



SCADA & ADMS System for TPCODL Network

Tender Enquiry : TPCODL/P&S/222/20-21

Pre-Bid Meeting
24th March 2021



Lighting up Lives!

TPCODL

TP CENTRAL ODISHA DISTRIBUTION LIMITED

(A Tata Power and Odisha Government Joint Venture)

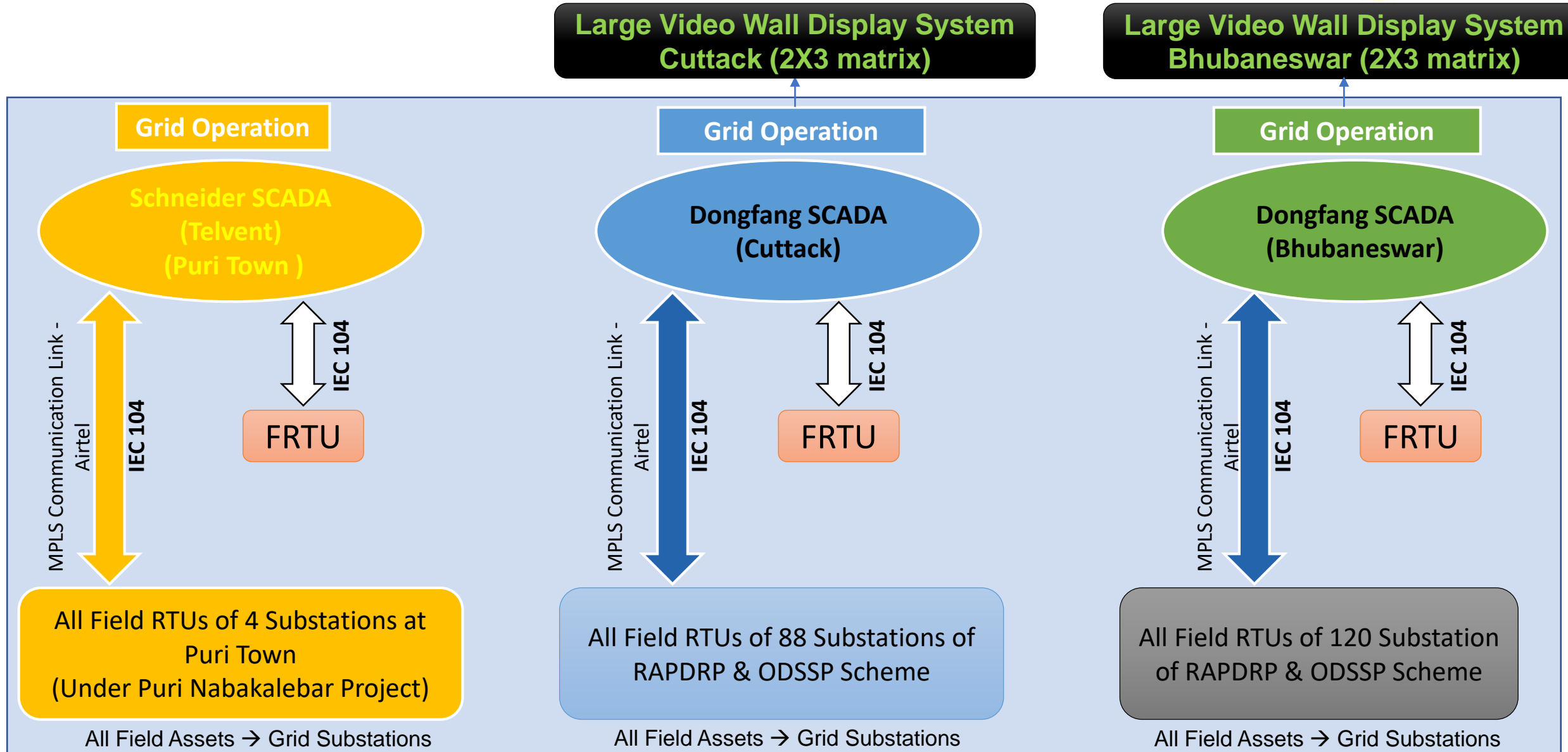


TPCODL Distribution Network

Description	UoM	Quantity
Distribution Network	Sq. Km.	29354
Number of Circles	Nos.	5
Number of Divisions	Nos.	20
No. of Sub-divisions	Nos.	64
Consumer base	Million	2.6
AT & C loss (as on 31st Mar 2020)	%	30.44
Primary Substations	Nos.	371
33 kV Feeders	Nos.	190
11 kV Outgoing Feeders	Nos.	1019
Total Circuit length 33 KV Feeders	Kms	3911.58
Total Circuit length of LT Network	Kms	55359
Power Transformers (33/11 kV)	Nos.	666
Distribution Transformers	Nos.	71889
Total Installed Capacity of Primary S/s	MVA	4475
Peak Demand	MW	1603
Annual Consumption	MUs	8600



