Introduction to Transmission

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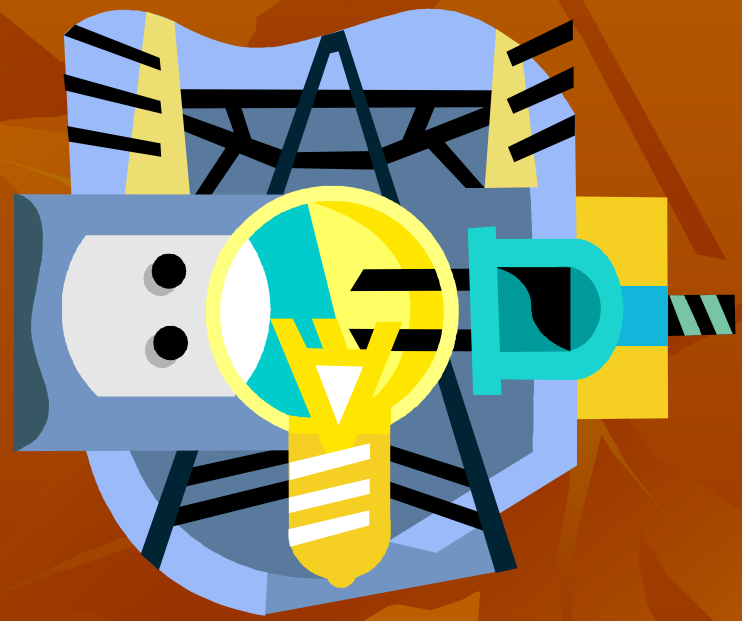
MISSOURI RIVER ENERGY SERVICES℠

Agenda

- The SD System
- Transmission
  - What is it?
  - Need for improvement
  - Deficiencies
- Regulatory Processes
- MISO

