Helping our members work together to keep the lights on... today and in the future

SPP Southwest Power Pool

SPP: A Closer Look

Heather Starnes

Manager, Regulatory Policy

Southwest Power Pool

Our Beginning

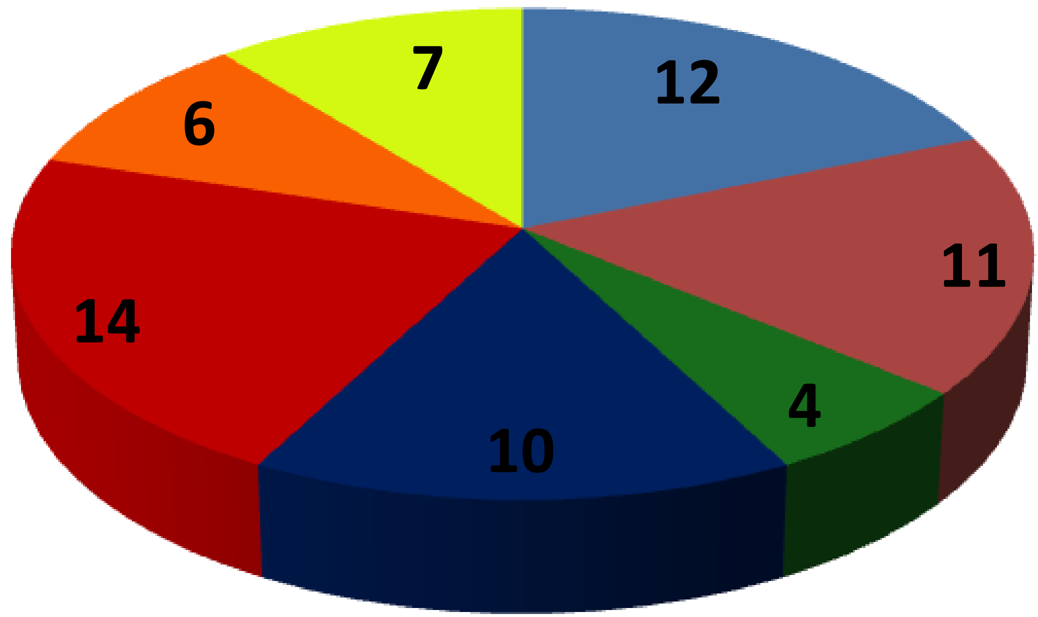
- **Founded 1941 with 11 members**
  - **Utilities pooled electricity to power Arkansas aluminum plant needed for critical defense**
- **Maintained after WWII to continue benefits of regional coordination**

The SPP Difference

- Relationship - Based
- Member - Driven
- Independence Through Diversity
- Evolutionary vs. Revolutionary
- Reliability and Economics Inseparable

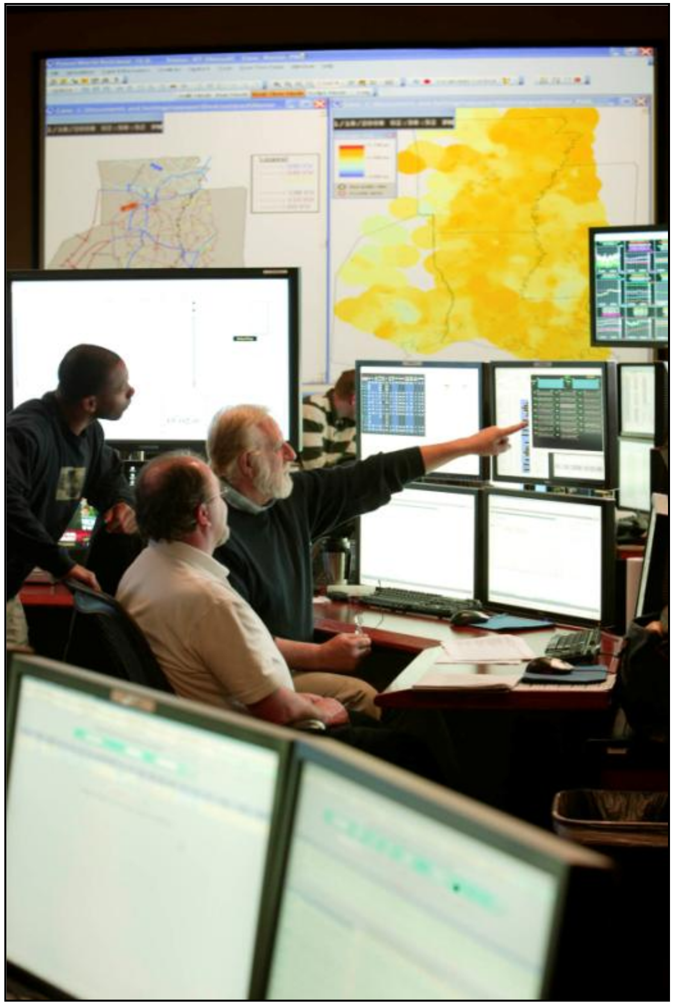
64 SPP Members

- Cooperatives
- Municipals
- State Agencies
- Marketers
- Investor-Owned
- Independent Transmission Companies
- Independent Power Producers / Wholesale Generation



