From: Datta-Barua, Manjula
To: SYSTEMPROTECTIONWG@LISTS.ERCOT.COM;
Subject: Re: Schweitzer Engineering Comments about CREZ Line Relaying
Date: Thursday, October 29, 2009 4:53:20 PM

Please add the following items to the agenda:

1) Discuss ERCOT Market Notice "W-A101609-01 Submittal of Annual Disturbance Monitoring Equipment" issued on October 16, 2009
2) Verification of Transient Stability model using DFR data

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From: System Protection Working Group [mailto:SYSTEMPROTECTIONWG@LISTS.ERCOT.COM] **On Behalf Of** Kakarla, Raja Sekhar
Sent: Thursday, October 29, 2009 2:47 PM
To: SYSTEMPROTECTIONWG@LISTS.ERCOT.COM
Subject: FW: Schweitzer Engineering Comments about CREZ Line Relaying

Members SPWG:

Please see email below from Cathey Carter of ERCOT which throws some light on the system protection implementation difficulties for CREZ lines. This is just for your information. If the members want we can discuss this in the upcoming meeting.

Regards

Raja Sekhar Kakarla
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From: Carter, Cathey
Sent: Thursday, October 29, 2009 9:50 AM
To: Kakarla, Raja Sekhar
Subject: FW: Schweitzer Engineering Comments about CREZ Line Relaying

Raja, FYI for SPWG. Please share with SPWG as appropriate. Thanks.

From: Competitive Renewable Energy Zone Transmission service Providers [mailto: CREZ_TSP@LISTS.ERCOT.COM] **On Behalf Of** Carter, Cathey
Sent: Thursday, October 29, 2009 9:42 AM
To: CREZ_TSP@LISTS.ERCOT.COM
Subject: Schweitzer Engineering Comments about CREZ Line Relaying

Hello CREZ TSP engineers,

Tim Cook asked me to commit to writing to everyone what I learned from Schweitzer about possible relaying challenges for CREZ lines. First, my understanding of system protection practices is stale – I have never set a Schweitzer relay myself. Each TSP is responsible for consulting with their own protection experts to be sure that they install appropriate protection schemes for their own lines.

I contacted Schweitzer through their Contact Us email address with the specific questions of whether or not their relays would recognize and correctly respond to two different hypothetical faults. I explained that the area where ERCOT lines may cross SPP lines is relatively weak in both systems, being far from SPP generation and supplied by induction windfarms on the ERCOT side.

1. New CREZ line crossing over an existing SPP line drops a single phase onto a single phase of SPP, but neither contacts ground. Fault is ERCOT single-phase to SPP single phase.
2. New CREZ line crossing over an existing SPP collapses onto the SPP line, which also collapse to ground. Fault is ERCOT three-phase to SPP three-phase to ground.

Derrick Haas from the Schweitzer Houston office (713-779-9005) called me back to say that the second fault should be recognized and tripped by both ERCOT and SPP protection schemes. He said that he couldn't answer for the first fault. Each situation of this type would need to be studied individually.

I also contacted a former co-worker who has been with Schweitzer in the Charlotte office for many years now. Bernie Matta said these are called "cross-country" faults and said the same things Derrick said about the relay responses. He then gave me several other things to think about.

- The windfarm contributions to a fault can be small and not last long. High-speed tripping and

no reclosing recommended.

- "ERCOT should do it's best to avoid running it's line in parallel with other lines of an isolated system. The mutual coupling could otherwise cause nightmares for the relaying people. If unavoidable, negative sequence relaying should be heavily emphasized."
- "For a line that is dedicated to a windfarm, I have used one shot of delayed reclosing at the utility end if the line is dead. The delay is around 10 seconds or so. This allows voltage to be provided at the windfarm (assuming the fault was only temporary) so that they can re-energize their station and do their own synchronization. It allows the utility personnel to not have to be involved in the re-energization, and not have to assume any risk of energizing on damaged generators."

I hope this is useful to those of you with lines that cross over SPP lines.

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