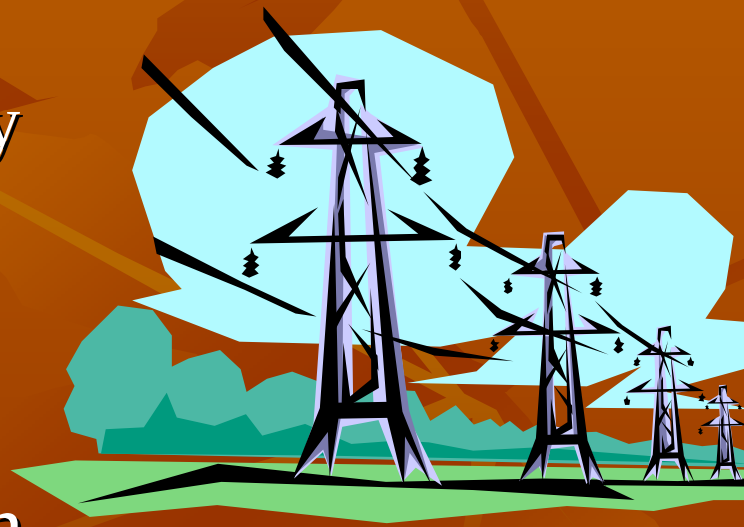


Electricity

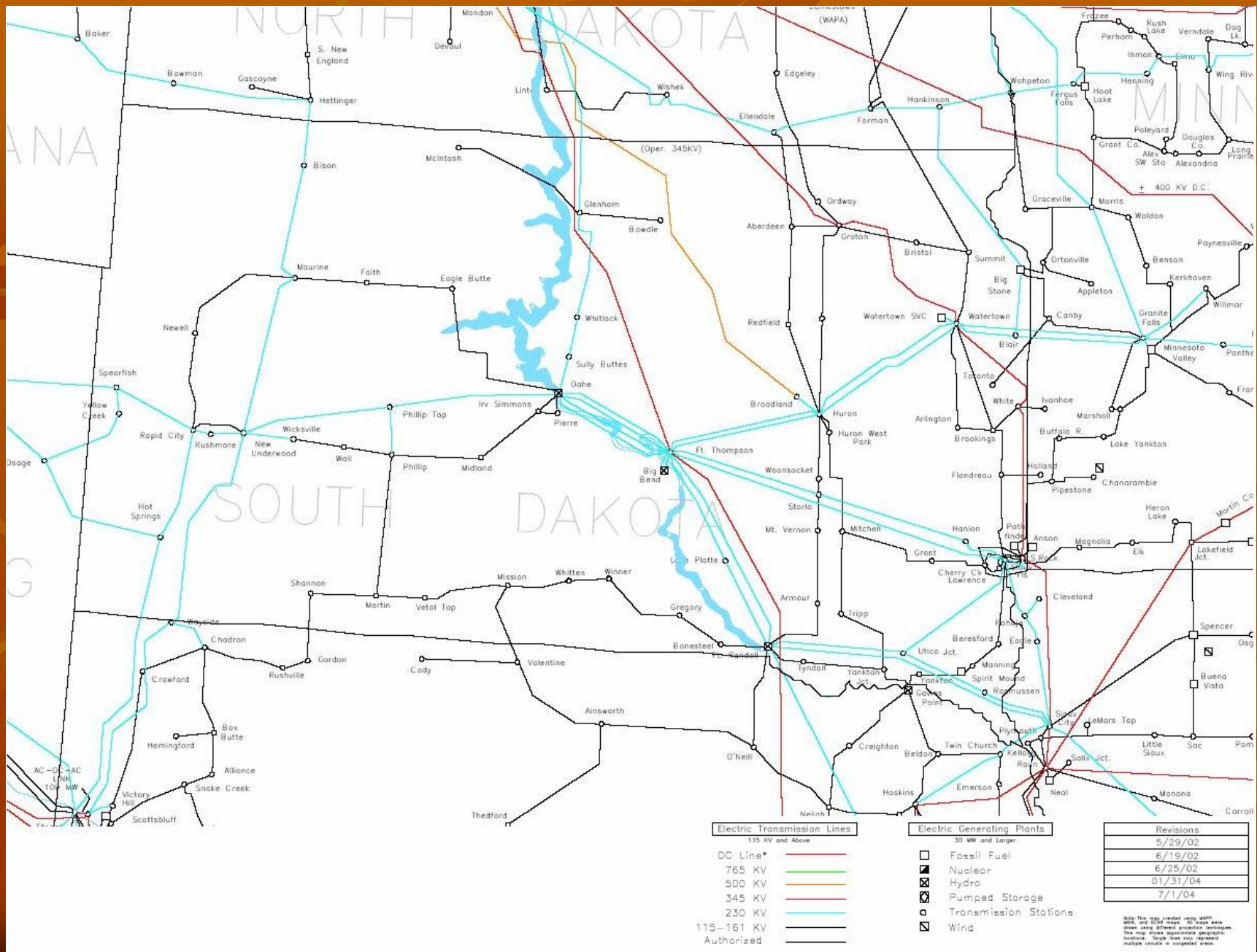
- Can’t be stored
- It is delivered the instant it is needed
- Transmission carries electricity from the generating plant to distribution points

Transmission

- Transmission – Used for bulk power transfers
  - 230 kV and higher is generally transmission
  - Between 230 k V & 115 kV maybe transmission
- Sub-transmission/distribution
  - Below 115 kV is generally not transmission



South Dakota Utilities Participate In A Regional System



Transmission's Role

- To reliably deliver electricity to distribution systems
- To connect utilities together to enhance reliability
- To accommodate economic exchanges of electricity (wholesale market)

Generation in South Dakota (>10 MW)

Name	Capacity (MW)	Category	Operator
Oahe	714	Hydro	WAPA
Big Bend	536	Hydro	WAPA
Big Stone	472.6	ST Coal	OTP
Fort Randall	356	Hydro	WAPA
Angus Anson	229	CT Gas	Xcel
Gavins Point	113	Hydro	WAPA
Watertown	65	CT Oil	MRES
Spirit Mound	104	CT Oil	BEPC
Huron	49	CT Gas	NWPS
Highmore	40	Wind	FPL
Lange PP	40	CT Gas	BHP
Aberdeen	29.4	CT Oil	NWPS
Lake Preston	29.4	CT Oil	OTP
Ben French	25	ST Coal	BHP
Huron	14.8	CT Gas	NWPS
Yankton	11.42	CT Gas	NWPS
Total	2829		