Present SCADA Systems and Operation Philosophy





Intent of RFP

- Deployment of New SCADA & ADMS System at Main Control Center (MCC) and Nodal Control Centre (NCC) at each circle (5)
- Main & Respective Nodal Control Center shall work as hot redundant Control Center
- Fully redundant multisite architecture operating from MCC and Nodal Control Centre (NCC) to share operational responsibility in real-time
- SCADA, ADMS & OMS System Software and Hardware version should be same and tightly integrated with each other
- SCADA and ADMS System will collect field data on IEC 60870-5-104 from Remote Terminal Units (RTUs) / Data Concentrator / FRTUs / Autoreclosers / Sectionalizer / FPIs etc.
- Interface to systems like GIS, SAP-PM, MM, AMR/AMI, PQM, VMS, CIS, IoT based system, Enterprise Historian, Weather Monitoring, Renewable portfolio etc.
- Bi-directional data exchange with State Load Dispatch Center (Main and Backup) over Secured ICCP/TASE.2
- Centralized Cyber Security Management System, Communication Network Management System
- Large Video Projection System
- Auxiliary AC & DC Power System (UPS, Battery, Battery Charger)



Proposed SCADA/ADMS System Execution Plan

- Part-A:** Installation and commissioning of SCADA and other Systems at MCC and 5 Nos. of NCC
- Installation & commissioning of Nodal SCADA system for 5 circles, with Other Applications/Systems
 - Installation & commissioning of MCC SCADA system, data migration from existing system and integration with other systems.
- Part-B:** Installation, commissioning and integration of ADMS & OMS System at MCC and 5 nos. of NCC with SCADA and other systems installed under Part-A.
- Installation & commissioning of DMS System at MCC and NCC and integration with respective SCADA and other systems installed under this RFP and other Purchaser's Applications/Systems.
 - Installation & commissioning of OMS System at MCC and NCC and integration with respective SCADA and other systems installed under this RFP and other Purchaser's Applications/Systems.
- System design shall be as per the phases for seamless integration of equipment of each phase to meet all functional requirement. Configuration of SCADA system shall ensure no major changes are required in the installed SCADA system for integration of ADMS and OMS applications.
 - TPCODL is intending to commission the ADMS & OMS System after the Go-live of SCADA System at MCC and 5 nos. of NCC



At present entire communication network (MPLS/VPN) is established using services of the Network Bandwidth Service Provider (NBSP). This network is used for following critical application:

- Remote Monitoring and Control of 33/11 kV Sub-station equipment from Power System Control Centre
 - Inter Control Center connectivity
 - Remote IED management like Relay parameterization, fault disturbance record collection etc.
- Communication backbone for the entire system will be on MPLS/VPN cloud, currently there is no secondary communication link available. However, the proposed system shall be capable of redundant communication architecture.
 - Bidder to specify the bandwidth requirement to meet the required functionality and submit the detail application landscape to optimize/enhance the available bandwidth requirement.

