

PRESENTATION ON SCADA SYSTEM



SCADA SYSTEM



SCADA (Supervisory Control & Data Acquisition) System



- ❑ TO MONITOR & CONTROL THE WIDELY SPREAD FACILITIES FROM A CENTRALIZED LOCATION
- ❑ CENTRALIZED ALARM, EVENT & REPORT MANAGEMENT FOR ALL THE DISTRIBUTED FACILITIES
- ❑ PROVIDE 'REMOTE-EYE' TO THE OPERATION OF WIDELY SPREAD FACILITIES
- ❑ TO PROVIDE INPUTS FOR LEAK DETECTION SOFTWARE



SCADA SYSTEM OBJECTIVES



❑ Centralized checking of status of various widely spread facilities w.r.t

- Readiness to dispatch products
- Pumping status
- Readiness for receipt & distribution of products
- Status of valves

❑ To ensure that the requested control action will not result in unsafe operation

❑ To ensure proper shutdown by closing various remote facilities in orderly manner as per pre-defined sequence



TYPICAL CROSS COUNTRY PIPELINE

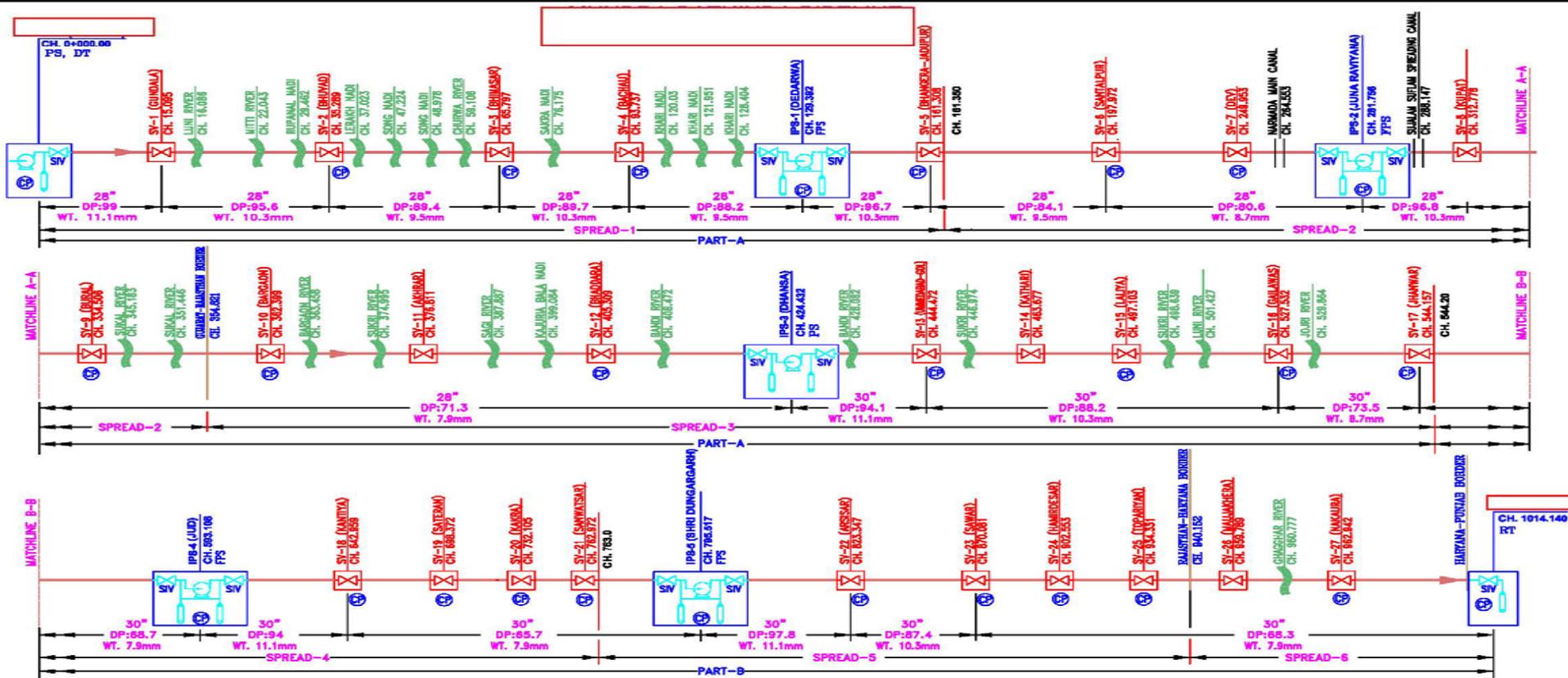


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TYPICAL CROSS COUNTRY PIPELINE



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LEGEND:

| | | | |
|-----|---|--|---|
| PS | PUMPING STATION | | PS LAUNCHER/ RECEIVER |
| FPS | FUTURE PUMPING STATION | | PUMP |
