UCH COMPRESSION PROJECT

Design Engineering, Procurement (Supply), Construction, Installation/Erection, Pre-Commissioning, Commissioning & Start-up (including performance testing and Reliability Guarantee Test) of Compression System at UCH Compression Project
Tender Enquiry No. PROC-FC/CB/PROJ/UCH(COM)-4462/2019

Pre-Bid Clarification-10

SR No.	Disc.	Tender Document Reference	Paragraph	Statement	Query	REPLY
1	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	5.16 Modification in Existing Plant Control System and SCADA system shall be included in EPCC contractor Scope	Due to the fact that is clear the request in SOW to up-grade existinig ICSS systems (DCS/ESD) please provide for UCH-I plat e UCH-II plant reference of: - ICSS vendor name (ABB) - ICSS model and type - ICSS date of installation	The existing ICSS(DCS/ESD) installed at UCH-II plant is ABB 800 XA. And Infi 90 (BRC – 410 processor) DCS/ESD System, whose front end is 800XA is installed at UCH-I.
2	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	5.16 Modification in Existing Plant Control System and SCADA system shall be included in EPCC contractor Scope	Due to the fact that is clear the request in SOW to up-grade existinig SCADA systems please provide for UCH-I plat e UCH-II plant reference of: - SCADA vendor name - SCADA model and type - SCADA date of installation	Bidder should collect relevent informtaion during pre-bid site and and further clarify during pre-bid site meeting.
3	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	5.8 EPCC Contractor is responsible for Supply and installation of fire and gas detectors and devices for complete compression area	Due to the fact that is clear the request in SOW to up-grade existinig Plant F&G systems please provide for UCH-I plat e UCH-II plant reference of: - plant F&G vendor name - plant F&G model and type - plant F&G date of installation	The existing plant F&G system shall only be modify in below case; Combine Fire Detetction & Suppression System with dedicated Control Panel shall be considrered for new MCC, the system shal be FM-200 based. The Combine Fire Detetction & Suppression System Control Panel shall interrface with exitsing plant F&G System for alarm & monitoring. F&G system Installed at UCH-II Plant is ABB 800XA. No modification work is required in existing UCH-I F&G System. F&G to be installed at UCH-II, No modification for F&G at UCH-I. The F&G for slug catched to be supplied separately as at UCH-I , there is not additional hardware availble for additional I/O of new slug catcher along with its F&G. Bidder should also collect relevent informtaion during pre-bid site and and further clarify during pre-bid site meeting.
4	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering		Due to the fact that no telecoms systems are listed as to be modified, Contractor understands that telecom system is NOT IN SOW of the project. Please confirm.	As per Scope of work Clause: 12.3.12.5; LAN and Telephone System shall be considrered for new MCC room. Further CCTV System is also confirmed for inclusion.
5	I&C	0221-IMF-6000-0 (Control System Architecture)		General statement: interconnection with ICSS of Compressor pakges	With ref. to the Contro System Architecture, it is not foreseen a software network link between Compressor Control System and ICSS. ICSS shall be interconnect with compressors only by HW signals for safety and protection reason. Company to comfirm.	Bidder understanding is correct; however this shall be further finalized during detail engineering stage.

6	I&C	SEC-III SOW & 0221-GS-9510-3		General statement: Compressor control system behaviour	The nos 3 Compressors are fully controlled & protected by the 3 PLC plus overall control network; also load sharing, stand by coordination are managed by compressor control systems. Please company confirm	Bidder understanding is correct; however this shall be further finalized during detail engineering stage.
7	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	5.16 Modification in Existing Plant Control System and SCADA system shall be included in EPCC contractor Scope	Please provide detailed documentation for existing ICSS systems architecture drawing in order to better analyze integration of new process area.	Please note that the detail project document Shall be shared with the siccessful bidder after contract award.
8	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	5.16 Modification in Existing Plant Control System and SCADA system shall be included in EPCC contractor Scope	Please provide detailed documentation for existing SCADA systems architecture drawing in order to better analyze integration of new process area.	Please note that the detail project document Shall be shared with the siccessful bidder.
9	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	5.8 EPCC Contractor is responsible for Supply and installation of fire and gas detectors and devices for complete compression area	Please provide details systems architecture drawing for existing F&G in order to better analyze integration of new process area	Please note that the detail project document Shall be shared with the siccessful bidder.
