Planning - Calendar & Methodology

- WECC/TEPPC
- WestConnect Planning Cycle
- SWAT
- APS Planning Calendar
- Methodology
Western Transmission Planning Today

WECC (PCC & TEPPC)

NWPP Area
- NTAC
- Col.Grid
- NTTG

PSPA
- CAISO
- LADWP
- Others

West Connect
- SSPG
- CCPG
- SWAT

RETI

WGA & CREPC

WIA

CEDA

RETA

FERC Transmission Barriers Conference 10/14/08
Transmission Expansion Planning Policy Committee Structure

WECC Board of Directors

Transmission Expansion Planning Policy Committee (TEPPC)

Technical Advisory Committee (TAS)

Data Work Group
- Generation
- Transmission
- Loads
- Fuels

Models Work Group
- Hydro
- Wind
- Validation
- Evaluation
- Marketplace

Studies Work Group
- WECC Transmission Study (Biennial)
- DOE Congestion Study (Triennial)
- Consensus Scenarios

Historical Analysis Work Group
- Line Flows
- OTC
Organizational Description: TEPPC Charter

- Overseeing development and management of a common economic performance data base for use in transmission planning studies and analysis.
- Providing policy guidance and management of the regional planning process across the region.
- Guiding analyses and modeling for Western Interconnection economic transmission expansion planning.
A Layered Approach Using Existing Organizations

Layer Linkages
- Attachment K
- SPG Charter / Agreement
- TEPPC Protocol
- WECC Membership & TEPPC Protocol
- Direct Input from Customers & Stakeholders

WECC
TEPPC

SPG

Customers

TP
## WECC Regional Planning Process Sequence

<table>
<thead>
<tr>
<th>Stages</th>
<th>Needs</th>
<th>Formation</th>
<th>Technical Studies</th>
<th>Licensing</th>
<th>Construction</th>
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<tr>
<td>Synchronized Study Plan</td>
<td>Screening Studies</td>
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<td>Project Planning Review</td>
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<td>Project Path Rating Review</td>
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<td>Annual Reports Required Throughout Planning Process</td>
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**Column Heading Notes:**
- Needs = Examination of potential long-term transmission needs.
- Formation = Development of proposals of specific project proposals by sponsors.
- Licensing = Project sponsor activities to obtain rights-of-way, certificates of purpose and necessity, etc.
- Construction = Building of foundations, towers, conductor, substations, etc.
WestConnect Footprint with Sub-Regional Planning Groups

SIERRA
Being Organized as Planning Group

CCPG
Colorado Coordinated Planning Group

SWAT
Southwest Area Transmission

SWAT – http://www.azpower.org/swat
CCPG – http://ccpg.basinelectric.com
WestConnect – http://www.westconnect.com
Parties to WestConnect Planning Project Agreement

Arizona Public Service Co.
El Paso Electric Co.
Imperial Irrigation District
Sierra Pacific Power Co.
Nevada Power Co.
Public Service Company of NM
Sacramento Municipal Utility District
Salt River Project
Southwest Transmission Coop.
Tri-State Transmission & Generation Assoc.
Transmission Agency of Northern California
Public Service Company of CO
Tucson Electric Power Co.
Western Area Power Admin.
WestConnect Planning
Support for Attachment K

- WestConnect obligates TP to participate in Subregional Planning Process
- WestConnect each year
  - Develops WestConnect Planning Area Transmission Plan
  - Publishes WestConnect Transmission Planning Report
Planning Cycle Concept

TEPPC
Economic Study Results
For
WestConnect Footprint

Planning Cycle 1

- Planning Report Prep.
- Workshop
- 3 months
- Annual Mtg

Planning Cycle 2

- WestConnect Economic Study Request of TEPPC

- STPG Study Results
- Future Study Needs

- Publish 10 Yr Plans
- Approve
  - Cycle 1 Trans. Reports
  - Cycle 2 Study Plans
Purpose – To provide an open, transparent, and collaborative forum for all stakeholders to submit input and projects to a subregional transmission planning effort in order to develop a high level transmission plan that maximizes regional benefits, while making efficient use of the existing transmission system.