| IPS | INTERMEDIATE PIGGING STATION | | SECTIONALIZING VALVE STATION |
| DT | DESPATCH TERMINAL | | PROPOSED MUNDRA-BATHINDA PIPELINE, SIZE 28"φ & 30"φ |
| RT | RECEIPT TERMINAL | | RIVER |
| DP | DESIGN PRESSURE (IN kg/cm ² g) | | CANAL |
| | CATHODIC PROTECTION STATION | | |
| SV | STATION ISOLATION VALVE | | |
| WT | WALL THICKNESS | | |

NOTES:

- ALL CHANGES INDICATED ARE IN Km AND ARE w.r.t. CHAINAGE 000.00 AT MUNDRA DESPATCH TERMINAL.
- CHAINAGES ARE AS PER SURVEY DATA PROVIDED BY CLIENT.
- LOCATIONS OF PUMPING STATIONS, IP STATIONS & SV STATIONS ARE INDICATIVE ONLY AND EXACT LOCATIONS SHALL BE FINALISED DEPENDING ON AVAILABILITY OF PLOTS.
- ALL SVs ARE REMOTE OPERATED

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NEW DELHI

PROJECT :
CLIENT :
JOB NO :

| REV. | DATE | REVISION | BY | CHK | APPROVED |
|------|----------|-----------------------------------|-----|-------|----------|
| 3 | 06.11.08 | REVISED & RESSUED FOR ENGINEERING | NKS | NAWIN | RK |
| 2 | 08.10.08 | REVISED & RESSUED FOR ENGINEERING | NKS | NAWIN | RK |
| 1 | 27.06.08 | REVISED & RESSUED FOR ENGINEERING | NKS | NAWIN | RK |

