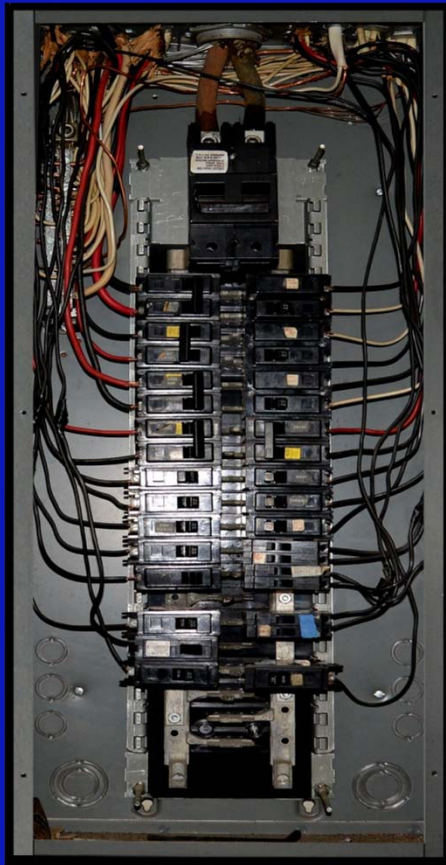


ELECTRICAL PROTECTION ISSUES AND AC POWER PROBLEMS IN THE HOME



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***PEG General Meeting –
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Telco-Sales, Inc.®

Observed Power Service *Symptoms*

- *Lights dimming and “flickering”*
- *Microwave light dims when unit is cooking*
- *Ceiling fan light goes out when TV in family room is powered ‘ON’*
- *Intermittent video “freeze frame” and video /macro-blocking severe!*

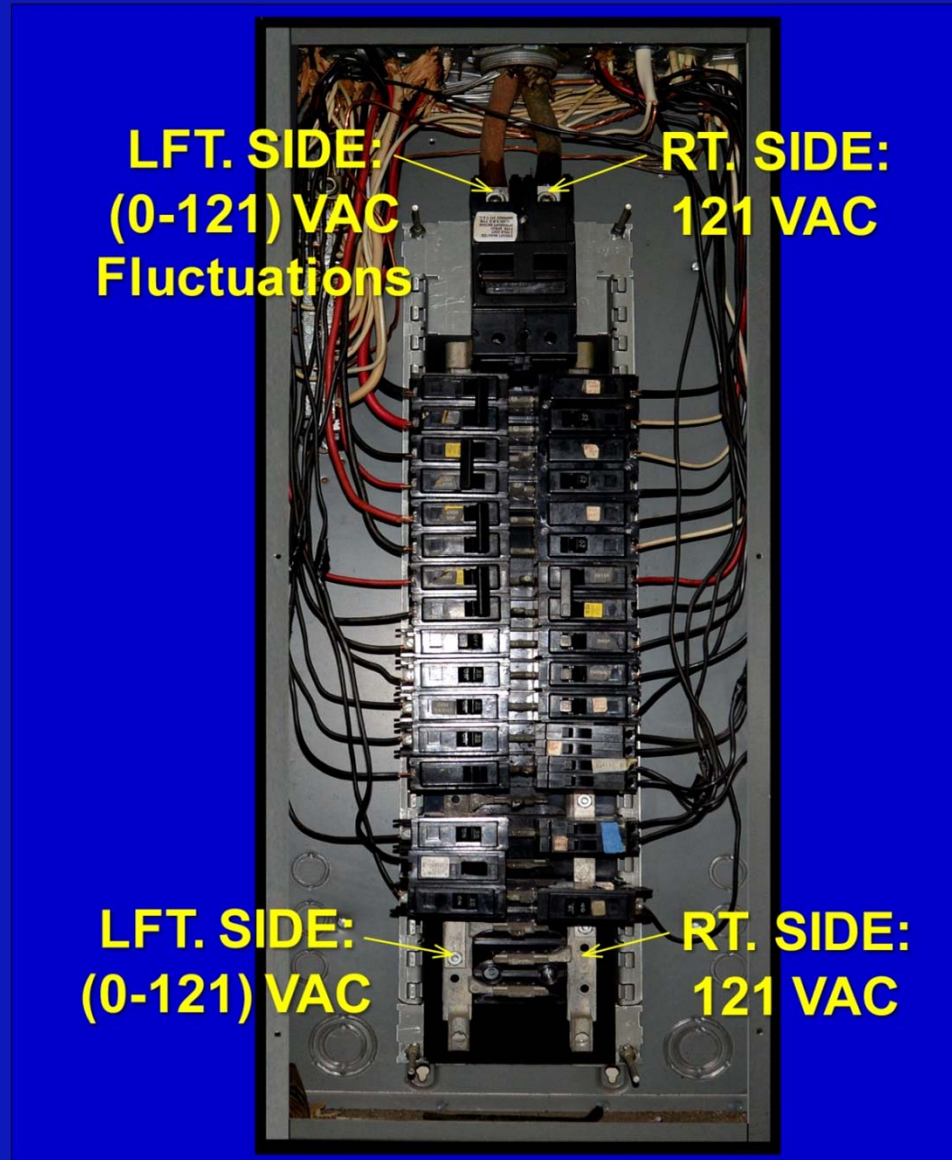
Observed Power Service Symptoms (Cont'd)

