POWER WORLD DEMONSTRATION AND HANDS-ON

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AGENDA

1. What is PowerWorld?
2. PowerWorld Demo Case
3. PowerWorld Hands-on

WHAT IS POWERWORLD?

PowerWorld is a visual tool that aids power system operation.

Today, we'll be using the simulator to explore power grid operation basics, mainly in physical protection.

TCIPG

TRUSTWORTHY CYBER INFRASTRUCTURE FOR THE POWER GRID | TCIPG.ORG

POWER FLOW

Recall the Power Flow demo. This time we will be doing so with a much wider scale…..virtually.

Power flow study is a way to analyze the power system (also called load-flow study). This method simplifies the three lines into something called a one line diagram.

POWER FLOW SIMULATION DEMO

- Open GSO_37BusCase (if you can't, you can look on the screen)

TRY IT YOURSELF

- Try clicking on some of the red dots yourself to get a feel of how this works.

- You can also open the wscc_9bus

Power flows where it wants, not exactly where we want it. It's like water.

TRANSIENT STABILITY

- Let's say we take off one of the lines……how will system behave as a response to that?

- Transient stability is a way to observe such behavior.

CRITICAL CLEARING TIME

If there exist a fault, the fault must cleared or isolated within a certain amount of time. The time period in which this needs to occur is called a critical clearing time.

TRANSIENT STABILITY SIMULATION DEMO

- Open TS_Demo (if you can't, you can look on the screen)

TASK

- The critical clearing time for our case was .29 seconds…….now, let's change the generator Mvar output to 50,100,150,200, and 0. What are the critical clearing time for each?

REFERENCE

- ECE 576 (UIUC) PowerWorld cases