10	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	5.8 EPCC Contractor is responsible for Supply and installation of fire and gas detectors and devices for complete compression area	Please provide existing plant field F&G devices layout in ordert to undestand existing criteria.	Please note that the detail project documents Shall be shared with the successful bidder.
11	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	5.8 EPCC Contractor is responsible for Supply and installation of fire and gas detectors and devices for complete compression area	Please clarified the F&G certification context: - filed device shall be as per NFPA UL/FM listed - Central control system shall be as per NFPA UL/FM or same hw as existing ESD	Bidder to eloborate the meaning of Central Control System here.
12	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	5.8 EPCC Contractor is responsible for Supply and installation of fire and gas detectors and devices for complete compression area	For the new building "MMC switchgear Building" Company to confirm if this building shall be protectec by a dedicated "Building F&G", indipendent from Plant fire and gas (interconnetdt HW for cumulative critical signals).	Bidder understanding is correct; combine Fire Detection & Suppression system shall be considered for MCC with dedicated Fire Detection & Suppression Control Panel; however the system shall interface with plant existing F&G system for alarm and monitoring.
13	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	5.8 EPCC Contractor is responsible for Supply and installation of fire and gas detectors and devices for complete compression area	In case of indipendednt building F&G please clarify if shall be linked to an existing building F&G dedicated to the supervision network and provied maker / type and model of building F&G units existing	
14	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering	Chp. 5.1.4 Instrument and I/O related to Methanol Injection shall be interfaced with dedicated Wellhead Control/SCADA system.	For the no.8 Methanol Injection Skid please provide the location area of the skids, the position fo the existing SCADA RTU to wich connect the instrumentaion and details about power supply location for pumps.	Refer attached Dwg No. 0221-PC-2201-A (Typical Plot Plan For Wellheads) The information related to the power supply shall be shared with the successful bidder after award of the project.
15	I&C	PBC-01 / Sec 5.30		" ..... in all aspects as per the basic requirements mentioned in this document ..... "	Please provide Specification for basic deign of ICSS (DCS/ESD) system as it is not present in the feed documentation. Contractor will supply ICSS as per ABB std equivalent to the existing system. Pls Confirm.	The existing installed ICSS(DCS/ESD) system is of ABB 800XA. Bidder shall only provide DCS extension panel, same make/model shall be prefared for new extension panel as mentioned in project documents and Scope Of Work.
16	I&C	PBC-01 / Sec 5.30		Emergency Shutdown Valves with tags nos. 251-ESDV-013 & 251-ESDV-012 , which are proposed to be installed on fuel gas skid shall be SIL-3 rated. EPCC contractor shall provide proper SIL certification certificates for the mentioned valves.	For new ESDV valve please clarify PST device maker / model / type according to existing plant philosophy and if shall be connected to ESD or, as allowed and acceptable by code, to DCS; please provide technical descrpition.	All Instrumentation and valves shall be supplied according to the provided VENDOR LIST Document attached with ITB. With refernce to project document INSTRUMENT LIST, Document # 0221-LT-6000-0, ESD valves shall interface with existing ESD System.

17	ELE	SEC-III SOW	4.16 Relocation Scope	Existing Cathodic protection equipment/material of aforementioned relocated diesel storage tank and piping, as far as practicable, shall be dismantled, relocated and to be installed	Please provide documentation of existing Cathodic protection system: data sheet, drawings, details, etc.	Cathodic protection data of existing system shall be verified by bidder during pre-bid site visit and ascertain that whether it is feasible to relocate & to be used again for the new system. If it is not suitable to re-utilize then new CP system shall be designed and provided accordingly. CP system shall be designed and supplied in accordance with requirements stipulated in updated version of NACE and standards. New CP system shall be based on impressed current method and anode system based on closely distributed system shall be applied to underground piping and conductive polymeric anodes (Anode flex) for on-grade Storage tanks. All the existing data shall be acquired during pe-bid site visit.