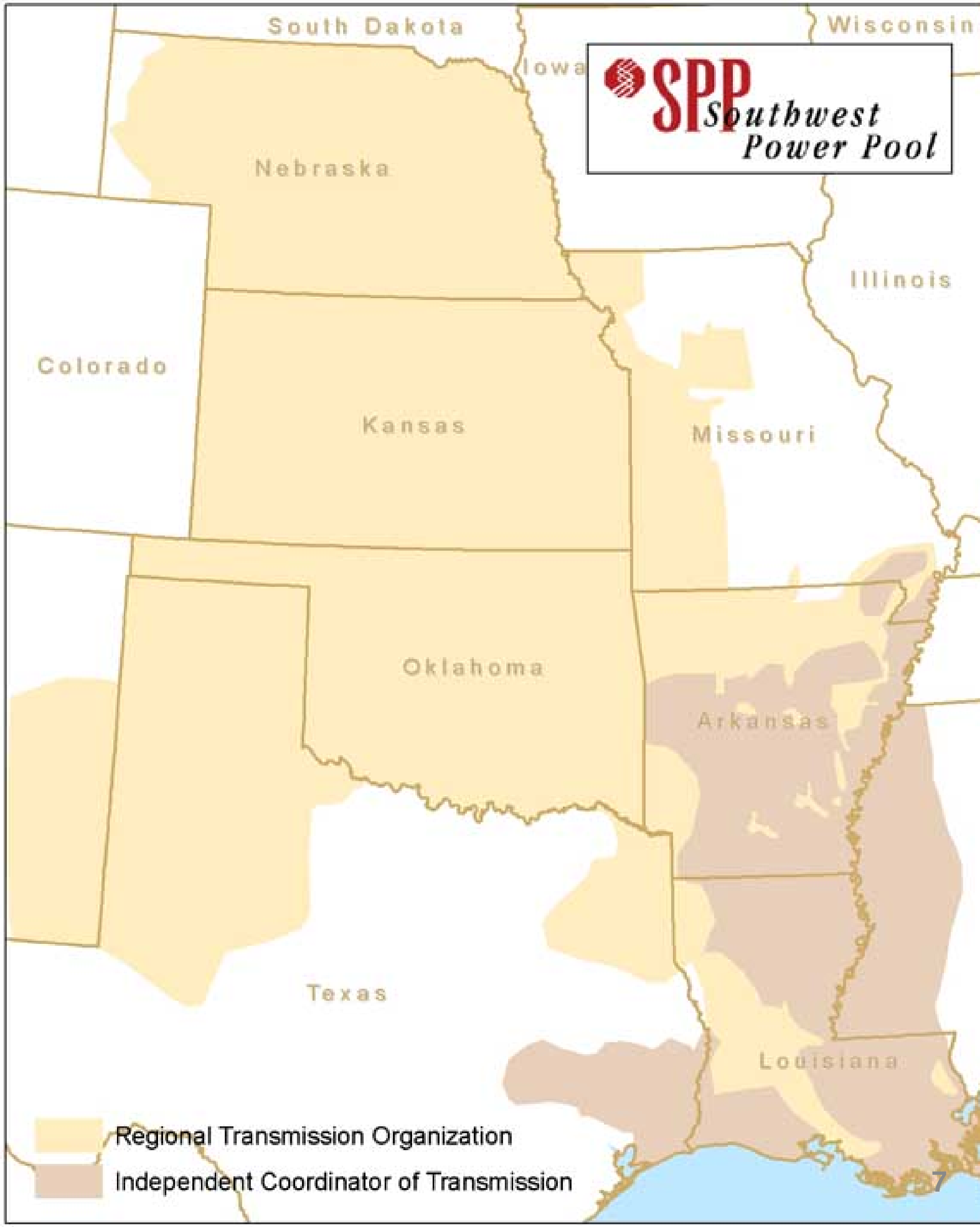
SPP at a Glance

- Located in Little Rock
- ~475 employees
- $139 million operating budget (2011)
- 24 x 7 operation
- Full redundancy and backup site



Members in 9 states

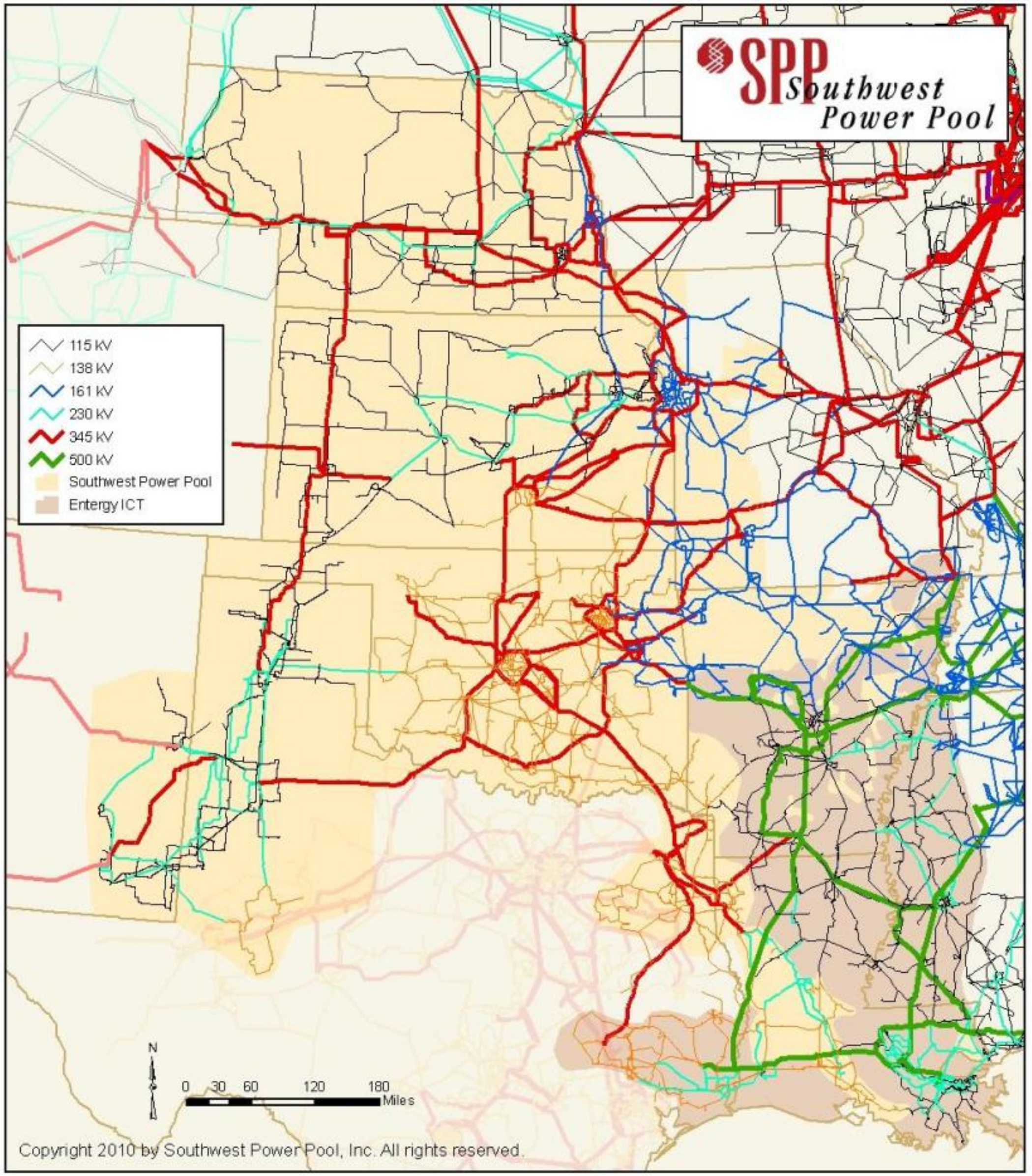
- Arkansas
- Kansas
- Louisiana
- Mississippi
- Missouri
- Nebraska
- New Mexico
- Oklahoma
- Texas



Provide services to Entergy on contract basis (ICT)

Operating Region 2010

- **370,000 miles service territory**
- **859 generating plants**
- **6,101 substations**
- **48,930 miles transmission:**
  - 69 kV – 12,722 miles
  - 115 kV – 10,143 miles
  - 138 kV – 10,009 miles
  - 161 kV – 5,097 miles
  - 230 kV – 3,787 miles
  - 345 kV – 7,079 miles
  - 500 kV – 93 miles

