

Decision: Approved.

Action: CEE, Hassan Transmission Zone.

Subject 3: Establishing 1x10 MVA, 110/11 kV sub-station at **Kuppagadde** Village in Soraba Taluk, Shivamogga District by constructing 110 kV SC tap line from existing near 110KV Thogarsi sub-station line for a distance of 8Kms.

Proposed by: CEE, Hassan Transmission Zone.SKETCH-7

1. Existing transmission network details:

a) Existing sub-station details: At present, Kuppagadde village, Soraba Taluk, Shivamogga District is fed from the following sub-stations.

Sl. No.	Name of the sub-station	Installed capacity	Total DTC capacities connected in KVA	Sub-station peak load in MW	Loading factor
1	110/11 kV Kotipura(Anavatti) sub-station	1x10 MVA, 1x20 MVA,	43499 KVA	20	0.78

b) Existing feeder details: The areas around Kuppagadde village are fed from 03 numbers of 11kV feeders from 110/11 kV Kotipura(Anavatti) sub-station. The details of the feeders feeding in and around the location of the proposed sub-station are given in the table below.

the table below.								
Sl. No	Name of the Station	Name of the Feeder	Type of conductor	Length of the Feeder in KM	Connected load in kVA	Peak load in Amps	%VR	AEL in MU
1	110/11kV Kotipura (Anavatti) sub-station	F2- Kuppagadde	Rabbit	24.6	4432	160	36.22	0.3613
		F9- Bommnhally	Rabbit	39.5	4357	166	54.54	0.7477
		F14- Nittaki	Rabbit	22.6	2913	210	34.33	0.4497
Total					11702			1.5587

d) Problems facing due to existing system:

- Length of 11 kV feeders are **24.6 Kms, 39.5 Kms and 22.6 Km** and are very lengthy/loaded to **4432 kV^A, 4357 kVA and 2913kVA** respectively.
- Annual energy loss is 0.3613, 0.7477 & 0.4497 MU and **total 1.5587 MU**
- VR is **36.22%, 54.54% & 34.33%**

2. In view of this, the following alternatives are studied:

a) Alternative-I: Construction of 11kV link line

All the existing 3 Nos. of feeders F2-Kuppagadde, F9- Bommanahalli & F14-Nittaki are Double circuit feeders and there is no availability of corridor to construct link lines to these feeders, hence the alternative-1 proposal is not proposed.

b) Alternative-II: Reconductoring of existing 11kV feeders

i. Proposals: In this proposal, all the existing 3 feeders have rabbit conductor.

ii. Features:

II. Features.								
Sl. No.	Name of the Sub-station	Name of the Feeder	Conductor	Length of Feeder in Km	Connect ed Load in kVA	Peak Load in Amps	% VR	Annual Energy Loss in MU
1.	110/11kV Kotipura (Anavatti) sub-station	F-2 Kuppagadde Feeder	Coyote	24.6	4432	160	23.35	0.1535
		F-9 Bommanahalli feeder	Coyote	39.5	4357	166	35.16	0.3175
		F-14 Nittaki Feeder	Coyote	22.6	2913	210	22.13	0.191
Total					11702			0.662

iii) Gist:

- The estimated cost of this proposal is **Rs. 361.00 Lakhs**.
- After reconductoring the voltage regulation ranges from **22.13 % to 35.16%**.
- Annual energy savings for this proposal is = **1.5587-0.662=0.8967 MU/Annum**
- BCR works out to be **1.09(@ 5.91 / unit rate)**.
- Even though the BCR works out be 1.09, the future load growth cannot be met by this and the feeders will remain lengthy with interruption & regulation being on higher side.
- Even after Reconductoring the existing ACSR rabbit conductor by Coyote conductor, % VR is crossing the permissible limits. Hence alternative-II proposal is not feasible

iv) Conclusion: Reconductoring of existing 11kV feeders will not improve voltage regulation to the tail end system.

c) Alternative-III:

i) Proposals: Establishing 1x10 MVA, 110/11 kV sub-station at Kuppagadde in Soraba Taluk, Shivamogga District by constructing 8Kms 110 kV SC tap line from existing 110kV line near Thogarsi substation for a distance of 8 Kms.

ii) Features:

- It is proposed to construct 110 kV SC tap line on DC towers from existing

110kV line near Thogarsi substation to the proposed sub-station for a distance of 8 Kms.

- The peak load of the 110/11kV Kotipura(Anavatti) sub-station is 20.0MW and the Thogarsi substation feeding from 220/110/11kV Balligavi receiving station with a 110kV line is having a Lynx conductor of peak load of 30.0MW.
- The details of the feeders after establishment of proposed 110/11 kV Kuppagadde sub-station is given in the table below.