MCC

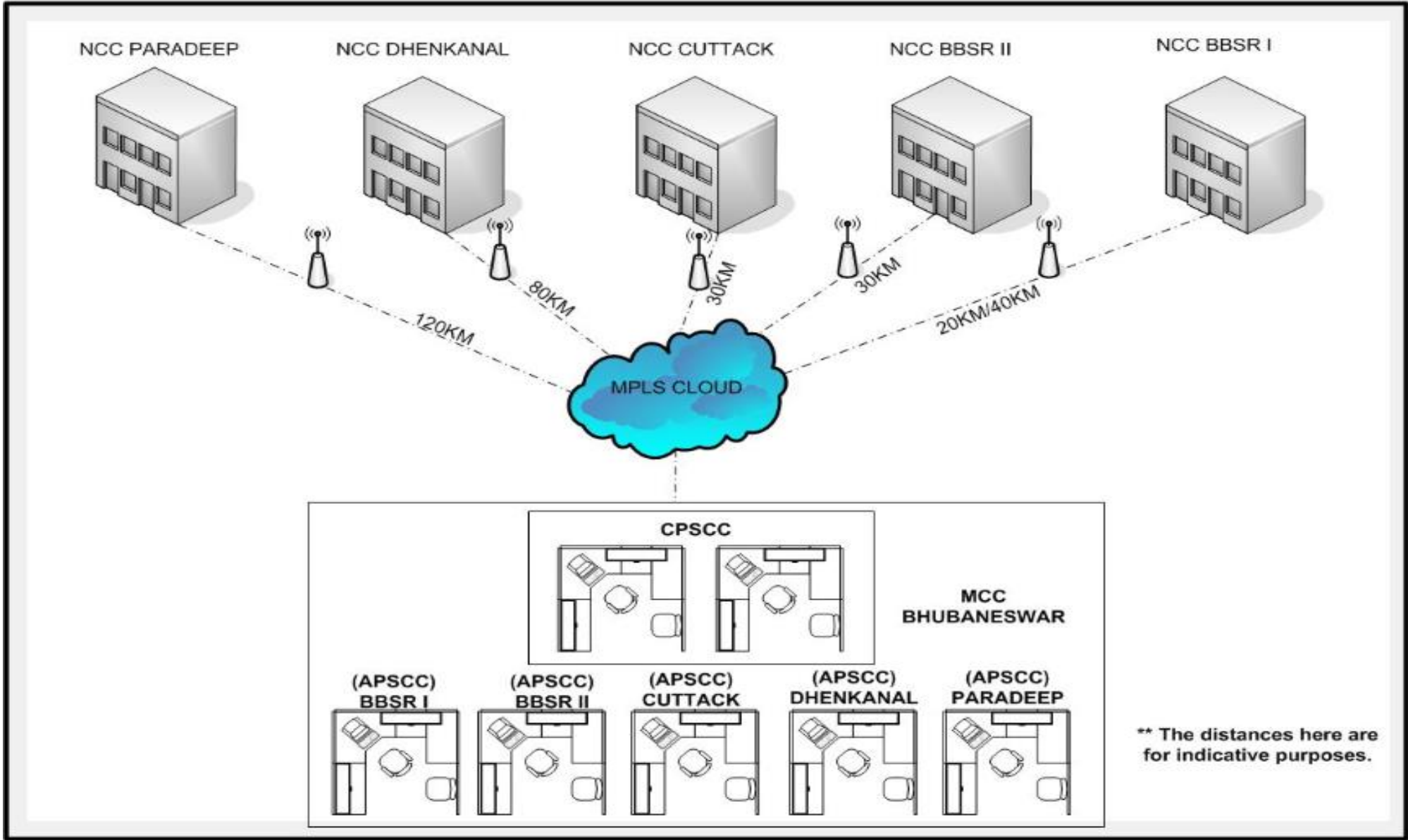
Sr. No.	Item	Existing Count	System Sizing		
			5 Years	100 % Expandability	
1	Number of Primary Substations (33/11 kV)	371	750	1500	SCADA Servers (Main & Standby) with 10,00,000 Physical I/Os FEP Servers # 1 (Main & Standby) for 5,00,000 Physical I/Os FEP Servers # 2 (Main & Standby) for 5,00,000 Physical I/Os
2	RMU at 33 & 11 KV	1600	5000	10,000	
3	Autorecloser at 33 & 11 KV	12	2000	4,000	
4	Sectionaliser at 33 & 11 KV	500	5000	10,000	
5	O/H FPI with Communication at 33 & 11 KV	100	5000	10,000	

Each NCC

Sr. No.	Item	System Sizing		
		5 Years	100 % Expandability	
1	Number of Primary Substations (33/11 kV)	150	300	SCADA Servers (Main & Standby) with 3,00,000 Physical I/Os FEP Servers # 1 (Main & Standby) for 1,50,000 Physical I/Os FEP Servers # 2 (Main & Standby) for 1,50,000 Physical I/Os
2	RMU at 33 & 11 KV	1000	2000	
3	Autorecloser at 33 & 11 KV	350	700	
4	Sectionaliser at 33 & 11 KV	1000	2000	
5	O/H FPI with Communication at 33 & 11 KV	1000	2000	

