

Section 7. Technical Specifications

The Goods and Related Services shall comply with following Technical Specifications:

Item No	Name of Item or Related Service	Technical Specification and Standards
1	2	3
GOODS:		
Supply, Installation, Testing and Commissioning of Hot Well Level Control System of APSCL.		
01.	Electro-pneumatic Positioner (digital valve Controllers).	Model: Emerson Fieldvue DVC6200/ Equivalent Positioner Type: DVC6200 Input Signal: 4-20 mA dc Diagnostics: Performance-PD Action: Direct, Gauges: 0-60 Psig/ 0- 4 bar Transmitter: 4-20 mA Position Transmitter Mounting Type: Field Mounting Manufacturer: Emerson/Equivalent. Country of origin: Singapore/Malaysia/G7/EU
02.	DVC-6200 Aluminum Mounting KIT with Bracket + Feedback Array + Mounting	Assembly including required Allen Screw for Valve Travel 4 ¼ Inch (For 5RM40G401) P/N.: GG 20240 X 082 (Aluminum) Controller Mounting Kit: Std 18-8 SST or Equivalent With all accessories. Manufacturer: Emerson/Equivalent. Country of origin: Singapore/Malaysia/G7/EU
03.	DVC-6200 Aluminum Mounting KIT with Bracket + Feedback Array + Mounting	Assembly including required Allen Screw for Valve Travel 1 ½ Inch (For 5RM40G402) P/N.: GG 20240 X 042 (Aluminum) Controller Mounting Kit: Std 18-8 SST or Equivalent With all accessories. Manufacturer: Emerson/Equivalent. Country of origin: Singapore/Malaysia/G7/EU
04.	Feedback Array for Emerson Fieldvue DVC6200	4 ¼ Inch Valve Travel (For 5RM40G401) Model: GG 20240 X 082 or equivalent Manufacturer: Emerson/Equivalent. Country of origin: Singapore/Malaysia/G7/EU
05.	Feedback Array for Emerson Fieldvue DVC6200	1 ¼ Inch Valve Travel(For 5RM40G402) Model: GG 20240 X 042 or equivalent. Manufacturer: Emerson/Equivalent. Country of origin: Singapore/Malaysia/G7/EU

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06.	Level Troll Transmitter Complete Set (Tag: 5 SD 11L002)	Level Troll Type: 249BF or equivalent. Equalizing Connection Size: DN50 Connection Location: Up Side & Lower Side (3) Rating: PN25, Connection Style: RF Flange Displacer Length: 14 Inch Displacer Diameter: 3 Inch Trim Material: 316SST Instrumentation Mtg Position: Left Hand Process Temperature: 40 to 100°C Process Fluid: Hot Well Water Fluid Specific Gravity: 1.0 Type: DLC3010, Reverse Action, Output Signal: 4 to 20 mA DC (Replacement against s/n F146699) Manufacturer: Emerson/Equivalent. Country of origin: Singapore/Malaysia/G7/EU
07.	Level Troll Cage Head with mounting accessories	Type: 249BF; STYLES 3&4, 1 ½ NPT Part No.: 1Q33628X112 and 1B5530X022 (DLC3000 MTG KIT) or equivalent. Manufacturer: Emerson/Equivalent. Country of origin: Singapore/Malaysia/G7/EU
08.	Programmable Logic controller with I/O Module	Model: 1769 Series L31 Compact Logix or equivalent. Channel 0 & 1 RS-232 Serial Port Communication ports parameter – CH0 - RS-232 & CH1- RS-232 Default parameter as below Protocol- DF1 Full-duplex, DF1 Full-duplex- 19.2 Kbps, Parity-None, Station Address- 0 DF1, DH-485, ASCII & DF1, DH-485, fully isolated , User memory- 512 KB, Number of I/O modules - max- 16 I/O modules Number of I/O banks- max-3 banks Backplane current-330 mA at 5V DC, 40 mA at 24V DC , Power dissipation- 2.61 W Programming cable type - 1747-CP3 or 1756-CP3 Isolation voltage- 30V (continuous), Basic Insulation Type Operational Temperature- 0~60 °C Programming Option: for unit 5 Controller should set internally programmed under RS Logix 5000 platform with for Analog I/O card, all I/O channel must be configured for APSCL Hot well unit, 3 Analog in for 1 LIT, 2 valve status indication , 2 PID & function blocks for main & recycle control Valve operation for automatic control of hot well level Programming Option: for Spare unit Complete set L31 controller, chassis power supply, Analog Input, Output card set unit must be programmed fully as a critical spare for unit 4 & 5 in case replacement needed Manufacturer: Allen Bradley/Equivalent. Country of origin: Singapore/Malaysia/G7/EU
09.	Allan Bradley 1769 Logix chassis power supply unit	Series compact Logix chassis power supply unit User Power Output Voltage- 5 V dc, 24 V dc Output Current-4 A Maximum Operating Temperature-60 Degree C For Use With- Compact output module Manufacturer: Allen Bradley/Equivalent. Country of origin: Singapore/Malaysia/G7/EU

