

Population of Substations and lines

Substations

DETAILS OF VOLTAGE CLASS WISE SUB STATIONS					
Sr. No.	VOLTAGE CLASS				Total
	400 KV	220 KV	132 KV	66 KV & Others	
1	9	64	48	727	848

Transmission network

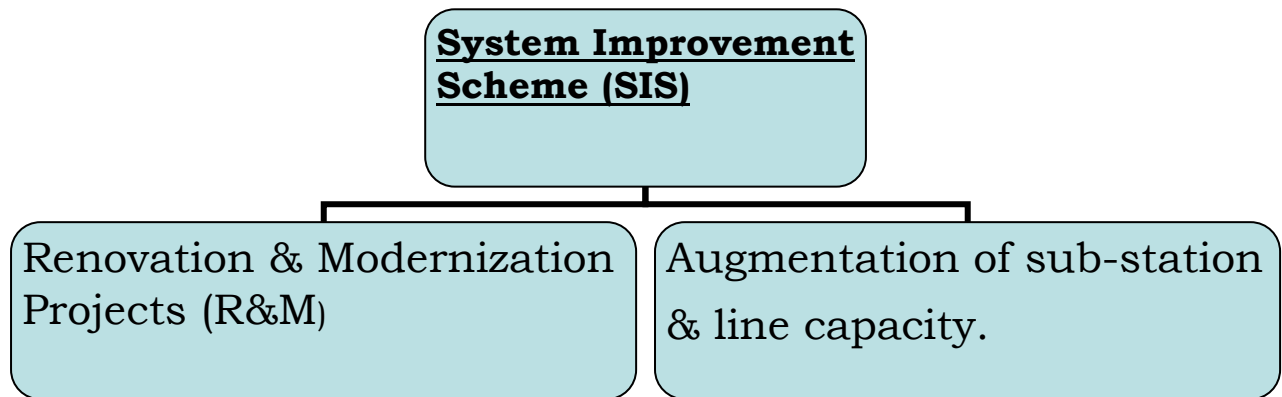
Sr. No.	Voltage Class	Nos. of Feeder	Total Length of Line in KMs.
1	66 KV	993	16369
2	132 KV	137	4550
3	220 KV	206	11334
4	400 KV	14	1842

The numbers of sub-stations age wise, circle wise are as under:

Name of circle	AGEWISE SUB-STATIONS									Total
	0 to 5	6 to 10	11 to 15	16 to 20	21 to 25	26 to 30	31 to 35	36 to 40	above 41	
NAVSARI	13	12	11	9	7	3	6	4	5	70
BHARUCH	6	7	11	7	5	5	2	1	1	45
JAMBUVA	8	10	15	17	12	5	14	8	2	91
NADIAD	22	12	27	14	9	9	6	7	2	108
MEHASANA	23	9	23	15	12	13	7	3	0	105
PALANPUR	36	18	30	20	4	7	5	1	0	121
GONDAL	22	16	19	10	4	5	3	2	4	85
JUNAGADH	7	18	17	8	6	4	8	2	1	71
AMRELI	17	21	22	11	2	6	3	4	0	86
ANJAR	15	13	11	6	2	7	3	0	0	57
ASOJ	3	2	1	3	0	0	0	0	0	9
Total:	172	138	187	120	63	64	57	32	15	848

System Improvement Scheme (SIS):

The existing assets of GETCO are managed by the Operation & maintenance department under SIS scheme and divided into two main categories.



Renovation & Modernization (R&M)

- Replacement of obsolete & over aged S/S equipments.
- Strengthening of transmission lines by replacement of Conductor, Insulator, H/W, Earth wire etc.
- Data Acquisition System (DAS) through Static meter.
- Renovation, maintenance of office building / Colony & modernization.
- Procurement of Testing & Safety equipments.
- Replacement of Relays.
- Cross Boundary Protection.
- Flood affected S/s & Breakdown maintenance.

(a) Replacement of obsolete & over aged S/S equipments.

- (1) Breakers.
- (2) Current Transformers (400 KV, 220 KV, 132 KV & 66 KV).
- (3) Lightning Arrestors.
- (4) Power Transformers.
- (5) Isolators.
- (6) Battery Sets & Battery chargers.

(B) Strengthening of transmission lines by replacement of Conductor, Insulator, H/W, Earth wire etc.

