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RAS Modeling in Transient Stability

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Agenda

- Problem Statement
- Solution – Excel Macro using Simauto
- Q & A
- Demonstration

Problem Statement

While the Transient Stability RAS format is not yet in use, how do you model RAS actions in transient stability when the RAS takes into account variables in the system and act accordingly?

Example (will be part of the demonstration):
Path 26 RAS is a flow based RAS that takes into account the flows on Path 26 and when the monitored outage occurs, the RAS decides how much generation / load is tripped. The generation dropping equation is:
Gen Trip = (28/11*Path 26 flows – 3000)
Load Trip = 4/3 * (Path 26 flows – 3550)
There are also a combination of 5 Generator Injection Groups that add up the Gen Trip

So you can see that this is relatively easy to get the set of generators to trip if there is only one base case but if there are multiple base cases with different flows and different dispatch patterns, it becomes a time consuming exercise on top of coding the sequence in transient stability.

Solution

- What I did was to figure out the logic first and then implement using an Excel Macro

  I figured out with Matt Davis's help that this can be accomplished the quickest by using Difference Tool. The tool's built in capability helps find the changes in the base case after the contingency then record it accordingly – my task was to output the results into Excel
- So what I did was to create the Excel Macro to do the following steps:
  1. Open the base case(s) and read in all the contingencies of the base case(s)
  2. Let the user select which contingencies that needs to monitor for RAS Actions
  3. When the run button is pressed, it sets the base case as present then takes the contingency then compares
  4. The Excel sheet will output the result of the comparison so that you know which line(s) / load(s) / generator(s) that were tripped for that particular base case and contingency
- Two things to take into account:
  - First, this tool records the contingency(ies) itself but at least it is a confirmation that the outage was taken correctly

Solution (cont.)

- Second, the timings for the actions are not included so that needs to be manually done but at least most of the actions is recorded that you can start coding it in the Transient Stability Tool

Q & A