O&G SUPPLIER).
7. FOR SIGNALS TAG REFER TO UCS I/O LIST SOM6752722 (V-1258-201-A-2608).
8. DISCHARGE INHIBITED IN CASE MV-7215, MV-7221 AND MV-7218 VALVES ARE CLOSED SIMULTANEOUSLY.

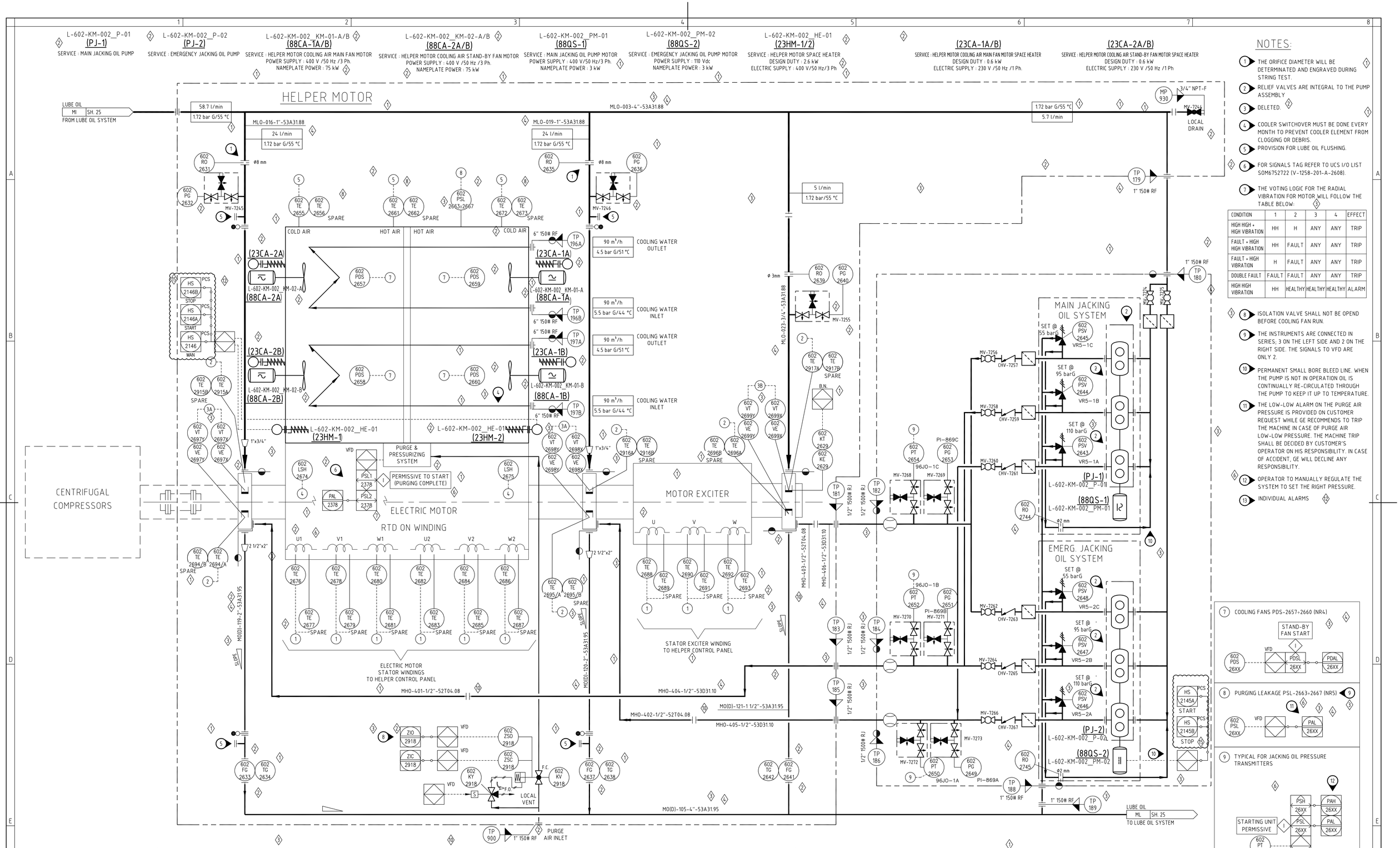
GE Oil & Gas	TITLE FIRE FIGHTING SKID SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 23 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED

REVISE WITH PidXp ONLY

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

IDRA 23-JUL-2015 AS BUILT



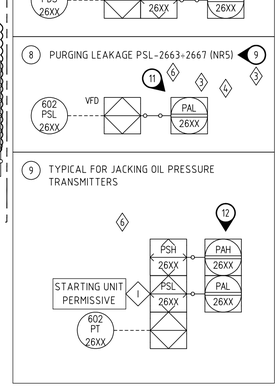
NOTES:

1. THE ORIFICE DIAMETER WILL BE DETERMINATED AND ENGRAVED DURING STRING TEST.
2. RELIEF VALVES ARE INTEGRAL TO THE PUMP ASSEMBLY
3. DELETED.
4. COOLER SWITCHOVER MUST BE DONE EVERY MONTH TO PREVENT COOLER ELEMENT FROM CLOGGING OR DEBRIS.
5. PROVISION FOR LUBE OIL FLUSHING.
6. FOR SIGNALS TAG REFER TO UCS I/O LIST SOM6752722 (V-1258-201-A-2608).
7. THE VOTING LOGIC FOR THE RADIAL VIBRATION FOR MOTOR WILL FOLLOW THE TABLE BELOW:

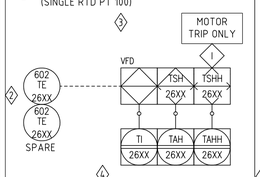
CONDITION	1	2	3	4	EFFECT
HIGH HIGH + HIGH VIBRATION	HH	H	ANY	ANY	TRIP
FAULT + HIGH HIGH VIBRATION	HH	FAULT	ANY	ANY	TRIP
FAULT + HIGH VIBRATION	H	FAULT	ANY	ANY	TRIP
DOUBLE FAULT	FAULT	FAULT	ANY	ANY	TRIP
HIGH HIGH VIBRATION	HH	HEALTHY	HEALTHY	HEALTHY	ALARM

8. ISOLATION VALVE SHALL NOT BE OPEND BEFORE COOLING FAN RUN.
9. THE INSTRUMENTS ARE CONNECTED IN SERIES; 3 ON THE LEFT SIDE AND 2 ON THE RIGHT SIDE. THE SIGNALS TO VFD ARE ONLY 2.
10. PERMANENT SMALL BORE BLEED LINE. WHEN THE PUMP IS NOT IN OPERATION OIL IS CONTINUALLY RE-CIRCULATED THROUGH THE PUMP TO KEEP IT UP TO TEMPERATURE.
11. THE LOW-LOW ALARM ON THE PURGE AIR PRESSURE IS PROVIDED ON CUSTOMER REQUEST WHILE GE RECOMMENDS TO TRIP THE MACHINE IN CASE OF PURGE AIR LOW-LOW PRESSURE. THE MACHINE TRIP SHALL BE DECIDED BY CUSTOMER'S OPERATOR ON HIS RESPONSIBILITY. IN CASE OF ACCIDENT, GE WILL DECLINE ANY RESPONSIBILITY.
12. OPERATOR TO MANUALLY REGULATE THE SYSTEM TO SET THE RIGHT PRESSURE.
13. INDIVIDUAL ALARMS

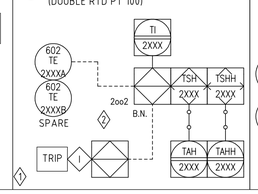
7. COOLING FANS PDS-2657÷2660 (NR4)



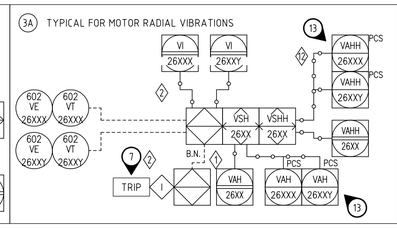
1 TYPICAL FOR MOTOR WINDINGS TEMPERATURE (SINGLE RTD PT 100)



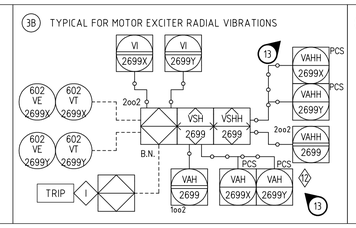
2 TYPICAL FOR BEARINGS TEMPERATURE (DOUBLE RTD PT 100)



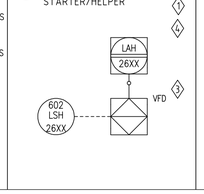
3A TYPICAL FOR MOTOR RADIAL VIBRATIONS



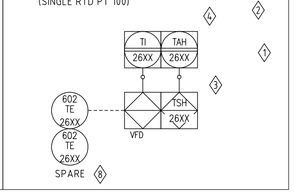
3B TYPICAL FOR MOTOR EXCITER RADIAL VIBRATIONS



4 LEVEL SWITCH FOR MOTOR STARTER/HELPER



5 TYPICAL FOR THERMOELEMENTS ON ELECTRIC MOTOR (SINGLE RTD PT 100)



TITLE	HELPER MOTOR SYSTEM P&I DIAGRAM
DOCUMENT CODE	SOM5081989
REVISION	15
REVISION DESCRIPTION	REVISED WHERE SHOWN <15>
PAGE MARKER	N/A
SECURITY CODE	N
ORIGINAL JOB	1607070÷71/1102980÷81
SIZE	1
LANGUAGE	A
SHEET	24 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED

REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

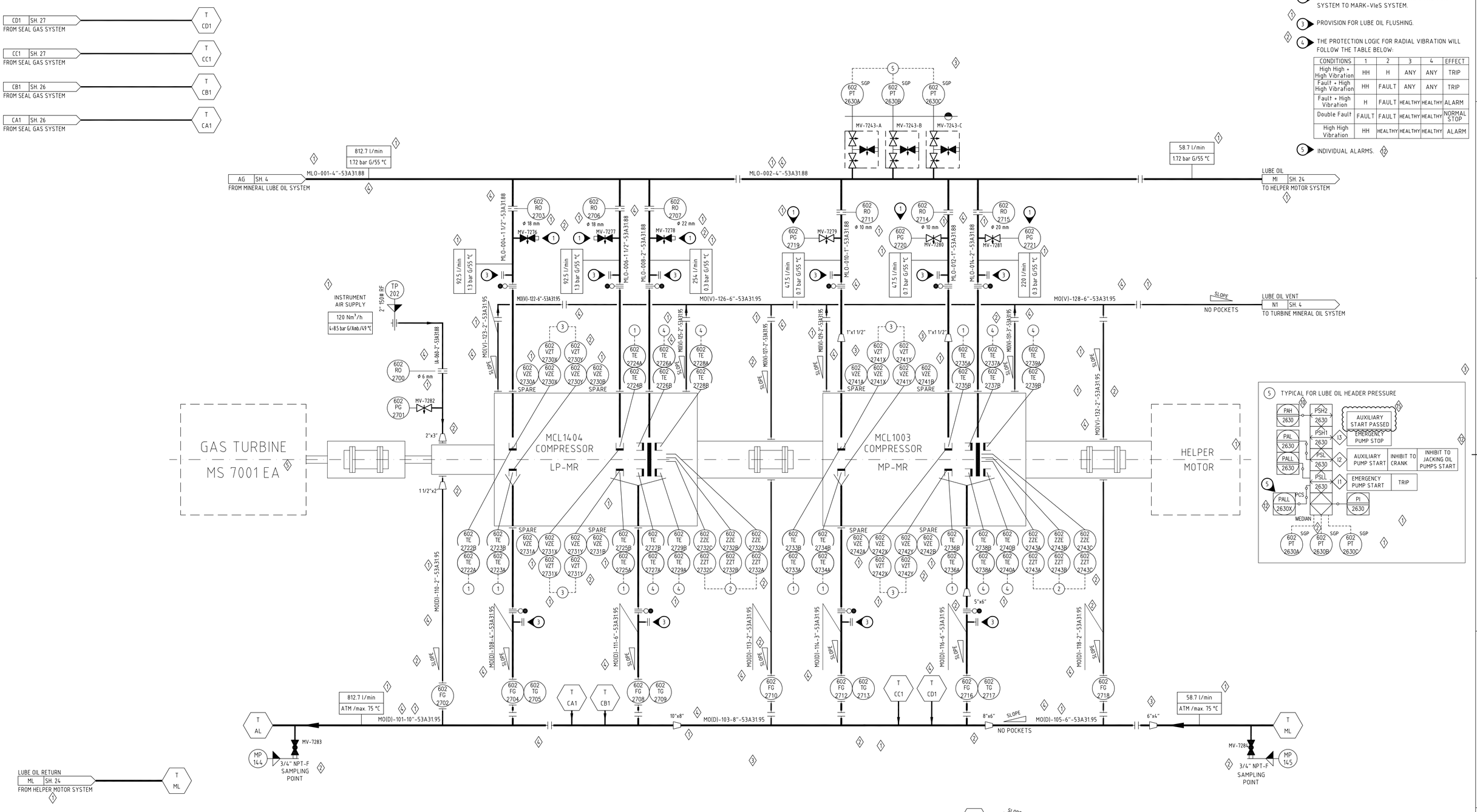
QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

NOTES:

1. CONNECTION BY TESTING AND COMMISSIONING USE N.3 PRESSURE GAUGE SUPPLY LOOSE BY NP
2. CUMULATIVE HARDWIRED TRIP SIGNAL FROM BN SYSTEM TO MARK-VIeS SYSTEM.
3. PROVISION FOR LUBE OIL FLUSHING.
4. THE PROTECTION LOGIC FOR RADIAL VIBRATION WILL FOLLOW THE TABLE BELOW:

CONDITIONS	1	2	3	4	EFFECT
High High + High Vibration	HH	H	ANY	ANY	TRIP
Fault + High High Vibrafion	HH	FAULT	ANY	ANY	TRIP
Fault + High Vibration	H	FAULT	HEALTHY	HEALTHY	ALARM
Double Fault	FAULT	FAULT	HEALTHY	HEALTHY	NORMAL STOP
High High Vibration	HH	HEALTHY	HEALTHY	HEALTHY	ALARM

5. INDIVIDUAL ALARMS.



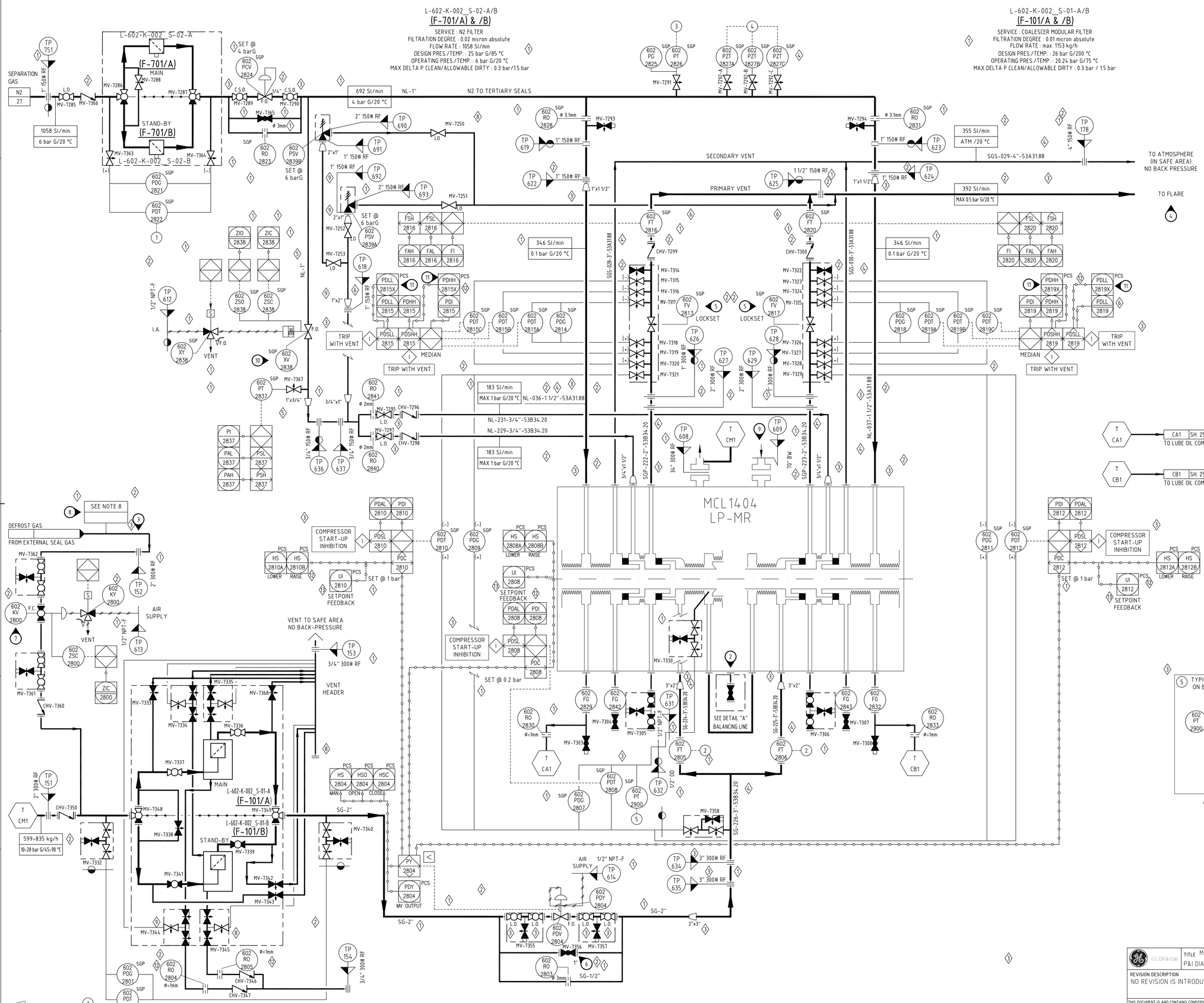
GE Oil & Gas	TITLE LUBE OIL COMPRESSOR SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070+71/1102980-81 / SIZE 1	LANGUAGE A
			SHEET 25 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED

REVISE WITH PidXp ONLY

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

1. DELETED.
2. THE NUMBER OF DRAINS IS 6.
3. ISOLATION AND VENT VALVES TO BE PROVIDED BY CUSTOMER WHEN CONTAMINATION RISK OF EXTERNAL SOURCE BY PROCESS GAS TO BE AVOIDED.
4. NORMAL FLARE BACK-PRESSURE: 0.1 barG
   MAXIMUM FLARE BACK-PRESSURE: 0.5 barG
   PIPING SLOPE TOWARD FLARE; CONNECTION TO BE ON THE TOP OF FLARE PIPE TO AVOID LIQUID FLOWBACK TO SEAL SYSTEM.
5. THE VALVE IS PROVIDED WITH AN HANDLE TO ADJUST THE ORIFICE. DURING NORMAL OPERATION REMOVE THE HANDLE TO AVOID WRONG SETTING.
6. VALVE MUST BE OPEN DURING N2 RUNNING OR DURING START-UP WITH N2 AS EXTERNAL SEAL GAS.
7. VALVE IS ALWAYS OPEN DURING START-UP/SHUT-DOWN AND N2/AIR/DEFROST RUNNING.
8. FOR DETAILS SEE "UTILITY CONSUMPTION LIST" SOM6631468 (V-2158-201-A-2760, L290-AP-LIS-0011).
9. SEE NOTE 7 ON SHEET 2/28 (STMBOLS & LEGEND P&I DIAGRAM).
10. INTERMEDIATE NITROGEN INJECTION SHALL BE CLOSED IN CASE OF COMPRESSOR DEPRESSURIZZATION IN ORDER TO PREVENT REVERSE PRESSURIZZATION OF THE PRIMARY SEAL. THE VALVE WILL BE AUTOMATIC CLOSED BASED ON THE PREDEFINED SETTING OF DIFFERENTIAL PRESSURE BETWEEN SEAL GAS AND PRIMARY VENT (PDT 2810/2812).
11. INDIVIDUAL ALARMS.

