Power Generating Station Process and Attack Scenarios

* The process is highlighted here mainly.
* The aim is to create a system which we can enhance later using only codes, i.e., there is no need to add additional hardware.

**Process:**

The process is tabulated below. Here, the change in load is detected. The frequency varies in response to the change in load. Pump and motor speed controls are then varied based on the reading of frequency.

The values of speeds of motor and pump and frequency are all discrete (i.e., low, medium or high). Pump speed is always in response to the change in load, frequency and speed of motor. In normal scenario, the motor speed is always medium.

As an example scenario, if more loads are added, the speed signal of motor is set to low from medium. The frequency in the display is showed as lower than 50. Then, the pump is signalled to increase the speed. As a response to that, the motor speed is increased from low to medium. The frequency now moves from lower than 50 to 50.

|  |  |  |  |
| --- | --- | --- | --- |
| ***Loads*** | ***Frequency*** | ***Motor*** | ***Pump*** |
| Train + airport | 50 | Medium | Medium (no change) |
| Either Train or airport | >50 | High | Lower (decrease fuel) |
| Everything on | <50 | Low | Higher (increase fuel) |
| Any load | off | off | Off (serious fault or attack) |

**Inputs and Outputs:**

* The main input is the **load connected**.
* **Frequency reading** is coupled to it. The first visual output. Also, an input.
* **Motor speed is changed accordingly**.
* Based on the motor speed and frequency, **the pump speed is changed**. It is both an input and an output.
* The policy here is **frequency must be 50 and motor speed must be medium at all cost**. No matter what the load.

**Note: All the quantities, motor speed, pump speed, loads and frequency must be available at the HMI or the control centre.**

**The logic is only done using coding. No hardwiring of logic on the platform.**