SCHEMATIC ARRANGEMENT OF PIPELINE FACILITIES

| | |
|---|-------------|
| DRAWING NO. | REV. |
| | 3 |
| SHEET 1 OF 1 | |

6022-000-10-71-3002_Rev 2 Schematics.Dwg

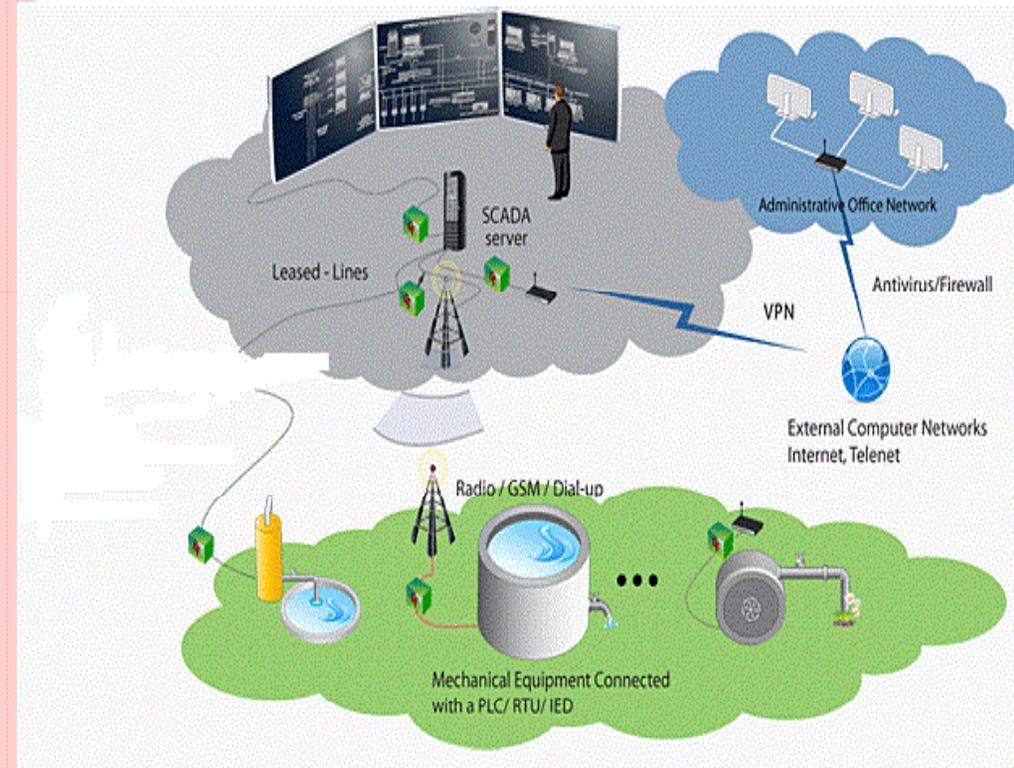
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SCADA SYSTEM HARDWARE COMPONENTS



- SCADA system Server & Workstations
- Remote Workstations
- Remote Telemetry Units (RTU)
- WAN Routers



SCADA system Server & Workstations



Separate Redundant SCADA server & MMI workstations with Client-Server concept implemented at hardware & software level



REMOTE WORKSTATION



• Remote workstation is normally envisaged at manned stations (other than Master Station location): -

➤ Pump/ Compressor stations

➤ Terminals

to provide complete SCADA system capability (graphics & reports) so that the operators at these locations are fully informed of: -

➤ All the monitoring variables of remote facilities

➤ Status of various remote facilities

➤ Alarms/ Events for remote facilities

➤ Issue controls (under password control)



REMOTE TELEMETRY UNIT (RTU)



- ✓ Microprocessor based intelligent unit supporting CPU, RAM, Real time clock, EPROM.
- ✓ The basic unit of RTU consists of
 - Power Supply Module
 - Processor Module
 - I/O Modules
 - Communication Modules
 - Serial Interface Module
- ✓ Interfaces with Field instruments through intelligent input/ output subsystem and converts the information into the digital frame structure for interfacing with Telecom channels through communication modules



RTU



The RTU provides the engineering functions of:

- High/ low limit checking
- Time tagging
- Engineering unit conversion
- Self diagnostics
- Remote configuration and downloading
- Interfacing with PLC/ Flow computers etc.

The various I/O cards provided are:

- Digital input card
- Digital output card
- Analog input card
- Analog output card



SCADA SYSTEM COMMUNICATION PROTOCOL



SCADA system Open communication protocols for communication between Master station & RTUs :

