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1. EXISTING SCADA SYSTEM

The Kunnar Pasakhi Deep (KPD) and Tando Allahyar (TAY) fields of Oil & Gas Development Company Limited are located in Hyderabad District about 25 km away from Hyderabad city of Sindh Province. Presently KPD-TAY field is consisting of 41 number of producing well sites. Field is operated with full potential having 5000 BPD oil, 250 MMSCFD gas and 400 + MT/day LPG.

The KPD-TAY field comprises of following facilities:

- Wellhead facilities
- Surface Gas Gathering Network
- Gas Processing Plant (including Amine Sweetening Unit)
- LPG extraction units (2 trains of Dew Point Control, Turbo Expander / Recompression, De-Ethanizer, De-Butanizer etc.)
- Condensate Stabilization units (2 trains)
- Sales Gas Compressors (3 x 50% capacity)
- LPG & Condensate Storage
- LPG & Condensate Loading
- LPG & Condensate Metering
- Power Generation
- Utilities such as Hot Oil System, Fuel Gas System, Compressed Air System etc.
- LPG and Condensate Recovery
- Produced Water Handling System
- Custody and Metering Systems

A fully functional SCADA server is installed for 30 Nos well sites. This SCADA system is used to control and monitor various wellhead parameters remotely. OGDCL intends to expand this SCADA system to other **11 wells** of the same field. Purpose of this document is to share details of existing SCADA system with potential Bidders/Contractors/ Packagers

who will supply, install and commission the SCADA system for additional **11** nos. wells. Main components and corresponding details of existing SCADA system is provided below.

1.1 Existing SCADA HMI

SCADA HMI comprise of following items:

SCADA HMI Component	Details
SCADA Connectivity Server	Redundant Pair of Servers HMI Make: ABB 800xA Version 5.1 Hardware Make: HP
SCADA Aspect Server	Redundant Pair of Servers HMI Make: ABB 800xA Version 5.1 Hardware Make: HP
SCADA Historian	Simplex Server HMI Make: ABB 800xA Version 5.1 Hardware Make: HP
SCADA Engineering / Operator Workstation	HMI Make: ABB 800xA Version 5.1 Hardware Make: HP
SCADA Operator Workstation	HMI Make: ABB 800xA Version 5.1 Hardware Make: HP
SCADA Engineering Mobile Workstation	HMI Make: ABB 800xA Version 5.1 Hardware Make: HP
SCADA Screen Printer	Make: HP
SCADA Alarm Event Printer	Make: HP
SCADA Report Printer	Make: HP

1.1.1 Existing SCADA HMI Licenses

Qty	Description	Order Code
1	800xA Base System, 800xA 5.1 Includes one Operator Workplace, one Engineering Workplace, AC800M Connectivity, Redundant Aspect Server, Plant Explorer, Logging of Operator Actions, Topology Status Viewer, Softpoint Server, Scheduler, Primary History Logs (logging of signals for operator trends for up to 3 months), 10 Asset Monitors and Diagnostics Collection. Fast log-over of users.	3BSE061234R1
3	1,000 tags, redundant, 800xA 5.1 (Enables tag access through redundant Connectivity Servers.)	3BSE061236R2

Qty	Description	Order Code
1	<i>OLE-DB Real Time Data Client Connection, 800xA 5.1</i> <i>Allows real-time system data to be accessed via an OLE-DB interface.</i> <i>One per external access.</i>	3BSE061246R1
1	Operator Workplace - Additional Client, 800xA 5.1 Includes one local or remote operator workplace, Excel based reporting aspects, MS Excel is NOT included, use of up to 2 screens is included (One is included with Core system so this limit to Total-1) The total quantity of Operator Workplaces, Large Operator Workplaces and Engineering Workplaces - must not exceed 80.	3BSE061255R1
30	PM861/PM861A Software License, 800xA 5.1 50 Controller Capacity Points	3BSE061900R1
1	1,000 HART Device Aspect Objects, 800xA 5.1	3BSE061360R1
1	HART Multiplexer Connect, 800xA 5.1 Enables HART Device Integration to connect to HART devices using HART Multiplexers.	3BSE061362R1
2	800xA History Signals - Basic 1000 signals	3BSE067077R10

