*SOUTH OIL COMPANY*

*TENDER DOCUMENT*





1. **INTRODUCTION**

 PUMPING STATION ONE(PS-1) DEPOT IS LAY IN SOUTH OF IRAQ (60)KM WEST OF BASRAH DOWN TOWN ,IS CONTAIN A TEN STORAGE TANKS 82000 M3 EACH ,AND FIVE BOOSTER PUMPS TO DELIVER CRUDE OIL FROM STORAGE TANKS TO EXSIT MAIN TURBINE PUMPS,ECAH BOOSTER USED TO DELIVER CRUDE OIL FROM TWO TANKS, ALL BOOSTER PUMPS CONNECTED TO (2) HEADERS SIZE (42") .THE EXSIT TURBO PUMPS DELIVER CRUDE OIL TO FAO TERMINAL THROUGH EXIST TRUNK LINES (42")&(48") AT DISCHARGE HEAD 605M .

 S.O.C. INTENDS TO SUPPLY AND CONSTRUCTION A NEW CRUDE OIL TURBINE PUMPING UNITS TO BE INSTALLED IN PS1-DEPOT COMPLETE WITH ALL ELECIRICAL SUPPLY SYSTEM .THIS PACKAGE INCLUDES PUMPING UNITS REQUIRED FOR CRUDE OIL DELIVERY FROM BOOSTER PUMPS TO FAO DEPOT THROUGH EXSIT 48"&42" PIPE LINES. LENGTH 140 KM ,THIS PROJECT SHOULD DONE AS **EPC** **PROJECT** AND THE CONTRACTOR SHOULD BE INSTALLED THE TURBINE PUMPS IN PS-1DEPOT WITH CIVIL WORK FOR UNITS FOUNDATION ,ELECTRICAL ROOM,CONTROL ROOM AND SERVICE ROOMS…ETC ACC. TO SOC REQUIRMENTS.

***2*.0 - LOCATION**

IRAQ-BASRAH –NORTH RUMELIA PS-1 DEPOT

**3) MAIN PROJECT ITEMS:-**

2 SET TURBO PUMPS WITH ALL ACCASSORIES

CIVIL WORK FOR TURBO PUMPS FOUNDATION,SHED,CONTROL ROOM,ELECTRICAL,SERVICE ROOMS,PIPE SUPPORTS …. ETC

SITE WORKS FOR PUMPS INSTALLATION

DRAIN SYSTEM WITH ALL ACCASSORIES

INTER CONNECTING PIPING ARRANGMENTS

CONTROL SYSTEM

ELECTRICAL SYSTEM

FIRE FIGHTING SYSTEM

4-**CRUDE OIL PROPERTIES**

- WATER CONTENT =0 .05 %

- OIL SP.GR. @ 60ºF = 0.8699

- API = 28-34

- OIL VISCOSITY @ 70ºF= 15.6 CST

 @ 100ºF = 8.2 CST

 @ 120ºF=8.3 CST

SALT CONTENT PPM= 31

 R.V.P = 8.3 PSI

5**- FUEL GAS PROPERTIES**

GAS PRESSURE ( 20-35 Kg/CM2)

**FUEL GAS ANALYSIS ARE FOLLOWS :**

|  |  |
| --- | --- |
| COMPONENT  | VOL% |
| CO2 | 2.53 |
| H2S | NIL |
| C1 | 73.75 |
| C2 | 14.78 |
| C3 | 6.25 |
| 1-C4  | 1.45 |
| 1-C5 | 0.25 |
| N-C5 | 0.25 |
| C6+ | 0.09 |
| TOTAL  | 100% |

SP. GR A 15.6/15.6 ̊C = 0.7502

**6-CODES AND STNDARD:**

THE DESIGN , FABRICATION AND INSTALLATIONS OF THE EQUIPMENT SYSTEMS SHALL BE IN ACCORDANCE WITH GOODS INDUSTRIAL PRACTICES AND IN COMPLIANCE WITH THE LATEST EDITIONS AND REVISIONS OF THE FOLLOWING CODES AND STANDARDS AS APPLICABLE :

**-**AMERICAN NATIONAL STANDARDS INSTITUE , ANSI

ANSI B1.20.1 , ANSI B16.9 , ANSI B16.11 , ANSI B16.13 , ANSI B16.15 , ANSI B31.3 , ANSI B31.4 , ANSI B16.34 , ANSI B16.20 , ANSI B16.21

**-**AMERICAN PETROLUM INSTITUE

API RP 14E , API 600,API 650 , API 601 , API 610 , RP 500B PART1,API 650 , RP 520 PART1 , RP 520 PARTII ,API616,ETC

 RP 550B PARTI

**-**AMERICAN SOCIETY OF MECHANICAL ENGINEERS (ASME) ASME SEC.VIII ,

 DIV1.AWS D.1

**7- ENVIRONMENTAL CONDITION**

AMBIENT TEMP.                                         :             -5 , 60 °C

HUMIDITY ( NOVEMBER TO MARCH )  %        :            80 - 90

MAX RAIN FALL PER DAY mm                :           200

MAX WIND VELOCITY                                          :           140 KM/HR

WIND VELOCITY FOR DESIGN                           :           160 KM/HR

**THIS TENDER CONTAIN TWO MAIN SECTIONS:-**

**SECTION ONE**

1.0 **SCOPE OF SUPPLY**

 THE SCOPE SHALL INCLUDE DESIGN , DETAIL ENGINEERING,PROCUREMENT & DELIVERY OF EQUIPMENTS AND MATERIAL ,CONSTRUCTION TURBINE PUMPS , SUPERVISION DURING COMMISSIONING AND START UP AS SHOWN BELOW:-

* 1. **HORIZONTAL MAIN PUMPS**

TWO HORIZONTAL CENTRIFUGAL PUMPS, GAS TURBINE DRIVEN ARE REQUIRED TO RECEIVE CRUDE OIL FROM THE BOOSTER PUMPS (SUPPLY BY OTHER) AND DELIVERED IT INTO THE EXISTING 48” DIA. PIPE LINE . THE PUMPS AND TURBINE TO BE SUPPLIED ON COMMON SKID AND WITH ALL NECESSARY VALVES, FLOW CONTROL VALVES, PIPING AND ACCESSORIES PREFABRICATED TO THE MAXIMUM POSSIBLE EXTENT.THE TYPE OF CONNECTION SHOULD BE IN PARALLEL.

 THE CONTRACTOR SHOHLD BE MAKE SOME CONNECTION BETWEEN THE EXSIT UNIT AND SUGGESTED UNIT ACCORDING TO SOUTH OIL COMPANY REQUIRMENTS.

THE PUMPS SET SHALL SUPPLIED & OPERATE WITH THE FOLLOWING REQUIREMENTS:

DESIGN CODE : API (610-S6 ) LATEST ED.

NOS OF PUMPS : THREE (IN PARALLEL)

LIQUID PUMPS : CRUDE OIL WITH API (31.6)

DUTY : CONTINUOUS 24 HR /DAY

SUCTION HEAD (FOR 1ST PUMP) : 80 M

DISCHARGE HEAD : 605M

FLOW RATE :6100 M3/HR ( FOR EACH PUMP)

NPSH REQUIRED : (40-46)M

LUB. SYSTEM : TO BE CONFIRMED AS PER CODE.

AMBIENT TEMP : 0°C / MIN 55 ˚C MAX.

OPERATING TEMP : 13 - 80 ˚C

PUMPS INLET & OUTLET NOZZLE : MSS-SP44 24"X600#& 18"X600#

COUPLING : DIRECT FLEXIBLE(META STREAM)

EFFICIENCY : AS HIGH AS POSSIBLE

 PROTECTION / MEASUREMENTS : PRESSURE , TEMP AND VIBRATION.

SEAL TYPE : MECHANICAL

COOLING METHOD : BY PUMPING LIQUID

NO. OF STAGES : NOT MORE THAN 2 STAGE

TYPE OF CASING : AXIALLY SPLIT

* 1. **GAS TURBINE**

' TWO BRAND NEW TURBINE PUMPING UNITS ARE REQUIRED TO RECEIVE CRUDE OIL FROM BOOSTER PUMPS AND DELIVER IT TO THE EXISTING 48" PIPE LINE TO FAO DEPOT ,. THE TURBINES TO BE SUPPLIED ON SEPARATE SKIDS EACH WITH ALL NECESSARY VALVES, FLOW CONTROL VALVES, PIPING AND ACCESSORIES PREFABRICATED TO THE MAXIMUM POSSIBLE EXTENT (ONE PACKAGE).

THE TURBINE PUMPING SET SHALL SUPPLIED & OPERATE WITH THE FOLLOWING REQUIREMENTS:

**DESIGN CODE API 616 LATEST EDITION**

**MEDIA CRUDE OIL**

**DUTY CONTINOUS 24 HR/DAY**

**TURBINE SPECIFICATIONS**

INDIUSTRAIL GAS TURBINE AND POWER TURBINE (L.P) ,HEAVY DUTY CONTIOUS OPERATION FAST AND SMOOTH . HIGH RELIABILITY ,LONG LIFE AND CAPABLE OF DEVELOPING THE HORSE POWER REQUIRED TO DRIVE THE CRUDE OIL PUMP.

