**Distribution Automation System (DAS) under BENGALURU Distribution**

**Up-gradation Project:**

**Preamble:**

The DAS project in Bescom is to automate the 11kV Distribution network for remote monitoring, control and operation of the 11 kV network in the Bangalore City. The implementation of Distribution Automation in the Bangalore City will enhance reliability and quality of power supply. The revenue realization will improve due to the reduction in down time for fault location and quick restoration achieved through the Distribution Automation system comprising of SCADA and Advance DMS application software.

The Distribution Automation Scheme (DAS) is in its final implementing stage. The project is an external aided project and approved by MoP, GoI. JICA, the funding agency approved the project in November 2006. The total cost of the project is Rs 563.7 Crs. The project was funded (soft loan) by JICA (JBIC) and Bescom. JICA’s contribution is Rs 417.1 Crs and from BESCOM side about Rs146.6 Crs. The Project involves Consultancy and Construction activities. M/s KEMA, USA and M/s CPRI, B’lore were appointed as Project Management Consultants (PMC) through Global Tendering process.

**OBJECTIVES:**

* To automate Distribution network for remote monitoring, supervisory control and operation of the 11 kV network in Bangalore City
* Providing assured quality and reliable power supply.
* To improve quality of service management and customers satisfaction.
* To avoid loss of time for fault location and restoration of power supply due to manual operation.
* To integrate all IT related activities.
* To improve Network Control management.
* Optimum power factor, reduction in losses.

**Benefits of DAS**

* Visibility of network parameters in field for better control on distribution network by SCADA and advance DMS applications in the system
* Increased energy sales and revenue due to reduction in downtime for restoration of power supply & ensuring reliable power.
* Improved quality of service management and customer satisfaction.
* Better network Management and control over Capex expenditure.
* Improved efficiency in distribution network operation results in lower costs.

Details of Construction of Packages:

|  |  |  |  |
| --- | --- | --- | --- |
| Sl No | Package | Brief Details of Package contract | Contractor Name |
| 1 | Pkg-I | Establishing 2 nos of DAS Master stations, Control Centre Facilities with all IT equipments and Communications System. | M/s EFACEC-Engenharia-e-Systemas, Portugal |
| 2 | Pkg-IA | Construction of BICC-1 Control Centre building at HSR | M/s Amrutha Constructions Pvt Ltd, B’lore |
| 3 | Pkg-IB | Construction of BICC-2 Control Centre building at Rajainagar | M/s Hombale construction & estates Pvt ltd, B’lore |
| 4 | Pkg-IIA | Supply, Installation, commissioning and Integration of Remote terminal units for interfacing with control centre and DAS RMU | M/s ABB, ltd.,  B’lore |
| 5 | Pkg-IIB | Supply, Installation, commissioning and Integration of Remote terminal units for interfacing with control centre and DAS RMU | M/s CGL,  Gurgaon |
| 6 | Pkg-IIC | Supply, Installation, commissioning and Integration of Remote terminal units for interfacing with control centre and DAS RMU | M/s EFACEC, Enganharia-e-Systemas, Portugal |
| 7 | Pkg-IIIA | Supply, Installation, commissioning and Integration of LRS/LBS with control centre | M/s P&C Technologies,  S. Korea |
| 8 | Pkg-IIIB | Supply, Installation, commissioning and Integration of LRS/LBS with control centre | M/s ENTEC Electric Co. Ltd,  S. Korea |
| 9 | Pkg-IV A | Supply, Installation, commissioning and Integration of DAS RMU with control center | M/s Schneider Electric Pvt ltd, B’lore |
| 10 | Pkg-IV B | Supply, Installation, commissioning and Integration of DAS RMU with control center | M/s CGL, Nasik |
| 11 | Pkg-IV C | Supply, Installation, commissioning and Integration of DAS RMU with control center | M/s Siemens ltd, Chennai |
| 12 | Pkg-VA | Supply, Installation, commissioning and Integration of DAS RMU with control center | M/s Eswari Electric Pvt Ltd, Chennai |
| 13 | Pkg-VB | Supply, Installation, commissioning and Integration of DAS RMU with control center | M/s Schneider Infrastructure ltd, Vadodara |
| 14 | Pkg-VI | Construction of Overhead lines (HT AB Cable, coyote conductor, spun poles and other accessories) for enhancing OH lines infrastructure in DAS project | M/s L&T Ltd, Chennai |
| 15 | Pkg-VII | Construction of Underground cables for enhancing UG Distribution lines infrastructure in DAS project | M/s L&T Ltd, Chennai |
| 16 | PMC | Consultancy services for design, tendering, implementation and capacity building | M/s KEMA, USA & M/s CPRI, B’lore |

