Open Phase Detection and Protection







NRC Public Meeting

November 1, 2013

Open Phase Detection and Protection

- "Meter as Relay" Solution
  - Standard pickup; low level processing
- Modified Solution
  - Dual level sensors (excitation and power ranges)
  - Low power level alarm; high power level trip
  - "Redundant" packages (SPV and reliability)
    - 2 sets of sensors
    - 2 sets of relay cabinets (to be installed adjacent to transformers)

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Plant	Unit	Transformers					Comments
Brunswick	1	Main	SUT				
	2	Main	SUT				
Catawba	1	1A Main	1B Main				New SUTs at Catawba are not included. OPD will be addressed in the SUT project if it proceeds.
	2	2A Main	2B Main				New SUTs at Catawba are not included. OPD will be addressed in the SUT project if it proceeds.
Crystal River	3	OPT	BEST				Skip if fuel is in final storage?
Harris	1	Main	SAT 1A	SAT 1B			Skip Main if we never backfeed?
McGuire	1	1A Main	1B Main				
	2	2A Main	2B Main				
Robinson	2	Main	SUT 1	SUT 2			Skip Main if we never backfeed?
Oconee	1-3	CT1	CT2	CT3	CT4	CT5	Skip CT4 and CT5 if designated as safety power supplies?
	1	Main					Outage backfeeds are typical
	2	Main					Outage backfeeds are typical
	3	Main					Outage backfeeds are typical

Totals

22 Transformers minimum.

24 Transformers likely (including the HNP and RNP Mains).

28 Transformers possible.

We want redundant systems for SPV and reliability.

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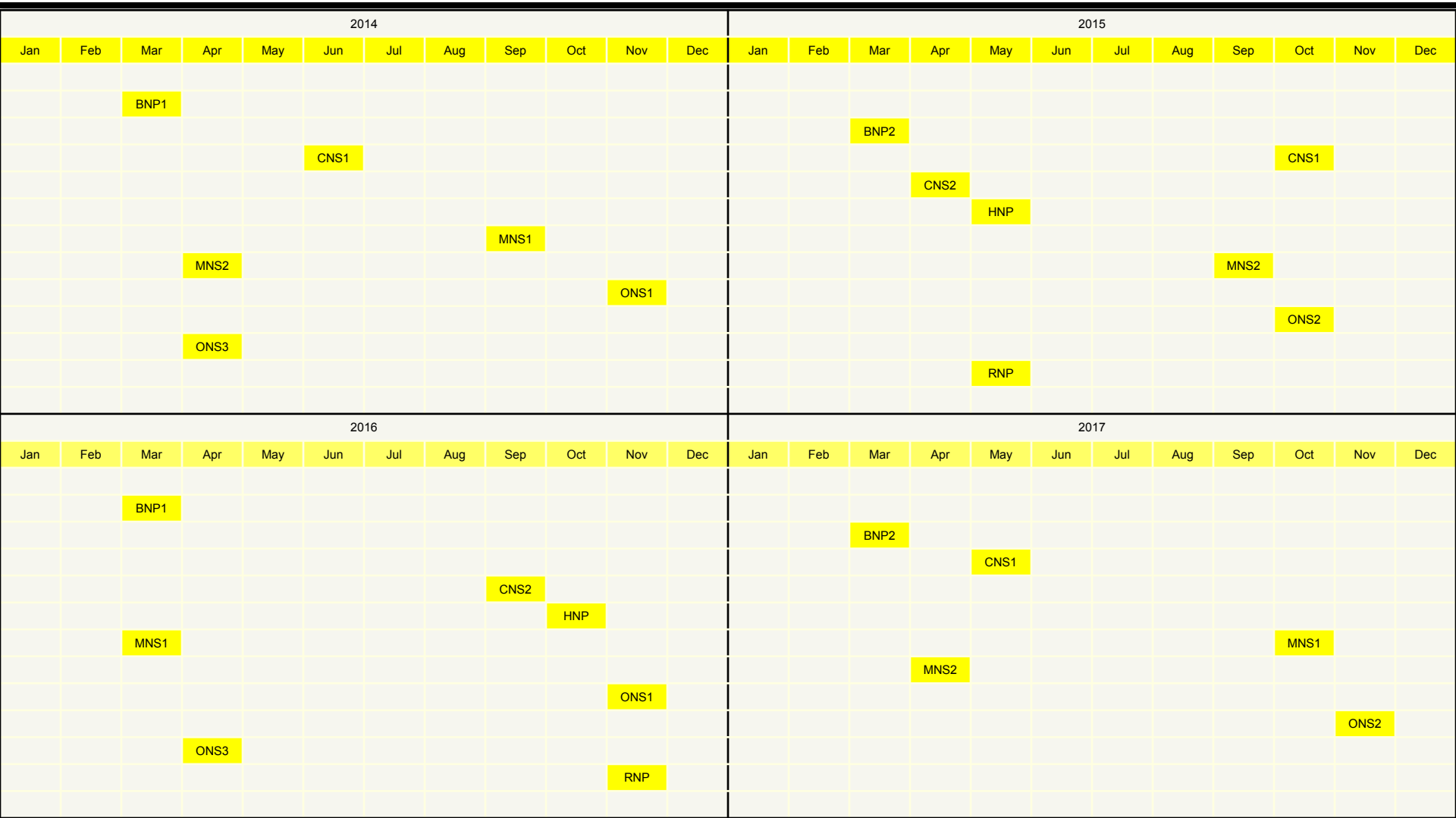

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- Project Concerns:
  - Final scope (number of transformers to be protected).
  - Multi-site, multi-plant, short, integrated schedule.
  - Available suppliers.
  - Verify that LAR will not be required or schedule LAR for Tech Spec updates.