* TYPE OF TURBINE : SIMPLE CYCLE TWO SHAFT GAS TURBINE.
* AXIAL AIR FLOW TYPE COMPRESSOR WITH A HIGH COMPRESSION RATIO ,PREVENTED FROM REACHING THE SURGE LIMIT DURING ACCELERATION AND SHOULD BE ACCESSIBLE FOR INSPECTION WITHOUT MAJOR ENGINE DISASSEMBLE.
* COMBUSTOR ASSEMBLY SHOULD BE ACCESSIBLE FOR INSPECTION WITHOUT MAJOR ENGINE DISASSEMBLE.

**COMMON SKID DESIGN**

TURBINE SHOULD BE ACCOMODATES ON SKID OR BASE MOUNTED

POWER TURBINE AND AUXILIARY SYSTEMS PACKAGED ON A SINGLE SKID

MODULARIZED SYSTEM DESIGN

**CONNECTION**

FLEXIBLE METAL COUPLING BETWEEN THE GEARBOX AND DRIVEN EQUIPMENT (PUMP SET)COUPLNG DO NOT REQUIRE LUBRICATION ,IMPOSE NO EXCESSIVE AXIAL OR RADIAL LOADS SUITABLE GUARD COVERS FOR ROTATING COMPONENTS

**GEAR BOX**

RUGGED INDUSTRIAL GEAR BOX OF ASSEMBLYAND DISASSEMBELY FACILITY

**DRIVEN EQUIPMENT**

TURBINE SHOULD DRIVE A PUMP SET. HIGHEST EFFICIENCY PUMP IN THE INDUSTRY AND HIGH EFF. MANUFACTURERS SHOULD BE OFFERED.

**AIR SERVICES**

SERVICE AIR COMPRESSORS FOR GENERAL AND DAILY USE.

**LUBRICATING OIL SYSTEM**

SYNTHETIC OIL SHOULD BE PROVIDES TO GAS TURBINE ,POWER TURBINE,GEAR BOX AND PUMP FOR HIGHER DURABILITY AND LONGER LIFE THAN MINERAL OIL

AC MOTOR DRIVEN ACCESSORIES AND AUXILIARY PUMP FOR BACKUP

AIR OIL COOLER,OIL HEATER ,FLAME TRAP AND TANK VENT SEPARATOR

OIL SYSTEM COMPONENTS SKID MOUNTED DESIGNED TO API STANDARD.

MECHANICAL LUBE. OIL PUMP.

EMERGENCY DC PUMPS MOTORS .

**FUEL SYSTEM**

ON SKID FUEL SYSTEM INCLUDES ALL COMPONENTS NEEDED TO CONTROL FUEL DURING STARTUP AND OPERATION

OPERATES ON NATURAL GAS

* GAS SCRUBER AND GAS HEATER SHOULD BE INCLUDED
* BOOSTING COMPRESSOR (IF REQUIRED) TO TREAT THE GAS UP TO SPECIFICATION OF GAS TURBINES.

**AIR INTAKE SYSTEM**

INCLUDES TWO STAGE DRY FILTERS, SELF CLEANING TYPE, HIGH EFFICINCY ,SILENCER AND FLOW DIRECTION GEOMETRY PROVIDES CLEAN ,UNIFORM AIR FLOW TO GAS TURBINE ENGINE BECAUSE IT WORK IN DUSTY CLIMATE SITE SPECIFIC DESIGN TO MINIMIZES DISTRUPTION OF INLET AIR.

FILTRATION SYSTEM MUST BE AVAILABLE TO HANDLE SITE EXTREMES TO SERVE SEVERE HEAT AND DUST

**GAS TURBINE ENCLOUSER**

ACOUSTIC ENCLOSURES MEET WIDE RANGE OF REQUIRMENTS FOR HIGH TEMP. AND HUMIDITY. FACTORY COMPLETED ENCLOUSER CAN HOUSE ALL AUXILARY EQUIPMENTS ON TURBINE SKID WITH PIPING AND WIRING COMPLETED AND TESTED AT FACTORY COMPLETED ENCLOUSERS SHIPPED WITH CONNECTIONS INTACT FOR SIMPLIFIED INSTALLATION AND COMMISSIONING

MANUALS SHOULD BE INCLUDED SOFT HARD COPY .

**WATER WASHING SYSTEM**

WATER WASHING SYSTEM SHALL INCLUDES AC WATER WASH PUMP INCLUDES STORAGE TANKS, PRESSURE GAUGES,VALVES AND PIPING .

**TYPE OF SEALING**

MECHANICAL SEAL FLUSHED BY SAME PRESSURIZED LIQUID WITH A HIGH EFFICINCY CYCLONE SEPERATORS AND DESIGNED WITH THE LATEST MODIFECATIONS TO TREAT WITH ALL TYPES OF CRUDE OIL.

**DRAIN SYSTEM**

- COMPLETE DRAIN SYSTEM WITH DRANG PUMP SHOULD BE INCLUDED .

**FIRE FIGHTNG SYSTEM**

- COMPLETE FIRE FIGHTNG SYSTEM PACKAGE FOR EACH TURBINE UNIT TO BE INLCULDED. AND CO2 FIRE PROTECTION SYSTEM WTH ALL ACCESSORIES .

**OVER HEAD CRANES**

TWO OVER HEAD CRANES (SUITABLE FOR ALL EQUIPMENTS WEIGHTS ) EACH ONE WITH ALL ACCESSORIES SHOULD BE INSTALLED TO LIFT THE MECHANICAL PARTS DURING THE MAINTENANCE .THE FIRST IS INSTALLED INSUDE THE GAS TURBINE SHED AREA AND THE OTHER INSTALLED INSIDE PUMPS SHED AREA.

**TURBINE& PUMPS SHED**

TURBO PUMP UNIT SHOULD BE INSIDE SHED ,THE SHED TO BE DIVIDED INTO TWO AREA SEPRATED BY WALL USED TO DECREASE THE NOSIE ,THE FIRST AREA CONTAIN THE GAS TURBINE WITH ACCASSORIES ,THE OTHER AREA CONTAINS THE PUMP.

**1.3 ELECTRICAL SYSYEM**

ELECRICAL SYSYEM REQUIRED SHOULD BE INCLUDE THE FOLLOWING BUT NOT LIMTTED :

* + 1. **POWER TRANSFORMERS** :

 -TWO STEP DOWN LOW VOLTAGE TRANSFORMER 6.6 / 0.4 KV FOR **( PS- 1** DEPOT **)**

 ALL THESE POWER TRANSFORMERS WITH THE FOLLOWING SPECIFICATION AND ACCORDING TO THE IEC -76 STANDARD .

CAPACITY : 1.5 MVA

FREQUINCY : 50 HZ

MINERAL OIL IMMERSED INTEGRALLY FILLEDINSTALLATION:INDOOR

COOLING : ONAN

 OFF-CIRCUIT TAP CHANGER ON HV SIDE : ± 2 X 2.5 %

VECTOR GROUP : DYN11

AMBIENT TEMPERATURE : 55 C⁰

WINDING MATERIAL HV/LV : CU/CU

TEMP CONTROL : PROTECTIVE RELAY DGPT2

HV & LV CONNECTION : : ∆ / Y

PRIMARY SIDE : PLUG IN CONNECTION

SECONDARY : 4 FLAT BUS IN SIDE IP 54 TERMINAL BOX .

**1.3.2- LVM DISTRIBUTION BOARD**  **:**

LOW VOLTAGE MAIN DISTRIBUTION BOARD , INDOOR TYPE , FREE STANDING , 400V , 3PH, 4 WIRES , 50HZ , CONSIST OF THREE SECTIONS A , B , C COMPLET WITH FOLLOWING :

-TWO INCOMING L.V AIR CIRCUIT BREAKER ( A.B.C ) , 3500 A RATING CURRENT, 80 KA MAX SHORT CIRCUIT CURRENT FOR SECTIONS A, B .

-ONE BUS COUPLER L.V AIR CIRCUIT BREAKER ( A.B.C ) , 3500 A RATING CURRENT , 80 KA MAX SHORT CIRCUIT CURRENT BETWEEN SECTIONS A, B .

- ONE INCOMER L.V AIR CIRCUIT BREAKER ( A.B.C ) , 2000 A RATING CURRENT, 80 KA MAX SHORT CIRCUIT CURRENT FOR SECTION C COMING FROM GENERATORS .

-ONE BUS COUPLER L.V AIR CIRCUIT BREAKER ( A.B.C ) , 2000 A RATING CURRENT , 80 KA MAX SHORT CIRCUIT CURRENT BETWEEN SECTIONS B, C .

 SECTION C USED FOR ( UPS – FIRE FIGHTING – LIGHTING – VALVES …….EXT .

 SO SWITCH SUITABLE BETWEEN INCOMERS .

- 3 NOS. OUT GOING FEEDERS ( A.B.C ) , 800 A , 3 PH ( 1 NOS. FOR EACH MCC FOR EACH TURBINE ) .