SD Load and Generation Energy Sales

Generation by Fuel (GWhr)

Energy Source	1993	1997	2002	Growth Rate % (1993-2002)	1993 % Share	1997 % Share	2002 % Share
Coal	2,642	3,314	3,272	2.4	50.3	26.6	42.4
Petroleum	12	7	5	−9.6	0.2	0.1	0.1
Natural Gas	11	117	86	26.2	0.2	0.9	1.1
Hydroelectric	2,591	9,012	4,354	5.9	49.3	72.4	56.4
Other Renewables	0	0	6	na	0	0	0.1
Total	5,256	12,450	7,722	4.4	100	100	100

Retail Sales by Customer Sector (GWhr)

Sector	1993	1997	2002	Growth Rate % (1993-2002)	1993 % Share	1997 % Share	2002 % Share
Residential	3,109	3,376	3,733	2	45	43.4	41.8
Commercial	1,621	2,207	3,062	7.3	23.5	28.4	34.3
Industrial	1,847	1,841	1,604	−1.6	26.8	23.7	17.9
Other	327	349	538	5.7	4.7	4.5	6
Total	6,905	7,773	8,937	2.9	100	100	100

* From EIA State Electricity Profiles 2002

Wholesale Market

- Transmission allows utilities to make bulk power transfers and take advantage of energy cost differences
- In 1992, FERC opened up transmission system to all generators, thus deregulating the wholesale energy market

- Safeguards reliability. It established “rules of the road” for transmission operation
- MAPP assures any new additions to the transmission system will maintain or enhance reliability, not harm it

MISO

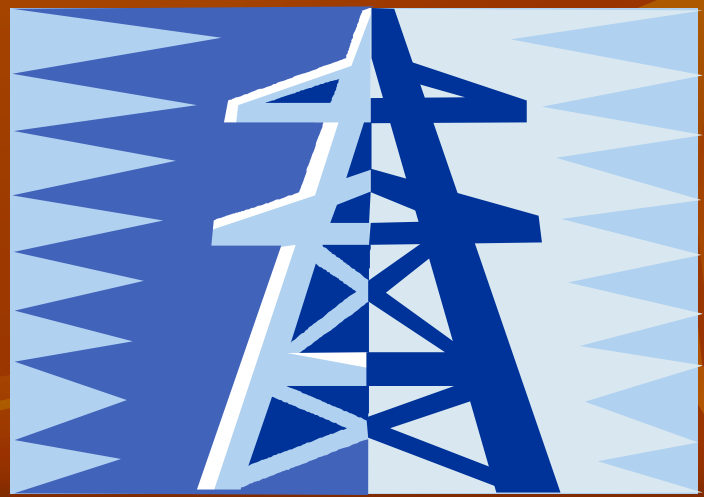
- Independent System Operator
  - Coordinates regional planning
  - Ensures equal access to transmission system
  - Maintains or improves transmission reliability
  - Operate energy market starting 3/1/05

Today's Challenges

- Aging system
- Growing electric usage
- Changing role of system
- Generation additions
- FERC Requirements to build for Transmission Service requests
- Transmission Constraints/ Lack of ATC

Aging Transmission System

- Portions 35 to 50 years old while others are between 50 and 80 years old.
- Limited expansion over last two decades
  - Portions of system at or near capacity
  - Problems dealing with load growth
  - Problems dealing with new generation



Electric Demand Has Grown

- Electricity usage in Midwest has steadily grown
  - 1993-2002 2.9% annually*
- Some of the fastest growing (electrically) parts of the U.S. are in the Upper Midwest