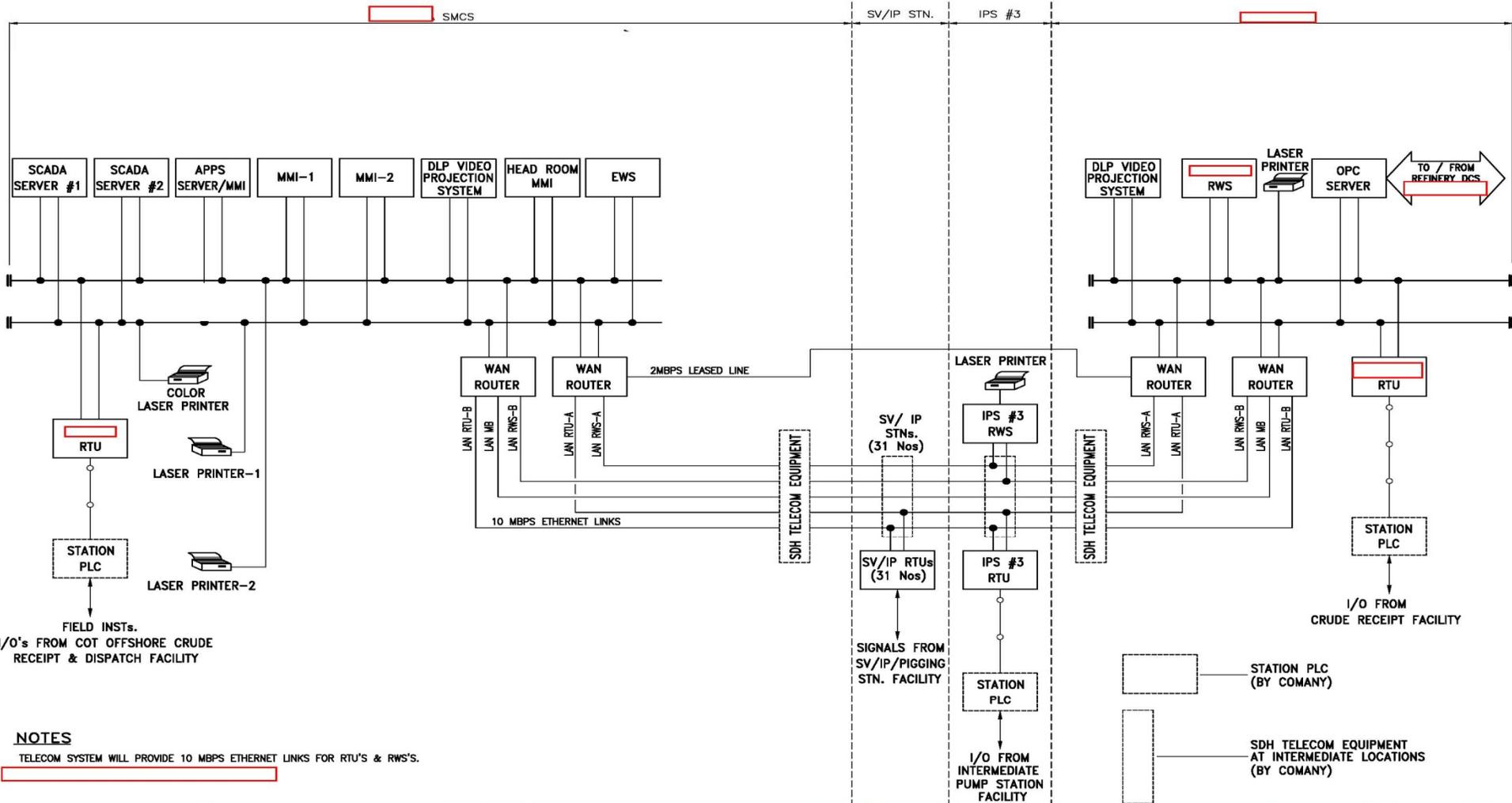
- ❖ DNP 3.0
- ❖ IEC 60870-5-104



TYPICAL SCADA SYSTEM ARCHITECTURE



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NOTES
TELECOM SYSTEM WILL PROVIDE 10 MBPS ETHERNET LINKS FOR RTU'S & RWS'S.