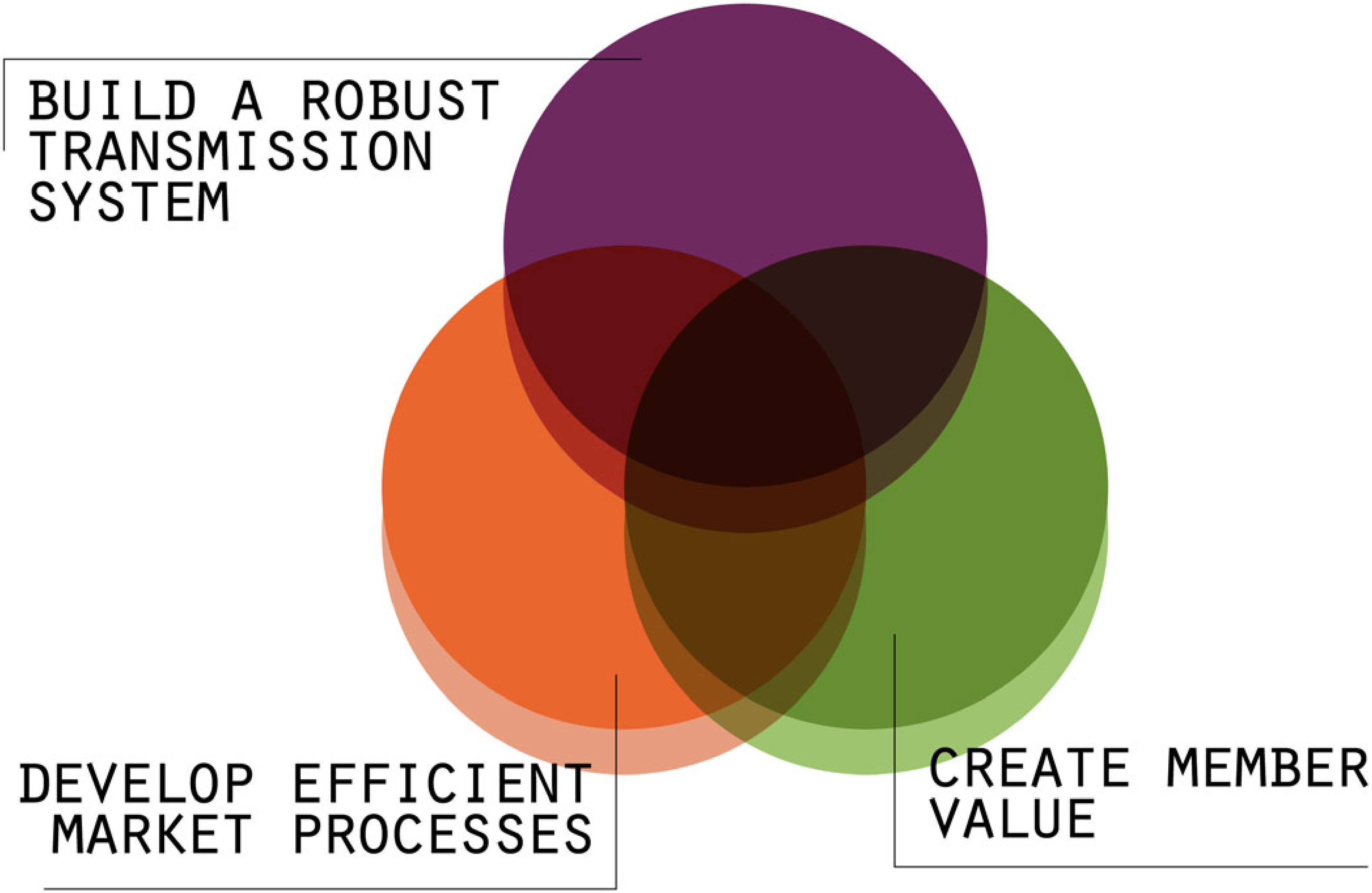


Did You Know?

- SPP's members serve over 15 million people
- In 2010, SPP members completed 78 transmission projects totaling $468 million.

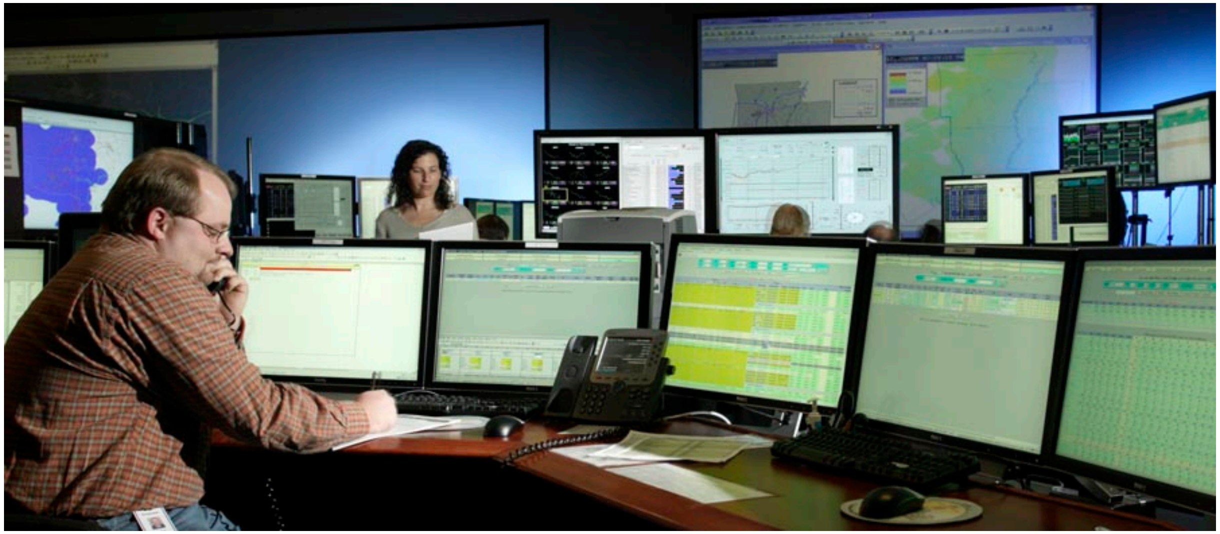
- SPP's transmission owners collect ~$800 million annually to recoup costs of transmission, and have over $4.7 billion in net transmission investment.
- 48,930 miles of transmission lines in SPP's footprint would circle the earth - almost twice!

SPP Strategically



Our Major Services

- Facilitation
- Reliability Coordination
- Transmission Service/ Tariff Administration
- Market Operation
- Standards Setting
- Compliance Enforcement
- Transmission Planning
- Training