18	ELE	4985-ELB-6602-5 (SH 2 of 3)		Single Line Diagram for M.V Switchgear	Please provide the following: - contact reference of Original Equipment Manufacturer of MV switchboard. - schematic diagrams	.- Existing MV Switchgear manufacturer is Schneider Electric Pakistan (SEPK). Bidder can easily approach/contact to SEPK focal person by visiting website/factory/office. - Typical schematics already illustrated on to 4985-ELB-6602-5 Single Line Diagram for M.V Switchgear, sheet 2 of 3, further details (Vendor drawings) will be shared after the award of contract. Further below are the details of existing panels: Production type: P1X-12 of SCHNIDER Electric, Pakistan and year of production 2013-2014. Any further detail, if required, will be collected/verified by bidder during pre-bid site visit.
19	ELE	0221-ELD-6702-0		New Switchgear-MCC Room Equipment Layout	In order to optimize the cable amount, confirm if it si acceptable an alternative solution with a Local Electrical & Control Room for each Turbocompressor Package, containing relevant MCC, Battery Charger and UCP according to Turbocompressor Manufacturer Standard	Not acceptable. Bidder to adhere the tender requirement.
20	ELE	0221-ELB-6601-0		Single Line Diagram-for UPS System	Due to endorsement of vital loads (protection relay and control circuits of new LV switchboard/MCC) and as per best practice, confirm if it is acceptable the solution with DC UPS (battery charger and Battery) instead of AC UPS.	Not acceptable. Bidder to adhere the tender requirement.
21	PIP	SEC-III SOW	4.14	RELOCATION SCOPE: The contractor shall be complete responsible for dismantling, relocation,re-installation, testing and commissioning of electrical equipment of Diesel storage tank (800-TK1010) area and Diesel pumps (800-P101A/B).	No documantation is available in ITT received,Please provide : P&I Diagram of the diesel storage thank & Diesel Pumps, piping arrangement of the actual installation of Diesel Tank	P&ID of existing diesel system is attached for your reference.However,bidder shall carry out site visit to gather any required data for scope clarification.

22	PIP	SEC-III SOW	1.1.11	The EPCC Contractor shall make all necessary work plans/procedures as required by the OGDCL and shall submit the same for approval prior to execution. It is also intended to specifically mention that all the final tie-ins/hookup works will be completed during UCH gas Plants shutdown.	The Article mentions that all ties in will be performed during the Plant shutdown . Can we assume that all the tie in comnnection will be "cold tie in"? Please confirm.	Referring to Sec.3.6 of referred document, bidder to develop/finalize tie-in schedule depicting type of tie-ins as per tender requirements.
23	HSED	SEC-III SOW	8	No requirements for FERA or QRA studies is present in tender documentation.	Please confirm nthat the Quantitative Risk Assessment is not requested for the project. In particular QRA/FERA/EERA/Dropped Object studies are exluded from Contracto scope.	Bidder to adhere with requirements as mentioned in referred document or any other document of tender.
24	HSED	SEC-III SOW	8	No requirement for passive protection (fireproofing) is presenrt in Tender documentation.	Confirm no fireproofing is deemed necessary in the revamping areas of the plant.	Bidder to adhere with tender requirements as mentioned in Doc. No.0221-PA-2005-A (Specification for Unfired Pressure Vessel) regarding fireproofing.
24	HSED	General Arrangement MCC room doc. n. 0221-CD-7101	8	General Arrangement of MCC room show only one door and Battery room has the door going toward the MCC room.	Consider a change in the door design of the General arrangement of MCC room and Battery room. A secondary door is necessary at MCC room and exit door from Battery room shall be toward the external area and not inside MCC room.	Please note that MCC room shall be provided with main double leaf door and one emergency exit single leaf door while direction or arrangment will be decided during detail engineering. Similarly, battery room shall be provided with one door opening, however, openning whether towards inside the MCC room or outwards shall be discussed/ finalized during detailed engineering.
26	HSED	SEC-III SOW	13.2	Environmental Impact Assessment.	EPCC Contractor shall conform to the recommendations of Environment Impact Assessment (already performed by OGDCL). Please provide the EIA for assessment of recommendations.	The study will be carryout by OGDCL and report will be shared to successful bidder.
27	HSED	HAZOP Close-out doc. n. 0221-A-1006	4	Recommendation to EPC Ctr is to verify the adequacy of the existing flare for new gas load and liquid handling capacity.	Please provide the existing "Flare Heat radiation and dispersion study" and the existing "Flare load summary".	Refer to Tender dccument, Volume-IIA, Basis of Design (0221-A-1001), Annexure-III, for the required information.
