

# **Distributed Resources Engineering (DRE) Interconnection Updates**

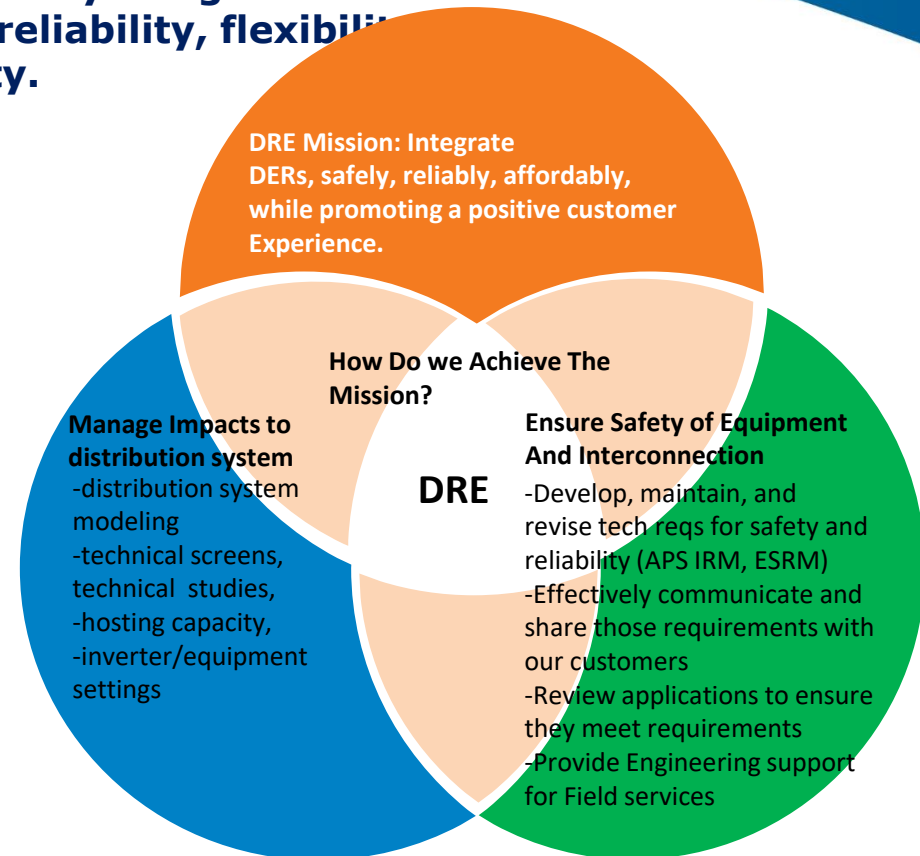
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## DRE's Mission:

**To partner with our customers to sustainably integrate DERs to the distribution grid with a focus on safety, reliability, flexibility, power quality, and customer affordability.**



# Updates to APS Interconnection Requirements Manual v9.0

- Alignment with ACC Interconnection Process
- Guidelines for Meter Socket Adapters
- IEEE 1547-2018 & UL 1741
- Distributed Energy Resource metering

# Alignment with ACC Interconnection Process

- Technical studies performed with agreement from Customer on projects that fail technical screens or are over 2 MW (Study Track)
- Clarification of requirements for systems in each review track
- Parallel Systems
  - Export vs Inadvertent Export
  - Maximum Capacity definition
- Non-parallel Systems
  - UL 1008 open transition transfer switch (Separate System)
  - No metering required

# Interconnection Studies

- Required for systems 2MW and greater (Level 3 Systems)
- Only required for Level 1 and Level 2 Systems that do not pass screens or supplemental reviews
- Study results will be shared and discussed with customer upon completion
- Any equipment or facilities required as a result of studies will be mutually agreed upon prior to construction

# IEEE 1547-2018 & UL 1741 SB

- Section 10.1(C) – UL 1741 SB certification to be required effective July 1, 2023.
- Submit inverter settings
  - Category B APS settings for voltage control (Volt-Var/Volt-Watt)
  - Default Category 3 settings for Abnormal Response
  - Settings shared on [aps.com/dg](https://aps.com/dg)

# Distributed Energy Resource (DER) Metering

- PV Energy reporting
- Visibility to manage interconnected assets on the grid for reliability, safety, and operational/planning needs
- PV Production metering is required
- Stand Alone ESS
  - ESS meter or, In Lieu of an ESS Production Meter, customer can agree to provide ESS data to APS on an hourly basis
- For projects that include PV and ESS, PV production metering is required, however, no separate ESS meter is required. PV production meter should be located so that gross PV generation can be recorded.