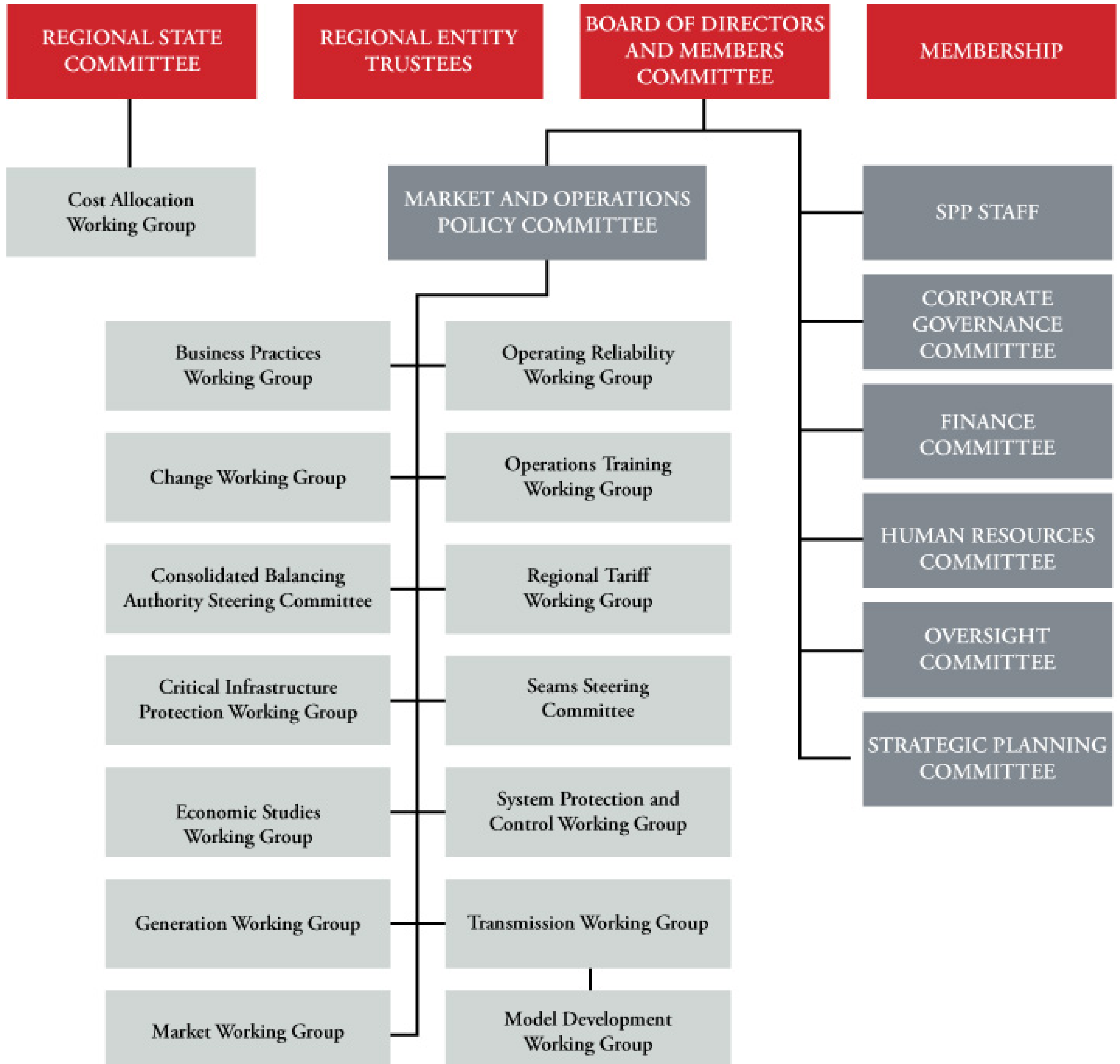
Regional

Independent

Cost-effective

Focus on reliability

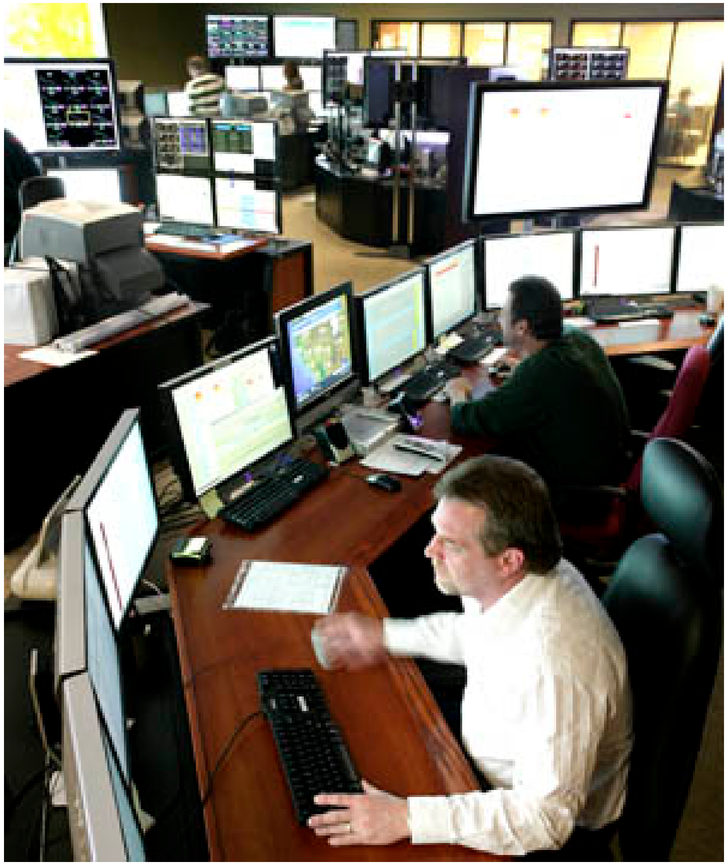
Facilitation: Helping our members work together



Reliability Coordination

- Monitor grid 24 x 365
- Anticipate problems
- Take preemptive action
- Coordinate regional response
- Independent

As "air traffic controllers," our operators comply with…



…over 1,300 pages of reliability standards and criteria

Transmission Service

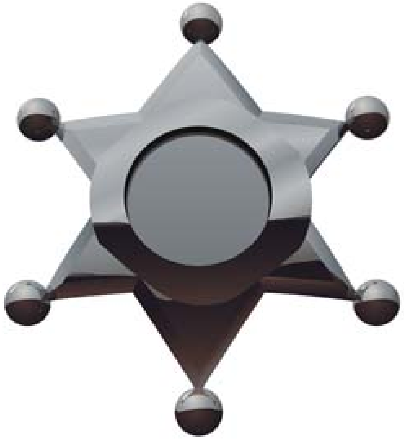
- Provides “one-stop shopping” for use of regional transmission lines
- Consistent rates, terms, conditions for all users
- Independent
- Process ~9,200 transactions/month
- 2010 transmission service transactions = $698 million

As “Sales agents,” we administer …

…2,100+ page transmission tariff on behalf of members and customers

Compliance Enforcement and Standards Setting

- SPP Regional Entity enforces compliance with federal NERC reliability standards
- Creates regional reliability standards with stakeholder input
- Provides training and education to users, owners, and operators of bulk power grid



Training

- 2010 Training program awarded over 21,000 continuing education hours to 410 operators from 25 member companies
- SPP offers:
  - Regional/sub-regional restoration drills
  - System operations conferences
  - Regional emergency operations sessions
  - Train-the-Trainer classes

Transmission Planning: How does SPP decide what and where transmission is needed?

- Generation Interconnection Studies
  - Determines transmission upgrades needed to connect new generation to electric grid
- Aggregate Transmission Service Studies
  - Determines transmission upgrades needed to transmit energy from new generation to load
  - Shares costs of studies and new transmission
- Specific transmission studies
- Integrated Transmission Planning process

Integrated Transmission Planning: Economics and Reliability Analysis

ITPNT

- Annual Near-Term plan
- Reliability is primary focus
- Identifies potential problems and needed upgrades
- Coordinates with ITP10, ITP20, Aggregate and Generation Interconnection study processes

ITP10

- Analyzes transmission system for 10-year horizon
- Establishes timing of ITP20 projects

ITP20

- Develops 345 kV+ backbone for 20-year horizon
- Studies broad range of possible futures

SPP Transmission Expansion Plan

- Summary
  - Comprehensive summary of projects for 2011 – 2021 horizon
  - Approximately $5 billion in projects within the horizon
  - Report contains OATT Attachment O and seams agreement coordinated planning
- Highlights
  - 50 Notifications to Construct (NTC) issued to members for 2011
  - NTCs for Priority Projects issued in July 2010

Planned Transmission – 3-Year Summary

(Dollars in Millions)

2010 STEP (Nearest 10 Million)	2009 STEP (Nearest 10 Million)	2008 STEP (Nearest 10 Million)	Upgrade Type
$1,420			2010 Priority Projects
$820	$770		2009 Balanced Portfolio
$650	$540	$320	Transmission Service Request and Generation Interconnection Service Agreements
$1,220	$1,690	$880	Reliability - Base Plan
$540	$1,030	$520	Reliability - Other
	$320	$620	Sponsored Upgrades
$4.65B	$4.35B	$2.3B	SPP Subtotal
$420	$100	$350	non-OATT upgrades
$5.1B	$4.45B	$2.7B	Appendix A - TOTAL

Has filed Service Agreement or is Board-approved

Regional State Committee

- **Retail regulatory commissioners:**

Arkansas	Missouri	Oklahoma
Kansas	Nebraska	Texas
Mississippi	New Mexico	

Louisiana maintains active observer status

- **Responsibilities/Authorities**
  - Cost allocation
  - Ensure adequate supply
  - Market cost/benefit analyses

RSC & CAWG

	Regional State Committee (RSC)	Cost Allocation Working Group (CAWG)
Arkansas	Commissioner Reeves	Sam Loudenslager/Pat Mosier
Kansas	Commissioner Wright	Tom DeBaun/James Sanderson
Oklahoma	Commissioner Murphy	Trent Campbell
Missouri	Commissioner Davis	Adam McKinnie
Nebraska	Chairman Siedschlag	John Krajewski
New Mexico	Commissioner Lyons	Craig Dunbar
Texas	Chairman Nelson	Richard Greffe

Who pays for transmission projects?