1.1.2 New Licenses required for Addition 11 Wells

Recommended upgrade of licenses for additional 11 wells is as below:

SCADA HMI Component	Details	Order Code	Quantity
SCADA Connectivity/Aspect Server	Addition of 1000 redundant tags for additional wells	3BSE061236R2	02
SCADA Historian	Addition of 1000 tags for additional 11 wells	3BSE061267R1	01
SCADA Operator Workstation	Addition of one new OWS in existing system	3BSE061255R1	01
SCADA OPC Server	PLC Connect: Used to connect 3 rd party RTU/PLC with ABB 800XA system	3BSE061242R1	01

After addition of above mentioned SCADA OPC Server (PLC Connect), SCADA system will be able to connect with 3rd Party PLCs/RTUs or other control equipment with following considerations:

PLC Connect includes the following:

- Object-oriented PLC Server with alarm detection for Boolean, integer and real values, data processing and scaling functions. Object types include composite process object types and extended signal types.
- Basic integration of connected PLCs and RTUs.
- Built in protocols for Comli, SattBus, Modbus Serial and Modbus TCP/IP.
- Dialed communication (Option) for Comli and Modbus Serial.
- OPC DA (1.0 and 2.05a) client functionality.
- Upload of OPC server configuration.
- Configuration data stored in Aspect Directory.
- Support for Bulk Data Manager.
- Support for multiple control networks, that is, multiple connectivity servers in separate PCs in one system.
- Support for redundant connectivity servers with PLC/OPC Server communication surveillance.
- Handling of calculated soft points.
- Open interfaces for calculations, and other client applications.

While selecting new RTUs, bidder/contractor for additional SCADA wells shall consider above features/limitation of the existing system and select that hardware/software which is fully compliant and compatible with existing system. Recommendations from OEM shall also be sought to ensure this compatibility.

1.2 Existing Networking Architecture

Data from well sites is gathered and distributed to SCADA servers and operator stations by redundant network managed by differed layers of network switches, network accessories, DLS extenders etc. Control network and hardware network are complete separated using separate ethernet switches. Details of existing architecture can be seen in attached system architecture diagram of existing SCADA system.

1.3 Radio Communication System

Following Radio communication equipment is installed at Kunar CCR / Base station and at each remote RTU site. As base station / CCR, Radio system installed is fully redundant. Radio systems installed at wellsite are simplex.

Detail of Radio hardware, software and licenses that are already deployed at base station / CCR is as follows:

Radio Components (At Master/Base Station)	Details
Redline RDL3000-UHF	RDL3000 XP Ellipse 2.3-2.7GHz Base Station RF-2xN(f) GPS-1xTNC(f) Eth-1xRJ45 100Base-T Gland
Sectoral Antennas	Antenna Sectoral 2.3-2.7GHz 14dBi 3ft(90cm) 120-deg dual-pol GPS-Ant 2xN(m) 1xTNC(m) DT-MNT
Radio Software	Software ClearView 2 NMS
Station Bandwidth License	RDL3000 Ellipse Base Station 50 Mbps Capacity
Station Redundancy License	RDL3000 Ellipse Base Station Redundancy

Details of Radio hardware, software and licenses that are already deployed at remote well sites are as follows:

Radio Components (At Remote Well Site)	Details
Redline CONNECT-OWS	Connect-OWS IP+SER-Terminal 2.3-2.7GHz 15dBi-Ant MNT DC-POE DIN-LP 2eth-RJ45 2ser-RJ45

While selecting new radio systems at well site, bidder/contractor for additional SCADA wells shall consider above features/limitation of the existing system and select only that hardware/software which is fully compliant and compatible with existing base Radio system. Existing spare capacity shall also be considered, and any additional items required to accommodate new well site data at master/base Radio station shall be provided by SCADA system contractor. Recommendations from OEM shall also be sought to ensure this compatibility and spare capacity.