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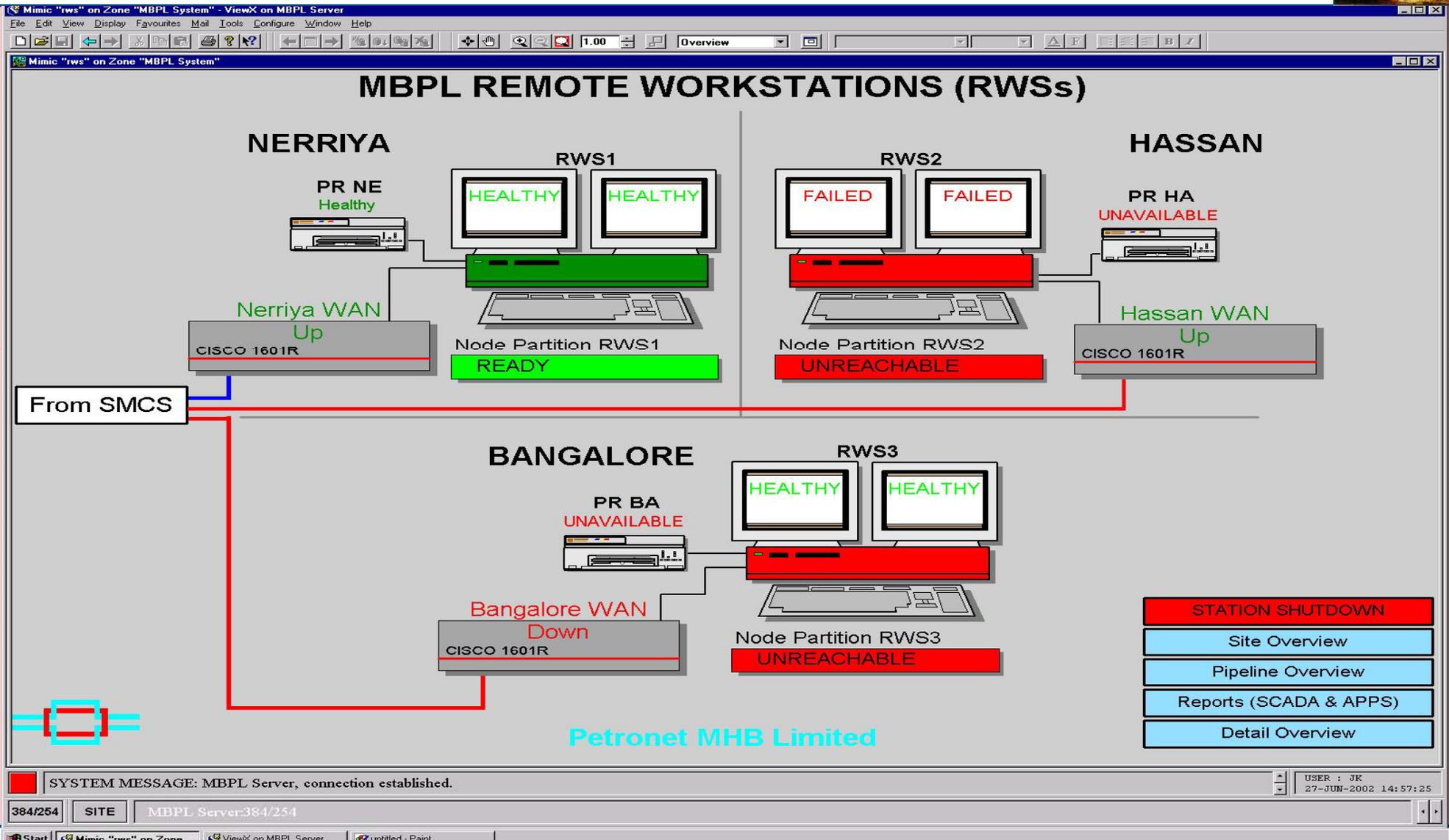
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SCADA SYSTEM
BLOCK DIAGRAM