- Sponsored: Project owner builds and receives credit for use of transmission lines
- Directly-assigned: Project owner builds and is responsible for cost recovery
- Highway/Byway: Most SPP projects paid for under this methodology

Voltage	Region Pays	Local Zone Pays
300 kV and above	100%	0%
above 100 kV and below 300 kV	33%	67%
100 kV and below	0%	100%

Integrated Marketplace

Why?
What is it?
Impacts to SPP Members

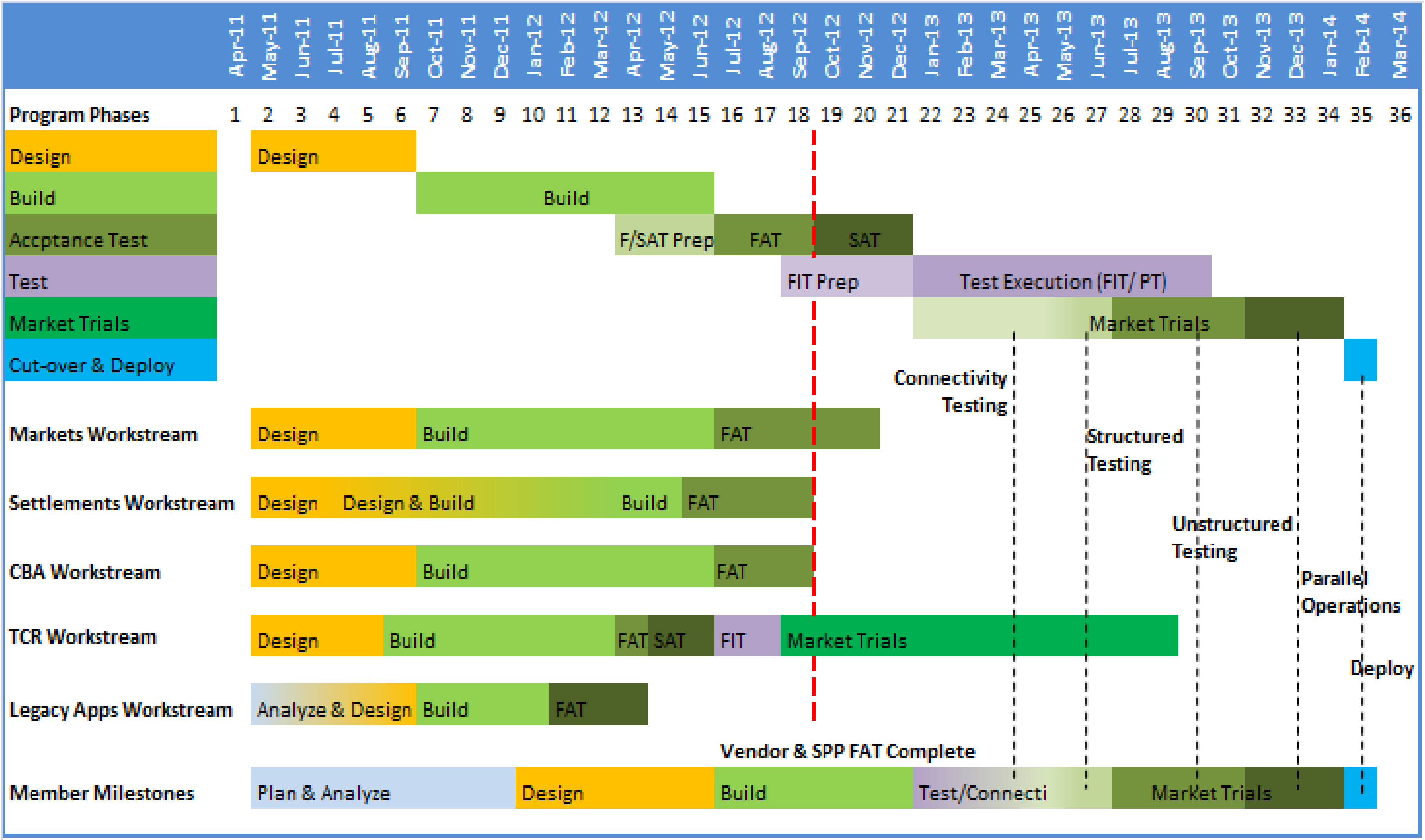
Richard Dillon
Director, Market Design

Southwest Power Pool

Key Dates in Integrated Marketplace History

Key Milestone	Completion Date
Cost-Benefit Analysis for Future Markets Completed	April 2009
RSC Endorsement of Cost-Benefit Analysis	April 2009
Board Approval of Implementation Budget	April 2011
SPP Stakeholders developed detailed Market Design	2008-2010
MWG Finalized Baseline Protocols	September 2010
MOPC Approval of Baseline Protocols	October 2010
Board Approval of Implementation Budget	January 2011
SPP Contracted Vendors	May 2011

Marketplace Timeline



FAT: Factory Acceptance Test | SAT: Site Acceptance Test | FIT: Functional Integration Test | PT: Performance Test

Why Integrated Marketplace?

- Net Benefits ~ $100 million/year
- Reduce total energy costs through centralized unit commitment while maintaining reliable operations
- Day-Ahead Market allows additional price assurance capability prior to real-time
- Includes new markets for Operating Reserve to support implementation of Consolidated Balancing Authority (CBA) and facilitate reserve sharing

EIS vs. Integrated Marketplace Features

Capability	EIS	Integrated Marketplace
<u>Transmission</u>		
• Reservations	✓	✓
• Scheduling (internal/external)	All Reservations	Third Party Reservations
• Transmission Congestion Rights		✓
Energy		
• Bilaterals	✓	✓
• Day-Ahead Market		✓
• Real-Time Balancing Market	✓	✓
<u>Operating Reserves and Regulation</u>	Self-Designated	Market
<u>Unit Commitment</u>	Self-Commitment	Centralized Commitment
<u>Balancing Authority</u>	Multiple	Single

SPP design leverages proven features from other RTO markets

	CAISO	ERCOT Nodal	MISO	PJM	SPP Marketplace
Day-Ahead Market	✓	✓	✓	✓	✓
Real-Time Market	✓	✓	✓	✓	✓
Marginal Losses	✓	✓	✓	✓	✓
Co-Optimization	✓	✓	✓	✓	✓
Must Offer in Day-Ahead Market	✓		✓	✓	✓
Resource Make-Whole Payment	✓	✓	✓	✓	✓
Transmission Congestion Rights/Auction Revenue Rights (TCR/ARR)	✓	✓	✓	✓	✓
Virtual Energy	Feb 2011	✓	✓	✓	✓

Design was selective for regional differences

	CAISO	ERCOT Nodal	MISO	PJM	SPP Marketplace
Combined-Cycle Special Handling	Partial Implementation	In Process			✓
5-Minute Settlement			✓ (Operating Reserve only)		✓
Zonal Operating Reserve Cost Allocation			✓		✓
Installed Capacity Market		Reliability Must Run		✓	

