Removal of the Wolfs Crossing-Sandwich Line Special Protection System (SPS)

ComEd / Exelon Corporation
Transmission Planning
Wolfs Crossing-Sandwich Line Location
Wolfs Crossing-Sandwich 138kV line SPS

✓ Original Purpose
  • To prevent low voltage on Wolfs Crossing-Sandwich 138 kV line 14302
  • Described in ComEd System Planning Operating Guide (SPOG) 3-31
  • SPS is normally in-service

✓ SPS Action
  • Trips L14302 if the circuit breaker is open at TSS 143 Wolfs Crossing
Wolfs Crossing-Sandwich 138kV line (L14302) before reinforcement

SPS transfer trips L14302 for open L14302 breaker
Reinforcements Impacting L14302

✓ L14302 configuration changes
  • New TSS 167 Plano 345-138kV autotransformer and 138kV buses
  • Line split into two lines
    – East half (L14302) connects TSS 143 Wolfs Crossing and TSS 167 Plano
    – West half (L14609) connects TSS 167 Plano and TSS 146 Sandwich
    – Before reinforcement an open breaker at TSS 143 Wolfs Crossing makes L14302 radial, causing low voltage.
    – The new TSS 167 Plano 345-138kV autotransformer provides an alternate source for L14302.
Wolfs Crossing-Sandwich 138kV line (L14302) before reinforcement

- TSS 167 Plano
- New 345-138kV autotransformer and 138kV bus
- TSS 146 Sandwich
- TDC load on line tap
- TSS 143 Wolfs Crossing
- TDC load on line tap
L14302 SPS Is No Longer Required

- Reinforcement is complete
- SPS is no longer required and can be removed.
  - A open breaker at TSS 143 Wolfs Crossing no longer results in low voltages along L14302
  - New TSS 167 Plano 345-138kV autotransformer can support the load and voltage on L14302 with L14302 line breaker open.
- Reliability First has been informed of planned SPS removal per RF SPS Review Procedure
Questions?
Removal of the Waukegan Special Protection System (SPS)

ComEd / Exelon Corporation
Transmission Planning
Station 16 Waukegan Location
Station 16 Waukegan (Prior to Reinforcements)

Normally open 138 kV bus tie 4-14
Waukegan SPS Description

✓ Original Purpose
  • To prevent low voltage or transmission line overloads for loss of a 138 kV line concurrent with a Waukegan unit outage
  • Described in ComEd System Planning Operating Guide (SPOG) 2-29
  • SPS is normally in service

✓ Triggering Event
  • Waukegan Unit 7 or Unit 8 trips off line

✓ SPS Action
  • Closes 138 kV bus tie 4-14 at Station 16 Waukegan for the loss of either Waukegan unit 7 or 8.
Reinforcements at Waukegan

✓ Reinforcement Project at Station 16 Waukegan (PJM s0494)
  • Install two 345/138kV autotransformers
  • Remove old 138kV yard and replace with a new 138kV yard and breakers.
  • Connects four 345kV lines to Waukegan substation.
Waukegan SPS No Longer Required

✓ SPS will no longer be required after reinforcements and can be removed
  • New autotransformers provide redundant 138kV sources
  • The SPS will not be necessary to meet planning criteria.

✓ When SPS will be removed
  • When the bus tie 4-14 circuit breaker is removed from service as part of the Waukegan project (last quarter of 2014)
  • SPS to remain in-service throughout summer of 2014

✓ Reliability First has been informed of planned SPS removal per RF SPS Review Procedure
Questions?
Removal of the Zion Energy Center Special Protection System (SPS)

ComEd / Exelon Corporation
Transmission Planning
Zion Energy Center Location
Zion Energy Center Background

✓ Purpose of Zion E.C. SPS
  • Prevent Zion EC generator instability for certain faults cleared in delayed time
  • Described in ComEd System Planning Operating Guide (SPOG) 1-3-K
  • SPS is normally in-service

✓ Installation of ATC’s 345kV Pleasant Prairie to Zion E.C. (PLPL41) prompted a dynamic stability analysis of the Zion E.C. SPS.
Zion Energy Center SPS Description

✓ Original Purpose
  • Prevent Zion EC generator instability for certain faults cleared in delayed time
  • Described in ComEd System Planning Operating Guide (SPOG) 1-3-K
  • SPS is normally in-service

✓ Triggering Event
  • Multi-phase fault cleared in delayed time when all three units are operating

✓ SPS Action
  • Trips one Zion EC unit
Zion E.C. SPS Is No Longer Required

✓ ComEd Stability Study Results
  • Zion EC is stable for faults that would normally result in SPS operation
✓ SPS is no longer required and can be removed
  • The SPS will not be necessary to meet planning criteria.
✓ SPS can be taken out-of-service following approval from ReliabilityFirst
  • ReliabilityFirst has been informed of planned SPS removal per RF SPS Review Procedure
  • Permanent removal expected prior to summer 2015
Questions?