Electric Disturbance Events

Group 2

ABOUT US

G2 Team:

Abdelrahman Adel Ahmed
Nada Mahmoud Hamed
Ahmad Frhat Mohamad
Bassem Amr Mohamed
Hady Mohamed Kamel
Islam Mohamed Sayed
Aya Mohamed Khamis

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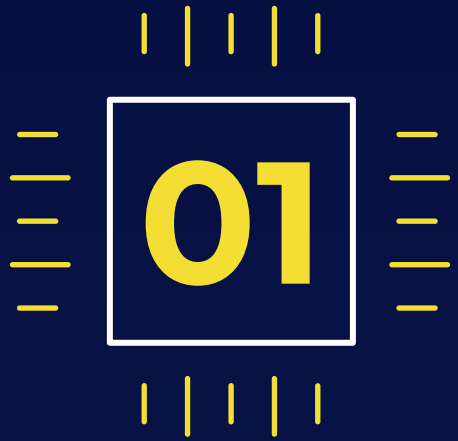
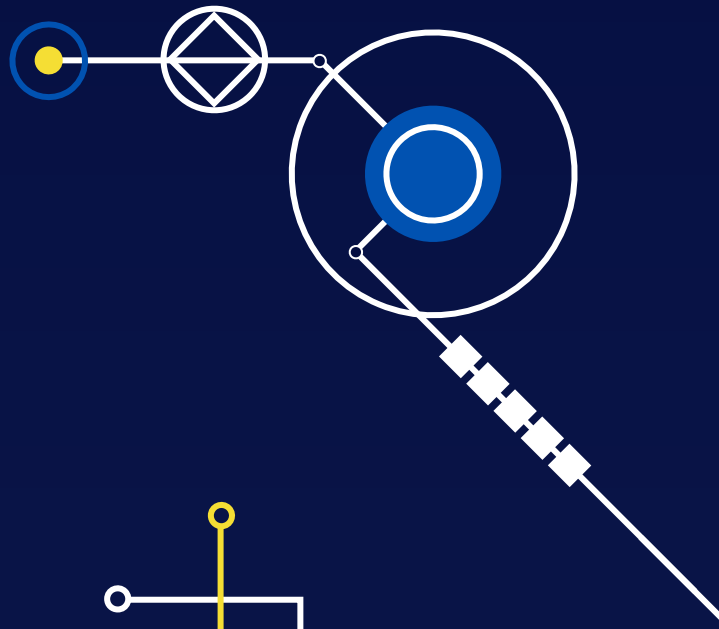
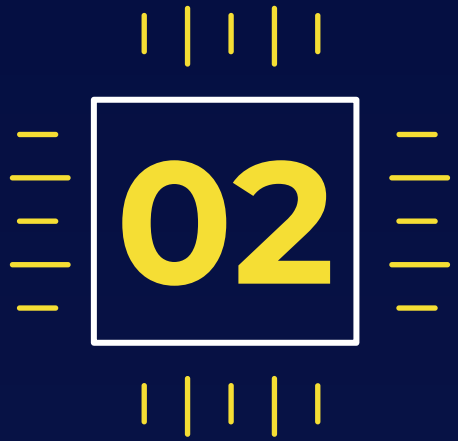


About the Project

- Electric outage incidents in the US power grid from January 2002 to July 2023.
- Information on electric disturbance events is collected using Form DOE-417 and published online in an annual summary.
- including details related to the event start and end time, location, alert criteria, demand loss, and estimated number of people affected.





Project Main Goals

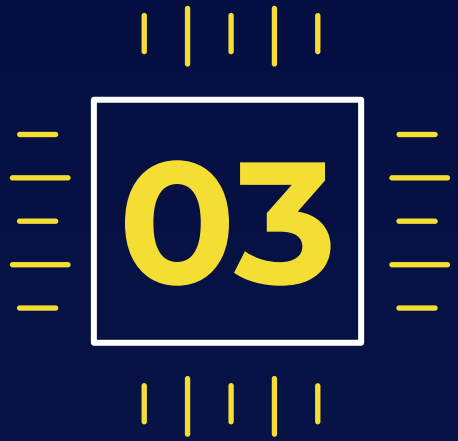
Our Goals

Model goals:

1. All records are exist.
2. The model is fast as possible.
3. The model is dynamic.

Report goals:

1. identify possible weak points in the grid and their trend over time
2. Reaching effective and realistic proposals to improve grid performance



Main conclusion

Conclusion Summary

Key Findings:

- Outage frequency has increased, while the number of affected customers and outage duration have both declined, particularly from 2015 to 2022.

Event Type Analysis:

- Natural disasters are the leading cause of power outages then comes **Operational malfunctions.**
- Operational malfunctions account for nearly 75% of the total impact in WECC.
- **Floods** and **wildfires** are key contributors, with average outage durations exceeding **19 days** for floods, while **wildfires** rank second with over **5 days** of outages.

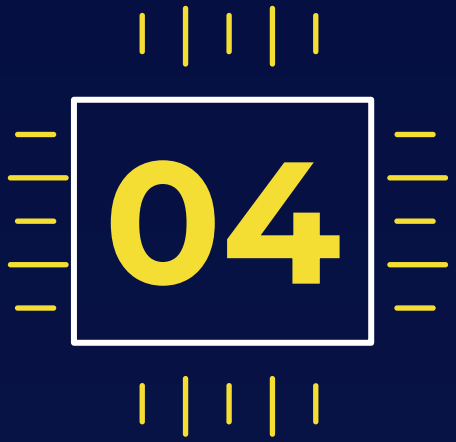
Conclusion Summary

Regional Analysis:

- **WECC:** Faces higher outage impacts, primarily due to operational challenges and natural disasters.
- **NPCC:** Enhanced grid security against risks like vandalism, supported by improved preventative measures and monitoring.
- **MRO & TRE:** Has the lowest outage frequency, thanks to advanced technology adoption.
- **Impact scores** have shown a declining trend in all regions, except for **WECC**.

Conclusion:

While there is national progress in reducing outage impacts, regions like WECC continue to face specific challenges. Continued investment in resilient infrastructure, smart technology, and disaster preparedness remains crucial to sustaining improvements in grid performance.



Suggested solutions

1. Dividing the WECC Region into Smaller Operational Units
2. Increasing Investment in Disaster-Resistant Infrastructure
3. Accelerating the Adoption of Smart Grid Technologies
4. Enhancing Preventive Maintenance and Monitoring Systems
5. Developing a Comprehensive Disaster Response Plan

THANKS!

Do you have any questions?