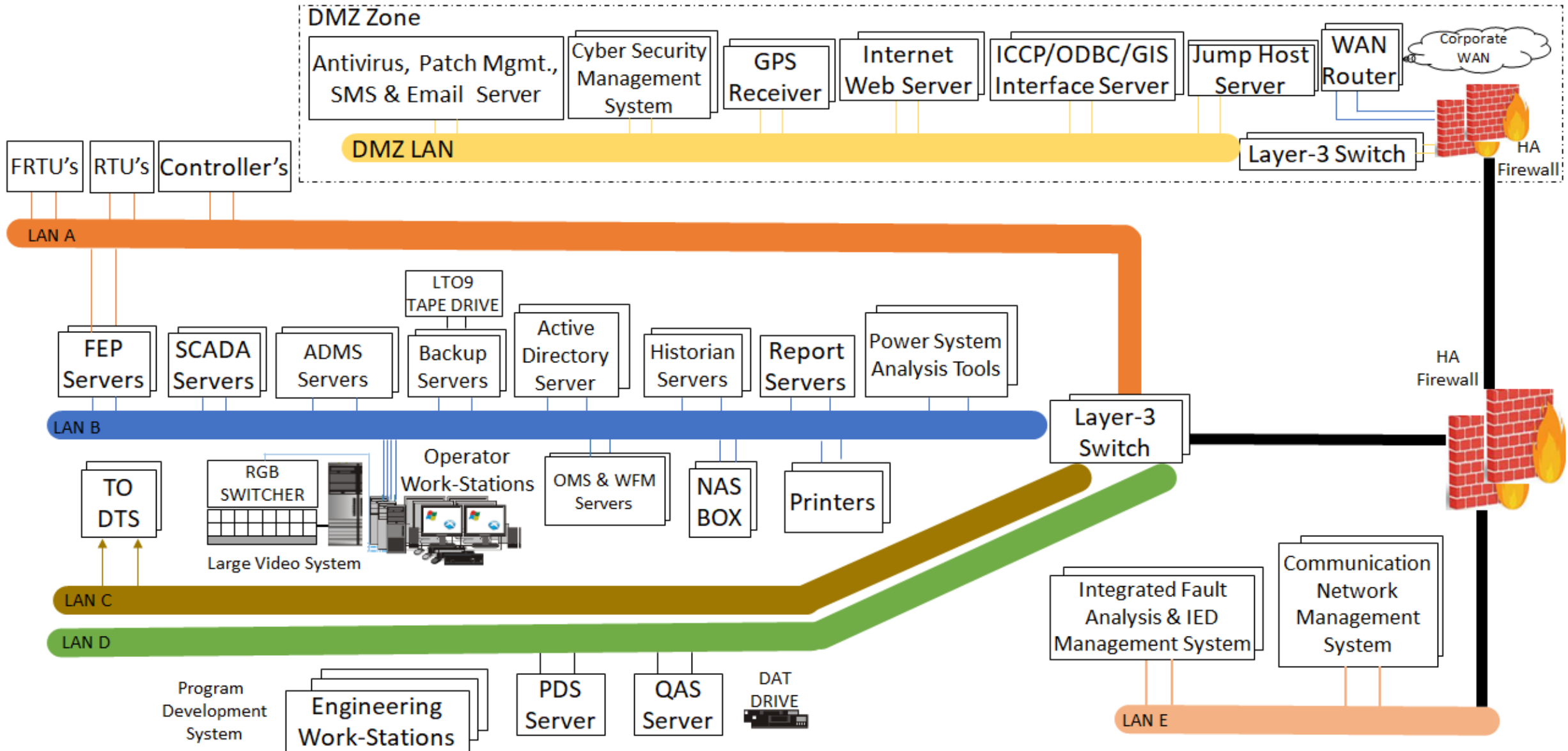


Proposed SCADA Systems and Operation Philosophy





