

CHAPTER 9DISCUSSION AND CONCLUSIONS

In the first place, the results of the method in this report has been checked by means of the problem in the 'Ward and Hale's report'. In this procedure the transformer turn-ratios are set at the same values.

The first example selected to demonstrate the method of voltage solution presented here has been taken from 'Ward and Hale's report'. The results are not the same, since the transformer are set at different conditions. But they are quite reasonable, since the mathematic part was previously proved, and the voltage positions are at the appropriate places. The accuracy of the estimate voltage solution is set at 3 decimal points, but it may be slightly different when actual taps are selected.

The second example is considered some parts of the Y.E.A. transmission system. The first case is the maximum generation occurred at 19.30, Monday, January 30, 67. The solutions of the Y.E.A. and this method are compared as follows

Bus bar	Volt(mag) (Y.E.A.)	Volt(mag)
1	1.05	1.05
2	1.02	.994
3	1.0	.979
4	.964	.967
5	.957	.965
6	1.024	.999
Synchronous condenser	-.31	-.51

The second case is the minimum generation of the same parts of the Y.E.A. system occurred at 4.00, Monday, January 2, 67. Both solutions are compared as follows.

Bus bar	Volt(mag)(Y.E.A.)	Volt(mag)
1	.988	1.05
2	1.01	1.08
3	1.00	1.05
4	.972	1.03
5	.97	1.03
6	1.017	.999
Synchronous condenser	.25	.55

The difference of the results of the two processes is due to the different defined conditions.

Disadvantage This method must be divided into five sections, since the Fortran needs more space for storing constants than others, so there are less space left for computation programme, and the programme must be written concisely. The ILE-1620 I used is also a basic type computer, without any facility. Hence it is rather inconvenient in handling this programme.

Advantage The convergence of this method is quite good compared to the Ward and Hale's method. The same problem that that method needs 62 iterations for convergence, this method needs only 40 iterations with transformer taps correction, or within 25 iteration with fixed transformer taps.

Suggestion for Further Development.

The method described in this paper should be written in the Symbolic Processing System, if the IEM- 1620 I computer is still used. So that the five sections of this fortran method may be reduced in to one section.