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10.	Allan Bradley 1769-IF8 Series analog input card	<p>8 input channel analog module For 4~20 mA Analog signal Maximum working voltage 30 V DC, 50~60 HZ Operating temperature 0~60 Degree C Channel impedance 250 K Ohm Max current draw 70 mA at 24 VDC supply Maximum current for each channel 0.35 A at full scale SIL 2 rated Manufacturer: Allen Bradley/Equivalent. Country of origin: Singapore/Malaysia/G7/EU</p>
11.	Allan Bradley 1769-OF8C Series analog output card	<p>8 input channel analog module For 4~20 mA Analog signal Maximum working voltage 30 V DC, 50~60 HZ Operating temperature 0~60 Degree C Maximum resistive load 0~500 Ohm for each channel Max current draw 185 mA at 24 VDC supply Max. accuracy for current channel 0.35 at full scale SIL 2 rated Manufacturer: Allen Bradley/Equivalent. Country of origin: Singapore/Malaysia/G7/EU</p>
12.	Power supply unit	<p>Model: Allan Bradley 1606-XLX240E or equivalent. Input AC 100~240 V, single phase, Din Rail Mounted with LED indication for DC output & overload Line frequency 50~60 Hz Output 24V, 360 watts, 10A Output voltage maximum adjustment range 24~28 V DC. SIL 2 rated Operating temperature -20~70 Degree C Manufacturer: Allen Bradley/Equivalent. Country of origin: Singapore/Malaysia/G7/EU</p>
13.	Allan Bradley 1606-XLX redundancy power module	<p>24 VDC x 24 VDC Type: 1606-XLS Series or equivalent. Performance, Input Voltage: 24 - 28 VDC, Output Voltage: 2.15 V, Output Current: 40 A, Output Power: 960 W, Frequency Rating: 47 - 63 HZ, SIL 2 rated Input Current: 20 A, Material: Plastic, Mounting: DIN Rail Operating Temperature: -25 To 70 DEG C Manufacturer: Allen Bradley/Equivalent. Country of origin: Singapore/Malaysia/G7/EU</p>
14.	Allen-Bradley 1769-ECR	<p>Compact Logix Right End Cap/Terminator, Series A. SIL 2 rated Bus Current Draw, max: 5 mA at 5V DC Operating altitude: 2000 m (6562 ft), Series A Manufacturer: Allen Bradley/Equivalent. Made in Singapore/Malaysia/G-7/ EU</p>

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15.	HMI (For Unit-5)	<p>Model- Cat- 2711P-RDT10C or equivalent. Panel view Plus 1000 HMI 12" screen Touchscreen, Ethernet, and RS-232, Screen Size: 10.4" Power Input 18~32 VDC, Power consumption- 70 Watt Operating Temperature 0~55 Degree C Line frequency 47~63 Hz Enclosure rating- NEMA type 12, 13, indoor use only IP54, IP65 Resolution-640 X 480 Backlight- CCFL, 50,000 Hr. life time Keyboard function key- function key, numeric & navigation Display color combination- thin film Metrix, thin film transistor with liquid crystal display, Battery life time- 4 years Application flush memory 20 MB Protocol- Ethernet, serial port, USB Programming HMI graphics display must be developed under factory suite platform for APSCL as per Howell unit, all graphics icon should be color combination, each dynamic icon animation must be done with PLC I/O channel, PID block & function, Alarm, Trend display should be an option for navigation & control Manufacturer: Allen Bradley/Equivalent. Country of origin: Singapore/Malaysia/G7/EU</p>
16.	PLC & HMI Panel	<p>Locally fabricated panel, made of 2 mm thick galvanize sheet with gray color coated, design should meet to install the HMI on front or as per APSCL recommendation. All PLC stuff inside the DIN rail Panel should contain Lubber, ventilation fan for cooling MCCB should be installed & assign for dual AC 230 input for Main supply from UPS & utility Internal wiring has to be with all cable marker as per electrical drawing All I/O should assign individual 0.5 A fuse for overload protection</p>
17.	Multiple conductor cables (Instrumentation cables)	<p>Multiple conductor cables suitable for 24 V DC Electrical signals used for monitoring or controlling in process & applications. Size 14~18 AWG, with Internal screening or shielded Cable outer color Black or Gray, internal Color combination Pair of white & Black/Red & Black. Or Combination of two color, double Outer sleeve PVC insulated Suitable for class 1 DIV 2 hazardous atmosphere, flexible multistring internal conductor suitable for bend & curve at harsh environment, cable type should be tolerable to maximum 60 Degree process temperature piping at surroundings Made in Bangladesh/India/china/ Malaysia</p>
18.	SS 316 Fittings	<p>Swagelok SS Compression fittings Swagelok Straight connector 3/8" OD tube x 1/4" MNPT, All fitting should be made of 316 SS, non-corrosive Made in: G-7/EU</p>
19.	Swagelok Ball valve	<p>3/8" OD tube connection Rated 0~500 Psig pressure, Temperature -65 to 300° F, Body material- Stainless steel, Packing Materials- PTFE , Configurations- 3-way Swagelok Bulk head 3/8" Made in : G-7/EU</p>
20.	304 SS tube	<p>3/8" OD tube suitable for Swagelok fittings, wall thickness 0.035" suitable for pneumatic air supply pressure 250 Psig , non-corrosive, flexibility for 180 Degree bend</p>

