

# Rulemaking Regarding Interconnection of Distributed Generation Facilities (Docket No. RE-0000A-07-0609)

**Don McAdams**  
**Principal Standards Engineer**



Tucson Electric Power

April 13, 2016












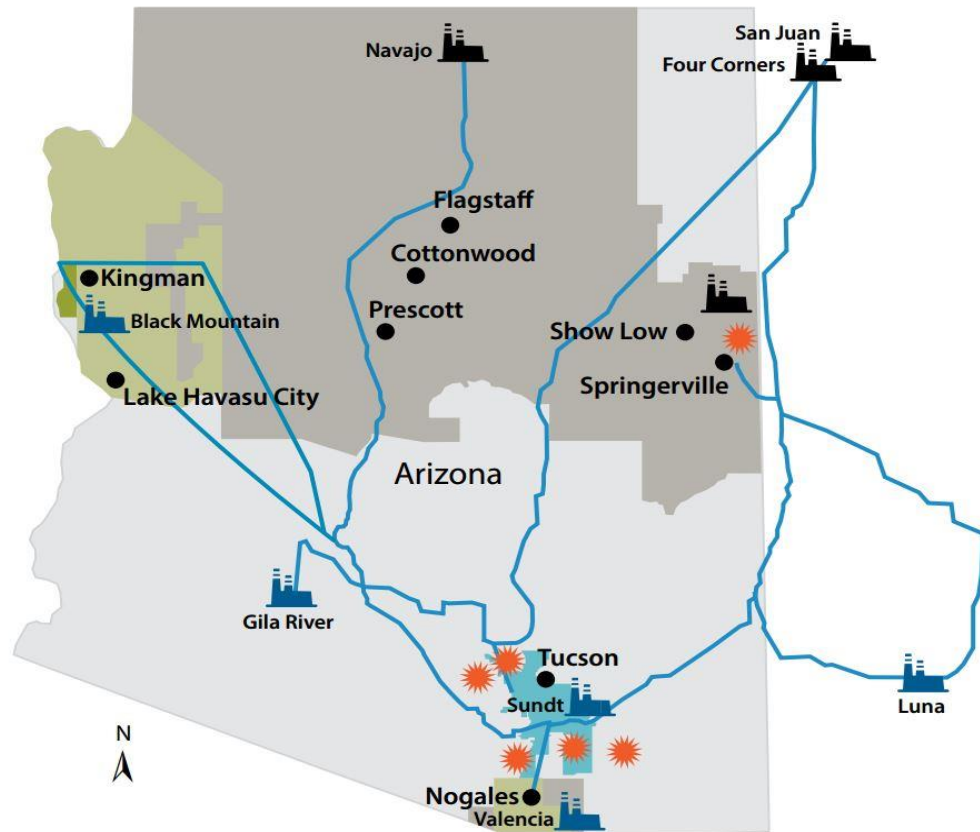
# Agenda

- ▶ Overview
- ▶ Process Standardization
- ▶ AC Disconnect Switch
- ▶ Process Screens
- ▶ New Technology
- ▶ Recap

# Service Areas

## SERVICE AREAS / CUSTOMERS

-  Tucson Electric Power Service Area
-  UNS Gas Service Area
-  UNS Electric Service Area
-  UNS Gas & Electric Service Area
-  Transmission Line
-  Coal-Fired Power Plant
-  Natural Gas-Fired Power Plant
-  Community-Scale Solar Power
-  Company Offices



# Overview

	TEP	UNS Electric
Service Territory Population	1,000,000	250,000
Retail Peak Demand (2015)	2,218 MW	429 MW
Customers	417,000	93,000
Residential DG Customers	~ 11,000	~ 2,000

