



DRUM Project: Best Practice

Case study of installation of fault passage indicator

Preamble

The long 11Kv feeders passing through agricultural fields are susceptible to interruptions. Such interruptions, transient or permanent, cause inconvenience and affect the working of end users.

The procedure normally followed when 11kv feeder trips is as under:

1. The line is charged after two minutes. If it does not trip the fault is treated as transient. If it again trips, then one more try is given after three minutes.
2. If the second trial fails, the line is declared under permanent fault.
3. The line is charged after opening the isolating switches one-by-one starting from the Sub-Station end of the feeder. The procedure is repeated till the faulty section is reached and isolated.

It would be observed from the above that :

1. The procedure of isolating faulty location is time consuming and person-dependant. In case of long rural feeder if the location of fault is at far end of the feeder it takes hours to resume supply even to healthy section of the feeder.
2. In case of transient fault in most of the cases conscious investigation and flagging of the location of fault for ensuing preventive maintenance is missed.

Fault Passage Indicator



In order to address the above issue, the D.P.R. for DRUM initiatives at Umreth site envisaged to install Fault Passage Indicators (F.P.I.) on strategic locations of 11 KV feeders. The F.P.I. are installed on over head conductor at the beginning of all tap lines and at logical sections of the feeder. In case of occurrence of fault, the F.P.I. in the path of fault current glows and indicates the path of fault current and thus leads to the location of fault. This coupled with the effective communication (cell phone provided to the field staff) helps locating the faulty section expeditiously and thereby faster restoration of the supply in the healthy part of the feeder.

The blinking pattern of F.P.I. is different for transient and sustained fault.



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Installation



Power to villages of DRUM Site at Umreth is supplied through 18 11Kv feeders. 720 FPIs are installed on carefully selected strategic locations on these feeders. The installation procedure is simple and does not require shutdown of feeder. The work was completed in 15 days.

The operation of FPIs and different pattern of blinking was explained to the Field Staff through orientation training conducted at local office and the same was well received by the Field Staff.

Efficient and effective communication between the Helpers located in the villages and the Sub-Division Office is

very essential to communicate the blinking of FPIs as soon as the feeder is declared under Sustained Fault. This was achieved by providing mobile phones under C.U.G. Scheme of MGVCL. The running cost of this is marginal.

Benefits

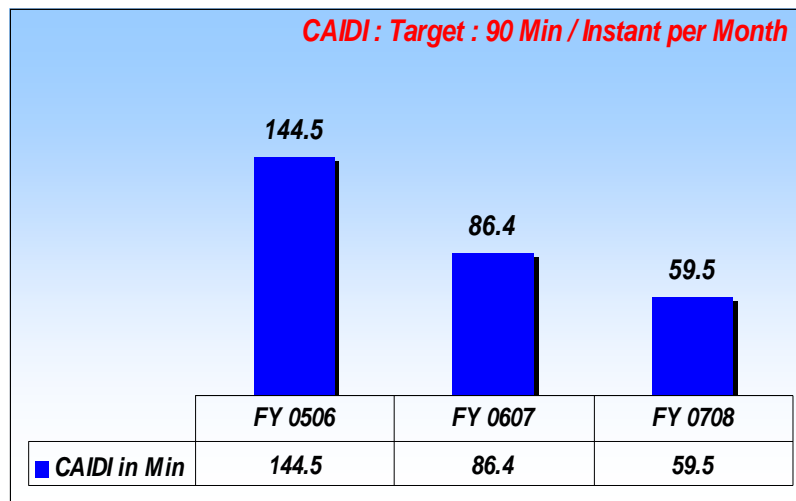
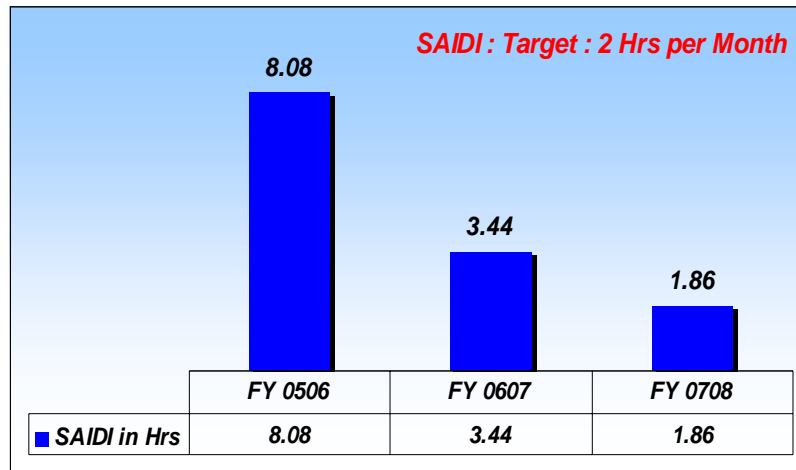
It is observed that on an average, it was taking 2 to 6 hours to restore the supply depending on the length of the feeder, location of fault and available communication. On installation of FPIs and effective communication, this reduced to 30 minutes to 1 hour.

This has significantly improved the reliability of power supply to rural areas. The following charts indicate the improvement achieved in CAIDI and SAIDI of the reliability indices.



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Expenditure

The total expenditure of installing FPIs on 18 feeders is Rs. 83 Lacs approximately. Since the battery life is of the order of 3 to 5 years, there is no running cost except periodical testing of FPIs.

Conclusion

The installation of FPIs associated with effective communication system significantly improves the reliability of rural feeder. One of the other advantages is that in case of transient fault, the susceptible section is identified for focused attention during preventive maintenance, which otherwise goes unnoticed.

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