

Computer support Systems for construction of extra-high voltage transmission line

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We have developed four Computer Systems to assist transmission line engineers in evaluating transmission line plans and designs.

The reasons we adopted the Systems are the following,

- ① Recently the overhead transmission lines in Japan have become longer and larger than ever, as power generation capacity has become larger and its location is getting further from the consumption area.
- ② We have to achieve economical and efficient designs for transmission lines combined with the environmental considerations, which are important nowadays.

Our System consists of the following four Systems.

1. "Route Selection Supporting System".

By using this System, we can find the optimal route based on map information (geographical data), restricted areas data and so on.

We can also conduct preliminary examination for tower position and height.

For the operation of the System, various data is input in advance.

The data is social and environmental information (i.e. national park, city areas, and flora/fauna) and technical information (i.e. classification of salt contamination, Isokeraunic Level) and so on.

This System also has a visual impact simulation function called DTM (Digitized Terrain Modelling), this is useful when we plan to construct transmission lines in or near the scenic areas such as national parks.

2. "Tower Design Supporting System".

By using this System, we can examine electric insulation clearance, wire movement, clearance design, reasonable wire tension as well as economic efficiency.

The data input of the System is carried out through dialog with the computer, in addition to that, this System has an automatic tower shape drawing function.

3. "Tower Structure Design System".

We only need to input loading condition of the tower to get the optimal structure detail.

It can calculate the stress loaded on each member of the tower and automatically select the desirable dimension for the member.

By using this System, we are able to carry out precise tower design and do several trial designs easily.

4. "Integrated Tower Foundation Design System".

Just after we select the foundation type, taking the calculation result of the "Tower Structure Designing System" into account, the System automatically computes the optimal foundation shape which will be able to cope with the loads.

In addition to that, to achieve the most economical design, this System calculates quantity of soil excavation, reinforcing bar and so on, before it decides the foundation shape.

We design transmission lines efficiently by using these Systems. This also contributes to reducing the environmental impact caused by the construction of transmission lines.