

American Energy Market Regulator Case Study – SQL Overview

Scenario Overview

The American Energy Market Regulator (AEMR) is responsible for looking after the United States of America's domestic energy network. The regulator's responsibility is to ensure that America's energy network remains reliable with minimal disruptions, which are known as outages. There are four key types of outages:

- **Consequential** – This outage is caused by an exogenous event or a **consequence** of work unrelated to the energy provider (i.e. A transmission line may be down, which means that a particular power provider may be unable to send energy to the network)
- **Forced** – This outage is caused by a situation that has **forced** the power generating asset to be unavailable. In other words, it has caught the AEMR by surprise and was not planned. (i.e. A cooling tower that supplies water to cool down a power-generating asset has broken down, which has now forced the power-generating asset offline as the temperature can no longer be regulated properly.)
- **Opportunistic** – This outage arises when an energy provider wishes to be proactive with the maintenance of their assets and believes that it can complete maintenance on its plant **within** a 48-hour window. If it takes longer than this, the

outage is considered a PLANNED outage as it was **planned** in advance and will take longer than 48 hours.

- **Planned** – This outage arises when an energy provider reports to the AEMR that an energy-generating asset needs to be taken offline for **routine** or **planned** maintenance activities to ensure the reliability of the asset in the future.

Of the four outage types, the only one the AEMR penalizes is a **forced outage**, as this means that, if enough energy providers enter the forced outage state and the demand for energy is greater than the amount of energy that can be supplied, stress will be put on the energy system. This will then threaten the reliability of the network which is what the AEMR wishes to avoid.

Recently, the AEMR management team has been increasingly aware of a large number of energy providers that submitted outages over the 2016 and 2017 calendar years. The management team has expressed a desire to have the following two areas of concern addressed:

A) Energy Stability and Market Outages

B) Energy Losses and Market Reliability

As an analyst within the data and reporting team, you have been asked to address these two immediate areas of concern. Using your SQL skills, extract the data you need from the database and answer a series of queries (*you'll complete this work on the Next.Tech platform.*) Feel free to also explore beyond the queries asked and provide additional insights that you feel may be of interest to the management team.

As always, be sure to reach out to your mentor or use an **unlimited mentor call** if you get stuck while working through the case study!