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| | |

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SCADA SYSTEM



SCADA System Engineering activities



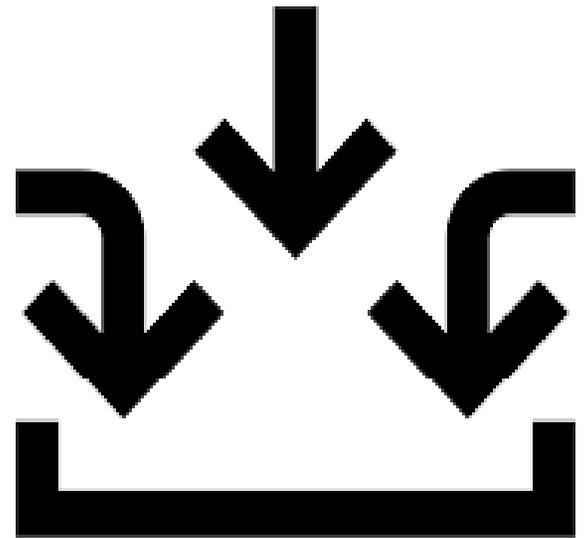
- Review of basic Process documents (Process Design Basis, P&IDs) as applicable for SCADA
- SCADA Design Basis
- Firming up of system configuration and specifications of SCADA
- Furnishing room sizes, layout, etc. to Architectural Group.
- Preparation of Material Requisition
- Technical bid evaluation of bids
- Preparation of Purchase Requisition
- Review of vendor's detailed engineering documents
- Participation in FAT
- Site assistance as required



Inputs Required from other Groups



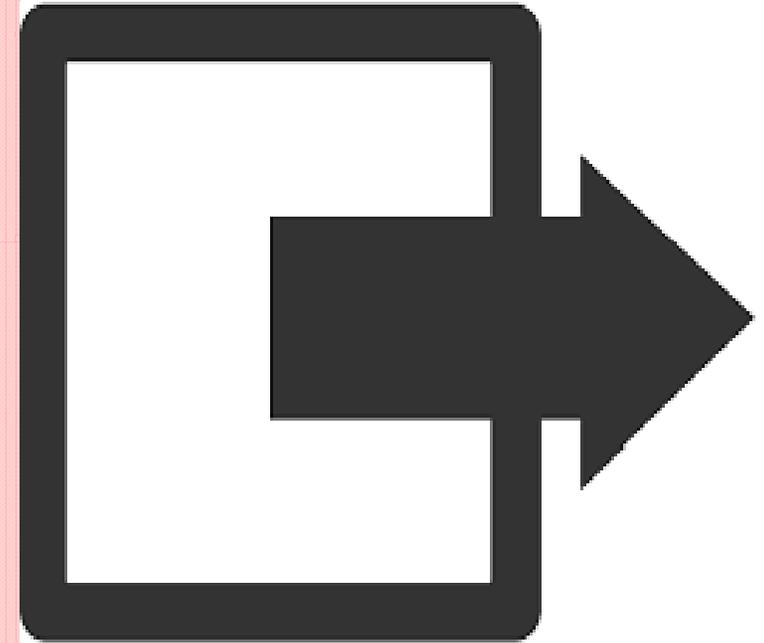
- ❖ Electrical I/O signals
- ❖ Cathodic protection system I/O signals
- ❖ Pipeline Schematic drawing
- ❖ Process
 - P&IDs
 - Process design basis
 - Pipeline Operation & Control Philosophy



Inputs preparation for overall Engineering



- ❖ Control room Sizing
- ❖ Electrical Loads for UPS
- ❖ Heat Loads for air conditioning.



