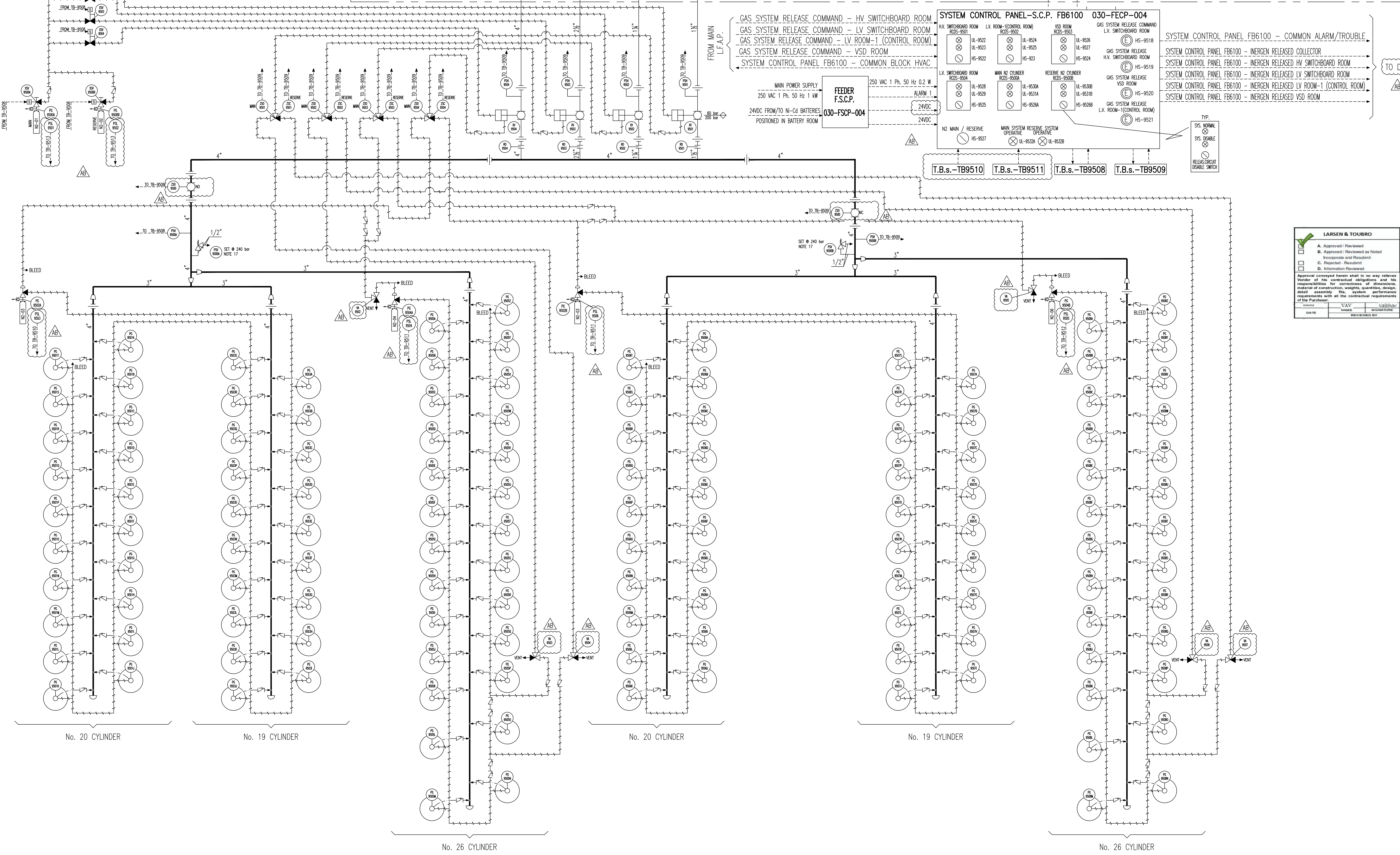
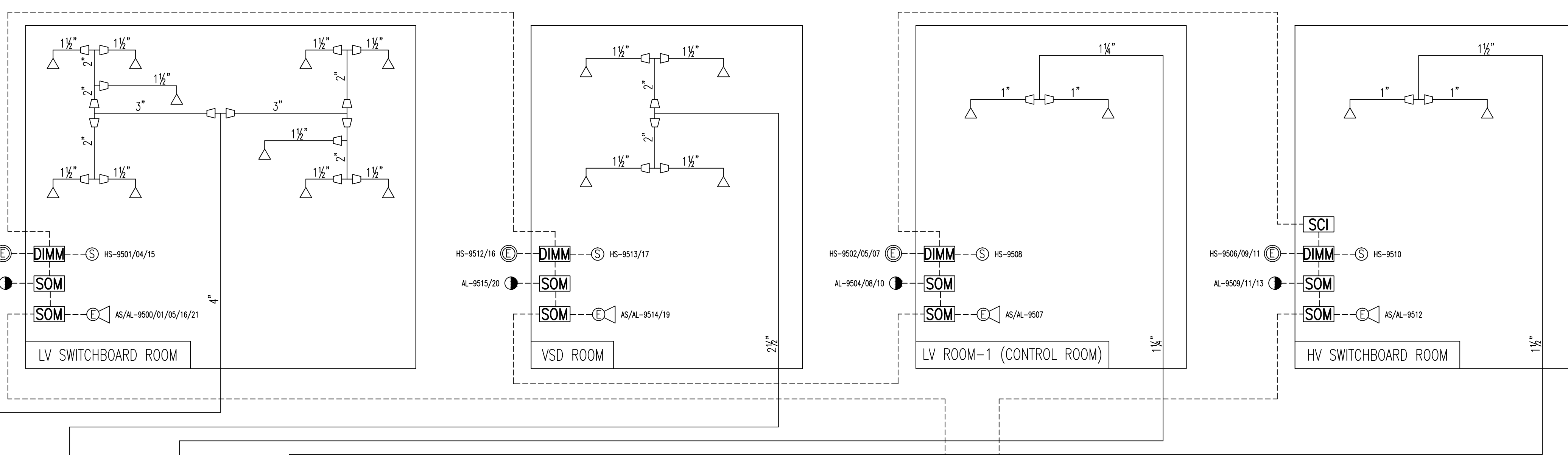


