partial discharge

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| Specifications | progress | note |
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| GIS, transformer partial discharge display and analysis function each follow the general purchase standard of element technology. (5.4.7.3-1) |  |  |
| When designing the location of the UHF sensor, the UHF built-in sensor output is calculated based on -20dBm and the external sensor output is -40dBm. |  |  |
| The margin of the sensor is designed based on the minimum detection signal of -55dBm for both internal and external sensors. |  | Trend files are created every 15 minutes, and the partial discharge signal size of 0 ~ -55dBm is divided by the number of amplitudes by 128 to be [128 phase \* 128 level PRPD] data. |
| The sensor is installed so that the detection section can be overlapped and monitored so that there is no non-detection section. |  |  |
| Real-time data (PRPS), event data (PRPS), and trend data (PRPD) are transmitted using the File Transfer function. |  | When a file is newly created, the server that provides data changes TrendTransF, EvtTransF, and RTTransF among LN data according to the time of the created file to notify the higher level of the file creation, and the upper level uses Directory Service and File Transfer Service to Confirm and receive the newly created file |
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| Since actual certification is a conformance test, changes can be made under the agreement between the manufacturer and KEPCO if there is more content than the certified data model. |  | dataNs (data namespace): If new data is added in addition to the DO indicated on the specification, brief grounds for the data are indicated ex) “KEPCO PDDiag spec 1.0” |
| Build a library of various noise and discharge types so that the operator can directly infer the cause of the partial discharge signal |  | It should be able to compare with the partial discharge signal on the same screen. |
| There must be a function to add, compare, analyze, and learn the event data that has been disturbed to the library. |  | The Partial Discharge Waveform Analysis Engine must have a structure that can be upgraded through consultation between the manufacturer and the user. |
| There must be a function to accumulate and analyze PRPS and PRPD data by setting a user's arbitrary time unit. |  |  |
| It must be configured to enable library update remotely, update the holding library learning and measurement data library, and have an extension structure that can report learning results remotely. |  |  |
| It should be possible to adjust event and alarm set points for each sensor. |  |  |
| It has a system self-diagnosis function and records faults such as communication errors and device errors after self-diagnosis. |  |  |
| A single-line diagram showing the location of the sensor and local unit should be displayed when selecting a substation, and displayed so that the operator can intuitively match the location of the facility on the single-line diagram of the substation. |  |  |
| Alarm data must be able to search details and have a report output function. |  |  |
| The measured data must be able to be displayed in synchronization with the power phase of the MTR site where the sensor is installed. |  |  |
| All data must be distinguishable by substation and sensor. |  |  |
| The threshold value for detecting a signal and the level of signal level for generating an event must be adjustable for each sensor. |  |  |
| Display Data must be capable of Phase Shift. It is placed at the top right of the initial screen so that the phase can be changed for each sensor. |  |  |
| PRPS and PRPD should be classified according to a certain size and number of times (number of discharges per unit time) and displayed by color, and the measured data should be displayed in 128\*60 (Bin\*Cycle). |  |  |
| Trend data for each sensor should be displayed as the maximum value and average value according to the operator's command. |  |  |
| It should be equipped with a function to set the criteria for judging abnormal symptoms in MTR, analyze the abnormal symptoms according to the criteria, output the analysis results as a report, and transmit alarms and event data to remote KEPCO PCs and SEDA servers. The driver should be able to change it. |  |  |
| The data measured by each sensor should be capable of trend analysis on the size of the signal, the number of discharges per unit time, etc., and should have a 3-dimensional visualization and analysis function. All channels must be synchronized through the synchronization signal. |  |  |
| Real-time data and event information must be stored for all available channels. |  | The real-time data of the sensor must be saved as a file in the CU.  The real-time data file follows the PRPS format of 128 phases x 60 periods x 60 seconds.  Partial discharge real-time data for at least 7 days must be stored.  Real-time data should be able to be extracted in the form of a file from the diagnosis unit.  A separate program capable of analyzing real-time data must be provided. |
| Partial discharge measurement data should be available for users to download as dat and csv files, and play the file with a separate player to facilitate data management. |  |  |
| When a partial discharge event is generated, the signal of the latest noise channel in the same time period must be stored and compared. |  | For example, assume that 1, 2, and 3 are PD channels and number 4 is a noise channel. If partial discharge is judged by data detected through channel 1, raw data of channel 1 and raw data of channel 4 in that time period should be compared. |

Data files are transmitted using the File Service of IEC 61850.

The extension name plate (EEName) indicates the installation location of the sensor, and the Location item follows the format below.

Location format: [substation name]\_[voltage] kV\_GIS/M.Tr [BAY/Tank number]\_[LU/CH number]

ex) “Yousung\_154kV\_GIS/M.Tr\_D01\_1A” : First (A) channel of No. D01 LU installed in D01 bay of 154kV GIS/Mtr of Yousung Substation

The event file is created according to the event that occurred according to the set threshold, and it is made of [PRPS of 128 phase x 60 cycle x 60 seconds] data.

Realtime file is created every second, and {PRPS of 128 phases x 60 cycles x 1 second] data. However, only data within 3 minutes of creation is valid. (Data of more than 3 minutes is treated as no file)