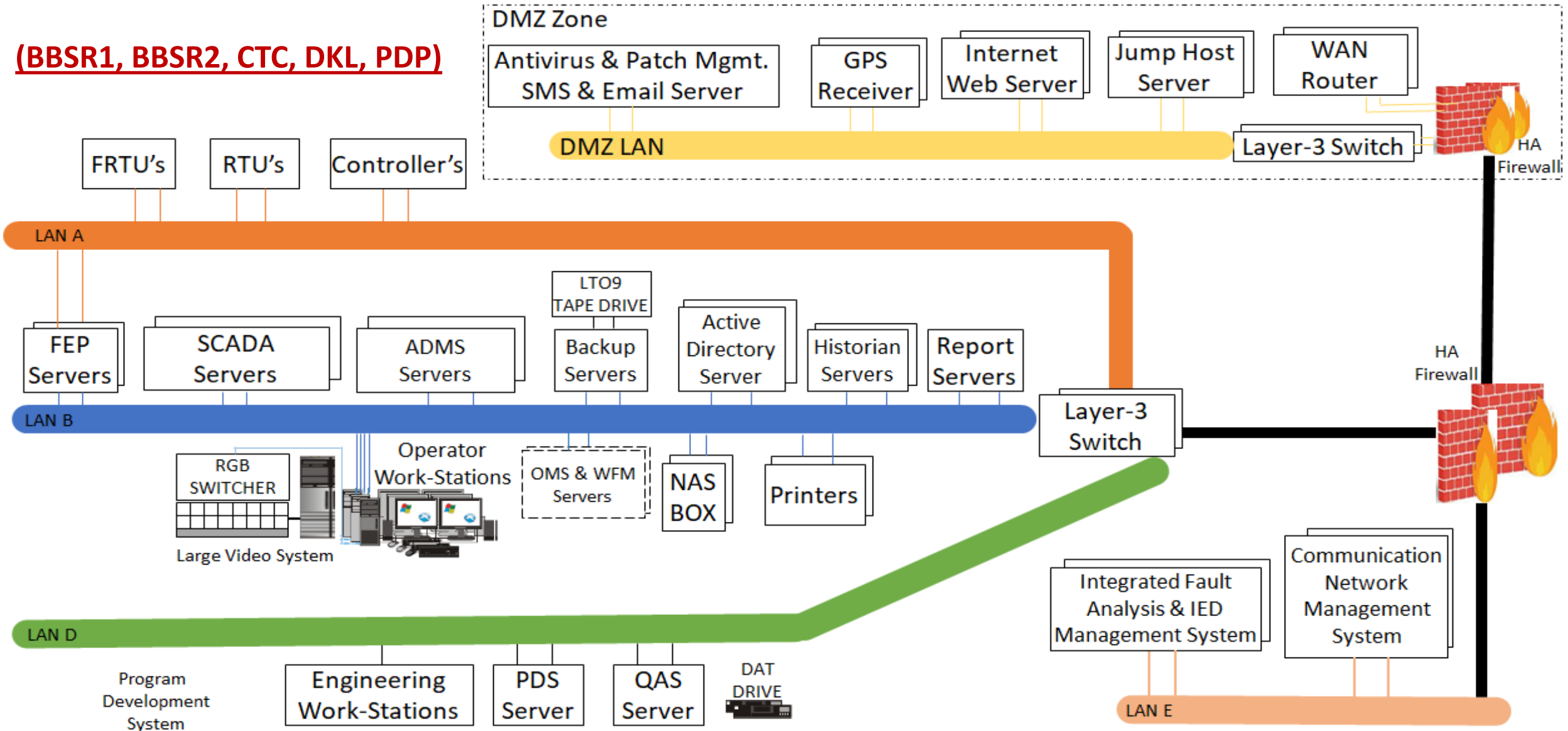
Indicative Proposed SCADA/ADMS System Architecture (MCC)