200BAR INERGEN SYSTEM PROTECTED ROOM - DESIGN TABLE									
PROTECTED BUILDING	PROTECTED AREA	VOLUME [c.m.]	DESIGN CONC. [%]	VOLUME FACTOR [c.m./c.m.]	SUPPLY AGENT [kg]	DESIGN AGENT [kg] NOTE 11	CYLINDER Q.TY	NOZZLE Q.TY	CONV.
CRUDE PUMP HOUSE SUBSTATION	LV SWITCHBOARD ROOM	2124.66	38.5	0.48854	1547.0	1470.7	65	65	10 Ø1½"
	VSD ROOM	823.57			618.8	570.1	26	26	4 Ø1½"
	LV ROOM-1 (CONTROL ROOM)	348.16			261.8	241.0	11	11	2 Ø1"
	HV SWITCHBOARD ROOM	370.28			285.6	256.3	12	12	2 Ø1"

TABLE 1 - PIPING CLASS	
BEFORE ISOLATION VALVE	PIPES ASTM A106 GR.B SCH.80 MINIMUM THREADED FITTINGS ASTM A105 3000 LBS MINIMUM / FLANGES 1500 LBS MINIMUM
AFTER ISOLATION VALVE	PIPES ASTM A106 GR.B SCH.40 MINIMUM THREADED FITTINGS ASTM A105 3000 LBS MINIMUM / FLANGES 600 LBS MINIMUM



- ### GENERAL NOTES
- FOR STANDARD SYMBOLS AND NOMENCLATURE SEE DRAWINGS.
    - 50489-530-020-PD-1104.001 / PIPING AND INSTRUMENTATION DIAGRAM-STANDARD SYMBOL & NOMENCLATURE
    - 50489-530-020-PD-1104.002 / PIPING AND INSTRUMENTATION DIAGRAM-STANDARD SYMBOL & NOMENCLATURE
    - 50489-530-020-PD-1106.001 / PIPING AND INSTRUMENTATION DIAGRAM-STANDARD DRAWING (BY DETAIL)
    - 50489-530-020-PD-1106.004 / PIPING AND INSTRUMENTATION DIAGRAM-STANDARD DRAWING (BY DETAIL)
    - 50489-530-020-PD-1108.001 / PIPING AND INSTRUMENTATION DIAGRAM-STANDARD DRAWING (BY DETAIL)
  - ALL INSTRUMENT TAG NO. SHOWN IN THIS PID ARE PRECEDED BY 030.