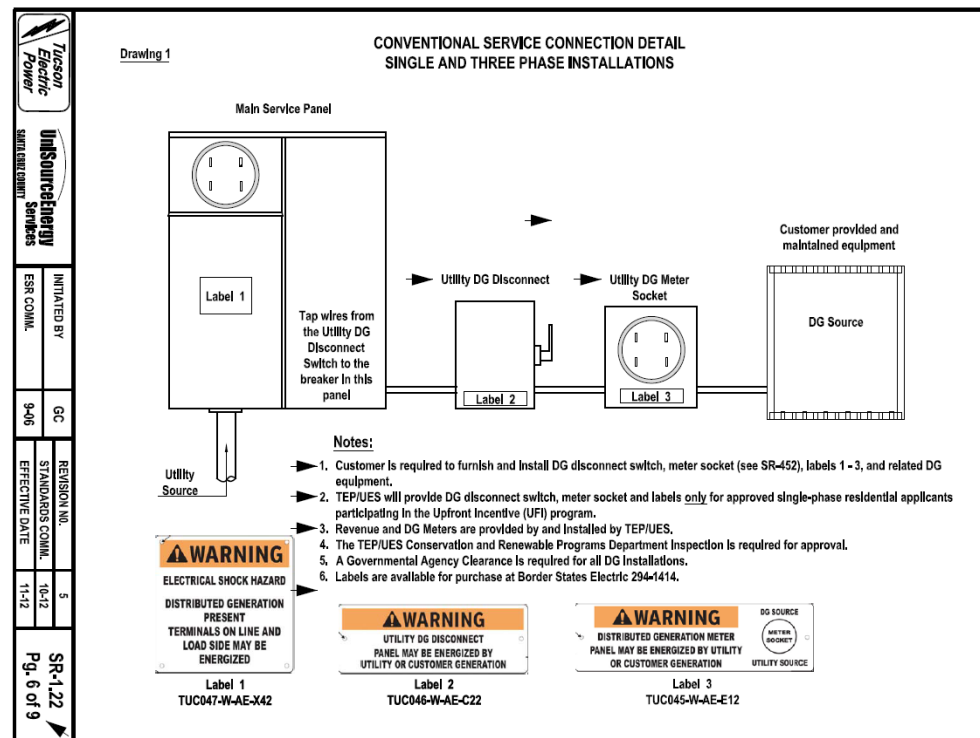
# Process Standardization

- ▶ Generally support standardized
  - Application forms, fees, & requirements
  - Study agreements
  - Pre-operational testing
  - Process and use of a modified IREC or FERC process
- ▶ Utility needs flexibility in determining technical requirements
  - Interconnection agreements
  - Technical manual
  - Technical specifications
  - Study thresholds

# AC Disconnect Switch

- ▶ Strongly support requirement of an AC disconnect switch
  - Ensures the Safety of our Workforce
    - Customer panel breaker is not a suitable disconnecting means per NFPA 70E
    - Safety device for both utility workers & emergency responders
    - Not redundant

- ▶ Disconnect Switch Benefits
  - Personnel Safety
  - Visible-open, lockable in the open position
  - Consistency for all DG systems
  - Easier and faster maintenance
  - Less disruption to customer
  - TEP/UNSE supplies the disconnect for residential customers at no cost