1 TYPICAL FOR SEAL DIFFERENTIAL PRESSURE TRANSMITTER ON FILTERS

2 TYPICAL FOR FLOW TRANSMITTERS ON SEAL GAS BUFFER LINE

3 TYPICAL FOR PRESSURE TRANSMITTER ON N2 FOR TERTIARY SEALS

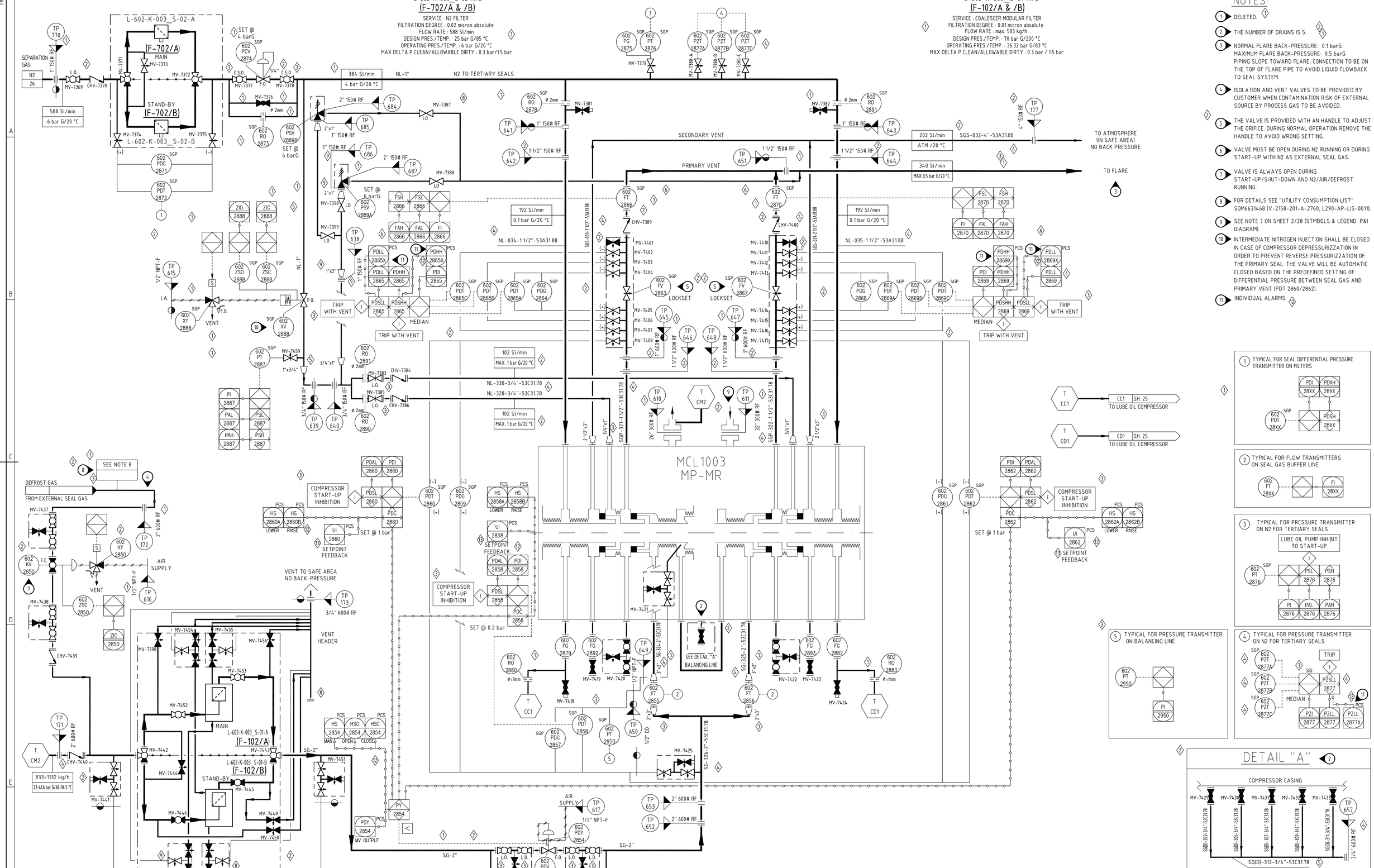
4 TYPICAL FOR PRESSURE TRANSMITTER ON N2 FOR TERTIARY SEALS

5 TYPICAL FOR PRESSURE TRANSMITTER ON BALANCING LINE

GE Oil & Gas	TITLE MCL1404 LP COMPRESSOR SEAL GAS SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-711/1102980-81 / SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED			SHEET 26 of 28

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES



NOTES:

1. DELETED.
2. THE NUMBER OF DRAINS IS 5.
3. NORMAL FLARE BACK-PRESSURE: 0.1 barG
   MAXIMUM FLARE BACK-PRESSURE: 0.5 barG
   PIPING SLOPE TOWARD FLARE, CONNECTION TO BE ON THE TOP OF FLARE PIPE TO AVOID LIQUID FLOWBACK TO SEAL SYSTEM.
4. ISOLATION AND VENT VALVES TO BE PROVIDED BY CUSTOMER WHEN CONTAMINATION RISK OF EXTERNAL SOURCE BY PROCESS GAS TO BE AVOIDED.
5. THE VALVE IS PROVIDED WITH AN HANDLE TO ADJUST THE ORIFICE. DURING NORMAL OPERATION REMOVE THE HANDLE TO AVOID WRONG SETTING.
6. VALVE MUST BE OPEN DURING N2 RUNNING OR DURING START-UP WITH N2 AS EXTERNAL SEAL GAS.
7. VALVE IS ALWAYS OPEN DURING START-UP/SHUT-DOWN AND N2/AIR/DEFROST RUNNING.
8. FOR DETAILS SEE "UTILITY CONSUMPTION LIST" SOM6631468 (V-2158-201-A-2760, L290-AP-LIS-0011).
9. SEE NOTE 7 ON SHEET 2/28 (STMBOLS & LEGEND P&I DIAGRAM).
10. INTERMEDIATE NITROGEN INJECTION SHALL BE CLOSED IN CASE OF COMPRESSOR DEPRESSURIZZATION IN ORDER TO PREVENT REVERSE PRESSURIZZATION OF THE PRIMARY SEAL. THE VALVE WILL BE AUTOMATIC CLOSED BASED ON THE PREDEFINED SETTING OF DIFFERENTIAL PRESSURE BETWEEN SEAL GAS AND PRIMARY VENT (PDT 2860/2862).
11. INDIVIDUAL ALARMS.