- ### NOTES
- WHEN GAS SYSTEM IS DISCHARGED, RELATED HVAC SYSTEM SHALL BE SHUT DOWN SIMULTANEOUSLY IN MANUAL OPERATING DIRECT ON SYSTEM DISCHARGE. THERE IS DELAY OF 30 SEC. IF THE DISCHARGE SYS. IS AUTOMATIC BY INERGEN RELEASE REQUEST.
  - THE PRE-DISCHARGE HORN/STROBE AND ABORT STATION SHALL BE INSTALLED IN THE PROTECTED ROOM. THE DISCHARGE WARNING LAMP AND MANUAL STATION SHALL BE INSTALLED OUTSIDE OF EXIT DOOR.
  - FOR SECONDARY POWER OF GAS SYSTEM CONTROL PANEL, THE BUILT-IN TYPE Ni-Cd BATTERY SHALL BE SUPPLIED.
  - FIRE DETECTION SYSTEM FOR GAS SUPPRESSION SYSTEM SHALL HAVE TWO CROSSED CIRCUITS PER PROTECTED AREA (NOT SANCO SCOPE OF SUPPLY).
  - PRE DISCHARGE HORN SHALL BE OPERATED BEFORE THE GAS RELEASED FOR PERSONNEL EVACUATION.
  - SOLENOID VALVE ON THE PILOT CYLINDER SHALL BE OPERED BY CROSSED CIRCUIT DETECTION AFTER 30 SEC. TIME DELAY.
  - ALL SIGNAL CABLE FOR GAS SYSTEM SHALL BE FIRE RESISTANT AS PER KOC STANDARD KOC-I-011 FOR INSTRUMENT CABLE (SEE "FIRE ALARM SYSTEM - DATA SHEETS" DOC. No. 50489-530-080-00081-DAT-V002).
  - MAIN POWER FOR GAS SYSTEM CONTROL PANEL WILL BE SUPPLIED FROM MAIN POWER IN NORMAL STAGE BUT, IN CASE OF EMERGENCY, IT WILL BE SUPPLIED BY NICKEL CADMIO BATTERIES.
  - 6-541 CYLINDERS BASED ON 80 LITERS CAPACITY, 200 bar SYSTEM. (SEE "GASEOUS FIRE SUPPRESSION SYSTEM - DATA SHEET" DOC. No. 50489-530-080-00081-DAT-V001)
  - GAS SUPPRESSION SYSTEM IS DESIGNED IN ACCORDANCE WITH NFPA 2001/NFPA 72 AND UL LISTED & FM APPROVED.
  - DISCHARGE TIME FOR K541 SYSTEM IS 120 sec ACCORDING TO NFPA 2001 chap. 5.7.1.1.2
  - TOTAL FLOODING SYSTEM
  - RESERVE CYLINDERS ARE 100% OF MAIN CYLINDERS
  - ISCAI DISCHARGE VALVES AND SELECTOR VALVES ARE A LATCHING SOLENOID ACTUATORS. ONLY DURING A FIRE ALARM INTO A PROTECTED ROOM THE RELEVANT SOLENOIDS ARE ENERGIZED AND SO BOTH DISCHARGE AND SELECTOR VALVES ARE OPENED. ONCE ENERGIZED AND SO ACTIVATED BOTH VALVES WILL REMAIN OPENED EVEN IF POWER FAILS AND IT MUST BE RESETTED DIRECTLY ON INSTRUMENT.
  - TYPE OF VENDOR'S SCOPE OF SUPPLY CABLES:
    - SGP FROM/TO TB, TB FROM/TO SPECIALISTIC MATERIALS (NOT IN INERGEN CYL. ROOM) - MIC CABLE
    - SGP FROM/TO TB, TB FROM/TO INSTRUMENT (IN INERGEN CYL. ROOM) - MIC CABLE
    - SGP FROM/TO FEEDER, FEEDER FROM/TO Ni-Cd BATTERIES - UL OR UR CABLE
    - ALL CABLE BUNDLES FOR MIC CABLE ARE IN ROOM 15
  - DESIGN PRESSURE: BEFORE ISOLATION VALVE: 200 bar  
AFTER ISOLATION VALVE: 60 bar
  - SET PRESSURE OF 240 bar CORRESPOND TO 55°C
  - BLEED VALVE DISCHARGES THE LEAKAGE GAS IN SMALL QUANTITY, AUTOMATICALLY CLOSSES WHEN DISCHARGE PRESSURIZING OCCURS. IT WILL OPEN MANUALLY BY PUSHING RELEASE BUTTON ON IT.
  - 3-WAY VENT VALVE TO BE OPERATED MANUALLY AFTER THE INERGEN SYSTEM DISCHARGE IN ORDER TO VENT TO ATMOSPHERE THE RESIDUAL N2 GAS IN PILOT LINE.