21.	Galvanize pipe	3/4" for cable run through inside, low schedule for conduit purpose.
22.	Cable Gland	Cable entry gland ½' MNPT, brass or oxidize coated, anti-rust coated suitable for supplied cable size, gland should be environmental rubber seal type to restrict water egress into devise Made in India/china/ Singapore
23.	Project accessories	such as U clamp, bracket for tube run, pipe run, mounting saddle, screw, cable Tie, metal tie, clamp, for securing cable, tube with other consumable for complete installation- Made in Bangladesh
24.	Fabricated manual option panel	For valve (5RM40G401 & 5RM40G402) manual control operation, duel regulated output option by precision regulator at front of panel for fine adjustment. Regulator Brand- Norgren, watts, Fisher, type ¼" main input, 1/8" FNPT output connection - made in: G-7 or EU Individual Pressure Gauge Range 0~100 Psig back connection ¼" FNPT connection, made by Mc Daniel, Ashcroft, WIKA, Made in: G-7 or EU Panel internal tubing should be 250 psig PVC rated suitable for Swagelok connection each end, main panel input & final output end should be 3/8" Swagelok bulk head connection for valve connection With all accessories. All Internal component From G-7/ EU/ Singapore.
25.	Project document	Such as P&ID, electrical drawing, operating manual, product delivery literature provided with detail supplied product specification & manufacturer detail, LOOP drawing, product catalog etc. Made in Bangladesh
26.	Project complete Installation, Testing & Commissioning works	Site acceptance test (SAT) will be done with the presence of customer representative. Key Task of Project Supplied electronic Level transmitter must be installed on Hot well bridle after removing existing pneumatic level transmitter power supply should be hook up & field calibration. Supplied electro-pneumatic DVC 6200 valve positioner field wiring termination with PLC with main & recycle valve Onsite calibration of all I/O Loop check & function check.
RELATED SERVICES:		
02.	Supply, Installation, Testing and Commissioning of Hot Well Level Control System of APSCl.	Not Applicable

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Note 01: Equipment's do not meet the requirements will not be certified.

Note 02: Quality will be certified after successful operation in the field & it will take 7 days.

Note 03: The Supplier shall provide Product Manual, Specification, O&M Manual for up gradation System, Instrument Data sheet, PLC data Sheet, Hook-up drawing, Inter - Connection diagram (Schematic Diagram), Functional diagram, PLC backup CD etc. during the delivery of the goods.

Note 04: Site visit will be highly encouraged.

Note 05: Operation philosophy of old & proposed hot well system is attached with tender documents.

Note 06: Dismantling of old materials, Supply, Installation, Testing & Commissioning is in supplier's scope.

- Note 07: At site if any modification of instrument (including extra accessories) is required that should be borne by the Supplier.
- Note 08: The supplied PLC & associated software license should be unlimited.
- Note 09: The Supplier should provide test and country of origin certificate for item no. 01, 06, 08,09,10,11,12,13,14 & 15.
- Note 10: System should be designed like that level, pressure & flow of condensate will not vary more than 3% during any operation of plant.
- Note 11: During cable laying & others works contractors' representative shall be present at site and proper PPE shall be maintained.
- Note 12: Training at site for 02 days for O&M engineers.
- Note 13: If actuator spring adjustment & maintenance is required that shall be done by the Supplier.



Section 8. Drawings

Attached.

A handwritten signature in black ink, appearing to read "P. Smith" or similar, with a horizontal line underneath.