**Current status:**

1. **Package –I: Establishing 2nos of DAS Master stations, Control Centre Facilities and Communications System.**

* The first phase of “Site Acceptance test” for DAS is completed on 15th Sep 2017. Variance resolution by ACS/EFACEC is in progress.
* Completion certificate pertaining to Installation and pre-commissioning of BCC2 is issued.
* Communication System “Integrated System Test” for Eastern ring completed.
* Communication System “Availability Test” for Eastern Ring completed.
* 2288 remote radio’s and antenna installed to DAS Equipment.
* Integration Testing is in progress. DAS is acquiring data from 950 Nos. sites (sites in production system) and further 600 Nos. of sites (Sites in Testing System) are in Configuration and Development system.
* SCADA data acquisition and monitoring activity for 950 sites is going on from Nov-2017.
* Eastern ring will be operationalized by Feb 2018 and Western ring by May 2018.(Dependencies of updated GIS & CIS data from IT section)
* WPC license for UHF network expansion on 13.11.2017. Import license for 821 Nos of radios was issued by WPC in Jan-2018. Radios are ready for shipment from Finland. Two batches (250 and 300 nos.) will arrive in Feb-2018 and third batch (221 Nos.) is expected to arrive in March-2018.

1. **Package 1A & 1B**

Construction of Control centre building at BICC-I, HSR layout and BICC-II at Rajaijnagar, Bangalore has been completed and occupied by DAS section

1. **Package –II : Supply, Erection ,Commission & integration of**

**RTU’s for existing and New DAS RMU’s**

(Packages IIA, IIB & IIC)

**Scope:**

* The scope includes Design, Supply, Installation, testing and commissioning of Remote Terminal Units (RTU’s) provided in DAS RMU’s under Package-IV and Package-V contracts of the project for interfacing with DAS control centre.
* The communication system is established by M/s SATEL of Package-I contract.
* Three lots were awarded in this package-II and details are as follows;

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sl.no | Packages | Firm | DWA Qty in nos | Supplied/ Installed Qty in Nos | P2P testing completed Qty in Nos |
| 1 | Package-IIA | M/s.ABB India Ltd, B’lore | 700 | 700 | 299 |
| 2 | Package-IIB | M/s. CGL India Ltd, Gurgaon | 495 | 495 | 168 |
| 3 | Package-IIC | M/s. Efacec, Portugal | 395 | 395 | 239 |
| Total | | | 1590 | 1590 | 706 |

*P2P testing details as on 31-1-2018*

Remarks: 1) The combined integration tests of RMU’s/RTU’s with control centre is in progress.

1. 372 nos of RTUs are in Production environment.
2. **Package –III: Supply, Erection, Commission & integration of Line   
   Reclosers & Load Break Switches**

(Packages IIIA & IIIB)

**Scope:**

* The scope includes Design, Supply, Installation, testing and commissioning of Line Recloser’s (LRC) & Load Break Switch (LBS) for interfacing with DAS control centre provided in Package-I of the project.
* Two lots were awarded in this package-III and details are as follows;

|  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- |
| Sl.  no | Packages | Firm | DWA Qty in nos | | Supplied/ Installed Qty in Nos | | P2P testing completed Qty in Nos |
|  |  |  | LRC | LBS | LRC | LBS |  |
| 1 | Package-IIIA | M/s P&C Ltd | 500 | 450 | 500 | 450 | 408 |
| 2 | Package-IIIB | M/s.Entec Ltd | 295 | 295 | 295 | 295 | 273 |
| Total | | | 795 | 745 | 795 | 745 | 681 |

Remarks: 1) The integration tests of LRC/LBS with control centre is in progress.

