Case Study

Southern U.S. Generation Customer

Emergency Control Cabinet Replacement

In May 2019, a leading power generation entity located in the United States with approximately 39,000 MW of generation had a sudden failure of a GSU transformer. The customer found that their viable spare transformer had a failed control cabinet. This cabinet would need to be replaced before placing the spare GSU transformer into service.

Background

Luminant, a subsidiary of Vistra, is a competitive power generation business which includes wholesale marketing and trading, mining, and development operations. NASS has performed many projects at Luminant facilities throughout the years, making the decision to task NOMOS and NASS with the cabinet replacement at the Odessa Power Plant easy

The Challenge

In May 2019, a GSU transformer failed at the Odessa Power Plant. During this time, the viable spare/replacement GSU control cabinet was also not in working order due to a previous incident and for it to be used, the cabinet would need to be replaced immediately. This posed a challenge for Luminant because of the potentially long lead time for a replacement but posed an opportunity for NOMOS and NASS to display not only our capabilities, but also provide a short lead time for a valued client.

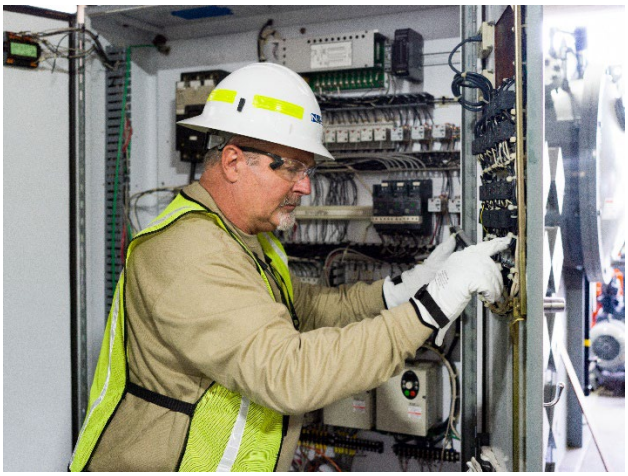
The Solution

For each day passing day and power not being generated to the grid, Luminant was experiencing a significant loss of revenue. NASS and NOMOS stood out to Luminant as a solution provider due to the previous projects and the ability of providing a cabinet, which was on hand at the time of the customer's need. The solution was not only in the product but also in the engineering support. The engineering support was key to making necessary modifications to the cabinet to meet Luminant's specific site/GSU needs.

Plant Dynamic Response to a Frequency Event

Luminant representatives reviewed the Hurricane GSU control cabinet schematic and marked the items that need to be changed to meet the on-site needs. These changes consisted of both physical and schematic drawing changes, such as:

- Wire sizes to be changed, to match the existing transformer.
- Controls for 12 fans, nominal data as marked.
- Addition of a Buchholz relay alarm.
- Removal of the sudden pressure relay from the stocked cabinet.
- Modifications to meet the GSU Hot spot CT ratings
- Terminal block designations had to be cross referenced to the original drawings, so that an installer could land the original field wiring to the connection points.



With these modifications, the cabinet was able to replace the existing GSU control cabinet.

Conclusion

Luminant's Odessa Power Plant was in an emergency situation- they needed an immediate response for a GSU transformer replacement to avoid significant financial loss. Their spare GSU cabinet was not functional at the time of the original failing but luckily, NOMOS was quick to react by replacing the failed cabinet with a

much-needed replacement. Once the replacement cabinet was identified, it was shipped and installed within five days by our expert technicians, resulting in a significantly lower loss than otherwise projected, and got Luminant back on the grid at full capacity within a short lead time.

Much of the control engineering work performed was to cross-reference all the external devices (gauges, breather, pressure relief device, fans, etc..) to connect at the spot where the current devices in the drawings connect. We supplied correct nameplates on the Seekirk annunciator and provided full wire markers to complete the job.

The Hurricane Series GSU control cabinet unit has the following features:

- Made of 11-gauge thick 304 Stainless steel with ANSI 70 grey powder coat paint applied on top (high quality cabinet)
- Runs off of 480V 3ph.
- Can be coupled with our standard Hurricane automatic transfer switch box (100Amps) in case of need for dual power inputs
- Can accommodate 30+ fans with some pumps split through up to 4 groups
- Can accommodate 21 bushing CTs
- Can accommodate up to 24 alarms wired back to annunciator panels (Seekirk units, 2)
- Includes temperature controller for automatic cooling control, can be easily bypassed.
- Can supply 2-3 devices on the 240V 1ph if not supplied by substation (depends on amps value)
- Multiple 12 points empty terminal block for spare
- Built with easily accessible North America material

The most important aspect has been to confirm amps value of the fan groups, or of each fan.

The current unit on shelf is equipped with 15 amps breaker per group.