1. TYPICAL FOR SEAL DIFFERENTIAL PRESSURE TRANSMITTER ON FILTERS
2. TYPICAL FOR FLOW TRANSMITTERS ON SEAL GAS BUFFER LINE
3. TYPICAL FOR PRESSURE TRANSMITTER ON N2 FOR TERTIARY SEALS
4. TYPICAL FOR PRESSURE TRANSMITTER ON N2 FOR TERTIARY SEALS
5. TYPICAL FOR PRESSURE TRANSMITTER ON BALANCING LINE

GE Oil & Gas	TITLE MCL1003 MP COMPRESSOR SEAL GAS SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070÷71/1102980÷81 / SIZE 1	LANGUAGE A
			SHEET 27 of 28

THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l. . UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l. ALL RIGHTS RESERVED

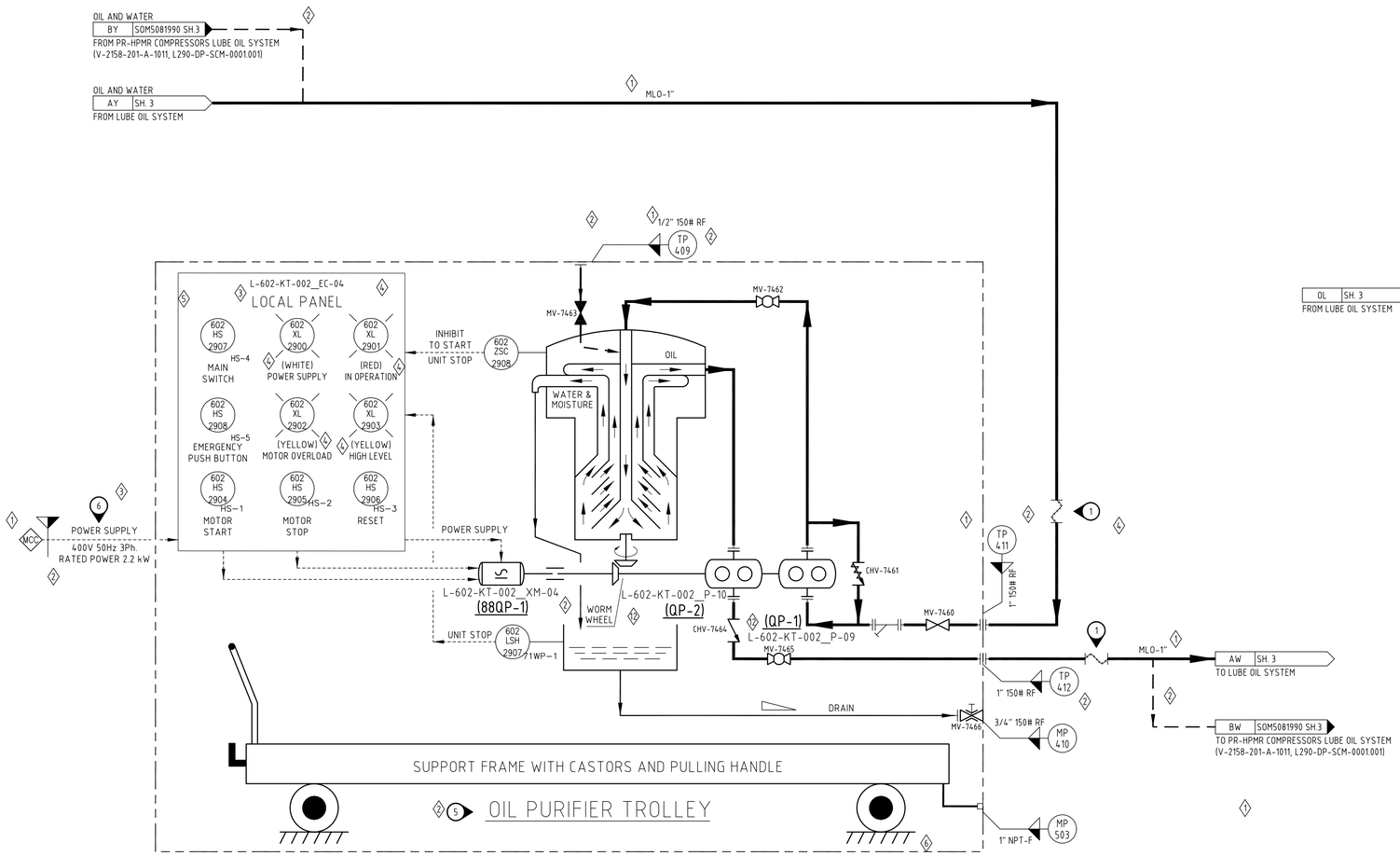
REVISE WITH PidXp ONLY

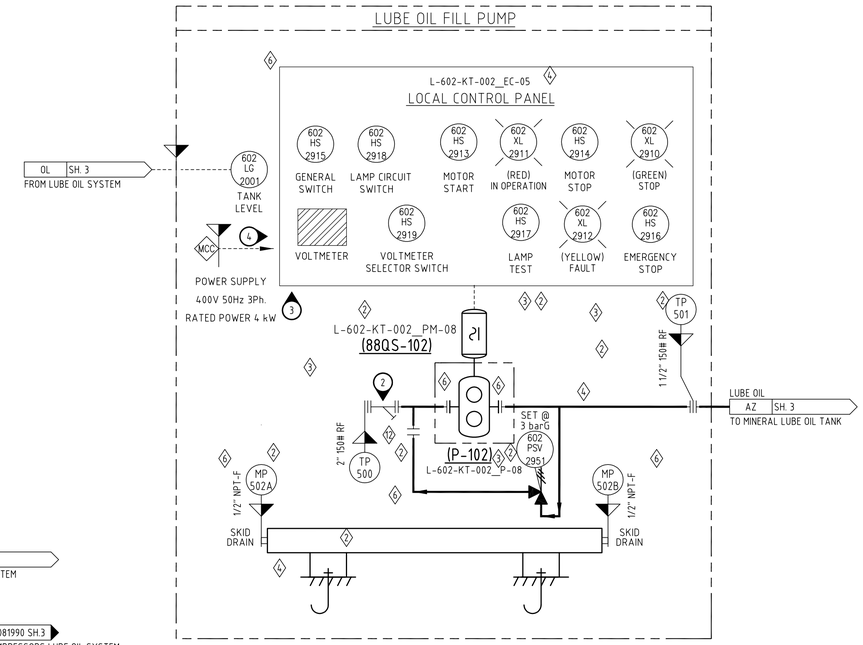
QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES

INDRA 23-JUL-2015 AS BUILT

NOTES:

1. 3 SETS OF 10 METERS FLEXIBLE OIL PIPING SUPPLIED WITH TROLLEY. (BY GE OIL&GAS)
2. Y-STRAINER FILTER TO PROTECT SCREW PUMP ONLY.
3. RED LAMP IS FOR RUNNING CONDITION, GREEN LAMP IS FOR STOP.
4. PANEL SHALL BE EQUIPPED WITH : A VOLTMETER AND SELECTOR SWITCH ARRANGED TO MEASURE EACH LINE-LINE AND/OR LINE-NEUTRAL VOLTAGE.
5. GE O&G WILL SUPPLY NO.1 LUBE OIL PURIFIER TROLLEY IN COMMON FOR NO.4 TURBOCOMPRESSOR TRAINS (NO.2 LP+MP MR COMPRESSOR TRAINS AND NO.2 PR+HP MR COMPRESSOR TRAINS).