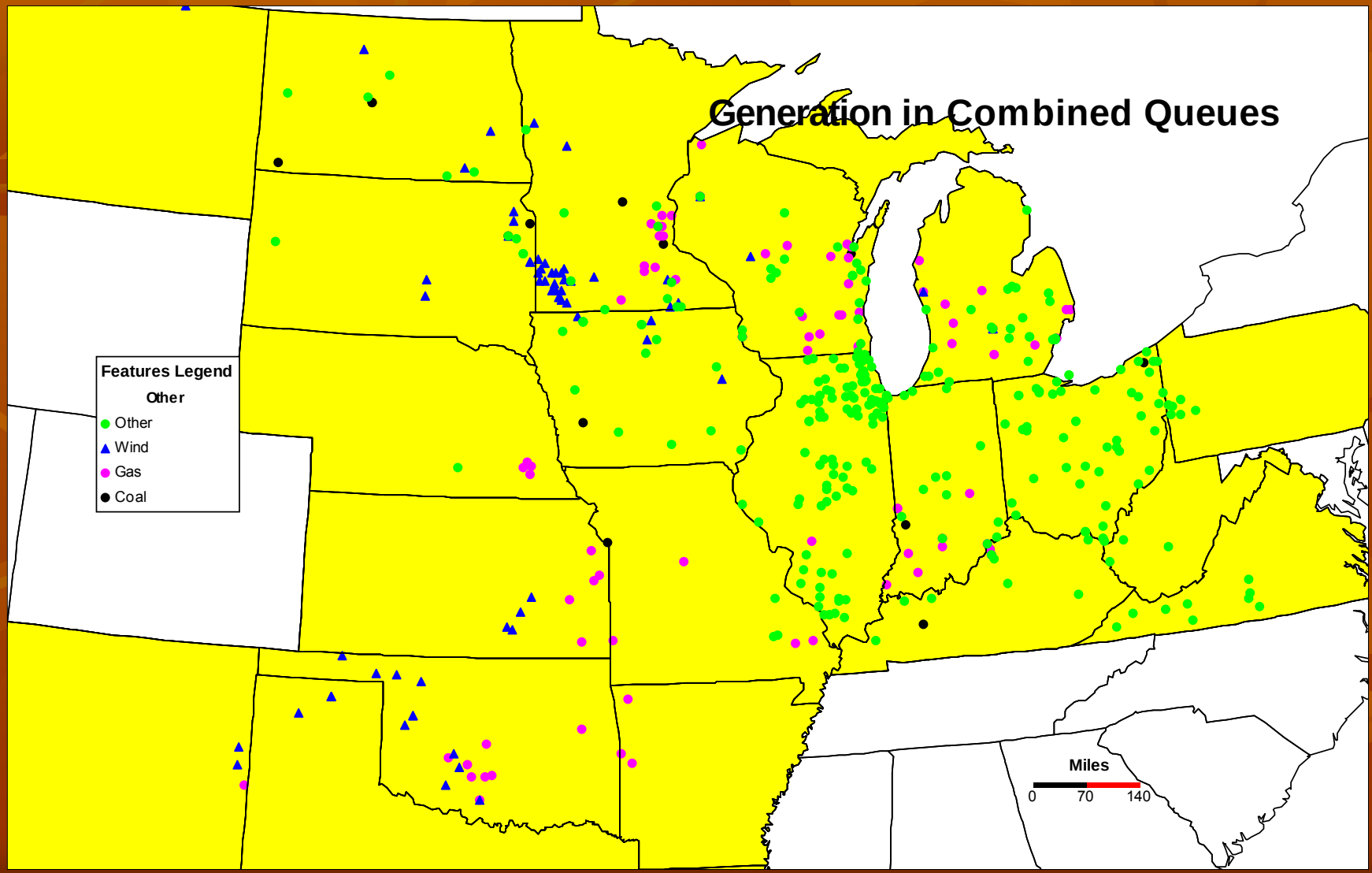
* Source: EIA State electricity profiles

Changing Roles

- Results in regional issues
  - Additions or deficiencies in South Dakota may affect service in neighboring states
  - Requires planning coordination
  - MISO starting an energy market 3/1/05

"It's a delicate balance!"