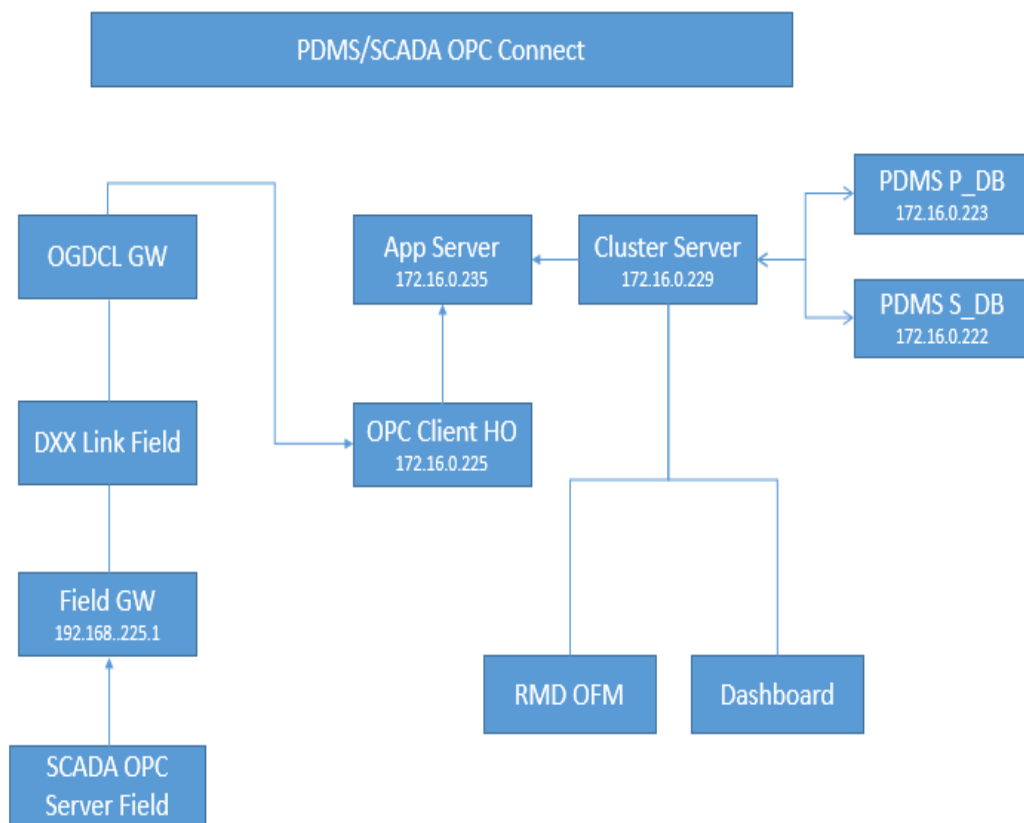
1.4 Well Site Area

SCADA system at wellsite consists following components:

1. RTU System (Redundant)
2. Solar System (Redundant)
3. Radio System(Simplex)
4. Process Instruments (DPTs, PTs, TTs, LTs, Pressure and Temp. Switches, Flow Meters etc.)
5. Control Elements (FCV, ESD Valves, WHCP etc.)
6. Fire and Gas Equipment (Flame, Combustible/Toxic Gas Detectors, Hooters, Beacons etc.)

2. EXISTING PRODUCTION DATA MANAGEMENT (PDMS) SYSTEM

OGDCL has installed a fully functional production data management (PDMS) system. Servers and Dashboard stations of this system are installed at OGDCL Head Office, Islamabad. Please see following block diagram to understand basic workflow of the system.



Bidder/Contractor of SCADA system shall be responsible to integrate the SCADA system with OGDCL PDMS system. Any hardware / software / license required at SCADA system for this integration will be supplied, installed, configured and commissioned by SCADA system Bidder/ Contractor. However, it shall be noted that OGDCL will be responsible for any hardware / software / license required at PDMS system. SCADA system vendor/bidder is expected and liable to extend full technical support to OGDCL for any technical support required by OGDCL.