- 3 NOS. OUT GOING FEEDERS ( A.B.C ) , 500 A , 3 PH .

- 3 NOS. OF AMMETER & ONE VOLTMETER PLUS VOLTMETER SELECTOR SWITCH .

 LOW VOLTAGE MAIN DISTRIBUTION BOARD SHOULD HAVE AN AUTO CHANGE OVER SWITCH 2/3 .

- INCOMERS SHOULD BE PROTECTED AGAINST O/C , S/C , E/F & U/V .

- AN AUXILIARY TRIP RELAY SHOULD BE INCLUDED FOR HIGH OIL TEMP. AND OVER PRESSURE OF THE INCOMERS ( 1.5 MVA ) TRANSFORMER .

- INCOMER METERING SHOULD BE COMPRISE AMMETER , AMMETER SELECTOR SWITCH , VOLTMETER , VOLTMETER SELECTOR SWITCH , AND SUPPLY HEALTHY INDICATOR LAMP .

- THE BUS SECTION CIRCUIT BREAKER SHALL HAVE A VOLTMETER AND SELECTOR SWITCH TO INDICATE THE BUS BAR VOLTAGE ON EITHER SIDE .

- MECHANICAL INTER LOCKING SHALL BE PROVIDED TO RESTRICT CLOSURE OF THE SECOND INCOMER AND THE BUS SECTION , TO ANY TWO OUT OF THREE .

- BUS BARS AND RISERS SHALL BE HARD DROWN COPPER AND TO BE WITHSTAND THE SHORT CIRCUIT LEVEL ( 80 KA ) .

 ALL THE ABOVE OUTGOING MCCB SHOULD PROVIDED RESPECTIVELY WITH :

* BRASS GLANDS SUITABLE FOR 3 PH ARMOURED CABLES .
* SPACE HEATER WITH THERMOSTAT .

**NOTE : ( ONE LOW VOLTAGE MAIN DISTRIBUTION BOARD PER EACH STATION ) .**

**1.3.3 - DUAL UPS:**

DUAL UPS 110 VAC WITH SUITABLE POWER FOR CONTROL SYSTEM CONSIST OF :

- BATTERY CHARGER .

- SET OF BATTERIES NI-CD SUITABLE .

- TOW INVERTERS WITH BY PASS LINE .

**NOTE : ( ONE DUAL UPS PER EACH STATION ) .**

**1.3.4 - CMCC SWITCHBOARD** **:**

COMPLETE MOTOR CONTROL CENTER FOR EACH TURBINE CONSIST OF :

CMCC SWITCHBOARD , 0.4KV,3PH, 4 WIRE , 50HZ , SUITABLE FOR INDOOR USE, FREE STANDING AND HAVE PROTECTION AGAINST S/C, O/L, E/F, U/V AND WITH ALL NECESSARY PROTECTION RELAYS AND MEASURMENTS AND CONTAINS THE FOLLOWING BUT NOT LIMITTED.

TOW INCOMERS ACB , 750A .

BUS COUPLER ACB, 750A .

OUT GOING FEEDERS FOR ALL LOW VOLTAGE LOAD .

CMCC SHOULD INCLUDE ALSO 20% OF THE LOAD ABOVE AS A SPEAR FOR FUTURE.

**NOTE : ( ONE CMCC PER EACH TURBINE ) .**

**1.3.5 - MV& LV POWER CABLES:**

BIDDER SHOULD SUBMIT ALL POWER CABLES ( 11KV & 0.4 KV ) C/W ALL ACCESSORIES ( TRMINAL JOINTS , LUGS AND GLANDS ) . TAKINGINTO ACCOUNT THE FOLLOWING :

THE DISTANCE BETWEEN MV SWG AND TRANSFORMERS AREA IS 500 M .

THE DISTANCE BETWEEN CMCC AND TURBINES AREA IS 500 M ALSO .

THE SPECIFICATION OF CABLES SHOULD BE AS FOLLOWING:-

MV CABLES

TYPE OF CABLE : XLPE 3 CORE

RATED INSULATION VOLTAGE : 12 KV

SERVICE VOLTAGE : 11 KV

CONDUCTOR : STANDED COPPER

CONDUCTOR INSULATION : XLPE

SEMICONDUCTOR SCREEN ON CONDUCTOR AND INSTULATION : EXTRUDED

METALIC SHELD : ONE CU TAPE

BEDDING : PVC

ARMOUR : GALVANIZED ROUND STEEL WIRE

OUTER SHEATH : PVC HYDROCARBON RESISTANT

LENTH PERDRUM : 500M

LV CABLES

RATED INSULATION VOLTAGE : 0.4 KV

CONDUCTOR : STRANDED CU

CONDUCTOR INSULATION : XLPE

BEDDING : PVC

ARMOUR : GALVANIZED ROUND STEEL WIRE

OUTER SHEATH : PVC HYDROCARBON RESISTANT

**1.3.6 - EARTHING SYSTEM:**

EARTHING SYSTEM FOR ALL EQUIOMENTS SHOULD BE INCLUDED, NOT EXCEED 1 Ω .

**1.3.7 - AREA LIGHTING:**

CLASSIFIED AREA ( EEX-D) LIGHTING USED IN HAZARDOUS AREA SHOULD BE INCLUDED .

.**1.3. 8 – EMERGENCY LIGHTING:**

MERGENCY LIGHTING SHOULD BE INCLUDED .

**1.3.9 - VALVES:**

 SYNCHROSET ROTORK TYPE IQ ACTUATOR VALVE HARD WIRED FOR CONVENTIONAL MONITORING AND CONTROL SUITABLE FOR HAZARDOUS AREA ( CLASS 1 , DIV 1 , GROUP C , D ) ( EEXD – 11C – T4 ) IP 68 .

***NOTE :***

 **- ALL ELECTRICAL EQUIPMENT SHOULD BE INSTALLED IN SUITABLE AIR CONDITIONING ROOM WITH SUITABLE LOCALLY OVERHEAD CRANE .**

 **- ELECTRICAL SPECIAL TOOLS SHOULD BE INCLUDED.**

 **- ALL MOTORS SHOULD BE USED IN HAZARDOUS AREA .**

**-BIDDER SHULD SUBMIT A VENDOR LIST FOR ALL THE ITEMS .**   **-EARS IS REQUIRED FOR EACH ANNUNCIATOR AND EACH RECORDER IN THE COMMON CONTROL PANEL.**

**-( 5 ) YEAR SPARE PART PRINT CHARTS FOR EACH RECORDERS REQUIRED .**

 **- PREFERRED ORIGINS : JAPANESE , USA , WEST EUROPA.**

* **EACH RECORDER MUST HAVE THE ABILITY TO COMMUNICATION WITH THE CONTROL ROOM PC UNIT .**

**- DRAWINGS & CATALOGUE SHOULD BE SUBMITTED .**

**- ALL REQUIRED CERTIFICATES SHOULD BE SUBMITTED .**

 **1.4 INSTRUMENTATION AND CONTROL PACKAGE.**

 **1.4.1 GENERAL**

* THE FOLLOWING SPECIFICATIONS ARE THE MINIMUM TECHNICAL REQUIRMENTS, ANY OTHER TECHNICAL SOLUTIONS REFLECT THE EXPERIENCE AND THE SUPPLIER OF THOS SUBJECT SHOULD BE OFFERD AND SUBJECTED TO SOUTH OIL COMPANY AND APPROVAL .
* THE FOLLOWING STANDARD AND CODES OR EQIVALENT SHALL CONSTITUTE A GUIDE WHERE APPLICABLE IN THE SELECTION ,DESIGN,AND INSTALLATION.
1. ENGINEERING DESIGN BASED ON IES,ISO,CENELEC
2. UNIT CONTROLLER PLC SOFTWARE IS BASED ON DIN/IEC 1131-3
3. PIPING AND INSTRUMENT DIAGRAM IS BASED ON ISA S5.1
4. API- RP551,552,553,554,556, INSTALLATION OF INSTRUMENT
* EACH TURBO PUMP SHOULD BE SUPPLIED WITH ITS OWN ,CONTROL PANEL AND PLC ( MICRO PROCESSOR BASED) ,A PROVISION FOR POSSIBILITY OF OPERATION OF TURBO PUMP FROM THIS DCS SYSTEM IS REQUIRED BY A TERMINAL STRIPS PROVISION (DCS CONTROL SYSTEM WILL BE SUPPLIED BY OTHERS)
* THE TURBINE UNIT SHALL HAVE A DEDICATED ,INDEPENDENT CONTROL
* CONTRACTOR SHOULD ENSURE THE SUPPLY ,INSTALLATION AND TEST OF ALL CONTROL ELEMENTS ASSOCIATED WITH THE TURBINE AUXILIARIES . CONTRACTOR SHOULD ENSURE THE DRIVEN EQUIPMENT ,INSTRUMENTATION AND PROCESS TAPS IS TO BE PROVIDED BY DRIVEN EQUIPMENT SUPPLIER.
* THE CONTRACTOR SHOULD BE ENSURE THAT THE TURBINE AUXILIARIES ALL SKIDS MOUNTED INSTRUMENTATION CABLES . ALL CABLES SHOULD BE IN CONDUCT AND SHOULD BE SUPPORTED AND TERMLEINATED IN JUNCTION BOXES AT THE EDEGE OF THE TURBINE UNIT SKID. TERMINATION SHOULD BE SEGREGATED INTO JUNCTION BOXES ACCORDING TO SIGNAL LEVEL AND FUNCTION ,THE CABLES INSIDE PACKAGE UNIT IS REQUIRED TO BE ARMOUND.
* UNIT CONTROL PANEL SHOULD BE PROVIDED FOR EACH TURBINE EACH CONTROL PANEL SHOULD BE COMPLETE WITH REQUIRED PANEL MOUNTED INSTRUMENT AND INTERNAL WIRING .
* ALSO VARIOUS TURBINE UNIT OPERATING PARAMETERS AND STATUS SHOULD BE DISPLAYED ON THE UNIT CONTROL PANEL AND SAHOULD BE FEED INTO THE STATION SUPERVISORY TERMINAL.
* THE ELECTRICAL COMPONENTS AND INSTALLATION INSIDE THE TURBINE ENCLOSURE OR WITHIN THE INSTALLATION AREA SHOULD BE CONFORM TO FREQUIRMENTS OF ELECTRICAL AREA CLASSIFICATION.