# Meter Socket Adapters

- UL 414 certified
- For Service panels no greater than 200A
- Sample drawings coming to [aps.com/dg](https://aps.com/dg)
- Technical requirements in Section 8.1(H)
- Option for Meter Socket Adapters are included on the Interconnection application



## **Timely Installation Guidance**

- Service Equipment Modifications
- Supply Side Taps

# Specific Requirements

## Service Equipment Modifications

- ESS Systems
- Backup Generators
- Supply Side Taps

# Service Equipment

## References

- NEC 110.3(B)
- NEC 230.46
- Wiles, John. "Supply-Side PV Connections: A Closer Look." *IAEI Magazine*, 16 Nov. 2013, <https://iaeimagazine.org/columns/photovoltaic/supply-side-pv-connections-a-closer-look/>.

# Example of UL Violation:

**Before**



**After**

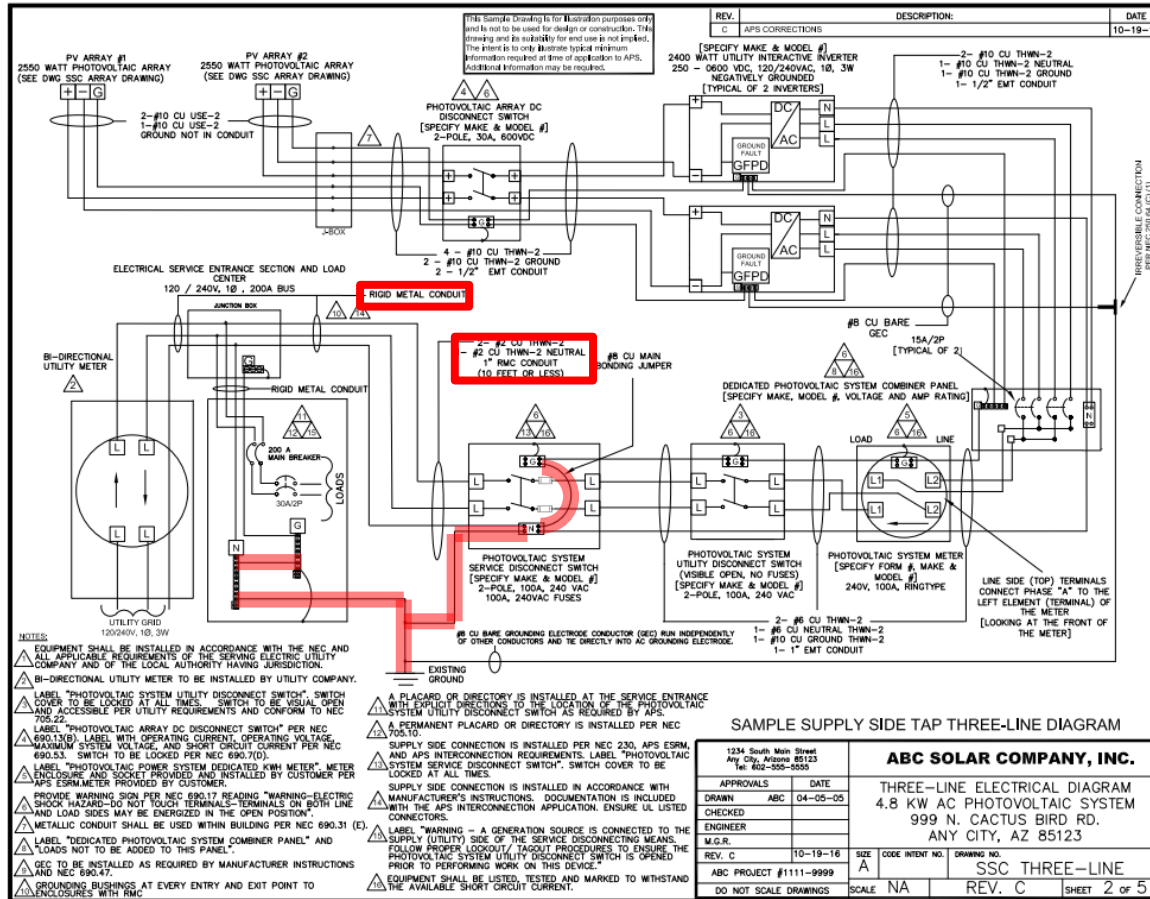


# Supply Side Tap- Definition

*“The Tap is on the load side of the APS billing meter and ahead of the main service disconnect to ensure that the billing meter registers net energy flow.”*

# Supply Side Tap- Requirements

- Rigid Metal Conduit (RMC) From Tap to Fused Disconnect
  - Cannot be less than #2
- Service Disconnect within 10' of Service Entrance Section (SES) (NEC 705.31)
  - Minimum Amp Rating of Service Disconnect is 60 A (NEC 230.79(D))
- NG Bond at Service Disconnect
  - GEC installed and connected to NEUTRAL (NEC 250.24(A)(1))



# Questions?