6. GENP WILL SUPPLY 20m OF FLEXIBLE POWER SUPPLY CABLE.





L-602-KT-002_XM-04
(88QP-1)
SERVICE : OIL PURIFIER MOTOR PUMP
POWER SUPPLY : 400 V/50 Hz/3 Ph
NAMEPLATE POWER : 2.2 kW

L-602-KT-002_P-09
(QP-1)
SERVICE : OIL PURIFIER PUMP

L-602-KT-002_P-10
(QP-2)
SERVICE : OIL PURIFIER PUMP

L-602-KT-002_P-08
(P-102)
SERVICE : OIL FILL PUMP
FLOW (AT P/T) : 133 l/min
OPERATING PRES./TEMP. : 3 bar G/AMB °C

L-602-KT-002_PM-08
(88QS-102)
SERVICE : OIL FILL PUMP MOTOR
POWER SUPPLY : 400 V/50 Hz/3 Ph
NAMEPLATE POWER : 4 kW

REVISE WITH PidXp ONLY

GE Oil & Gas	TITLE PURIFIER AND LUBE OIL FILL SYSTEM P&I DIAGRAM	DOCUMENT CODE SOM5081989	REVISION 15
REVISION DESCRIPTION NO REVISION IS INTRODUCED IN THIS PAGE		PAGE MARKER N/A	SECURITY CODE N
		ORIGINAL JOB 1607070-71/1102980-81 / SIZE 1	LANGUAGE A
THIS DOCUMENT IS AND CONTAINS CONFIDENTIAL AND PROPRIETARY INFORMATION OF Nuovo Pignone S.r.l. WHICH SHALL NOT BE USED OR DISCLOSED TO OTHERS, EXCEPT WITH THE WRITTEN PERMISSION OF Nuovo Pignone S.r.l.. UNPUBLISHED WORK ©2015 Nuovo Pignone S.r.l.. ALL RIGHTS RESERVED			SHEET 28 of 28

INDRA 23-JUL-2015 AS BUILT

QUESTO DISEGNO E' STATO ESEGUITO CON TECNICHE CAD - THIS DRAWING WAS MADE WITH CAD TECHNIQUES