**1.4.2 UNIT CONTROL PANEL**

 THE UNIT CONTROL PANEL SHOULD BE CONTAIN ALL LOGIC AND CONTROL INSTRUMENTATION REQUIRED FOR AUTOMATIC START-UP,NORMAL OPERATION ,NORMAL SHUT-DOWN AND EMERGENCY SHUT DOWN SEQUENCING .THE PRINCIPLE INSTRUMENTATION AND CONTROL SYSTEM SHOULD BE ELECTRICAL OR ELECTRONIC ,HOWEVER THE SUPPLIER /MAN FACTURES STANDARD CONTROL SCHEME SHOULD BE USED WHERE APPLICABLE PROVIDE A DETAILED DESCRIPTION OF THIS STANDARD CONTROL SYSTEM .

 THE UNIT CONTROL PANELS SHOULD BE INSTALLED IN THE CONTROL ROOM . THE DISTANCE FROM THE CONTROL ROOM TO THE TURBINE SKID TO LOCATED LATER.

**1.4.3 REMOTE CONTROL**

* THE LOCAL CONTROL SYSTEM SHOULD BE PROVID A SET POINT TO EACH SPEED CONTROLLER TO ACHIEVE A BALANCE CONDITION ,IN ADDATION,THE UNIT CONTROL PANEL SHOULD ACCEPT THE FALLOWING EXTERNAL COMMANDS FROM THE SUPERVISORY SYSTEM:
* OPERATE PERMISSIVE
* IDLE SPEED AND TRIP TO IDLE
* OPERATING SPEED
* NORMAL STOP
* OTHER SIGNALS SPECIFIED BY MANUFACTURER

**1.4.4 LOCAL CONTROLS:**

THE UNIT CONTROL PANEL SHOULD BE CONTAIN REMOTE LOCAL SELECTOR SWITCH ,WHICH SHALL DETERMINE THE MODE OF OPRATATION

* IN THE (REMOTE) POSITION ,THE COMMANDS SHALL BE ACCEPTED FROM THE SUPERVISORY SYSTEM ,WHILE IN THE (LOCAL )POSITION ,THE COMMANDS SHALL BE ACCEPTED -
* IN ADDATION "EMERGENCY STOP"PUSH BUTTONS ,SHALL BE PROVIDED ON THE UNIT CONTROL PANEL AND NEAR THE TURBINE ENCLOSURE .

**1.4.5 ALARM/SHUT-DOWN AND STATUS INDICATION**

ALARM,SHUT-DOWN AND STATUS INDICATION NON-SELF- CORRECTING MALFUNCTIONS SHALL PRODUCE A " LOCK-OUT" SHUT-DOWN. THIS CONDITION SHALL REQUIRE A MANUAL RESET AT THE UNIT CONTROL PANEL BEFORE A RESET CAN BE INDICATED .

ALL ALARM AND SHUT-DOWN FUNCTION SHALL BE ACTUAL AND VISUAL INDUCTION ,AN ACKNOWLEDGE BUTTON SHALL BE PROVIDED FOR SILENCING THE AUDIBLE ALARM ,BUT DISPLAYS SHALL BE RETAINED UNIT THE CONDITION IS CORRECTED AND A RESET COMMAND IS GIVEN

* EACH UNIT CONTROL PANEL SHOULD BE CONTAIN FLASHING FIRST-OUT ENUNCIATOR THAT SHALL INDICATE THE CAUSE OF ALARM AND /OR SHUT-DOWN CONDITION (OR EQUIVALENT)
* FOR EACH TURBO PUMP SHOULD BE HAVE ITS OWN PLC WHICH CONTAIN BUILT-IN HMI.
* FOR ALL TURBO PUMPS SHOULD HAVE MAIN HMI CONTROL ALL TURBO PUMPS AND FACILITY TO CONNECT TO MAIN CONTROL ROOM AT THE DEPOT.
* STATUS INDICATION LIGHTS (OR EQUIVALENT) ON THE PANEL SHALL BE USED TO INDICATE THE FALLOWING STATUS CONDITION ,AS MINIMUM:-
* UNIT READY
* START SEQUENCING
* IDLE SPEED
* OPERATING SPEED
* START FAILURE
* LOCKED-OUT
* ETC
* ALL ALARMS AND STATUS CONDITIONS BE PROVIDED TO SUPERVISORY SYSTEM
* MANUFACTURER ASSIGN THE REQUIRED ALARM SHUT-DOWN, MEASUREMENT,MONITORING TRENDS PARAMETERS,CONTROL AND SYSTEM

 **1.4.6 FUEL CONDITIONING UNIT**

BIDDER SHOULD BE PROVIDE ALL NECESSARY INSTRUMENT (PRESURE AND TEMPERATURE GAUGE ,PRESSURE RELIEF VALVE ,JUNCTION BOX, ETC)CONTROL VALVES IF ANY AND ALL NECEASSRY INSTRUMENT TO OUT THE UNIT IN OPERATION.

**1.4.7 FIRE &GAS DETECTION SYSTEM:-**

 A- THE OUTPUT SIGNALS OF THE FIRE SYSTEM (ALARM&S/D)SHOULD BE CONNECTED TO THE MAIN CONTROL PANEL .

B- HEAT DETECTORS SHOULD BE CONNECTED ON THE GEAR BOX ALSO(PUMP+GEAR BOX) .

C- THE WORKING TEMP. FOR THE SENSORE SHOULD BE 100ºC AT LEAST.

**NOTE:-**

THE BIDDER SHOULD BE PROVIDE ALL NECEASSRY POWER SYSTEM(UPS,BATTERY CHARGER,ETC) WHICH REQUIRED FOR OPRATION THE CONTROL SYSTEM .THE AVAILABLE POWER SUPPLY WILL BE THREE PHASE 380 V.

**1.5 DRAIN SYSTEM:-**

THE SCOPE OF SUPPLY SHOULD BE INCLUDING DESIGN ,PROCURMENT,AND INSTALLATION A DRAIN SYTEM TO COLLECT ALL DRAINS FROM PUMPS AND PIPING TO UNDER GROUND SLOPE TANK INSTALLED INSIDE CONCRETE BASIN EQUIPED WITH TWO VERRICAL PUMPS TO TRANSFER CRUDE OIL FROM DRAIN TANK TO EXSIT STORAGE TANKS OR SUCTION HEADERS.

**1.6 FIRE FIGHTING SYSTEM:-**

**FIRE DETECTION & FIRE FIGHTING SYSTEM**

EACH PUMPING UNIT SHOULD BE EQUIPPED WITH AUTOMATIC FIRE DETECTION & FIRE SUPPRESSION SYSTEM. CONTROLLED AND SUPERVISED BY CENTRAL CONTROL PANEL FOR EACH PUMPING TRAIN AS FOLLOW:-

