Organization of Under Frequency Load Shedding Modeling Data for Planning Coordinator Use

PJM Planning Committee Meeting
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Background

- It will be necessary for PJM, as a Planning Coordinator, to do simulations of UFLS implementation
  - Program Design and Evaluation
    - PRC-006
    - PRC-006-RFC-01
    - PRC-006-SERC-1
  - Event Analysis
    - PRC-009

Gathered Information Before

- Gathered detailed UFLS information twice before (2004 and 2008)
- Attempted to translate the supplied data into PSS/E dynamics relay models
  - Frequency set point
  - Percent of load to shed at the modeled bus
  - Time delay
- Multiple issues:
  - Extremely Time consuming
  - Buses are modeled differently in the power flow
  - Lower voltage busses not always modeled
  - Have to also consult the one-line drawings
- Never 100% sure we are getting it right

- In summary, it's extremely hard for us to line up the raw UFLS data with the power flow models
- We are proposing that the TO planners (familiar with the power flow models) get together with the TO protection engineers (responsible for UFLS) and align the data
  - The PSS/E dynamics models in DYRE format
  - UFLS data with associated bus numbers

Current – Data Sheets

Company	Substation	Circuit Name	Frequency Pickup (Hz)	Total Trip Time (sec)	Net Load (MW)	Electrically Nearest EHV Bus 100 kV or higher
PECO	Angora	Angora_130	59.3	0.18 s	2.87	Grays Ferry 230 kV

Proposal – Data Sheets

Company	Substation	Circuit Name	Frequency Pickup (Hz)	Total Trip Time (sec)	Percent of Load (%)	Bus Number	Bus Name
PECO	Angora	Angora_130	59.3	0.18 s	50.00	213454	GRFRRY69.0

Proposal – PSS/E Model

I	'LDS3xx'	LID	GBUS	GID	SC	f1	t1	tb1	frac1	f2	t2	tb2	frac2	
213454	'LDS3BL'	1	0.00	0.00	0.00	59.30	0.18	0.00	0.50					/ Buckingham _343

Summary

- Some companies already provided us with this data
- I'm available to discuss this further with your planners or relay engineers
  - Mark Kuras, 610-666-8924, kuras@pjm.com
- Like to have this done by the end of the year
- Will eventually become another line item in the TO/TOP Matrix in the Planning tab

Questions