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The expected benefit of digital substation can be considered separately into 2 stages, construction and operation phase. In construction phase, although cost for secondary equipment of digital substation is significantly higher, the system comprises of less devices which means smaller control room, fewer man-day required for installation. Hence, the total expenditure of substation building would be reduced. For operation phase, the benefit is to be a communication infrastructure in substation. This would allow further applications implementation, i.e., utilization of all the data and communication capability to improve operational and maintenance performance. Those application could be as follows.

First, an unmanned substation could be applied. Since all the data are digitalized and able to be sent/received, which is not the case in conventional substation, National Control Center (NCC)/Regional Control Center (RCC) can view as much information as available at substation. Furthermore, there are no longer physical cut-off switch or push button. Everything is implemented via logic gate so the control center is capable of managing all commands. The man-day requirement for operator to stay supervising in substation would be greatly reduced.

Secondly, remote configuration is possible. All the physical wiring is reduced to only communication cable. If there is a requirement to modify control and protection scheme, this can be done remotely by updating configuration without any additional wiring. Therefore, the man-day used in wiring and installation is less, including the commuting period for engineer from head quarter to substation.

Lastly, due to the amount of data conveyed to the server, this can be utilized for asset management which would enhance the efficiency and decrease the unplan events. This would also lead to the reduction in man-day because the time-base maintenance is changing to condition-base maintenance. Moreover, fault due to the primary equipment breakdown will be less which mean more consistent power delivery to consumer.

In conclusion, the total cost for greenfield project can be reduced and communication infrastructure has also been set up in substation. The benefit of the infrastructure could be measured from the result of those mentioned applications. This means a decrease in man-day required. Moreover, the reduction in the unintended blackout would be the interesting indicators to measure the benefit of carrying out digital substation.