**FIRE DETECTION SYSTEM**

* AS PART OF SYSTEM INTEGRITY SHOULD BE DESIGNED AND CONSTRUCTED ACCORDING TO NFPA-CODE AND STANDARD.
* DETECTION PHILOSOPHY BASED ON SINGLE ZONE PER EACH PROTECTED AREA WITHIN PUMPING UNIT.
* DETECTORS TO BE USED ( SMOKE,HEAT& UV) WHERE REQUIRED .
* PROTECTED AREAS PER EACH PUMPING UNIT /TRAIN:
	+ TURBINE ENCLOSURE & ITS ACCESSORIES.
	+ GEAR BOX, POWER TURBINE & COUPLING.
	+ CRUDE OIL PUMP BAY AS ONE ZONE.
* MAIN CONTROL ROOM AND LOW VOLTAGES EIEC. DIST. ROOM AND MCC.
* **CENTRAL FIRE PANEL:**
	+ COMOPSE AS ONE COMMON SUPERVISORY AND CONTROL UNIT FOR EACH COMPLETE UNIT PUMPING TRAIN AND ANOTHER REPEATER ONE LOCATED IN FIRE BRIGADE CONTROL ROOM WITH GENERAL ALARM SYSTEM.
	+ THE PANELS DELIVER ALL SYSTEM STATUS IN DISPLAY SCREEN WITH MODULAR SYSTEM LAY –OUT SHOWING EACH EVENTS AND ANOTHER TV-MONITOR INTEGRATED IN THE SAME SYSTEM.
	+ THE SYSTEM IN COROPORATE SHUTDOWN FUNCTION DUE TO FIRE ALARM OR FIRE SYSTEM GOES ON.
	+ ALL DETECTION AND ACTUATION ELECTRONIC CARDS TO BE PLUG-IN TYPE.
	+ SYSTEM POWER & SINGLE VOLTAGE TO BE COMBATABLE WITH OTHER SYSTEM COMPONENTS OF THE PUMPING TRAIN.
* **MANUAL CALL STATION (PUSH BUTTON):**
	+ THE AREA OF WHOLE PUMPING TRAIN SHOULD BE SUPPLIED WITH NUMBER OF SITE (P.B) FOR PERSONAL APPROACHES AND ANNOUNCING.
	+ **FIRE FIGHTING AND SUPPRESSION SYSTEM:**
	+ TYPE / TOTAL FLOODING , AUTOMATIC & MANUAL ACTUATION
	+ AGENT TO BE USED/ FM200 or FE25.
	+ APPLICATION RATE / AS PER DESIGN REQUIRMENTS.
	+ QUANTITY (SALVAGE + 100% RESERVE.)
	+ DISTRIBUTION / DIP HOT GALVANIZED CS PIPES AND SPRINKLERS.

 THE ABOVE SYSTEM PER EACH PUMPING UNIT SHOULD BE SUPPLIED PRE-DESIGNED AND PRE-FABRICATED WITH STAND –UP &COMMISSIONING (GAS) CHARGE.

* SALVAGE CYLINDERS &RESERVE CYLINDERS TO BE INTERCONNECTED TO COMMON PIPING MANIFOLD WITH THRU CHANGE OFF DEVICE AND ZONE DIRECTIONAL VALVES CAN BE ACTUATED AUTOMATICALLY AS WELL AS MANUALLY.
* SYSTEM STATUS AND SUPERVISORY SHOULD BE INTEGRATED IN SAME CONTROL PANEL OF THE DETECTION SYSTEM.

**ACCESSORIES & SERVICE EQUIPMENTS:**

* (900 – 1000) kg OF BULK AGENT TO BE PROVIDED WITH THE EQUIPMENTS DELIVERED PER EACH PUMPING TRAIN (STANDARD MANUFACTURER) CYLINDER.
* TEST, FILLING AND PRESSURIZING TOOL& EQUIPMENT TO BE SUPPLIED.
* FIRE DETECTORS FOR AT LEAST (TWO PER EACH TYPE )AS SPARE ITEM FOR EACH PUMPING UNIT.
1. **FIXED SYSTEM; EXPLO. GAS MONITORING:**
* FOR DETECT AND MONITOR ANY FLAMMABLE GAS LEAKAGE INSIDE TURBINE ENCLOSURE WITH SPECIFIED ALARM DEGREE AT THREE STAGES

 (OR AS MANUFACTURER SPECIFIED):-

* + 5% LEL GENERAL ALARM
	+ 10% LEL GENERAL CONTINUOUS
* 20 % > 10 % LEL PRE SHUTDOWN ALARM & 30 Sec. DELAY FOR COMMENCING UNIT SHUTDOWN.
* WALL MOUNTED PANEL ,WITH (IP65,RATING INCLUDE AT LEAST (8-12) CHANNELS COMPRISING BUILT-IN EVENT LOGGER ,SYSTEM STATUS AND INTEGRITY WATCHDOG.
	1. **INTER CONNECTING PIPING AND SKID**

PREFABRICATED SKIDS FOR MAIN PUMPS AND TURBINE , COATING AFTER ALL WELDING OF SKID HAS BEEN COMPLETED , ONE COAT OF CHROMATE PRIMER. .APPLIED FOLLOWED BY ALUMINUM COLOR ENAMEL FINAL PLANT.THE SCOPE OF SUPPLY SHOULD BE INCLUDED ALL INTERCONNECTING PIPNG FROM SUCTION HEADERS OF PUMPS TO DISCHARGE ,RECYCLE AND RELIEF HEADERS ,THE WORK SHOULD BE INCLUDED CONNECTED THE PROPOSAL UNIT WITH THE SUCTION&DISCHARGE HEADERS INSIDE THE DEPOT.WITH NECEASSRY STELL STRUCTUER SUPPORTS,SERVICES PLATFORMS,PIPING CROSSWAY AND WALKLY

ALL PIPING TO BE ACC. TO API 5 L

ALL FITTING TO BE ACC. TO ASTM A 234

STEEL STRUCTUER A 36

* 1. **VALVES**

ALL VALVES TO BE ACC. API 6D FACE TO FACE , DIM. ACC.TO ANSI B16.10 AND MSS-SP44 VALVES TESTING - ACC. TO API 598.

ALL VALVES SHOULD BE MOTORIZED BALL VALVES.

PUMPS TO BE PROVIDED WITH THE FOLLOWING VALVES AND INSTRUMENTATION:-

SUCTION LINE ISOLATION VALVES.

SUCTION LINE TEMPORARY STRAINER.

RECYCLE VALVES

DISCHARGE LINE ISOLATION VALVE

DISCHARGE LINE CHECK VALVE

LOCAL PRESSURE GAUGES & SWITCHES ON SEC. & DISCH.

LOCAL / REMOTE START / STOP PUSH BUTTONS.

PUMP AND TURBINE SPECIFICATION TO BE STATED CLEARLY AT A NAME PLATE.

CHARACTERISTIC CURVE FOR PUMPS TO BE SUPPLIED AS WELL AS CATALOGUES

* 1. **THIRD PARTY INSPECTION**

THE CONTRACTOR WILL HIRE A THIRD PARTY INSPECTION AGENCY FROM THE FOLLOWING AGENCIES, , DNV, LLOYDS.TUV AND ANY OTHER AGENCY WILL BE AGREED UPON BY THE TWO PARTIES. COSTS FOR THIS SERVICE WILL BE AT THE CONTRACTORS ACCOUNT

THE INSPECTORS OF THIRD PARTY WILL CHECK ALL THE TECHNICAL SPECIFICATION OF PUMPS& TURBINE ACCORDING TO THE RECOMMENDATION STANDARDS& ALL OTHER MATERIALS, ELECTRICAL SUPPLY SYSTEM EQUIPMENTS AND INSTRUMENTATION WILL BE CHECKED ACC. TO CONTACT SPECIFICATIONS AND DATA SHEET .

THIRD PARTY WILL CONFIRM THAT THE MATERIALS AND EQUIPMENT ARE SHIPPED ACC. TO THE NUMBER AND TECHNICAL SPECIFICATIONS OF THE CONTRACT.

* 1. **TESTING:**

THE SUPPLIER, OR MANUFACTURER SHOULD SUBMIT , DETAILED PROCEDURE FOR ALL RUNNING TESTS , FOR REVIEWING FOR AT LEAST THREE WEEKS BEFORE THE FIRST SCHEDULED TEST . THE FOLLOWING TESTS SHOULD WITNESSED BY OUR ENGINEERS.( ALL THE COST WILL BE BEARD BY THE SUPPLIER).

1. WITNESSED FULL DRIVER PERFORMANCE TEST.
2. WITNESSED HYDROSTATIC TESTS ON ALL PUMPS .
3. WITNESSED PERFORMANCE TESTS ON ALL PUMPS AND TURBINE.
4. WITNESSED TESTS NPSH TEST ON ONE PUMP ONLY
5. WITNESSED PERFPRMANCE TESTS FOR MV SWG&PMCC
6. FAT FOR CONTROL SYSTEM
* THE ABOVE TESTS SHOULD BE INTENDS AND WITNESSED BY THREE PERSONS FOR EACH ONE.
* MAIN PARTS PUMP ASSEMBLY SHOULD BE ATTEND BY SIX SOC ENGINEERS AT THE FACTORY FREE OF CHARGE.
* MAIN PARTS TURBINE ENGINS ASSEMBLY SHOULD BE ATTEND BY SIX SOC ENGINEERS AT THE FACTORY FREE OF CHARGE.

 **1.11 TRAINING:**

THE SUPPLIER, OR MANUFACTURER SHOULD SUBMIT , DETAILED TRAINING SCHEDUAL FOR ALL EQUIPMENTS , REVIEWING THE TECHNICAL TOPICS WHICH WILL BE DETAILED FOR FOUR WEEKS . THE FOLLOWING ENGINEERING DEPARTMENTS SHOULD ATTENDS BY OUR ENGINEERS.( ALL THE COST WILL BE BEARD BY THE SUPPLIER).

