Additional Information :

Reference transmission line loss ($PL_{RE,X,lines,p}$) is calculated by the formulae (2)-(4) and Steps 1-7 shown in F.2. The method means calculating reference transmission line loss based on the reference voltage that is set by adopting the mode value of the ratio to the base voltage of each transmission line. The mode value of the ratio to the base voltage is referred to as an indicator for reproducing the operation of the power grid that would not install OPENVQ. The validity of the calculation method can be confirmed by taking the steps shown below.

To start with, calculate transmission line losses of three cases:

a) Measured transmission line loss ($PL_{measured,X,lines}$)

Calculate transmission line loss $PL_{measured,X,lines,n}$ of the region X in each sampled day 1-12 by the calculation formula of EGAT shown in F.2.(4), using measured values of each sampled day that is determined following Step 1 in F.2. Calculate the sum of the losses in the sampled days as follows:

$$PL_{measured,X,lines} = \sum_{n=1}^{12} PL_{measured,X,lines,n}$$

b) Estimated transmission line loss in the case of installing OPENVQ ($PL_{OPENVQ,X,lines}$)

Calculate transmission line loss $PL_{OPENVQ,X,lines,n}$ of the region X under OPENVQ control in each sampled day 1-12, using active power and transmission line parameter measured in each sampled day ($P_{k,i,t}$,R_i,X_i,B_i) and estimated reactive power and voltage in the case of installing OPENVQ ($Q_{OPENVQ,k,i,t}$,$V_{OPENVQ,k,i,t}$,$V_{OPENVQ,l,i,t}$). Calculate the sum of the losses in the sampled days as follows:

$$PL_{OPENVQ,X,lines} = \sum_{n=1}^{12} PL_{OPENVQ,X,lines,n}$$

c) Reference transmission line loss ($PL_{RE,X,lines}$)

Calculate transmission line loss $PL_{RE,X,lines,n}$ of the region X in each sampled day 1-12 by the formulae (2)-(4) and Steps 1-7 shown in F.2., using active power and transmission line parameter measured in each sampled day ($P_{k,i,t}$,R_i,X_i,B_i) and reactive power and voltage in the case of installing OPENVQ as calculated in b). Calculate the sum of the losses in the sampled days as follows:

$$PL_{RE,X,lines} = \sum_{n=1}^{12} PL_{RE,X,lines,n}$$

Next, calculate following substation losses:

d) Measured substation loss ($PL_{measured,X,substations}$)

Calculate substation loss $PL_{measured,X,substations,n}$ of the region X in each sampled day 1-12, using measured values of the sampled days. Calculate the sum of the losses in the sampled days as follows:

$$PL_{measured,X,substations} = \sum_{n=1}^{12} PL_{measured,X,substations,n}$$

e) Simulated substation loss in the case of installing OPENVQ ($PL_{OPENVQ,X,substations}$)

Calculate substation loss $PL_{OPENVQ,X,substations,n}$ of the region X under OPENVQ control in each sampled day 1-12, using active power and substation parameter measured in each sampled day and reactive power and voltage in the case of installing OPENVQ as calculated in b). Calculate the sum of the losses in the sampled days as follows:

$$PL_{OPENVQ,X,substations} = \sum_{n=1}^{12} PL_{OPENVQ,X,substations,n}$$

The validity of the calculation method of reference emissions shown in F.2. is confirmed if the reference transmission line loss ($PL_{RE,X,lines}$) calculated above fulfills the following formula:

$$PL_{RE,X,lines} - PL_{measured,X,lines} < PL_{measured,X,substations} - PL_{OPENVQ,X,substations}$$

The above-mentioned steps should be taken using data during the sampling period mentioned in F.2. and the validity of which should be confirmed in the validation process.