




H.B. Robinson Steam Electric Plant, Unit No. 2
LAR Proposing to Add an Offsite Circuit to TS 3.8.1 and the Use of Automatic Load Tap Changers

September 7, 2017

DUKE ENERGY®

Duke Energy Attendees

Art Zaremba (Manager, Nuclear Fleet Licensing)

Jordan Vaughan (Senior Nuclear Engineer, Fleet Regulatory Affairs)

David Carroll (Manager Nuclear Engineering, Major Projects)

Neil Belanger (Senior Operations Specialist, Major Projects)

Tom Ferrell (Project Engineer, Major Projects)

2

Agenda

- Introductions / Opening Remarks
- Transmission Upgrade Project Overview
- Current Versus Future HBRSEP Electrical Distribution System
- License Amendment Request Overview
- Additional Technical Justification for Proposed Change

Transmission Upgrade Project Overview

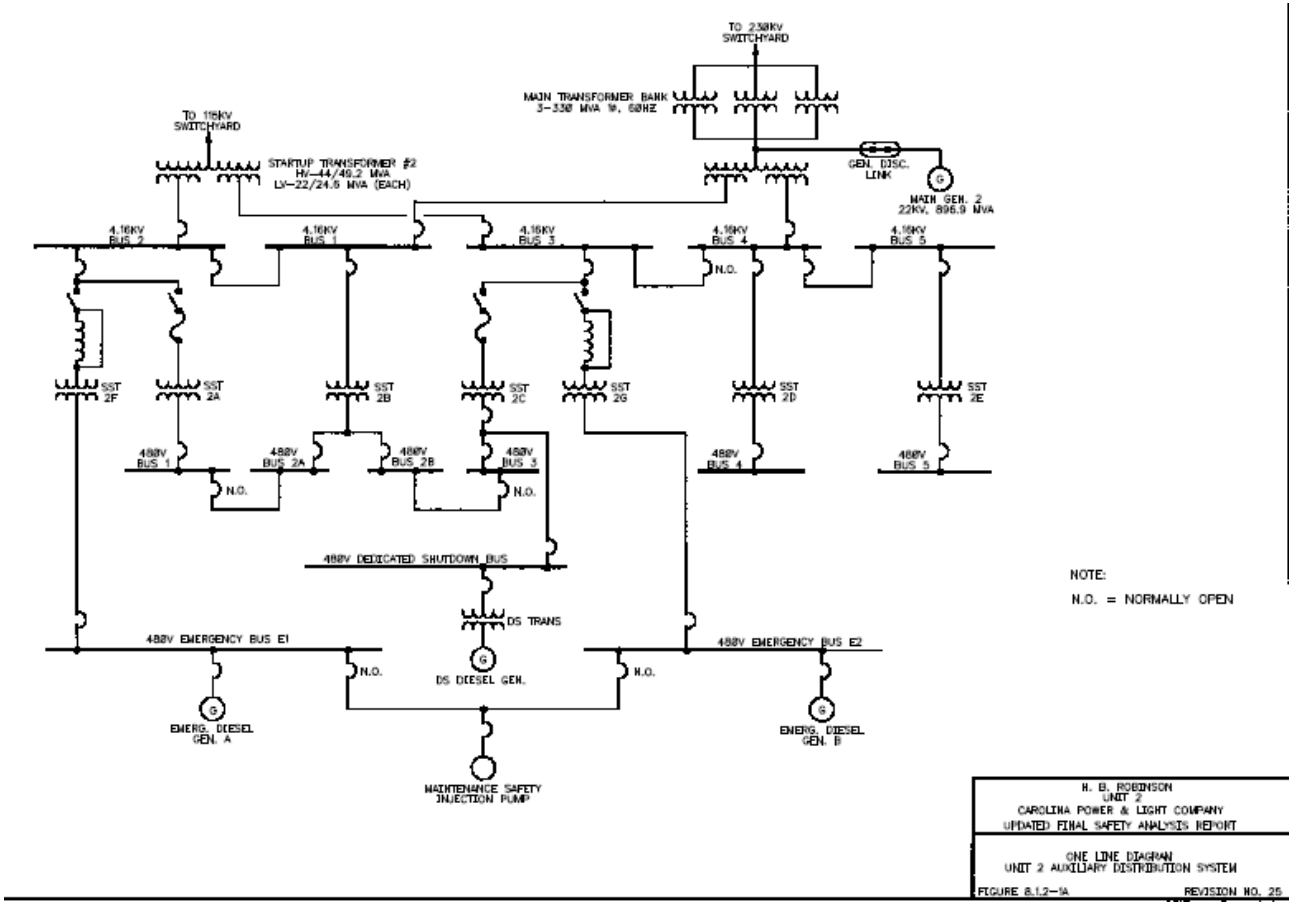
- Project Description: The Transmission Upgrade Project increases plant electrical distribution system reliability and availability by increasing the number of available offsite power sources. The increase in offsite sources is accomplished with the design and installation of a second startup transformer (SUT) to be connected to the 230kV switchyard and a new replacement 115kV SUT.