28	HSED	SEC-III SOW	14.5	Vent/Flare Heat Radiation and Dispersion Considerations as well as Liquid Dropout Potential	1- As per above request provide the existing "Flare Heat radiation and dispersion study". 2- In addition please confirm that the study is related to the existing Flare to confirm adequacy in terms of heat radiation and dispersion/flame out scenario. 3- Please confirm Flaresim and Phast are acceptable softwares for performing the analysis.	1- Refer our above response (Sr# 27). 2- Yes, however, the required study from bidder shall cover each operating and emergency scenarios being considered for both UCH-I & UCH-II existing flares. 3- Yes, both softwares are acceptable.
29	HSED	SEC-III SOW	14.5	SIL	SIL Allocation and SIL Verification will be included in the quotation and will be performed only for the ESD logics. F&G logic will not be submitted to a SIL Assessment. Please confirm if there is any requiremetn of minimum SIL rating for F&G detectors and F&G logic.	Bidder to note that maximum/highest SIL level determined/calculatedduring SIL study for any loop, shall be considrered for F&G Instruments.
30	HSED	SEC-III SOW	15.4	Philosophy	Please provide the existing HSE philosphies.	Need further elaboration for HSE Philosophy, however succesful bidder has to comply with OGDCL HSE policy.
31	MEC	Appendix C2 - BID PRICE SCHEDULE SUMMARY 0221-DS-1701-0 (Datasheet For Centrifugal Compressor) 0221-GS-9510-3 (Spec for Centrifugal Compressors)		Compressor Spare rotor	In bid price schedule summary item 1.1.1 c a spare rotor is indicated. In compressor data sheet page 8 a mechanical running test for spare rotor is indicated . However in turbocompressor specification, no spare rotor is indicated in the scope of supply. Please confirm that one (1) spare mechanically running tested compressor rotor in common with all the three compressors is required for the entire compression facility.	One Spare Rotor is required for entire compression facility.

32	MEC	SEC-III SOW 0221-DS-1704-0 (Datasheet of Trim Cooler 251-E-201 ABC) 0221-A-1001-0 (Basis of Design) 0221-A-1004-0 (Process Design of Compressor Trains) 0221-DS-1701-0 (Datasheet For Centrifugal Compressor)	Par. 2.3, 9.2 Note 1 Par. 3.3 Par 3.3 note 2	Trim cooler overdesign margin	As per SOW par. 2.3, cooler datasheet note 1, basis of design par. 3.3 and process design Par. 3.3, trim coolers shall be designed with 20% margin on exchange area. As per compressor data sheet note 2 and basis of design par. 3.3, Compressor shall be designed for 110% capacity. In SOW par. 9.2 an overall 10% capacity margin seems required. In trim cooler data sheet, design capacity is 100% compressor flowrate. Please confirm that trim cooler shall be designed with 20% surface margin on 100% compressor capacity as per cooler data sheet without considering any additional 10% capacity margin.	Bidder to note that, at FEED stage, design margin for all trim coolers is considered 20% on surface area only at 100% rated flow. Moreover, this margin is on worst duty scenario and bidder to submit performace sheets of trim coolers on all possible cases after award of contract.
33	MEC	Appendix C2 - BID PRICE SCHEDULE SUMMARY	item 1.1.3	Fuel gas skid	In bid price schedule summary item 1.1.3 two (2) fuel gas skids are indicated. Please confirm the understanding that the two (2) skids are: 1) FG KO drum 2) FG heater	Please note that 01 No. of Fuels Gas skid (with complete accessories as per Scope of work) is required. However, EPCC contractor shall evaluate during detailed engineering with respect to individual Fuel Gas Skid requirement for each turbo-compressor package.
34	MEC	0221-DS-1701-0 (Datasheet For Centrifugal Compressor) 0221-GS-9510-3 (Spec for Centrifugal Compressors)	Page 8 9.3.2.1	Compressor performance test	As per turbocompressor specification par. 9.3.2.1: "The tests, as specified in section 4.3 of API 617 and ASME PTC 10 Type II, are required for each compressor casing" Please confirm that "for each compressor casing" means "for each compressor casing type". Since the three compressor units are single casing and they are identical, one unit only shall be PTC-10 performance tested at factory and not all the three units. At site on the contrary all the units will be performance tested. Please confirm the understanding.	All three units casing shall be tested at shop and at site.