REMOTE WORK STATION

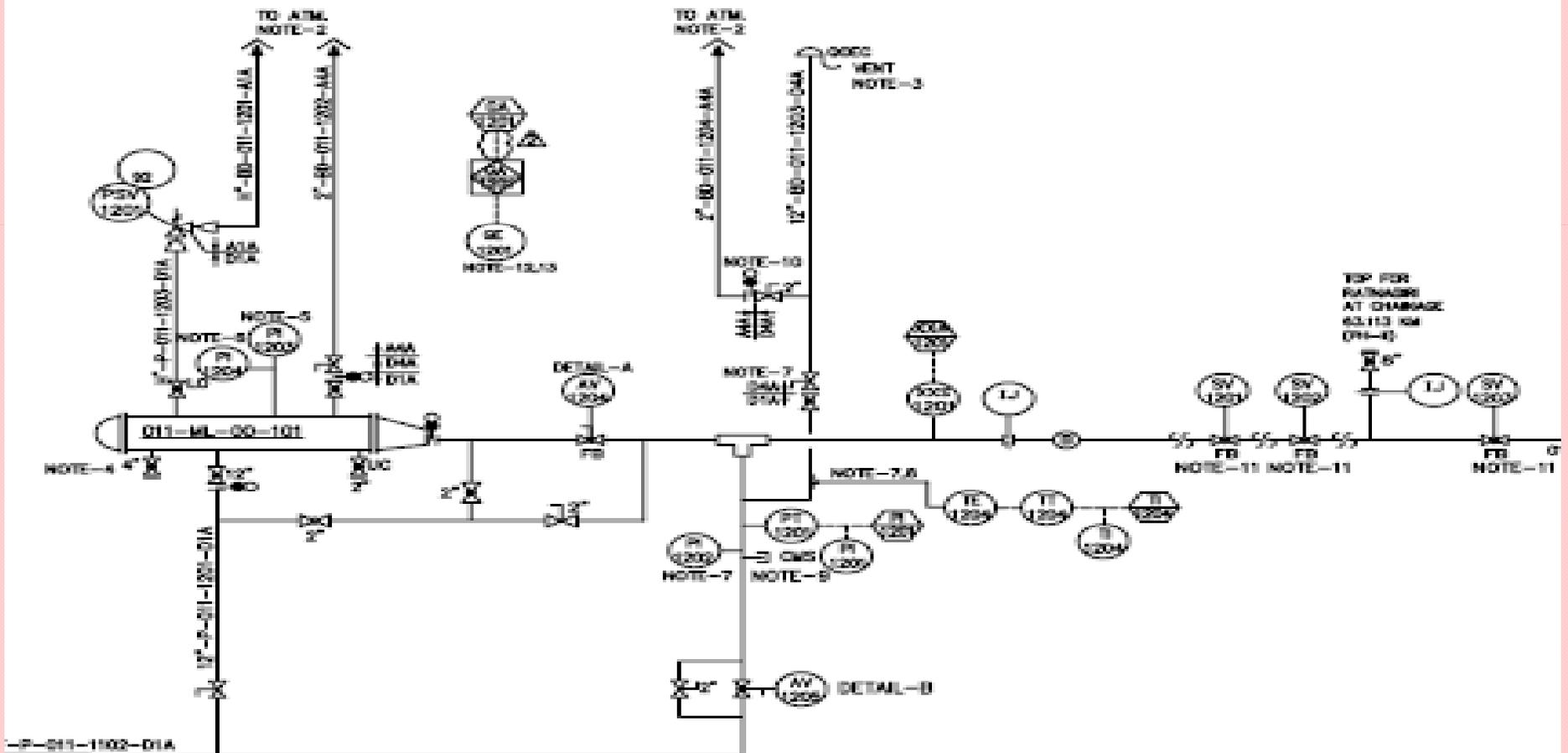


TYPICAL PIPELINE P&ID



Q11-ML-00-101
PIG LAUNCHER
 (CHARGE : G.D. RM)

Q11-ML-00-101
GAS PIPELINE
 (DABHOL TO IPS-3)
 36" NB - 249.106 KMS



इंजीनियर्स
इंडिया लिमिटेड
(भारत सरकार का उपक्रम)



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