The transmission lines which are in service for more than 22 to 25 years, situated on coastal area are affected due to saline atmosphere, resulted into corrosion of 'H' frame structure, tower stub, oxidation of conductor, hardware etc., are considered for R&M project.

The lines passing through coastal and chemical pollution areas are deteriorated and require strengthening. It is proposed to carry out R & M works of 70 Nos. of lines.

It is proposed to carry out strengthening of lines as under:

(i) Replacement of Conductor & Earth wires (KMs)

- Dog Conductor - 1200 KMs.
- Panther Conductor - 350 KMs.
- Zebra Conductor - 500 KMs.
- Earth wire (7/3.15 mm) - 200 KMs.

(ii) Replacement of Insulators (Silicon rubber / long rod) & Hardwares.

- 220 KV Suspension - 5400 Nos.
- 220 KV Tension - 2900 Nos.
- 132 KV Suspension - 4100 Nos.
- 132 KV Tension - 2600 Nos.
- 66 KV Suspension - 25000 Nos.
- 66 KV Tension - 10400 Nos.

(iii) Mechanical Strengthening of Towers / 'H' Frames.

(C) Renovation, maintenance of office building / Colony & modernization.

R & M OF CIVIL WORKS INCLUDES:

- Control room buildings
- Staff quarters
- Office / store buildings
- Roads
- Compound wall / fencing, etc.

R & M OF CIVIL WORKS IS A NEED OF TIME FOR:

- Extending the life of structures

- Improving the serviceability of the structures
- Better house-keeping

R & M OF CIVIL WORKS TO BE CARRIED OUT:

- In a phase manner over a period of five years
- Priority according to existing condition of structures

R & M OF CIVIL WORKS TO INCLUDE:

- Structural strengthening by grouting, re-plastering, etc.
- Water proofing of leakages on slab Repairing / Replacement of deteriorated doors, windows, water supply and drainage facilities, flooring, etc.
- Maintenance of roads, External and internal painting of various buildings, etc.

(D) Procurement of Testing & Safety equipments.

To strengthen the testing squad i.e. SMS it is proposed to procure new technology testing equipments like Tan delta kit, Vacuum Interrupter Tester, Thermal imaging cameras, Relay testing equipments, timers for breakers etc. It will help the segregating of faulty equipments, components and help in condition monitoring of equipments.

At many sub-station fire fighting equipments are very old / not working and at many sub-stations equipments are not available. Hence it is proposed to provide new fire fighting equipments and mulsifire system in 400 KV sub-stations.

(E) Replacement of Relays.

1) EE make distance protection relays: Type MM3V/SSRR3V

These relays are almost 20 to 30 years old and are electromagnetic type. This is a very old technology and now obsolete. The frequent failure of coils and other components render the relay fully or partially inoperative many a times and owing to lack of self-supervision feature the problem in the relay cannot be detected before damage is done.

Hence Electromagnetic distance protection scheme relays are required to be replaced with modern technology numerical relays which have no. of additional features including fault locator and disturbance recorders.

2) Differential relays: EE and UE make type - DDT & ITD.

These relays are also very old and obsolete with electromagnetic technology. These relays are not having second harmonic restraint feature which is very important to restrain unwarranted tripping of

transformers during energisation. These relays are also required to be replaced with modern technology numerical relays.

3) O/C, E/F relays: Jyoti make - Type JTRSA.

These relays are also very old and performance is not satisfactory as per the experience of our testing squads in the field offices. The population of such relays is over 1250 nos. However we have considered replacement of relays, which are more than 15 years old.

These relays are to be replaced mainly in 66KV substations on 66&11KV voltage class feeders and transformers. Hence we have proposed non-communicable relays for differential relay at Sr.no. (2) and O/C & E/F relays at Sr.no. (3) as the cost of communicable relay is almost three times that of non-communicable relays.

(F) Cross boundary protection.

Occurrences are observed when line clear is given for working on 11 KV out door cable box, even making off the breakers due to back feeding of power. Such occurrences have resulted into accident to line staff. To avoid such type of accidents it is proposed to provide cross boundary protection between GETCO & DISCOM by way of providing 11 KV switch on DP structure in GETCO premises. The switches will be provided on all 11 KV / 22 KV feeders whether it is urban, rural, industrial, JGY or AG feeders.