- Background: Both the new replacement 115kV SUT and the new 230kV SUT will be equipped with a Load Tap Changer (LTC) with automatic and manual control capabilities. The LTCs can automatically maintain the 4.16kV bus voltages at the required voltage regardless of variations in switchyard voltage. The ability to maintain the 4.16kV bus voltages at required voltage will minimize the occurrence and effect of any overvoltage or degraded grid voltage on plant electrical equipment and safety related buses E1 and E2 for anticipated variations in switchyard voltage.

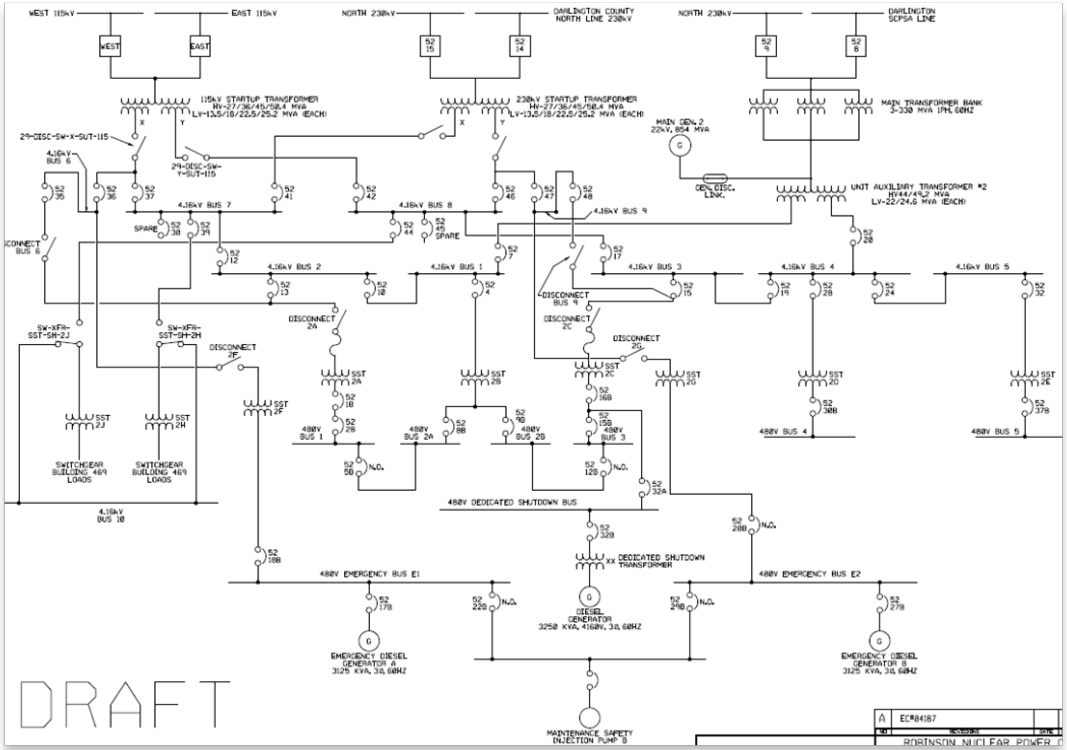
- Big Picture Changes to HBRSEP
  - Provides a second offsite power source.
  - Provides direct feeds to Emergency Buses E1 and E2 from the new replacement 115kV SUT and the new 230kV SUT (Bus E1 is no longer reliant on a Fast Bus Transfer after unit trip).
  - Allows the Energy Control Center to lower minimum required HBRSEP switchyard voltage. The LTCs compensate for this allowance.
  - Provides switchyard breaker controls for each LTC and SUT in the Main Control Room.
- Current Status of project

5

Current HBRSEP Electrical Distribution System



Post RO31 HBRSEP Electrical Distribution System



LAR Overview – Proposed Change #1

- Revise HBRSEP Technical Specification 3.8.1, “AC Sources – Operating” to reflect the addition of a second qualified offsite circuit
  - Necessitated by the addition of the new 230kV SUT
  - Proposed change is consistent with NUREG-1431, Revision 4, *Standard Technical Specifications Westinghouse Plants*
- Limiting Condition for Operation (LCO) 3.8.1.a modified to state: “Two qualified circuits…”
- Conditions, Required Actions (RA) and Completion Times are also modified to reflect two qualified offsite circuits.
- Only one change to HBRSEP TS 3.8.1 that is not within the scope of NUREG-1431
  - Maximum Completion Time for existing RAs A.2 and B.4 is currently 8 days (“8 days from discovery of failure to meet LCO”)
  - The new maximum Completion Time is modified to 10 days (“10 days from discovery of failure to meet LCO”) to reflect that there is now a 72 hour Completion Time for one offsite circuit inoperable
  - This change is consistent with other Westinghouse plant TSs and is considered editorial

Proposed Change #1 TS Markups

3.8 ELECTRICAL POWER SYSTEMS

3.8.1 AC Sources - Operating

LCO 3.8.1 The following AC electrical sources shall be OPERABLE:

a. ~~The~~ Two qualified circuits between the offsite transmission network and the onsite emergency AC Electrical Power Distribution System; and

b. Two diesel generators (DGs) capable of supplying the onsite emergency power distribution subsystem(s).