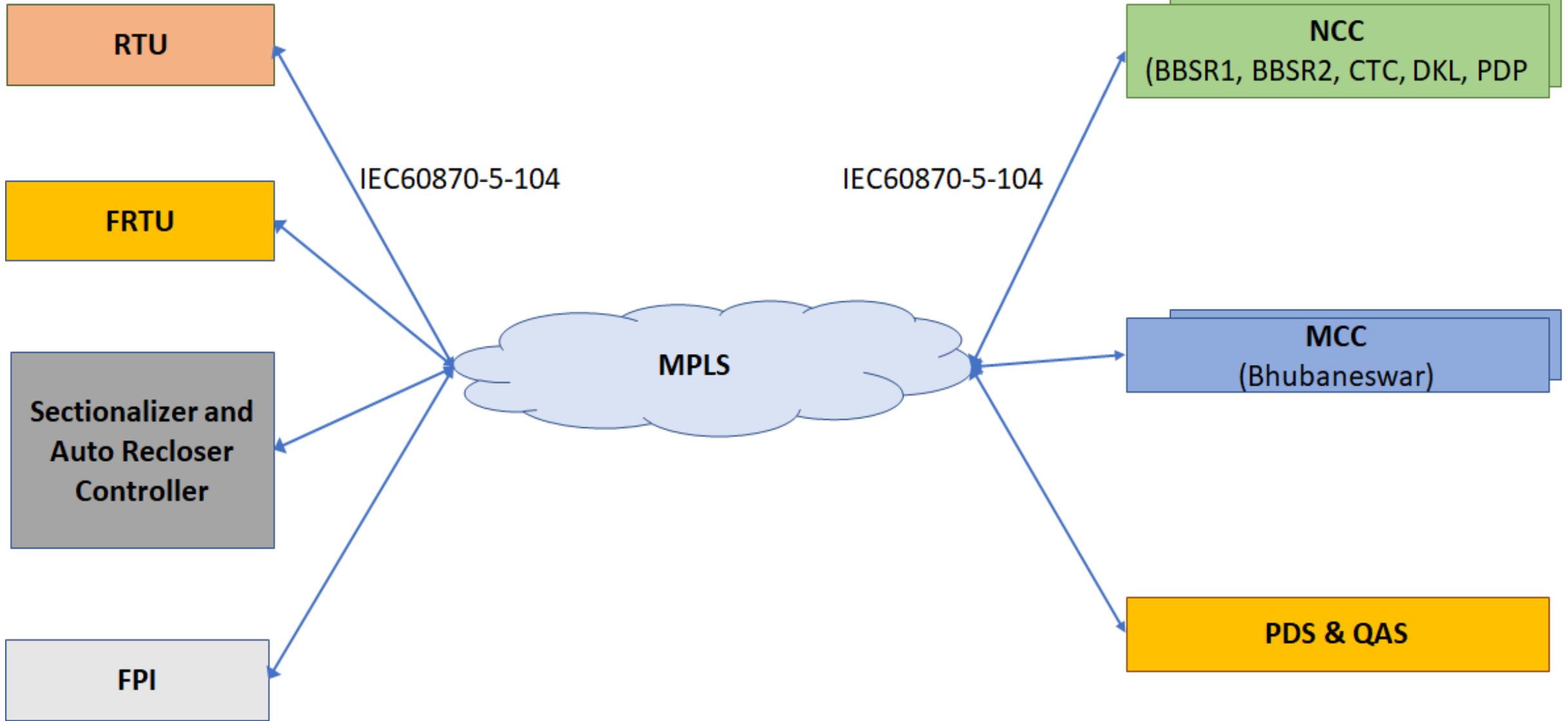
Indicative Proposed SCADA/ADMS System Architecture (NCC)

(BBSR1, BBSR2, CTC, DKL, PDP)





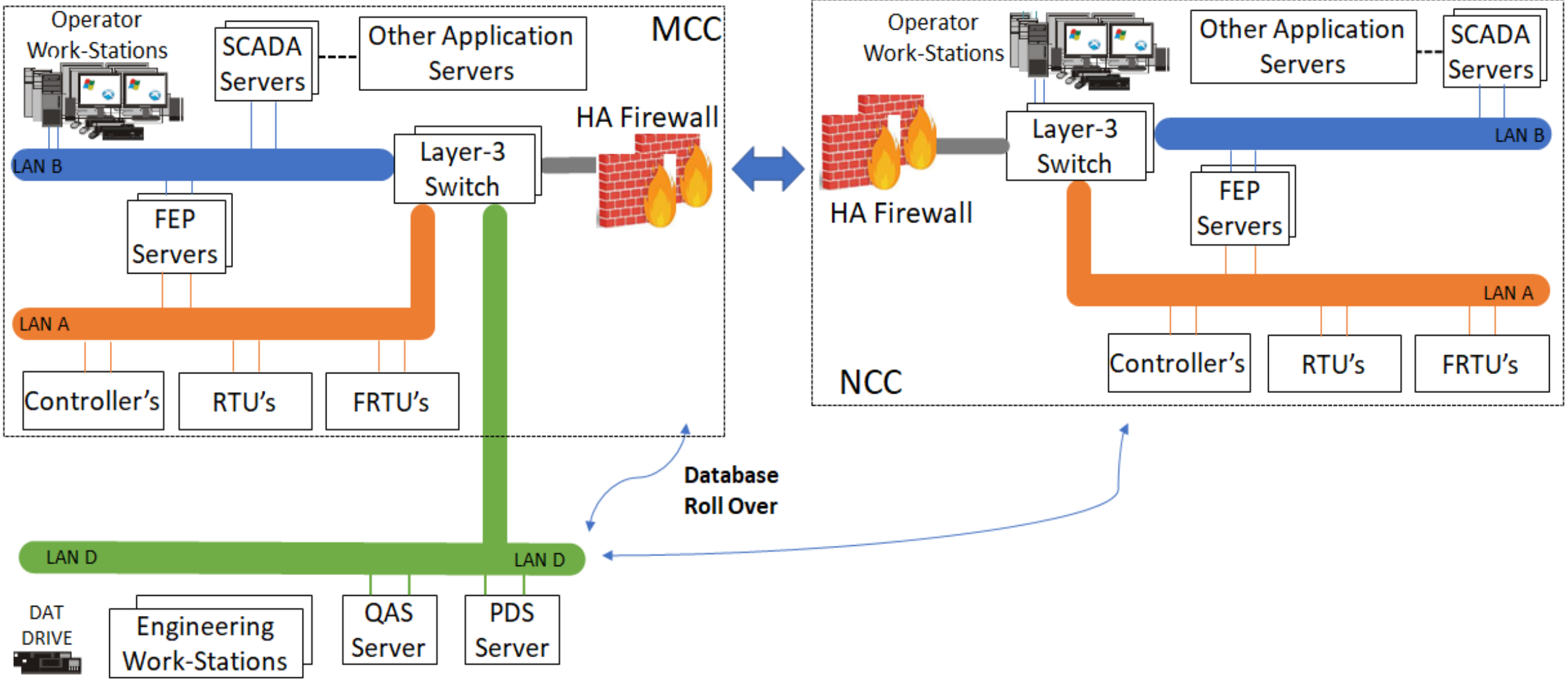
Communication Architecture with Field Devices