Principles:

- Open to all sectors of the electrical industry and regulators
- Collaborative planning forum for data exchange and coordination
- Identify common long range transmission needs
- Comparable technical study of alternatives
- Coordinate and integrate with WECC TEPPC and other subregional planning groups
SWAT Footprint
One of the WestConnect Sub-Regional Planning Groups

http://www.westconnect.com
APS
Ten Year Planning Cycle and Methodology
2009 Synchronized Study Plan
WECC PCC / WECC - TEPPC / WESTCONNECT

January
- WECC TEPPC Economic Studies Identified for 2009
- 10yr Planning studies Filing w/ACC

February
- WECC Annual Study Program Completed
- Base Cases Preparation For 10yr Plan

March

April
- BTA study results even # of years

May

June

July

August

September
- Deadline for submitting request for 2010 Economic Studies WECC / TEPPC

October
- 10yr Plan Study results
- SWAT Study results

November
- WESTCONNECT Study results

December

January (next year)
- WECC / TEPPC Economic Studies Identified for 2010

Study Work
- APS 10yr plan
- Subregional SWAT groups
- Westconnect Group
- WECC PCC
- WECC-TEPPC
- TEPPC Results including Economics studies
## Planning Calendar for Ten-Year Planning Cycle

### APS Transmission Planning – 10 Yr Plan

- **Jan.**
  - 10yr Plan – Filed with ACC by Jan. 31

- **Mar.**
  - APS Corporate Load Forecast

- **Apr.**
  - Develop 10yr base cases from AZ seed cases

- **Jun.**
  - 10yr. Plan study effort – Determination of projects, timings, and scope

- **Aug.**
  - APS Corporate Load Forecast – Post Summer

- **Sep.**
  - 10yr. Plan – New load forecast sensitivity

### Stakeholder Input

- **WestConnect Coordinated base case development**

- **Arizona Utilities coordinated seed case development – from WestConnect cases**

- **2nd Quarter Stakeholder Meeting – Stakeholder input on studies, request study alternatives, updates on current projects**

- **Sep. 1 – Network Transmission Customers and all other Transmission Customers Load & Resource Forecast**

- **Oct. 31 – Deadline to submit Economic Study Requests for 4th Quarter Meeting review**

- **4th Quarter Stakeholder Meeting – Review draft of current 10yr plan, discussion Economic Study requests, receive stakeholder input**

### Other Subregional Coordination

#### Activities Throughout the Year

- APS/SRP Coordination Meeting
- APS/WAPA Coordination Meeting
- WestConnect Meetings
- SWAT Meetings
  - CATS-EHV
  - CATS-HV
  - CRT
  - AZ/NM
  - SATS
  - Renewables
  - Short-circuit Working Group
1. Generator Interconnection Request studies are performed pursuant to the Large Generator Interconnection Procedure contained in the Transmission Provider’s Open Access Transmission Tariff (OATT). Transmission Service Requests are also performed pursuant to OATT procedures.

2. All requests for economic planning studies received by the Transmission Provider are forwarded to TEPPC for inclusion in the TEPPC Master List. TEPPC will evaluate only those requests that have regional impacts.
APS Planning - Studies Performed & Draft Ten-Year Plan

- Study Assumptions/Methodology
- Types of Studies Performed
- 2009-2018 Ten-Year Plan project descriptions
2009-2018 Study Assumptions/Methodology

- Coordinated Base Cases (Seed Cases)
  - 2009 - 2008 Summer Operating case
  - 2013 - CATS-EHV 2013 coordinated case
  - 2018 - CATS-EHV 2018 coordinated case
- 69kV transmission models incorporated
- Most up-to-date forecasts for peak summer loads
2009-2018 Study
Assumptions/Methodology

- Summer Peak cases
  - Thermal analysis
  - Post-Transient
  - Transient Stability (2011 & 2016)

- Maximum Load Serving Capability (Phx & Yuma)
  - Thermal and Post transient
<table>
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<th>TPL Planning Methodology</th>
<th>NERC STANDARD</th>
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APS Ten Year Plan Projects
2009-2018
2009:
- Dugas & Sugarloaf 500/69kV substations
- Milligan 230/69kV substation

2010:
- TS9-Pinnacle Peak 500/230kV line

2011:
- Flagstaff 345/69kV substation

2012:
- TS12 230/69kV substation

2013:
- Mazatzal 345/69kV substation
- Sundance-Pinal Central 230kV line

2014:
- Delany-Sun Valley 500kV
- Sun Valley-TS9 500kV
- Hassayampa-N.Gila 500kV line
2012:
- TS6 230/69kV substation

2014:
- Sun Valley-Trilby Wash 230kV

2015:
- Trilby Wash-Palm Valley 230kV
- TS2 & Jojoba 230/69kV substations

2016:
- Avery 230/69kV substation
APS Planning - Study Requests

- Generation Interconnection requests
  - APS OASIS contains Generation Interconnection Queue
    - 23 Solar projects
    - 8 Wind projects
    - 5 Others
- Currently one Transmission Service Requests under study
Transmission Planning Process and Study Methodology

John Lucas
Transmission Planning & Engineering Department Leader

Phoenix, May 4, 2009