- *Voltage at circuit breaker = 121 VAC for TV & kitchen (microwave)*
- *Turned ceiling fan light 'ON': voltage dropped to ~0 VAC.*
- *WHAT IS GOING ON?*

Observations

- *At least 3 separate 120 volt circuits affected*
- *No 220/240 volt appliances tested (yet)*
- *Measure AC voltage on both power rails for circuit breakers with “fault” condition created using ceiling fan light and microwave:*
 - *Left side: intermittent voltage fluctuations*
 - *Right side: steady 121 volts*
- *AC unit (5 ton/240 VAC) worked fine!*

“Fault” Isolation



“Fault” Isolation (Cont’d)

- *Initial tests:*
 - *Problem “appears” to be on field side of main breaker*
 - *200 Amp main breaker was replaced ~ 3 years ago – Bad reputation for reliability!*
 - *Contact power company to isolate inside main power cable from meter to main breaker*
- *Power drop support bracket replaced in April 2012 – (toggle bolt broke from load)*
- *Power cable between weather-head and meter base stressed*

Transformer



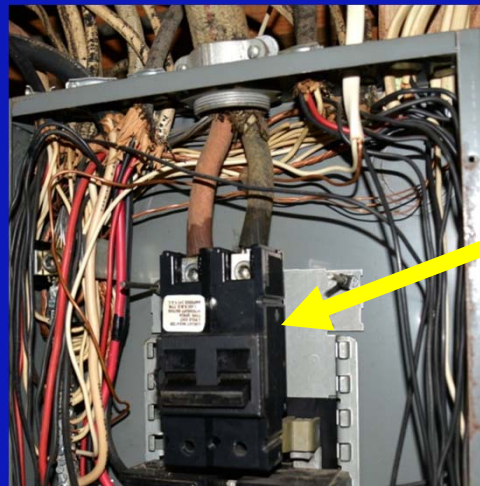
Drop Support & Weather-Head



Meter Base



200 Amp Disconnect



Where is the Problem?

- *Neighbor stated that they have not had any apparent voltage/service issues with power*
- *Since the drop was recently “stressed” when the support bracket broke, the most logical point appeared to be at the weather-head.*
- *Contacted the power to remove the meter and open the circuit at the transformer – (said they would br there in 5 days).*
- *Stated that I would remove the meter and they could reseal it after I was through – they showed up in 30 minutes!*

- *Situation was explained to power technician & where I thought problem was located.*
- *He looked at the meter base connectors, measured the voltage on the output side of the meter, and stated the connector on the left side was intermittently going “open.”*
- *Note: The AC worked because there was sufficient enough current (>30 Amps) to create and establish an ionized arc-path for the compressor to run.*
- *This bracket (~ 50+ yrs old) was burning up under heavy load.*

- *The bracket on the right side had been replaced ~ 10 years earlier – same issue.*
- *Cleaned contact surfaces for individual circuit breakers & main breaker while power was disconnected*
- *AC service panel should be replaced due to poor contacts & wore out circuit breakers, which are no longer available.*

Meter Base Bracket



Meter Base Bracket (Cont'd)



Conclusion

- *Old houses are a PAIN!*
- *If you are going to perform maintenance/repair in the AC service panel, remove the meter to avoid serious arc-flash hazard and open the service at the transformer.*
- *WARNING: Momentary current flow can easily exceed 10,000 Amps with LINE-to-GROUND fault.*

BE SAFE!!!