35	MEC	0221-DS-1701-0 (Datasheet For Centrifugal Compressor)	Page 8	Turbocompressor string test	Please confirm the understanding that turbocompressor complete unit test (string test) is required only at site but not at factory.	Each Complete compressor train performance testing at site shall be required as per tender requirements.
36	MEC	0221-GS-9510-3 (Spec for Centrifugal Compressors) 0221-DS-1701-0 (Datasheet For Centrifugal Compressor) 0221-A-1001-0 (Basis of Design)	Par. 7.1 Sheet 2 Note 2 Par. 3.3	Gas turbine power margin	As per turbocompressor specification note on guarantee table in par. 7.1 : "Power of turbine should be at least 10% in excess of maximum required BHP required for compressors at extreme case, without air inlet cooling at 130 Deg F". Guarantee table in par. 7.1 is based on 100% compressor capacity. As per turbocompressor specification par. 8.2.1 item f) : "The Gas Turbine shall be capable of developing at least 110% of the power input requirement, at site rated conditions, when the compressor is working rated compression scenario i.e. maximum flow and compression ratio." As per compressor data sheet note 2 and basis of design par. 3.3, Compressor shall be designed for 110% capacity. Please confirm the understanding that 10% power margin for gas turbine at 130 °F is required for compressor operating at 100% capacity and not at 110%.	Referring to Sec 8.2.1(f); "The Gas Turbine shall be capable of developing at least 110% of the power input requirement, at site rated conditions, when the compressor is working rated compression scenario i.e. maximum flow and compression ratio." Bidder to adhere with stipulated the tender requirements.

37	MEC	0221-DS-1702-0 (UCH-I Slugcatcher M-210) Datasheet 0221-DS-1703-0 (Datasheet for Suction Scrubbers) 0221-PA-2005-A (Specification for Unfired Pressure Vessel)	Sheet 2 Sheet 3 Par. 7.2	Vessel corrosion allowance	As per slugcatcher and suction scrubbers data sheets, vessels are cladded in SS304L but at the same time shall have a corrosion allowance of 6 mm. As per vessel specification par. 7.2 : "No corrosion allowance is required on stainless steel materials or materials protected by stainless steel unless otherwise specified." Please clarify if 6 mm corrosion allowance is required as per data sheet even if vessels are SS304L cladded.	Bidder to adhere with requirements as mentioned in Doc. No.0221-PA-2005-A (Specification for Unfired Pressure Vessel)
38	MEC /PRO	0221-DS-1705-0 (Cooling Water System) Data sheet Cooling water system P&ID	Sheet 3	Cooling tower	In data sheet and in P&IDs two towers CT-1000A/B are indicated. However number of required tower is one (1) in data sheet. Bidder understands that one (1) multi cells tower shall be provided. No spare tower is required. Please confirm the understanding.	Yes, bidder's understanding is correct. However, bidder to follow code & standard regarding spare cell requirement.
39	MEC /PRO	0221-DS-1705-0 (Cooling Water System) Data sheet	Sheet 6 and 7	Cooling water filters	Please confirm the understanding that no spare filters are required for cooling water (one (1) filter for each service shall be provided)	Bidder to adhere with requirements as mentioned in referred document or any other document of tender.
40	MEC /PRO	SEC-III SOW 0221-DS-1706-0 (Instrument Air and Nitrogen Generation Package)	Par. 2.6 Par. 2.1	Cooling water use	As per SOW par. 2.6 "Cooling water is required for Trim Coolers only." In I/A package data sheet par. 2.1 air compressor shall be water cooled. Please confirm that cooling water can be used also for air compressors cooling.	Yes, Cooling water from Cooling tower can be used for the said pupose, however, operating capacity of Cooling Tower shall be increased accordingly.
