- A Summary of –

Los Angeles Department of Water and Power Grid Reliability Study
Dated December 31, 2010

Presented: April 8, 2011
To: SACCWIS
Who are we?

• Municipal Utility

• Obligation to serve
• 1.4 million customers, serving a population of 4 million
• Vertically Integrated – Generation, Transmission, Distribution
• Own Balancing Authority
• Local generation for Los Angeles includes 4 large generating stations, 3 use ocean cooling
LADWP Grid Reliability Study

Power System Diagram
What is in the Study?

Local generation requirements to meet the NERC/WECC reliability standards and prudent utility practice.

1. **Resource Adequacy**
   
   Local resources for reserve requirement / Peak demand forecast

2. **Reliability Assessment**

   Assumptions / Criteria / Results / Critical Contingencies

3. **Study Procedure**

   Objective / Process / Criterion / Voltage and dynamic stability

4. **Load Forecast and Power Reliability Program (PRP)**

   Load forecast / PRP
What does it mean?

1. **Resource Adequacy:**

   *Local resources for reserve requirement / Peak demand forecast*

   - Resources – Generation and transmission
   - Operational Reliability – Reserve Requirements
   - Planning – Peak Demand Forecast & Transmission Configuration

   Bottom line: As located and configured, the current generating units and transmission lines will meet the forecast demand and reliability requirements in 2011.
Examples of how transmission growth is limited by residential and industrial growth along current right of ways
2. Reliability Assessment

Assumptions / Criteria / Results / Critical Contingencies

When performing a reliability study, the 3 basic criteria are:

1. **Pre-contingency** – All circuit loading are less than their continuous ratings and all voltages are normal

2. **Post Contingency** – Following the worst contingency (generation or transmission) no circuit loads beyond its emergency rating and no voltages fall below 95% of normal

3. **Recovery** – Following the contingency, sufficient generation must be available to relieve loading on all circuits to their continuous rating and restore voltage to normal
2. Reliability Assessment cont.

Assumptions / Criteria / Results / Critical Contingencies

Generation requirements:

**Pre-contingency** – Generation required before the event

**Post Contingency** – Additional generation after the contingency event

**Location** – must be properly located and available in the power system to meet reliability requirements
3. Study Procedure

Objective / Process / Criterion / Voltage and dynamic stability

Process – Using a power system model, we:

- Run a battery of transmission and generation contingencies (a loss event)
- Identify the worst single generation and transmission contingencies
- Determine how to restore the system to normal
- Identify the minimum generation (and its location) necessary to meet the reliability criteria.
4. **Load Forecast and Power Reliability Program (PRP)**

*Load Forecast / PRP*

- System Demands – forecasting models
- Power Reliability Program – Ongoing upgrades in Generation, Transmission, and Distribution
  - To meet **SAIDI** and **SAIFI** goals