SPP Integrated Marketplace Functions

Time

ARR/TCR Auction	Day Ahead Market	Day Ahead Reliability Unit Commitment	Intra-Day RUC / Real-Time Balancing Market	Settlement

- Performs unit commitment
- Sets DA prices
- TCRs cleared

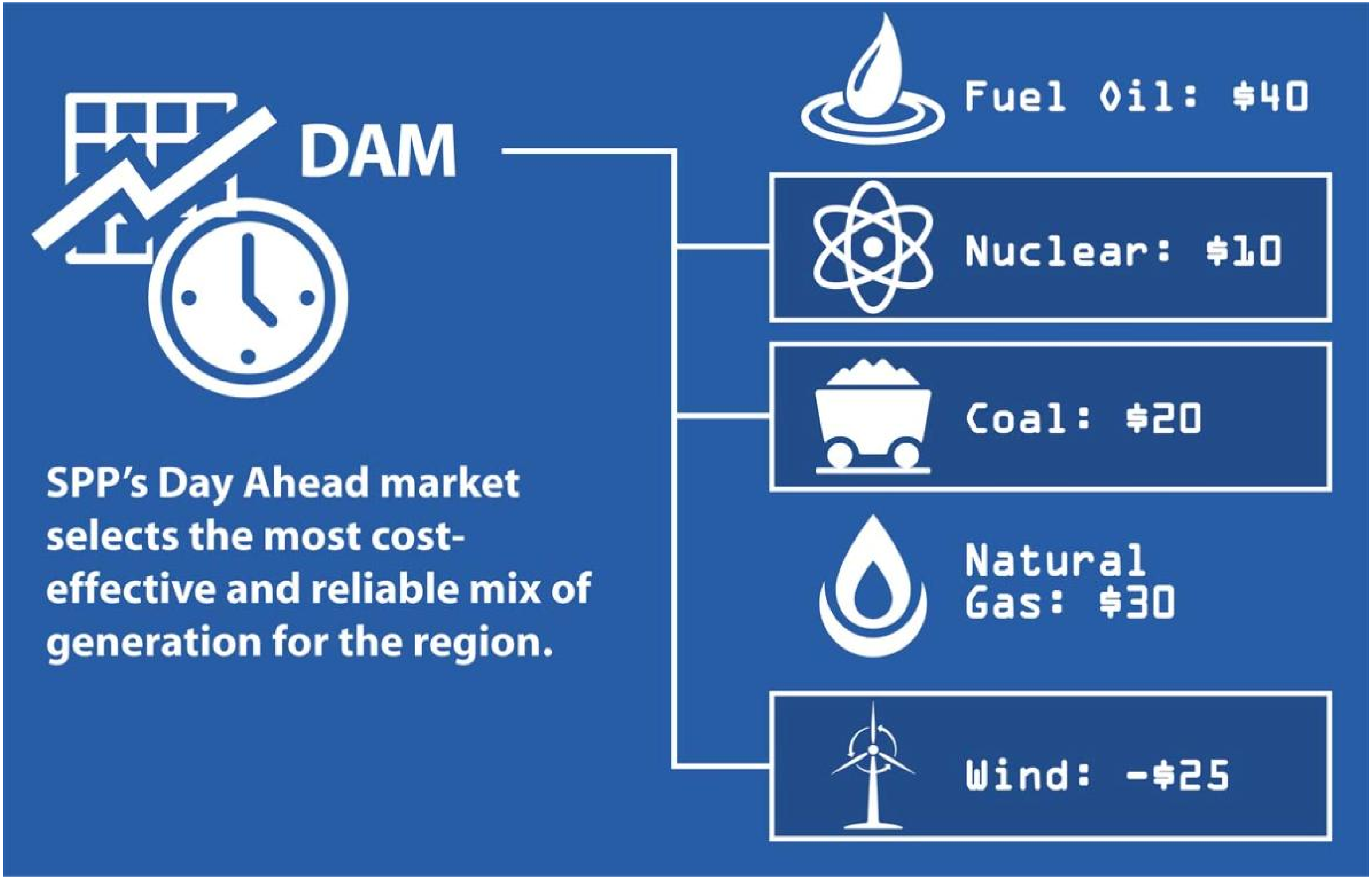
Makes sure enough capacity committed for next operating time frame

Real-Time dispatch much like today's EIS Market

Day-Ahead Market Scope and Objective

- Determines least-cost solution to meet Energy Bids and Reserve requirements
- Participants submit Offers and Bids to purchase and/ or sell Energy and Operating Reserve:
  - Energy
  - Regulation-Up
  - Regulation-Down
  - Spinning Reserve
  - Supplemental Reserve

Day Ahead market makes regional generation choices



Benefits of Operating Reserves market

- Greater access to reserve electricity
- Improve regional balancing of supply and demand
- Facilitate integration of renewable resources

Day-Ahead Market to achieve cost-effective unit commitment

- "Must offer" for physical Resources proposed in market design
- Includes Offers/Bids for virtual supply and virtual Load
- Import/Export schedules may also be submitted
- Co-optimizes Energy and Operating Reserve and produces Locational Marginal Prices (LMPs) and Market Clearing Prices (MCPs) to meet Energy Bids and Operating Reserve

Day-Ahead Market creates financially binding energy and commitment forecast

- Preliminary Unit Commitment is performed
- Creates financially-binding day-ahead schedule for Energy and Operating Reserve for Resources and Load that participate
- SPP guarantees revenue sufficiency of committed Resource Offers
- Transmission Congestions Rights are settled with these LMPs

Reliability Unit Commitment (RUC) Scope and Objective

- Day-Ahead RUC performed following Day-Ahead Market clearing
- Intra-Day RUC performed throughout Operating Day as needed, at least every four hours
- RUC ensures market physical commitment and produces adequate deliverable capacity to meet SPP Load Forecast and Operating Reserve requirements