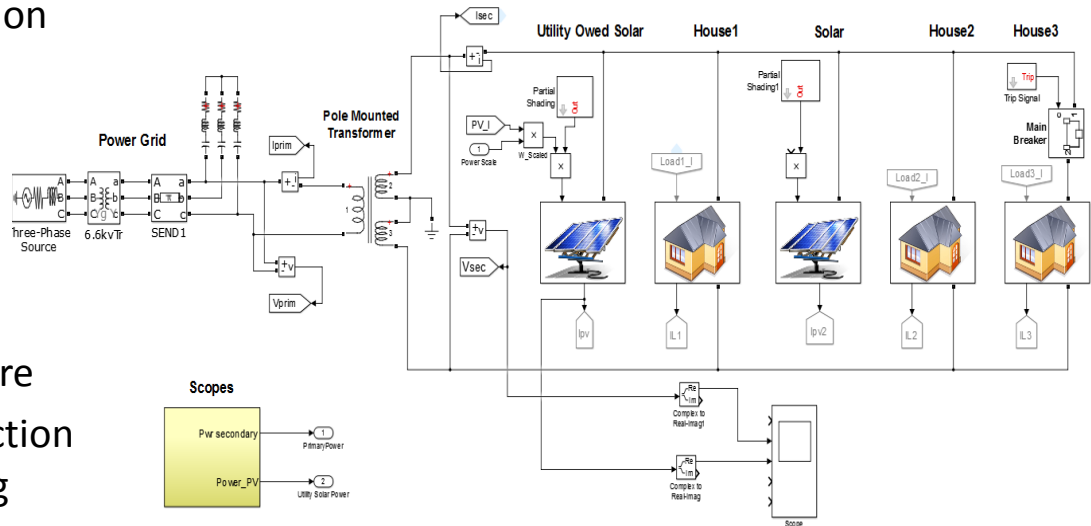
# Screens

- ▶ Do not support a blanket increase of the system size thresholds presently defined by the Level screens
  - The screens do not always result in additional studies
  - The screens support the process for escalation if a project could pose a risk
  - The screens should not be interpreted as automatic project approval if they are met
- ▶ Support further exploration of the concept of supplemental reviews

# New Technology

## ▶ Micro-Grids

- TEP is researching the integration of micro-grids
  - Simulations
  - Volt/VAR Optimization
  - Advanced Inverters
  - Energy Storage
  - Grid Management Software
- Micro-grids must break connection from the grid before energizing local source
- Support private micro-grids with the appropriate grid service charge and operational protocols

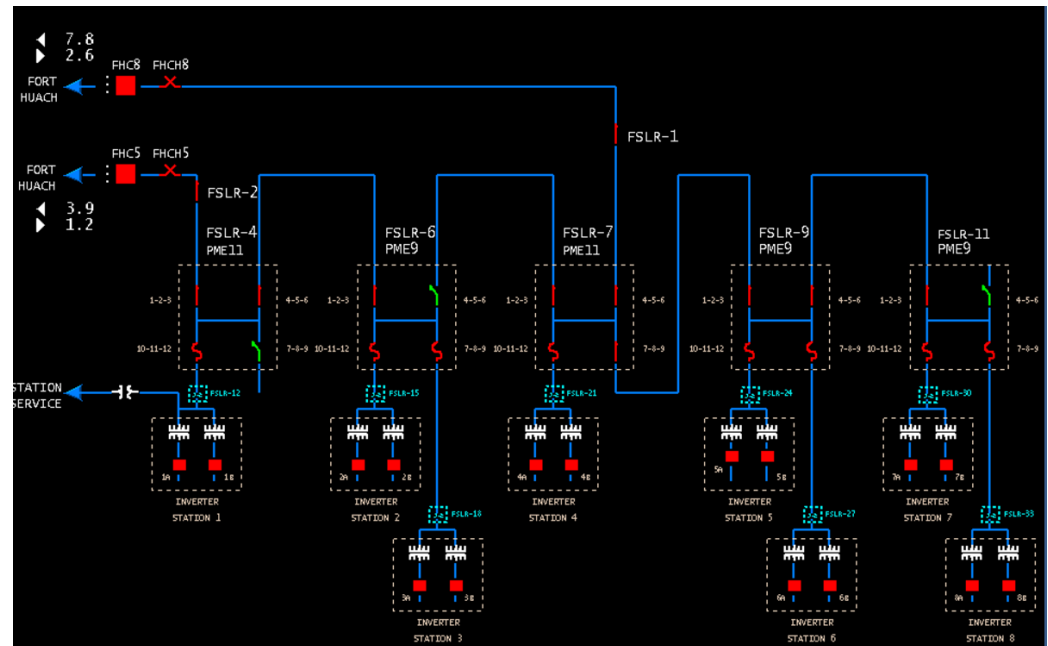




# New Technology

## ▶ Advanced Inverters

- Support creating an advanced inverter requirement/specification
- Standardized factory settings and testing procedures would be beneficial



# New Technology

## ▶ Energy Storage

- Support inclusion of energy storage in definition of “Generation Facility”
- Support requirement of advanced inverters for energy storage
- Additional study work is needed to better understand the impacts of energy storage on the grid
- Energy Storage and Rotating Machine technology should follow study track



# Recap

- ▶ Utility specific technical manuals
- ▶ AC Disconnect switch is critical to safety
- ▶ Adopt process standards for new technology to support continued integration of DG