RTUs, FRTUs, Controller's of the Circle will report to MCC, PDS/QAS and their respective NCC



Data Synchronization & Database Generation & Rollover from PDS & QAS to MCC, NCC



Program Development and Quality Assurance System



SCADA System - Functions

Basic SCADA Functions

- Data Acquisition & Control of Substation Devices
- Intelligent Alarm Processing, Sequence of Events
- Disturbance Data Collection and Replay
- Safety Tagging – Parent / Child
- Online Test facility of the commands
- Area of Responsibility (AOR)
- Dynamic Network Colouring
- Trends
- Reports, Standard and User defined Dashboards
- Integrated Graphical User Interface (GUI)
- Centralized Time Synchronization
- Calculator, Logic building
- Web – Enabled GUI
- Automated Energy Accounting

System Functions

- Open Platforms, Protocols & Interoperability
- Network Topology based Data Modeling
- Database Synchronization & Management - Multisite
- Debugging & Performance Measuring Tools
- Free-Form Report functions – Excel
- Web based tools
- SMS, Email System
- Video Streaming Interface
- Mobile Application



ADMS & OMS Applications

ADMS Applications

- Network Model
- Network Connectivity Analysis
- Dynamic Network Coloring
- Real-Time Network Analysis
 - Real-Time Network Analysis Function Execution
 - Real-Time Network Model Builder
 - Parameter Adaptation
 - State Estimator
 - Power Flow Studies
 - Contingency Analysis
 - Security constrained Dispatch
 - Voltage Var Control
- Load Shedding Application
- Switch Order Management
- Fault Location, Isolation & Restoration
- Load Forecasting
- Optimal Feeder Reconfiguration
- Distribution Power Flow (DPF)

Outage Management System Applications

- Outage Management, Trouble Call Management
- Crew Management, Field Scheduling and Dispatch
- Outage Analysis & Prediction
- Web Portal for Outage Management
- Mobile crew management Client
- Quality of Service Indices
- Interactive Voice Response



Cyber Security and Communication Network Management System

Cyber Security Management System

Communication Network Management

Network Security Management

Event and Log Management

File Integrity / Change Auditing

Automated Asset Management tool

IPS and IDS System

High Availability Firewalls (NGFW)

Active directory - Identity Management

RSA Security Appliance - SecurID

RSA Token Authenticator

Security Profiler

Designed and implemented system should be duly certified by appropriate certifying agency for the following parameter:

- Network design suitability and compliance for critical utility infrastructure.
- Penetration testing certification for implemented network for external and internal threat cases required and defined as per national and international cyber security accredited agencies.
- TPCODL will decide the third-party auditor, Bidder shall extend all required support (Applicable for all the supplied equipment i.e. own and sub-vendor products) and will be responsible to carry out periodic cyber security audits of the network during the period of Standard and extended Post Warranty period. The minimum frequency of audits will be in-line with the regulatory requirement.
- Bidder to fix all identified gaps detected during the audit at no additional cost to Purchaser during the Standard and extended Post Warranty period.

Cyber Security and Network Management system under this RFP, Bidder to execute the NDA with TPCODL. This also be valid, if the Principal vendor is obtaining/providing services of the third party/Sub-Vendor.