41	MEC	0221-A-1004-0 (Process Design of Compressor Trains) 0221-DS-1710-0 (Datasheet For UCH-II Utility Water Pump 930-P103C) 0221-A-1001-0 (Basis of Design)	Par. 3.6.5 4985-DS-1755 P103A/B data sheet	Utility water pump	As per Process Design par. 3.6.5, even if not necessary, a third stand-by utility water pump shall be added having same capacity as existing. Comparing required pump in 0221-DS-1710 930-P103C data sheet and existing pumps indicated in 4985-DS-1755 930-P103A/B data sheet however there are some differences, e.g.: - head is 60 ft instead of 145 ft - material CS/12%Cr instead of SS316L - ANSI std instead of ISO std Please clarify if third utility water pump shall be identical to existing ones or it shall be as per FEED data sheet.	Third Utility Water Pump (930-P103C) shall be identical to the existing ones.
42	MECH /ELE	0221-ELA-6501 Electrical Design Basis 0221-ELA-6502-0 Specification for LV A.C Induction Motor	Par. 3.4, 3.6, 6.2.2 Par. 4.1	LV motor design	As per electrical design basis par. 3.4 LV motors for safe area can be not Ex and motors for zone 2 can be Exn. As per electrical design basis par. 3.6 LV motors for outdoor can be IP 55. However as per electrical design basis par. 6.2.2 motors for use in Zone 1 or Zone 2 hazardous areas shall be certified EExde. In LV motor spec par. 4.1 motors shall be Exde flameproof motors and IP 56 for outdoor. Bidder assumes that motors can be designed as follow as per electrical design basis par. 3.4 and 3.6: - not Ex IP 55 motors for safe area outdoor - Exn IP 55 motors for Zone 2 outdoor Please confirm Bidder's assumption.	Bidder is advised if there is any conflit in the written statement for any Equipment selection in the tender, the most strigent shall prevail. Therefore, following criteria shall be considered for motor selection; - not Ex, motors for safe area outdoor. - EExde motors for Zone 1 or Zone 2 outdoor. - IP (Ingress protection) rating for both aformentioned cases (safe and classified areas) shall be same as defined in section 3.6 of Electrical Design basis.

43	I&C	SEC-III SOW	Chp. 5,0 Instrumentation and Control Engineering		Due to presence of H2S up to 700ppm in gas line, please provied primary process hook-up standard feature requested for lethal service in order to match existing plant dsign.	Bidder query is not clear. We understand that any hook-ups standards shall be developed by EPCC contractor durin g detailed engineering.
44	I&C	SEC-III SOW	4.9.11 Instrument Cable	Single pair and multi-core cable shall be PVC insulated 7-stranded copper conductor, PVC bedded, steel wire armored, overall screen with drain wire (for digital signal cable), individually and overall screen with drain wire (for analog signal cable),	Contractor undersand that: - Multi-core digiral cable is compose by group of single cores, overall screen with drain wire and armour Company please confirm - Multi.core analog cable is compose by group of single pairs twisted, screened each with drain wire and overall pairs group screen with drain wire and armour	This shall be finalised during detail engineering stage.
45	I&C	SEC-III SOW	5.0 JUNCTION BOXES AND WIRING / 5.1 General	The standard sizes for junction boxes shall contain the following numbers of terminals suitable to meet the 'Exe' certification: - 11 Terminals - 30 Terminals - 60 Terminals - 120 Terminals	Contractor understands that: For analog signal JB are grouped for max instruments/signals: - 11 terminals = 3 + 1 spare - 30 terminals = 8 + 2 spare - 60 terminals =16+ 4 spare - 120 terminals = 32 + 8 spare For analog Digital JB are grouped for max instruments/signals: - 11 terminals = 4 + 1 spare - 30 terminals = 12 + 3 spare - 60 terminals = 24 + 6 spare - 120 terminals = 48 + 12 spare Please confirm.	With reffernce to project document 0221-IMA-6000-0 (Specification for General & Packaged Instrumentation), *All junction boxes shall have at least 20% spare capacity in terms of gland connection entries, terminals and duct space. The spare entries shall be plugged with explosion proof plugs. Bidder to adhere the project requirement.*
46	I&C	SEC-III SOW	5.0 JUNCTION BOXES AND WIRING / 5.1 General	genera statement on cables termination	With reference to Sheet "Att.#1"-JB Termination_sample", please confirm Contractor understanding of the cables termination philosophy on junction box.	This shall be finalised during detail engineering stage.