RUC is in addition to Day-Ahead Market

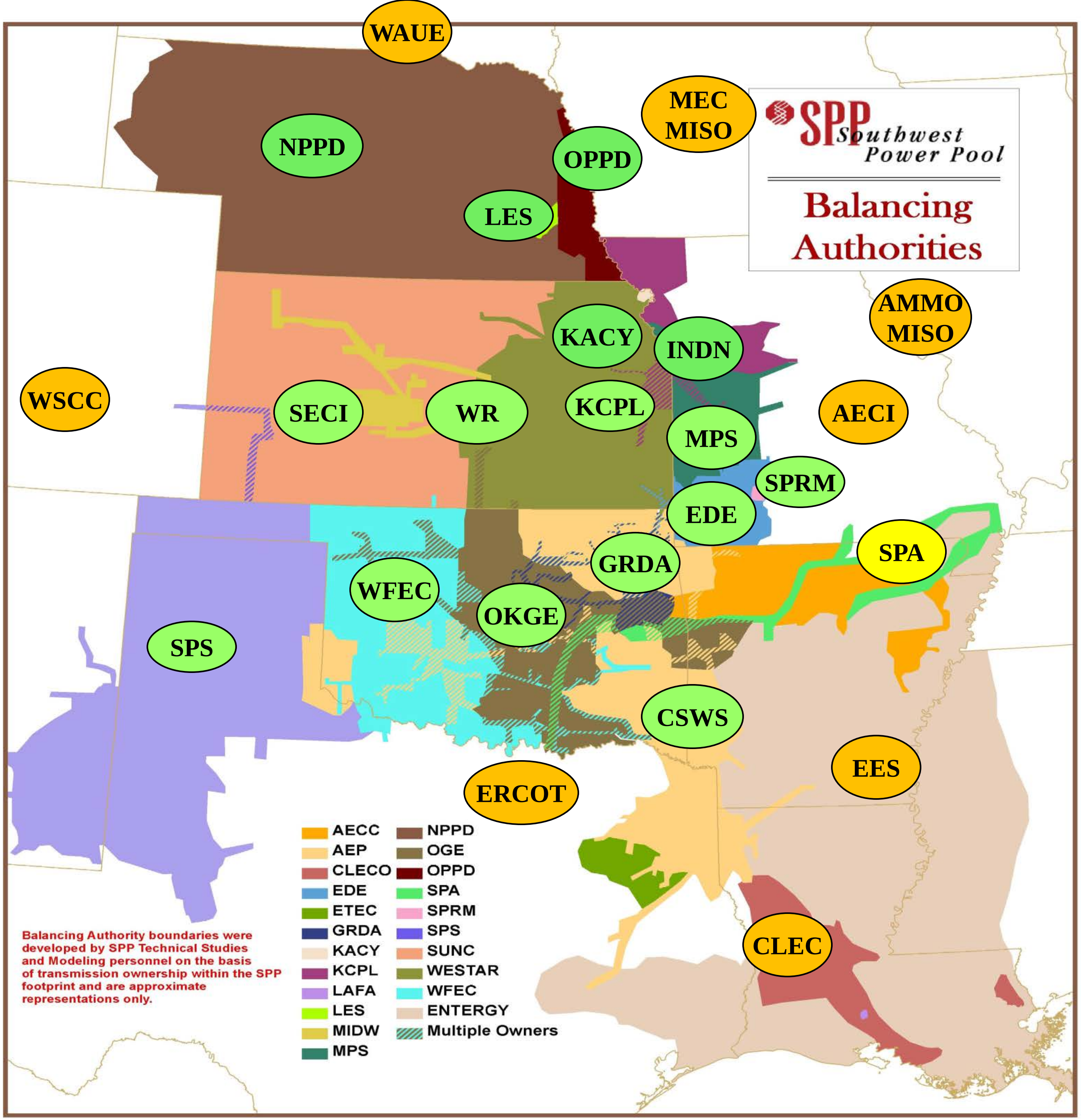
- **Every available Resource has to offer**
- **SPP guarantees revenue sufficiency of committed Resource Offers**

Real-Time Balancing Market similar to today's EIS - balancing Resources and Load.

- Uses Security Constrained Economic Dispatch (SCED) to ensure results are physically feasible
- Operates on continuous 5-minute basis
  - Calculates Dispatch Instructions for Energy and clears Operating Reserve by Resource

- Energy and Operating Reserve are co-optimized
- Settlements based on difference between results of RTBM process and Day-Ahead Market clearing
- Charges imposed on Market Participants for failure to deploy Energy and Operating Reserve as instructed

EIS Market BAs



XXX (green)	SPP EIS BAs (16)
XXX (yellow)	Not in EIS Market SPP is TSP (1)
XXX (orange)	1st tier BAs

Auction Revenue Rights (ARRs) and Transmission Congestions Rights (TCRs)

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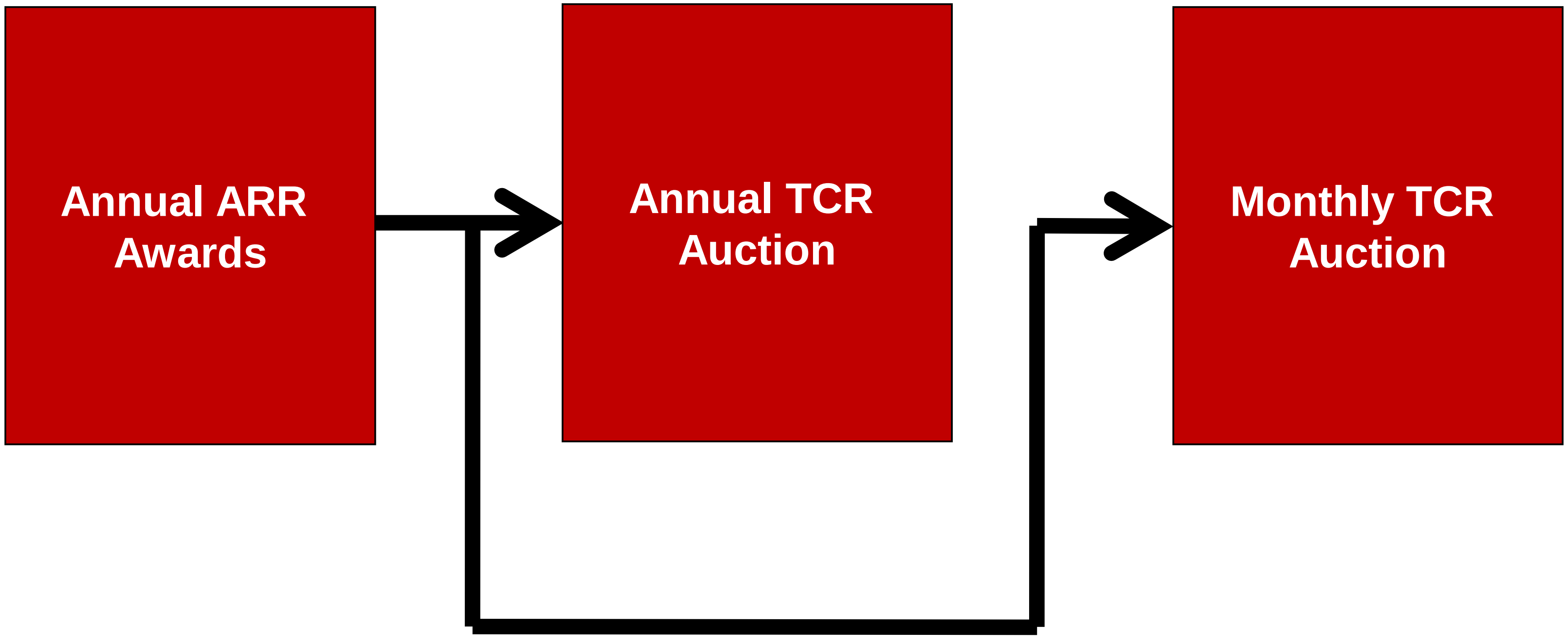
ARRs and TCRs allow Resource owners to be indifferent to unit commitment impact on congestion

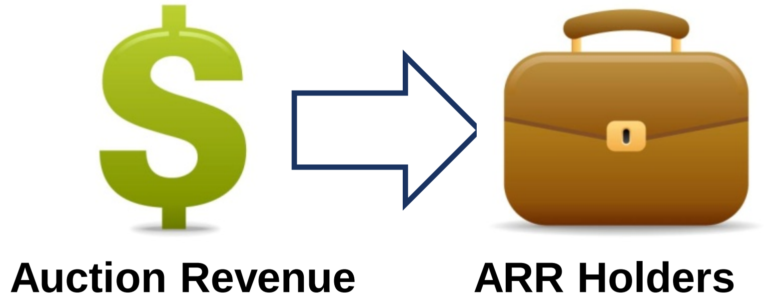


Auction Revenue Right (ARRs) …

- Market Participant's entitlement to a share of revenue generated in TCR auctions

- Allocated to Market Participants based on firm transmission rights (NITS or PTP) on SPP transmission grid

- Can be a credit or charge based on the TCR auction clearing price of the ARR path



$\sum_t$

Transmission Congestion Rights (TCRs) are…

- **Financial Instruments that entitle owner to a stream of revenues or charges**
- **Based on hourly Day Ahead marginal congestion component differences across the path**