1. TWENTY PERSONS FROM MECHANICAL ENGINEERING DEPARTMENT.
2. TWENTY PERSONS FROM ELECTRICAL ENGINEERING DEPARTMENT.
3. TWENTY PERSONS FROM INSTRUMENT ENGINEERING DEPARTMENT.
4. TWENTY PERSONS FROM THE OPERATION DEPARTMENTS.

**1.11 SPECIAL TOOLS:**

VENDER SHALL SPECIFY AND QUOTE RECOMMENDED SPECIAL TOOLS FOR PUMPS INSPECTIONS, ERECTION, NORMAL MAINTENANCE AND OVER HAUL REPAIR.

THE SPECIAL TOOLS LIST SHELL BE INCLUDE :

1. TWO HORIZONTAL STANDS FOR GAS TURBINE.
2. TWO HORIZONTAL STANDS FOR POWER TURBINE.
3. TWO SLINGS LIFT GAS TURBINE / POWER TURBINE HORIZONTAL.

**1.12 EQUIPMENT WARRANTY**

THE MANUFACTURER OR SUPPLIER AGREES TO REPAIR OR REPLACE ANY EQUIPMENT DESIGNED AND SUPPLIED BY THEM WHICH IS FOUND TO BE DEFECTIVE IN MATERIALS OR WORKMANSHIP WITHIN 547 DAYS FROM THE DATE OF THE LAST SHIPMENT OR 365 DAYS FROM EQUIPMENT START- UP WHICHEVER SHALL BE THE SOONER

AS SOON AS SUCH DEFECT HAVE BEEN DISCOVERED BY THE CLIENT , THE MANUFACTURER OR SUPPLIER WILL GIVE A WRITTEN NOTIFICATION AND HE MANUFACTURER SHALL PROPOSE A METHOD TO ACHIEVED A SATISFACTORY CORRECTION OF THE DEFECT , AND HE WILL BEAR ALL THE PREMIUM COSTS OF OVERTIME LABOUR, AIR FRIGHT, TRANSPORTATION , INSURANCE OR INSTALLATION COSTS.

**1.13 PERFORMANCE BOND**

A PERFORMANCE BOND OF (5%) OF TOTAL A MOUNT OF SUPPLIED EQUIPMENTS UNDER THE SCOPE. OF SUPPLY SUBJECTED IN THE FORM OF BANK GUARANTEE TO BE ISSUED BY SUPPLIER OR MANUFACTURERS BANK THROUGH THE BANK NOMINATED LATER IN FAVOR OF SOC.

THIS PERFORMANCE BOND WILL BE EFFECTIVE FROM THE DATE OF OPINING L/C FOR 365 DAYS FROM THE DATE OF SUCCESSFUL COMMISSIONING OF PUMPS OR 547 DAYS FROM DELIVERY OF THE LAST CONSIGNMENT CIF UM QASER WHICH EVER COME SOON EST.

**1.14 INSURANCE**

 THE CONTRACTOR IS REQUIRED TO INSURE ALL THE EQUIPMENTS AND MATERIALS FOR A VALUE OF 110% OF THE TOTAL VALUE OF THE MATERIALS AND EQUIPMENTS FOR THE SAKE OF THE BUYER, THE INSURANCE WILL ALLOW FOR A (3) WEEKS CLAIMS AFTER THE ARRIVAL OF THE MATERIALS AND EQUIPMENT TO UM QASER AND UNLOADING THEM . THE CHECK OF THE MATERIALS WILL BE IN THE BUYER STORES IN BASRAH, SO THE INSURANCE SHOULD ALLOW FOR THE CLAIM IN SUCH CASE WITH IN THE ABOVE TIMING . THE CONTRACTOR WILL BARE ALL THE COSTS OF THE INSURANCE

 **1.15. SPARE PARTS:-**

* + SCOPE OF SYPPLY SHOULD BE INCLUDING SUPPLY A LIST OF SPARE PARTS (ITEMIZED AND PRICED)

 AS FOLLOWING:-

-SPARE PARTS FOR (6) MONTHS IS REQUIRED FOR EACH ANNUNCIATOR AND EACH RECORDER IN THE COMMON CONTROL PANEL.

- 6 MONTHS SPARE PART PRINT CHARTS FOR EACH RECORDERS REQUIRED

* + TWO POWER SUPPLY UNITS IS REQUIRED ALSO AS A SPARE PARTS
	+ SPARE PART FOR TWO YEARS OPRATION FOR TURBO PUMPS
	+ SPARE PART FOR TWO YEARS FOR ELECTRICAL SYSTEM.
	+ SPARE PART FOR TWO YEARS OPERATION FOR INSTRUMENT.

**1.16 ORIGIN OF MATERIALS**

 THE ORIGIN OF PUMPS,MOTOR,INSTRUMENTION,ELECTRICAL SYSTEM,PIPING,VALVES SHOULD BE FROM:-

**:WEST EUROPE ,JAPAN, USA ( U.K , FRANCE, GERMANY, ITALY ) ( THE ORIGIN OF EACH PART SHOULD BE MENTION ) .**

**NOTES:-**

**THE OFFER SHALL INCLUDE THE FOLLOWING DOCUMENTS:-**

1. **PROCESS FLOW DIGRAM FOR THE COMPLETE PROJECT.**
2. **P&I DIAGRAMS.**
3. **DATA SHEETS FOR ALL EQUIPMENTS AND DEVICES.**

 **4- PERFORMANCE CURVE FOR TURBINE& PUMPS**

 **5-NECEASSRY CATALOUGES**

 **6- EXCUTION PERIOD**

 **7- EXCUTION PLAN AND DESCRPTION**

 **8- VENDOR LIST AS SOC REQUIRED**

 **9- API CRTIFICATE FOR TURBINE& PUMPS MANUFACTURER**

 **10-BIDDER SHOULD SUBMIT A FIVE YEARS EXPERIENCE OF SIMILAR PAST**

 **EXECUTED PROJECTS AS A PART OF THEIR TECHNICAL OFFER.**

 **11-BIDDER SHOULD SUBMIT TIME SECHEDUEL FOR PROCURMENTS .**

 **SHIPPING,INSTALLATION AND COMMISSION.**

**SECTION TWO**

**2- SITE INSTALLATION:-**

THE CONTRACTOR SHOULD BE INSTALLED THE TURBINE PUMP IN PS-1 DEPOT ,THE WORK INCLUDIND ALL CIVIL WORK( AS SHOWN BELOW) BUT NOT LIMMIT, MECHANICAL INSTALLATION,ELRCTRICAL AND INSTRUMENTATION WITH INTERCONNECTING PIPING

**2.1 CIVIL WORKS REQUIRMENT**

1 .CLEARING GRADING LEVELING & COMPACTION THE GROUND. REMOVE ALL ORGANIC MATERAILS , TREES& OTHER OBJECTION . REMOVE& REPLACMENT ANY WEAK SOIL OR UN COMPACTABLE SOIL.

2.FILLING & COMPACTION BY GRAVEL MATERAILS TYPC © ACCORDING TO DESIGN LEVEL .

3.CONSTRACT STEEL SHADE WITH TWO OVER HEAD CRANES TO PROTECT THE PUMPS AND TURBINE ACCORDING TO DIMENSIONS & WEIGHT OF PUMPS.

4. ECAVATION & CONCRETE WORKS (PLAIN & REINFORCED ) FOR SHADE & PUMPS FOUNDATIONS WITH ALL RLATING PATRS.

5. CONSTRACT CONTROL ROOM BUI LDING NEAT TO SITE (DIMENSIONS OF BUILDING WILL BE LATER AGREEMENT.

6. CONSTRACT SERVICE ROOM FOR PUMPS WORKERS.

7. CONSTRACT CONTROL ROOM FOR FIRE FIGHTING SYSTEM.

8. CONSTRACT ELECTRICAL SUB STATION CONTROL ROOM.

9. WORK THE CHANELS FOR THE DISCHARGE AND DRAIN PIPES.

**2.2 TURBO PUMPS INSALLATION:-**

THE CONTACTOR SHOULD SUPPLY TURBO PUMPS AND START TO INSTALLATION ACC. TO PROCEDUER DOWN BY SUPPLIER AND SUBMITTED TO SOUTH OIL COMPANY FOR APPROVAL. THE WORK INCLUDE THE CONSTRUCTION TURBO PUMPS CONNECTION IN SITE THROUGH BATTRY LIMIT WITH ALL ELECTRICAL AND INSTRUMENTATION SYSTEMS .

* 1. **INTER CONNECTING PIPING WORKS EXCUATION**

THE CONTRACTOR SHOULD SUBMIT A COMPLETE DESIGN FOR PIPING LAY OUT FOR TANKS CONNECTION WITH RECEIVE MANIFOLD AND BOOSTER PUMPS,AND CONNECTION BETWEEN BOOSTER PUMPS AND INLET FUTUER MAIN PUMPS , ALL PIPES SHOULD BE EXCUTED BY CONCRET TRANCHS ,THE WORK INCLUDS ALSO INSPECTION FOR ALL PIPING NET OF ALL PROJECT.