### REFERENCE DOCUMENTS

50489-530-080-00081-DAT-V001	GASEOUS FIRE SUPPRESSION SYSTEM - DATA SHEET
50489-530-080-00081-DAT-V002	FIRE ALARM SYSTEM - DATA SHEETS
50489-530-031-00081-GAD-V003	GASEOUS FIRE SUPPRESSION SYSTEM - CRUDE PUMP HOUSE SUBSTATION - CYLINDER ROOM ARRANGEMENT
50489-530-050-00081-LAD-V003	GASEOUS FIRE SUPPRESSION SYSTEM - CRUDE PUMP HOUSE SUBSTATION - PIPING LAYOUT
50489-530-080-00081-LAD-V003	FIRE ALARM SYSTEM - CRUDE PUMP HOUSE SUBSTATION - LAYOUT

- ### LEGENDS
- CYLINDER VALVE c/w PNEUMATIC ACTUATOR HEAD
  - N2 PILOT CYLINDER VALVE c/w ELECTRICAL ACTUATOR AND MANUAL ACTUATOR HEAD
  - ELECTRICAL-MANUAL ACTUATOR FOR SELECTOR VALVE
  - DISCHARGE NOZZLE
  - SYSTEM CONTROL PANEL SANCO FB 6100 (S.C.P.)
  - FEEDER FOR SYSTEM CONTROL PANEL SANCO FB 6100 (F.S.C.P.)
  - TERMINAL BOXES C/W TERMINAL
  - ELECTRIC ACTUATOR
  - LIMIT SWITCH
  - HIGH PRESSURE SWITCH
  - LOW PRESSURE SWITCH
  - GAS EXTINGUISH MANUAL STATION
  - GAS EXTINGUISH ABORT STATION
  - PRE-DISCHARGE HORN/STROBE RED
  - GAS-DISCHARGE LAMP STROBE RED
  - DUAL INPUT MONITOR MODULE C/W TERMINAL BOX
  - SUPERVISED OUTPUT MODULE C/W TERMINAL BOX
  - SHORT CIRCUIT ISOLATOR C/W TERMINAL BOX
  - SAFETY VALVE (DISCHARGE PIPING)
  - RUPTURE DISC (CYLINDER VALVE)
  - COPPER TUBING ø6mm
  - CHECK VALVE
  - THREE WAY VALVE
  - BALL VALVE

GRAPHIC SCALE 1:XX					
AB	AS BUILT	D.G.	L.C.	D.P.	D.P. 18.04.18
3	ISSUED FOR INCORPORATE CLIENT COMMENTS	A.F.	L.C.	D.P.	D.P. 104.12.17
2	REVISED WHERE NECESSARILY REQUIRED	A.F.	L.C.	D.P.	D.P. 22.09.17
1	ISSUED FOR INCORPORATE CLIENT COMMENTS	L.C.	L.C.	D.P.	D.P. 10.08.17
0	ISSUED FOR DESIGN	L.C.	L.C.	D.P.	D.P. 11.01.17
REV.	DESCRIPTION	DRAWN	CHECKED	HOD	DATE

### CONTRACTOR REVISION

<b>KUWAIT OIL CO. K. S. C.</b>		<b>شركة نفط الكويت ش.م.ك.</b>	
CONTRACTOR DETAILS:-			
<b>LARSEN &amp; TOUBRO LIMITED FARIDABAD</b>			
SUPPLIER DETAILS:-			
<b>SANCO</b>			
PROJECT TITLE:-			
<b>NEW GATHERING CENTRE GC-30 IN NORTH KUWAIT</b>			
DOCUMENT TITLE:-			
<b>PIPING &amp; INSTRUMENTATION DIAGRAM CRUDE PUMP HOUSE SUBST. INERT GAS SUPPRESSION SYSTEM P&amp;ID DIAGRAM</b>			
PROJECT NO.	DRAWING NO.	REV. SUPPLIER DRG. NO.	REV.
50489-530-000-00081-PD-V003	AB	SA-015859-003	AB
SHEET NO.	1 OF 1	SHEET NO.	1 OF 1
COMPANY DRG. NO.	REV. UTC NO.		
SHEET NO.			