Proposed Change #1 TS Markups (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. ~~The qualified~~One offsite circuit inoperable.	A.1 Perform SR 3.8.1.1 for OPERABLE offsite circuit. AND A.~~1~~2 Declare required feature(s) with no offsite power available inoperable when its redundant required feature(s) is inoperable. AND	1 hour AND Once per 12 hours thereafter ~~12~~ 24 hours from discovery of no offsite power to one train concurrent with inoperability of redundant required feature(s).

(continued)

Proposed Change #1 TS Markups (continued)

ACTIONS (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
A. (continued)	A.~~2~~3 Restore offsite circuit to OPERABLE status.	~~24~~ 72 hours AND ~~8~~ 10 days from discovery of failure to meet LCO

Proposed Change #1 TS Markups (continued)

	AND		
	B.4	Restore DG to OPERABLE status.	7 days AND ~~8~~ 10 days from discovery of failure to meet LCO
C. Two offsite circuits inoperable.	C.1	Declare required feature(s) inoperable when its redundant required feature(s) is inoperable.	12 hours from discovery of Condition C concurrent with inoperability of redundant required features
	AND		
	C.2	Restore one offsite circuit to OPERABLE status.	24 hours

Proposed Change #1 TS Markups (continued)

CONDITION	REQUIRED ACTION	COMPLETION TIME
D. One offsite circuit inoperable. AND One DG inoperable.	----------NOTE---------- Enter applicable Conditions and Required Actions of LCO 3.8.9, "Distribution Systems - Operating," when Condition D is entered with no AC power source to any train. ---------- D.1 Restore offsite circuit to OPERABLE status. OR D.2 Restore DG to OPERABLE status.	 12 hours 12 hours
E. Two DGs inoperable.	E.1 Restore one DG to OPERABLE status.	2 hours
~~C~~F. Required Action and associated Completion Time of Condition ~~A or B~~A, B, C, D, or E not met.	~~C~~F.1 Be in MODE 3. AND ~~C~~F.2 Be in MODE 5.	6 hours 36 hours

Proposed Change #1 TS Markups (continued)

~~D~~G.	~~Two~~ Three or more AC sources inoperable.	~~NOTE~~ ~~Entry into this Required Action may be delayed for no greater than 2 hours during performance of Required Action B.3.1 and Required Action B.3.2.2.~~ ~~---~~ ~~D~~G.1 Enter LCO 3.0.3	Immediately

Proposed Change #1 TS Markups (continued)

SR 3.8.1.18	----------NOTE---------- This Surveillance shall not be performed in MODE 1 or 2. ----------	
	Verify manual transfer of AC power sources from the normal offsite circuit to each alternate offsite circuit.	18 months

LAR Overview – Proposed Change #2

- Revise the current licensing basis as reflected in the HBRSEP UFSAR to allow for the use of LTCs in the automatic mode of operation on both SUTs (i.e., the new replacement 115kV SUT and the new 230kV SUT)
- Operation of LTCs in the automatic mode requires prior NRC staff approval in accordance with 10 CFR 50.59 (automatic LTC operation creates a possibility for the malfunction of a SSC important to safety with a different result than any previously evaluated in the UFSAR)
- Technical justification for the requested change will include LTC operational evaluation (including the Primary and Backup Controller setpoints, the 115kV/230kV SUTs Control and Limit Bands and ratings for the new SUTs) and a component level Failure Modes and Effects Analysis (FMEA).
- A review of all plant electrical bus alignments was conducted for both normal and accident grid transients (applied the worst case transient voltage acceptance criteria from existing ETAP calculations). In all cases, the new replacement 115kV startup transformer and the new 230kV startup transformer with LTCs were able to provide the transient response necessary to prevent operation of the safety related buses DGVR relay.

Additional LAR Technical Justification

The following additional technical justification will be provided in the LAR consistent with previous discussions with the NRC staff:

- Grid Voltage Profile Summary (i.e., Grid Stability Study)
- Steady State and Transient Load Flow Summaries
- Short Circuit Analysis Summary
- Demonstration of breaker coordination of new switchgear including coordination with existing switchgear


DUKE
ENERGY®