-OR-

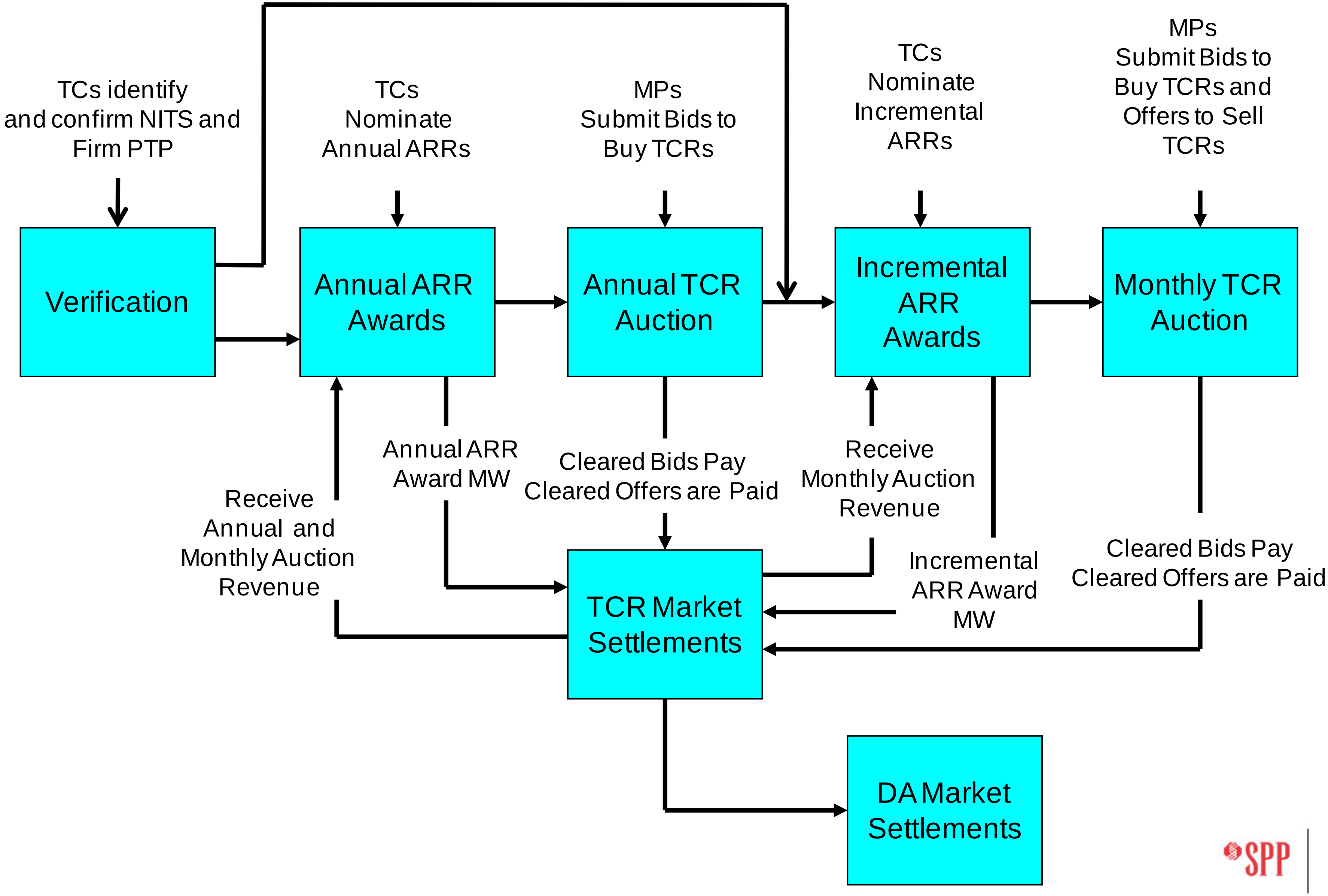
ARRs awarded annually – are basis of TCRs

- ARRs allocated annually (in April)
- Market Participants nominate from Firm Transmission Service
  - Network Integrated Transmission Service agreement
  - Point to Point Firm Transmission Service Request
- ARRs awarded
  - Monthly
  - Seasonal
  - On Peak
  - Off Peak

How can I obtain TCRs?

- Annual TCR auction
  - Holder converts ARR
  - Purchase transmission capability
- Monthly TCR auction
  - Purchase “left over” transmission capability
- Short-Term TCR request
  - Request with Transmission Service Request
- TCR secondary market

TCRs Process Overview



Settlement of ARRs/TCRs

- **Net Auction revenues are allocated to holders of ARRs**
- **Daily TCR settlements use Day-Ahead Market prices**
- **Auction Revenues, congestion revenues, and congestion rights revenues are settled concurrently with the Operating Day.**

Impact on SPP Members

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New Member Activities: TCR Markets

- Staffing to support mock TCR Markets, starting by 2Q 2012
- Staffing to support ARR processes and TCR auctions
  - Monthly/Seasonal ARR process & TCR auction (42 annual model inputs)
  - Monthly TCR auction (2 or 4 monthly model inputs)
- Staffing to support Secondary Market
  - Bulletin board system
  - Bilateral trading of existing TCRs

New Member Activities: Operations

- Staffing to support Day Ahead and Real-Time Balancing Market

- Develop Day-Ahead and Real-Time Decisional Data, including:
  - Three-Part Offers (Energy, Start Up, No Load)
  - Operating Reserve Offers (4 products)

- Work with vendors to develop software for internal use
  - Lead time is at least one year prior to delivery to MPs
  - SPP plans to meet with at least OATI, PCI, and ABB in February to review protocols and persuade development to begin

New Member Activities: Settlements

- Receive increased settlement statement detail
  - 47 charge types vs. 7 currently and over 120 billing determinants
- Understand complex calculations involving market-wide totals or rates
  - Make Whole Payments, Marginal Loss Surplus
- Analyze Transmission Congestion Settlements
- Develop new system interactions
- Review processes for credit
  - Impacts of TCRs & ARRs
- Enhance reporting – internally and externally

Summary

- Although Integrated Marketplace implementation is March 2014, Market Participants need to prepare sooner:
  - Analyze internal staffing
  - Develop software products
  - Develop Offers and Bids

Integrated Marketplace: Regulatory Timeline

2011: Q3, Q4 | 2012: Q1, Q2, Q3, Q4 | 2013: Q1, Q2, Q3, Q4 | 2014: Q1

Program timeline

- Design 6/1 – 9/30
- Build 10/1 – 6/30
- FAT 7/1 – 9/30
- SAT 10/1 – 12/31
- Market Trials 1/1/13 – 1/1/14
- Cutover & Deploy 1/1 – 3/31

State Commissions

- Educational outreach sessions Sept. – Nov.
- Educational outreach sessions Feb. - May
- Educational outreach sessions Sept. – Nov.
- Educational outreach sessions Feb. - May
- Educational outreach sessions Sept. – Nov.
- Approval letters from State Commissions (10/1)
- State commission approvals (3/1)

SPP

- RTWG approval of Tariff revisions (11/18)
- MOPC reviews/approves Tariff revisions (12/6)
- Board approves Tariff revisions (1/31)
- Potential compliance filing (8/13)

FERC

- File Tariff revisions (2/29)
- Conditional Order (6/29)
- Final conditional approval (12/31)
- File readiness/reversion plans (3/1)
- File readiness cert. (1/2)
- Final go-live order (1/31)

NERC

- NERC approves CBA cert. (12/4)

Market Participant Milestones