1. 293 nos of LRC’s & 280 nos of LBS’s are in production environment.
2. **Package –IV : Supply, Erection, Commission of New Ring Main Units**

(Packages IVA, IVB & IVC)

**Scope:**

* The scope includes Design, Supply, Installation, testing of DAS compact Ring Main Units (RMU’s) in the 11kV network identified for automation project. The DAS RMU’s are either 3-Way or 5-Way RMU’s as per the field requirement. The RMU’s have relays, MFM, FPI, etc that have communicable capability.
* Three lots of this package details are as follows

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sl.  no | Packages | Firm | DWA Qty in nos | Supplied/ Installed Qty in Nos | P2P testing completed Qty in Nos |
| 1 | Package-IVA | M/s Schneider Ltd | 345 | 345 | 138 |
| 2 | Package-IVB | M/s. CGL India Ltd | 250 | 250 | 70 |
| 3 | Package-IVC | M/s. Siemens Ltd | 195 | 195 | 96 |
| Total | | | 790 | 790 | 304 |

Remarks: 1) The integration tests of RMU’s with control centre is in   
 progress.

1. 159 nos of Package IV RMUs are in Production environment.
2. **Package – V : Supply, Erection, Commission for replacement**

**Of existing Ring Main Units**

(Packages VA & VB)

**Scope:**

* The scope includes Design, Supply, Installation, testing of DAS compact Ring Main Units (RMU’s) in the 11kV network identified for automatic project. The DAS RMU’s either 3-Way or 5-Way RMU’s are to be provided for the existing RMU’s identified for replacement as per the field requirement.
* Three lots in this package and details are as follows;

|  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- |
| Sl.  no | Packages | Firm | DWA Qty in nos | Supplied/ Installed Qty in Nos | P2P testing completed Qty in Nos |
| 1 | Package-VA | M/s.Schneider Electric Infrastructure Ltd. Vadodara | 600 | 600 | 312 |
| 2 | Package-VB | M/s. Eswari Electric Limited, Chennai | 200 | 200 | 90 |
| Total | | | 800 | 800 | 402 |

Remarks:1) The integration tests of RMU’s through RTU’s with control centre is in progress.

1. Already about 213 nos RMUs are in Production server.
2. **Package – VI: Construction Of Overhead Distribution Lines**

**Scope:**

* The scope of work of Package VI include design, manufacture, testing delivery, staging, installation, and commissioning of overhead distribution lines consisting of Areal-bunched (AB) cables and Aluminium-Conductor Steel-Reinforced (ACSR) bare conductors as 11kV segments within the Bangalore Metropolitan Area zone (BMAZ). The AB cables and Coyote ACSR conductors shall be used to replace and reinforce existing feeders segments as well as construct completely new segments.
* The scope of work also include the supply and installation of all pole structures, cross-arms, insulators, fittings and accessories that will be required to place the overhead lines with conductors and AB cables in safe and full operational service.

Status: Stringing and charging of 698.6 kM coyote conductor and 254.6 kM AB cable with related accessories completed.

1. **Package – VII : Construction Of Underground Distribution Lines**

**Scope:**

* The scope of work Package VII includes the design, manufacture, testing, staging, delivery, installation and commissioning of three-phase 11kV underground Cross-Linked Polyethylene (XLPE) cables. These cables shall be installed as feeder segments within the BMAZ. The scope of work also include the supply and installation of all other allied accessories that will be required to connect the cables to existing network elements and place the cables in safe and full operational service.

Status: Laying and charging of 228 kMs UG Cable is completed.

**Pending Activities:**

* Resolution of Variances from DAS SAT is in progress by Efacec / ACS
* Resolution of Variances from CS IST (Eastern Ring) is in progress by Efacec / SATEL
* Installation and testing of 821 Radios, and operational acceptance of Western ring.

**Roll out plan:**

BESCOM is tentatively planning for starting HSR Division operations during Feb 2018 by inauguration of DAS operations.

General Manager

(DAS & SG)