Data Manual for three-area AGC system

This manual provides details about the dataset for the area-area Automatic Generation Control (AGC) system. The dataset contains various operational scenarios, each represented in different folders. Each folder corresponds to a specific disturbance scenario followed by a cyber-attack (FDI or DoS attacks). Below are the descriptions of each scenario and folder structure:

1- Folder "Disturbance-Pulse" means that the data is collected when we have a disturbance occurred in the network, followed by a Pulse cyber-attack.
2- Folder "Disturbance-Ramp" means that the data is collected when we have a disturbance occurred in the network, followed by a Ramp cyber-attack.
3- Folder "Disturbance-DoS" means that the data is collected when we have a disturbance occurred in the network, followed by a DoS cyber-attack.

Each folder contains seven columns of data. The **first three columns** correspond to attacked frequency 1 deviation, attacked frequency 2 deviation, and attacked frequency 3 deviation, respectively. The fourth column represents the class labels, indicating the type of attack. There are 5 distinct classes in this dataset, outlined as follows:

- "0" refers to No Attack
- "1" refers to Attack on Frequency 1 Deviation
- "2" refers to Attack on Frequency 2 Deviation
- "3" refers to Attack on Frequency 3 Deviation
- "4" refers to Attack on Frequency 1 Deviation, Frequency 2 Deviation & Frequency 3 Deviation, simultaneously.

The **last three columns** represent the ground truth measurements, the original (un-attacked) frequency 1 deviation, frequency 2 deviation, and frequency 3 deviation, respectively.