Other Applications & Systems

Program Development and Quality Assurance System

Time Series Information Storage & Retrieval System

Automatic On-line Backup System, LTO9 Tape Drive with Auto Loader

Dispatcher Training Simulator (Standalone) – Study Mode Simulator
(Capable of replicating all the functions of Real-time System (MCC))

Free Format Reports, Dashboards and Analytics

Web Applications, Web Services, Clients (Corporate)

Centralized Time Synchronization System with GPS at MCC and at each NCC

Integrated Fault Analysis and IED Management System

Switch Order Management

Advance Analytics – Online, Offline

Weather Monitoring

Load Forecasting

Large Video Projection System

AC & DC Power Supply System

Communication components & accessories e.g. Converters, switches, routers, firewall, cables, connectors etc.



Enterprise & Other Systems Interfaces

Integration with various OT/IT systems on existing interfaces and provisioning of ESB interface over SOA

- Interface with Geographical Information System (Current ESRI Version 10.2.1 / Upgraded ESRI Version 10.6), Seamless integration with GIS
- Secured ICCP interface with SLDC, other utilities and third-party systems (Main & Backup)
- Video Streaming Interface for real-time monitoring of the electrical equipment through SCADA GUI during selection / operation
- SMS Gateway and Email Server
- AMR/AMI, IVR, WFM, FFM
- Other OPC, ODBC, SFTP, SAP interface, BI Interface
- Interface with Network Planning System (e.g. CYMEDIST)
- Interface to Enterprise Historian System
- Antivirus System (Enterprise Antivirus Software)
- Cyber Security Management System with Purchaser's Enterprise SOC/SIEM System
- Integration of IoT devices on protocol such as LORA, NB-IoT etc.
- Interface of OMS with proposed applications
- Integration with Purchaser's Large Video Wall
- Weather Monitoring through Web sites



Warranty, Post Warranty, Resident Engineers Support

- Resident Engineer Support for Own and Sub-vendor equipment/systems
- Role of Resident engineers as specified in the RFP
- Patch Management, Software upgradation, Firmware Upgradation for Own, Sub-vendor, Communication & Networking items
- Bidder to submit back to back Warranty/Post Warranty support PO with Sub-vendors

Warranty Type	Duration	Activities Planned
Standard Warranty	2 Years	System Hardware, Software Maintenance, upgradation & Patch Management Services - during the Standard Warranty period i.e. 2 years from the date of system handover after SAT & resolution of all punch point of SAT and fixing of all identified Gaps by Third party Cyber Security Auditor
Extended Warranty	5 Years	Hardware, Software Maintenance, upgradation and Patch Management Services - Additional 5 years support after completion of standard warranty period of 2 years
Software Annual Maintenance Services	3 Years	Additional 3 years support after completion of 7 Years (as mentioned above)



- Participation of Purchaser's Engineers (5 Engineers) at Vendor's works during the system built till completion of FAT (approx. 2 months).
- Total training Mandays shall be as per the RFP, utilization of the same will be as per the mutually agreed durations for individual applications/system
- Bidder to consider all basic, advance and certification courses of his owned and Sub Vendor System/equipment.



Bid Document Must have

- Three Hard Copies of the Technical Proposal (Bid Document)
- Pre-Qualification Requirement, with Project references
- Signed Copy of TPCODL Bid Document (TPCODL/P&S/222/20-21)
- Deviation / No deviation Certificate
- Delivery Schedule, Execution Plan
- Project Schedule (All activities in details) with resource deployment
- System Architecture (Phase wise)
- Unpriced BOQ mentioning Quoted/Not Quoted against all the items

LET'S CREATE ANOTHER SUCCESS STORY OF DISTRIBUTION REFORM

*Disclaimer: The contents of this presentation are private & confidential.
Please do not duplicate, circulate or distribute without prior permission.*



Thank You!

Amok Kumar Agarwala

Head-Automation & Technology

Mob: 9223220845

Email: amok.agarwala@tpcentralodisha.com



- Centralized Account Management – Multiple Platform, Single Sign-on, AAA
- Antivirus Scanner
- Communication Protection and Network Management – L2/L3 Network, SDH Network
- Patch Management, Info Protection, Malware & Monitoring, Incident Response
- Automated Asset Management System
- IDS and IPS System - Real-time alert of Compromise or Potential Compromise
- Remote Access, Jump Host Server
- Portable/Mobile/Wireless - Authorized, Monitored & Managed
- Network Segmentation, Access Control, Route and Traffic Control, Implementation of Trust Boundaries
- Configuration Management, Whitelisting/Blacklisting, System Integrity – OS, Protocols, Database
- Continuity - Disaster Recovery & Crisis Management Plan
- Big Data Cyber Security, Machine Learning Tools
- Integration of Proposed Solution with 3rd party SOC/SIEM