* 1. **DRAIN SYSTEM WITH SLOPE TANK**
	2. **ELECTRICAL SITE WORK FOR ALL ELECTRICAL SYSTEM**
	3. **INSTRUMENTATION & CONTROL SYSTEM SITE WORK**
	4. **FIRE FIGHTING SYSTEM WITH PIPING NET**
	5. **CATHODIC PROTECTION**

**2.9 DEMOBLIZING WORKS FOR ALL THE PROJECT ITEMS**

**2.10 THE COMMOSSIONING FOR THE PROJECT**

**VENDOR LIST**

|  |  |
| --- | --- |
| VENDORS | ITEM |
| WALTON WEIR PACIFICLVFTRIANGLEDELTA STARSTARLINEDELTA PACIFIC VALVESDAFRAMALFA VALVOLEVALVITALIAAES-AMERICAN ENERGY SEVICES INC.LCM ITALIAPBVORIONPETROL VALVESTYCOBFEOMBCAMERON | HAND VALVES |
| ROTORK | MOTORIZED VALVES |
| FISHERMASONEILANYAMATAKY | CONTROL VALVES AND SELF REGULATING VALVES(a) |
| FARRISMASONEILANDRESSERANDERSON CROSBY GREENWOODBROADYTRIANGLE SEMPELLA.S.CARRARO | RELIEF VALVES |
| MAXSEALHONEYWELLMIDLAND PNEUMATIC | SOLENOID VALVES |
| VEE BEEKAY SAFEKEY STONE YARWAYPLENTYBEA FILTERSFORAINPALL ITALIA | STRAINERS/FILTERS |
| COSASCOCAMERONROSE CORROSION | CRROSION COUPONS |
| NOUVA FIMADRESSERWIKA | GAUGES |
| MOBREYMAGNETROLFOXBORO | SWITCHES |
| FISHERFOXBOROMASONEILANABB | PNEUMATIC INSTRUMENTS |
| PANALARMASHCROFTHONEY WELLYAMATAKEABBRONANFISHER ROSEMOUNTFOXBOROE NDRESS&HAUSER | ELECTRIC INSTRUMENTS |
| FOXBORODANIELFISHERABB | MECHANICAL INSTRUMENTS INCLUDING ORIFIC PLATES |
| ENDRESS& HAUSERHONEY WELLFISHER ROSEMOUNTTHERMOCOUPLE INSTRUMENTS | TEMPERATURE INSTRUMENTS |
| FISHERFOX BOROUGHMANGETROL | *LEVEL GAUGES* |
| HYDRILINVALCOTHERMOELECTRIC | BS&W ANYLSIS |
| OLMIGEACOMP AIROILVERSTERLING BUCHANANALCOKWBATLAS COPCOIMI NORGREMKASSER | AIR SUPPLY |
| BICC(UK)GENERAL CABLE (SPAIN)DELTA(UK)NEXANS (FRANCE)CIC (FRANCE)BATT CABLES (UK) | CABLES |
| ABB(ITALY)SIEMENS (GERMENY)EATON(USA)SCHNEIDER (FRANCE)AREVA (FRANCE)GE (USA)FUJI (JAPAN) | MOTOR CONTROL CENTRE AND M.V. SWITCH GEAR |
| SIMPLEX | LOCAL CONTROL PANEL EQUIPMENT (FIELD CONTROL PANEL) |
| SCHORCH ELEKTRISCHE MASCHINEN GMBH | MOTORS |
| BETRA TRANSFORMATOREN (GERMENY)DTL PARSONS PEEBLES (UK)S.E.A (ITALY)ABB (ITALY)PAUWELS (BELGIUM)SGB ( GERMENY)BRUSH (UK)GEC (USA)SOUTH WALES TRANSFORMERS (UK) | TRANSFORMERS |
| CLORIDE (FRANCE)AEG (GERMENY)AEES (FRANCE)BORRI (ITALY)GUTTER (SWISS) | UPS&BATTERY CHARGER |
| CATERPILLER (USA)CUMMINS(UK) | DIESEL GENERATORS |
| UNION PUMPFLOWSERVERUHRPUMPENSUZLERMHTEBARA | CENTRIFUGAL PUMPS |
| ROLLS ROYCESIEMENSSOLAR TURBINEMITSUBISHI | TURBINE ENGINS |
| MILTON ROYBRAN AND LUEBBEGRASVENORDKM FRAMATOME | METERING PUMPS |
| SIEMENSALLEN BRADLYSILVERTECHYOKOGAWA(NETHERLAND)PRESTIGIOUS DISCOVERYTELEMECHANICS | PLC CONTROL |
| FLARE TECHLINDABIHSTERLING PROCESSGENECOR | HEATERS |
| FOX BOROPBV | CRUSH VALVE |
| KIDDESILVANESCAME SISTEMI SRLEUSEBI GROUP SRL | FIRE FIGHTING SYSTEM |
| Nippon Oil. Jgc Yokohama World Operation CenterMitsubishi CorporationOmronSaipemENERECO S.P.A.Black, Sivalls&Bryson EngineersAPSDRGPIETRO FIORENTINI SPAWEATHERFORDOIL TOOLMIDDLE EAST Limited | Process & Engineering |
| Innova srlLutz-JescoTECNAPuretechPROTECNOICBLAICOSSENERECO | WATER TREATMENT& RO UNITS |

**APPENDIX 1**

**DOCUMENTATION REQUIREMENTS**

THE MANUFACTURER OR SUPPLIER SHOULD SUBMIT TWO SET OF THE FOLLOWING DOCUMENTS:

|  |
| --- |
| **PUMP** |
| 1. CERTIFIED DIMENSIONAL OUTLINE DRAWING.
2. CERTIFICATE OF MATERIALS.
3. CROSS SECTIONAL DRAWINGS AND BILL OF MATERIALS
4. SHAFT SEAL DRAWING AND BILL OF MATERIALS.
5. COUPLING ASSEMBLY DRAWING AND BILL OF MATERIALS.
6. PRIMARY AND AUXILIARY SEALING SCHEMATIC AND BILL OF MATERIALS.
7. LUBE OIL SCHEMATIC AND BILL OF MATERIALS.
8. ELECTRIC AND INSTRUMENTATION SCHEMATIC AND BILL OF MATERIALS .
9. ELECTRIC AND INSTRUMENTATION ARRANGEMENT DRAWING AND LIST OF CONNECTIONS.
10. PERFORMANCE CURVE.
11. CERTIFIED HYDROSTATIC TEST DATA.
12. PERFORMANCE TEST DATA.
13. AS BUILT DATA SHEETS.
14. AS BUILT CLEARANCE.
15. SPARE PARTS RECOMMENDATIONS .
16. INSTALLATION , OPERATION , AND MAINTENANCE MANUALS
 |
| **TURBINE** |
| 1. CERTIFIED DIMENSIONAL OUTLINE DRAWING.
2. CERTIFICATE OF MATERIALS.
3. CROSS SECTIONAL DRAWINGS AND BILL OF MATERIALS
4. AS BUILT DATA SHEETS.
5. PERFORMANCE TEST DATA.
6. INSTALLATION , OPERATION , AND MAINTENANCE MANUALS.
7. SPARE PARTS RECOMMENDATIONS .
 |
| INSTRUMENTS |
| 1. PLC TECHNICAL CATALOGUES .
2. FIELD INSTRUMENTS CATALOGUES.
3. CERTIFICATE OF ORIGIN OF EACH EQUIPMENTS.
4. PLC INSTALLATION. OPERATION AND MAINTENANCE.
5. SPARE PART DETAIL LIST.
 |
| MV & CMCC & BATTERY CHARGER |
| 1. DATA SHEET
2. SINGLE LINE DIAGRAM
3. WIRING DRAWINGS
4. TECHNICAL CATALOGUES
5. INSTALLION, OPERATION AND MAINTENANCE MANUAL
6. SPARE PARTS RECOMMANDATION

  |

NOTE:

1. ALL DRAWING AND DATA MUST SHOW PROJECT, APPROPRIATION, PURCHASE ORDER, AND ITEM NUMBERS IN ADDITION TO THE PLANT LOCATION AND UNIT . IN ADDITION TO THE COPIES SPECIFIED ABOVE , ONE SET OF THE DRAWING / INSTRUCTIONS NECESSARY FOR FIELD INSTALLATION MUST BE FORWARDED IN ADEQUATE TIME PRIOR TO SHIPMENT TO GIVE ENOUGH TIME FOR CIVIL WORK DONE BY SOC.
2. ALL THE ABOVE DOCUMENTS SHOULD BE SUBMITTED IN THREE HARD COPIES AND THREE ELECTRIC COPIES.