Sl. No	Name of the Sub-station	Name of the Feeder	Length of Feeder in Km	Connected Load in kVA	Peak Load in Amps	% VR	Annual Energy Loss in MU
1	110/11kV Kotipura(Anavatti) sub-station	F-2 Kuppagadde Feeder	20.5	1368	49	10.47	0.0296
		F-9 Bommanahalli feeder	28.0	1255	47	13.56	0.052
		F-14 Nittaki Feeder	12.5	1003	73	8.02	0.0306
Total				3626			0.1122
2	Proposed 110/11kV Kuppagadde sub-station	F-1 New Kuppagadde	6.5	1193	43	2	0.0054
		F-2 New Yakshi	15.5	1871	68	9.42	0.0364
		F-3 New Gendla	11.3	1910	138	12.42	0.0897
		F-4 New Lakshimpura	8.7	1156	44	4.24	0.0176
		F-5 New Tavanadi	8.1	1946	74	4.47	0.0231
Total				8076			0.1722
Grand total				11702			0.2844

iii) **Gist:** The estimate cost of **Rs.700 Lakhs** was studied with formation of 5 numbers of 11 kV feeders.

- The voltage regulation ranges from **2.00 % to 12.42 %**
- The annual energy savings in the system for this proposal is **=1.5587 - 0.2844=1.2743 MU/annum.**
- The BCR works out to be **1.61 (@ 5.91/ Unit rate).**The calculations are confirmed by CEE, TZ, Hassan.

iv) **Recommendation of CEE, TZ Hassan:** By establishing new 110/11kV sub-station at Kuppagadde by constructing 8 kms of 110 kV SC tap line from existing 110kV line near Thogarsi substation (which is feeding from 220/110/11kV Balligavi receiving station) to proposed substation and drawing 5 Nos. of 11 kV feeders the Voltage regulation of the feeders feeding the area around can be brought within the

permissible limits. The energy savings is found to be 1.2734 MU/annum and BCR works out to 1.61.

v) The load transfer from the surrounding sub-stations on to the proposed 110kV Kuppagadde sub-station are as follows.

Sl. No.	Name of the 110/11 kV sub-station	Capacity and voltage class	Connected Load in kVA			Peak Load in MW	
			Existing	Transferred to 110 kV Kuppagadde sub-station	Residual	Before	After (Calculated)
1	1X 10MVA, 1X20MVA, 110/11kV Kotipura(Anavatti) sub-station	1x10 MVA & 1X20MVA 110/11 kV	43499	8076	35423	20.0	16.29
Total			43499	8076	35423	20.0	16.29

Planning section comments:

1. The work is included in APW 16-17 under list-5.
2. The proposal-I is not feasible as the line losses will not be within the permissible limits even after replacement of conductor. Proposal-II is feasible, as the BCR is 1.75 & energy savings will be 1.2734MU/Annum
3. The proposal for constructing 110KV SC tap line from existing near 110KV Thogarsi substation line for a distance of 8Kms cannot be considered in view of sec 44(6) of CEA regulation 2010 in view of operational protection issue of the system.

Discussion: The Committee discussed the subject in detail. The Committee noted that, at present Kuppagadde village and surrounding areas are fed from three feeders from 110/11 kV Kotipura(Anavatti) sub-station. The length of the 11 kV lines are upto 39.5kms & are passing through dense forest area, causing a lot of interruption. The % Voltage Regulations for all the four feeders feeding the area are ranges from 34.33 to 54.54%.

CEE(TZ), Hassan has submitted to the Committee that the existing 1x10MVA, and 1 x 20MVA, 110/11kV Kotipura(Anavatti) sub-stations have recorded the peak load of 20 MW and are loaded about 78% and is loaded

Further, the Committee observed that by Establishing 1 x 10 MVA, 110/11 kV sub-station at Kuppagadde, the following objectives can be achieved.

- a) There will be reduction in the length of 11 kV feeders feeding that area which reduces the interruptions.
- b) Tail end voltage of these 11 kV feeders will also improve.

- c) The savings of energy will be more.
- d) Future load growth can be catered.
- e) There will be improvement in voltage profile of the areas fed from the proposed 1 x 10 MVA, 110/11 kV sub-station at Kuppagadde sub-station.

Also, the committee observed that, connected load to an extent of 8076 kVA out of 43499 kVA of 110/11kV Kotipura(Anavatti) sub-station, is proposed for transfer on to proposed 1 x 10 MVA, 110/11 kV sub-station at Mavali. Hence the total load transfer from the 110/11kV Kotipura(Anavatti) sub-station to the proposed 1 x 10 MVA, 110/11 kV sub-station at Kuppagadde is 8076 kVA.

It was informed by D(T), MESCOM that if 110/11kV sub-station is constructed in this area, the power supply to Soraba will be improved, thus revenue to MESCOM will improve, moreover, reliable power supply can be arranged to the consumers of Soraba. However, the bottleneck to bring the 110kV line due to forest area needs to be sorted out by CEE, TZ, Hassan. The sub-station can be established only after forest clearance.

In view of the above, and based on the recommendation of the Director(Technical) MESCOM, Committee approved the proposal of establishing 1 x 10 MVA, 110/11 kV sub-station at Kuppagadde, in Soraba taluk, Shivamogga District by constructing 8 kms 110kV LILO line from existing 110kV Thogarsi sub-station to the proposed 1x 10MVA, 110/11kV at Kuppagadde in Soraba Taluk, Shivamogga District.

Decision: Approved

Action: CEE, Hassan Transmission Zone.