**APPENDIX 2**

**BREAK DOWN FOR PUMPS SUPPLY**

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| ITEM | DESCRIPTION | UNIT | QTY | UNIT PRICE | TOTAL PRICE |
|  | **SECTION ONE:-PROCURMENT OF MATERAILS:-** |  |  |  |  |
| 1 | DESIGN ENGINEERING AND FABRICATION DRAWING ACC. TO API STANDARD. FINAL DETAILED DESIGN DOCUMENTS , DATA SHEETS , ASSEMBLY DETAILS & PLANT INSTALLATIONS TO BE SUBMITTED IN 3 HARD COPIES & 3 ELECTRONIC COPIES . | SET | 1 |  |  |
| 2 | TURBO CRUDE OIL PUMPS(TURBINE+PUMP) designed acc. to API 610 & 616 (skid mounted). complete with interconnecting, piping, valves, fittings , , push button ,etc…. and instrumentations.- Flow rate: 6100 M3/HR - HEAD : 605M | SET | 2 |  |  |
| 3 | PLC CONTROL PANEL | SET | 2 |  |  |
| 4 | ELECTRICAL SYSTEM INCLUDING THE FALLOWING:- |  |  |  |  |
| - STEP DOWN LOW VOLTAGE TRANSFORMER 6.6 / 0.4 KV | NOS | 2 |  |  |
| -LOW VOLTAGE MAIN DISTRIBUTED BOARD ,INDOOR TYPE FREE STANDING. | SET | 2 |  |  |
| DUAL UPS 110 VAC WITH SUITABLE POWER FOR CONTROL SYSTEM CONSIST OF :- BATTERY CHARGER .- SET OF BATTERIES NI-CD SUITABLE .- INVERTERS WITH BY PASS LINE . |  |  |  |  |
| SET | 2 |
|  |  |
| CMCC SWITCHBOARD , 0.4KV,3PH, 4 WIRE , 50HZ , SUITABLE FOR INDOOR USE,FREE STANDING AND HAVE PROTECTION AGAINST S/C, O/L, E/F, U/V AND WITH ALL NECESSARY PROTECTION RELAYS AND MEASURMENTS AND CONTAINS |  |  |  |  |
| SET | 2 |
|  |  |
| FIVE YEARS RECOMMENDED SPARE PARTS FOR EACH RECORDES REQUIRED(ITEMIZED LIST SHOULD BE SUBMITTED) | SET | 2 |  |  |
|  |  |
| MV CABLE 11 KV X LPE / PVC / SWA PVC COPPEREACH CABLE DRUM SHOULD BE WITH 500 M LENGTH ANDACCORDING TO IEC 60502-2 | LOT | 2 |  |  |
| TERMINAL JOINT HEAT SHRINKABLE KIT FOR CABLES MENTIONED IN FOR ABOVE ITEM ( CABLE 11KV ) | LOT | 2 |  |  |
| THROUGH JOINT HEAT SHRINKABLE KITS FOR CABLES MENTIONED IN ABOVE ITEM ( CABLE 11KV ) | LOT | 2 |  |  |
| L.V CABLE 600/1000 V XLPE/PVC/SWA/PVC ACCORDING TO IEC 60502-1 | LOT | 2 |  |  |
| EARTHING SYSTEM FOR ALL EQUIOMENTS  | SET | 1 |  |  |
| CLASSIFIED AREA ( EEX-D) LIGHTING USED IN HAZARDOUS AREA  | SET | 1 |  |  |
|  EMERGENCY LIGHTING  | SET | 1 |  |  |
| SYNCHROPACK ROTORK TYPE IQ ACTUATOR VALVE HARD WIRED FOR CONVENTIONAL MONITORINGCONVENTIONAL MONITORING AND CONTROL SUITABLE FOR HAZARDOUS AREA ( CLASS 1 , DIV 1 , GROUP C , D ) ( EEXD – 11C – T4 ) IP68 | LOT | 2 |  |  |
| 5 | COMPLETE INSTRUMENTATION PACKAGE C/W ALL INSTRUMENTATION CABLING AND ACCESSORIES . | SET | 2 |  |  |
| 6 | FIRE FIGHTING SYSTEM | SET | 1 |  |  |
| 7 | DRAIN SYSTEM INCLUDING THE FALLOWING:-1. DRAIN TANK
2. DRAIN PUMPS
3. INTERCONNECTING PIPING
 | NOSSETLOT | 121 |  |  |
| 8 | SPARE PARTS FOR 2 YEARS OF OPERATION (MECHANICS,ELECTRICAL AND CONTROL PARTS) LIST SHOULD BE SUBMITTED | SET | 1 |  |  |
| 9 | A. FACTORY TEST AND DESIGN APPROVAL FOR 30 PERSONES FOR 14 DAYS. COMPLETE WITH FULL ACCOMMODIATION ,TRANSPORTATION AND ALL EXPENESE.B. TRAINING COURSE FOR 80 TRAINEES FOR TWO WEEKS AT WAREHOUSE MANUFACTURERS ( INCLUDING DESIGN , MAINTANCE ,MECHANICAL ,ELECTRICAL AND INSTRUMENT , ENGINEERS ) COMPLETE WITH FULL ACCOMMODIATION , TRANSPORTATION AND ALL EXPENESE | LOT | 1 |  |  |
|  | **SECTION TWO****PROJECT CONSTRUCTION AS SHOWN** |  |  |  |  |
| 10 |  CIVIL WORKS REQUIRMENT | **LOT** | 1 |  |  |
| 11 | TURBO PUMPS INSALLATION:- | **SET** | 2 |  |  |
| 12 | INTER CONNECTING PIPING WORKS EXCUATION | **LOT** | 1 |  |  |
| 13 | DRAIN SYSTEM WITH SLOPE TANK  | **SET** | 1 |  |  |
| 14 | ELECTRICAL SITE WORK FOR ALL ELECTRICAL SYSTEM  | **SET** | 1 |  |  |
| 15 | INSTRUMENTATION & CONTROL SYSTEM SITE WORK | **SET** | 1 |  |  |
| 16 | FIRE FIGHTING SYSTEM WITH PIPING NET | **SET** | 1 |  |  |
| 17 | CATHODIC PROTECTION | **SET** | 1 |  |  |
| 18 |  DEMOBLIZING WORKS FOR ALL THE PROJECT ITEMS | **SET** | 1 |  |  |
| 19 |  THE COMMOSSIONING FOR THE PROJECT | **UNIT** | 1 |  |  |
|  | . |  |  |  |  |
|  |  |  |  |  |  |
| TOTAL PRICE USD ,  |  |  |

 **GENERAL CONDITIONS TO BE ADHERED TO BY CONTENDERS**

1- **TECHNICAL & COMMERCIAL OFFERS TO BE SUBMITTED IN DUPLICATE BY THE MANUFACTURERS OR THROUGH THEIR GENERAL MANAGER OR THEIR OFFICAL DEPUTIES, COMMERCIAL MANAGER, SALES MANAGER AT THE SAME TIME IN A SEALED SEPARATE ENVELOPE WHICH SHOULD BE OFFER REF., BATCH NO., TECH. OR COMMERCIAL OFFER, RECEIPT NO. AND THE CLOSING DATE.**

**2- CONTENDERS SHOULD GIVE DETAILED PRICING AS PER THE ATTACHED ITEMIZED PRICE LIST. FAILURE TO DO SO WILL LEAD TO IGNORING THE OFFER.**

**3- NEITHER REVISED OFFER NOR PRICE REDUCTION IS ACCEPTED AFTER THE CLOSING DATE.**

**4- COMMERCIAL OFFER TO BE BASED ON:-**

**FULL SUPPLY AND MANUFACTURING OF VESSELS AND EQUIPMENTS OUTSIDE IRAQ AS PER SCOPE OF WORK AND ITEMIZED PRICES LIST.**

**5- OFFERS TO BE SUBMITTED BEFORE OR WITHIN THE CLOSING DATE PERIOD OTHERWISE THEY WILL BE NEGLECTED.**

**6- OFFERS SUBMITTED SHOULD BE VALID FOR A PERIOD NOT LESS THAN (90) DAYS FROM THE CLOSING DATE.**

**7- OFFERS CONDITIONS SHOULD BE CLEARLY SUCH AS DELIVERY TERMS, DELIVERY PERIOD, COUNTRY OF ORIGIN, PORT OF SHIPMENT, ENTRY POINT, BENEFICIARYS FULL NAME AND ADDRESS, THE ADVISING BANK AND ALL OTHER NECESSARY INFORMATION REQUIRED FOR CONTRACTING PURPOSES.**

**8- RELEVANT CATALOGUES, DIAGRAMS AND DATA SHEETS AND PEREFORMANCE CURVES FOR PUMPS MUST BE INCLUDED IN THE OFFER TO BE SUBMITTED SEPARATELY BUT SHOULD REFER TO OUR ENQ. NO. TENDER NAME AND OFFER REF.**

**9- TYBE AND MANUFACTURE FOR PUMP AND ELECTRIC MOTOR TO BE INCLUDED IN THE OFFERS**

1. **OFFER SHALL INCLUDE DESIGN APPROVAL FOR COMPLETE SYSTEM AS WELL TRAINING PERIOD FOR NOT LESS THAN 20 ENGINEERS FOR FOURTEEN DAYS EACH INCLUDING THE COST FOR TRAVAILING A CCOMMODA TION LIVING AND POCKET MONEY.**
2. **THIRD PARTY INSPECTION CERTIFICATE FOR EACH PART OF THE UNIT SHOULD BE SUPPLIED AND WILL WATCH & CERTIFY THE FACTORY CONSTRUCTION STEPES , SHOULD BE FROM A WELL KNOWN INSPECTOR ACCEPTED BY S.O.C .**