New generating facilities

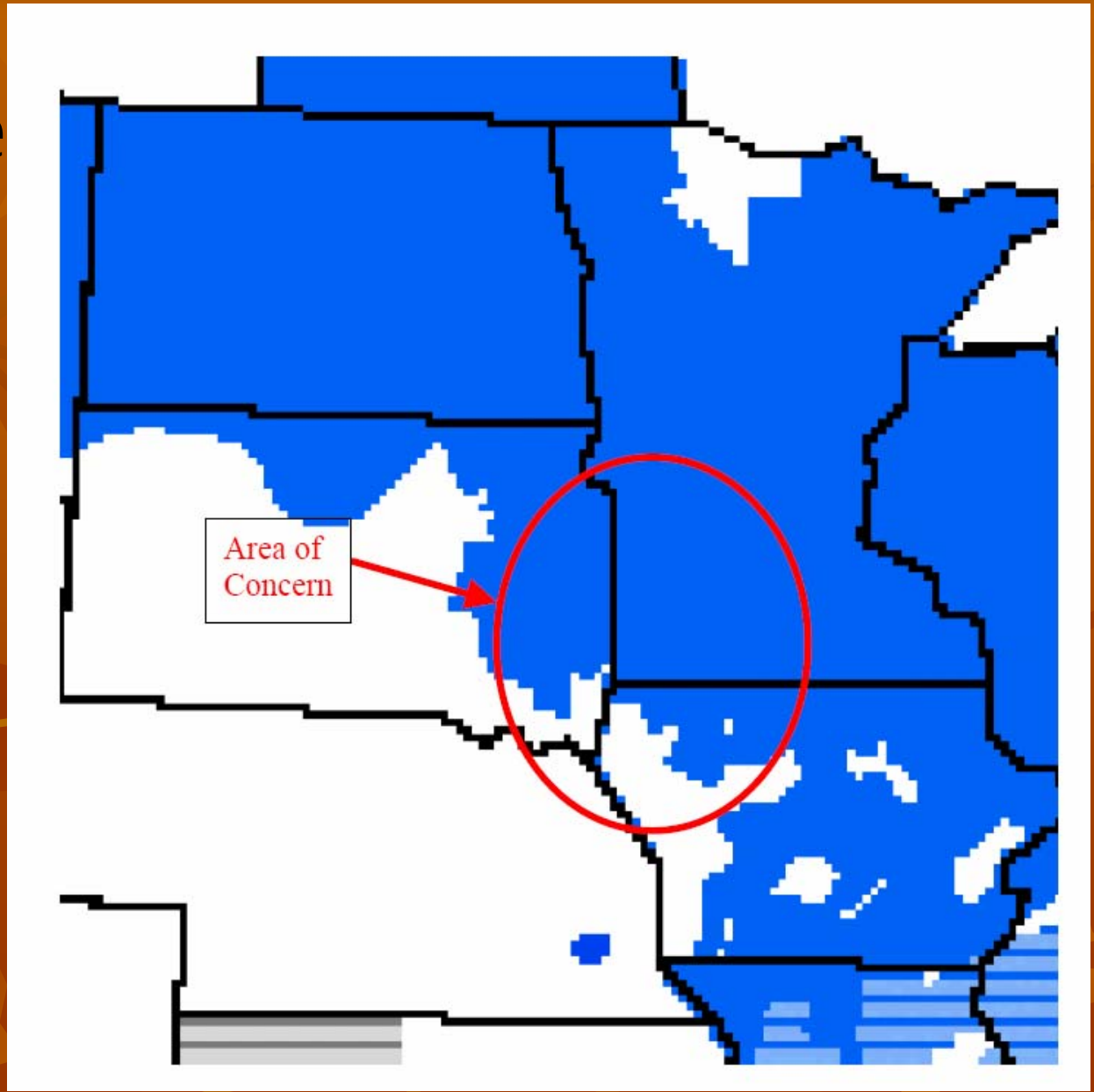


MISO Queue

- Currently
  - 21,000 MW of unstudied requests
  - Consists of 121 separate projects
- Since the open of the queue in Oct. 1998
  - 32,000 MW in 170 requests have been studied
  - 57,000 MW in 76 requests have been withdrawn

MISO Queue

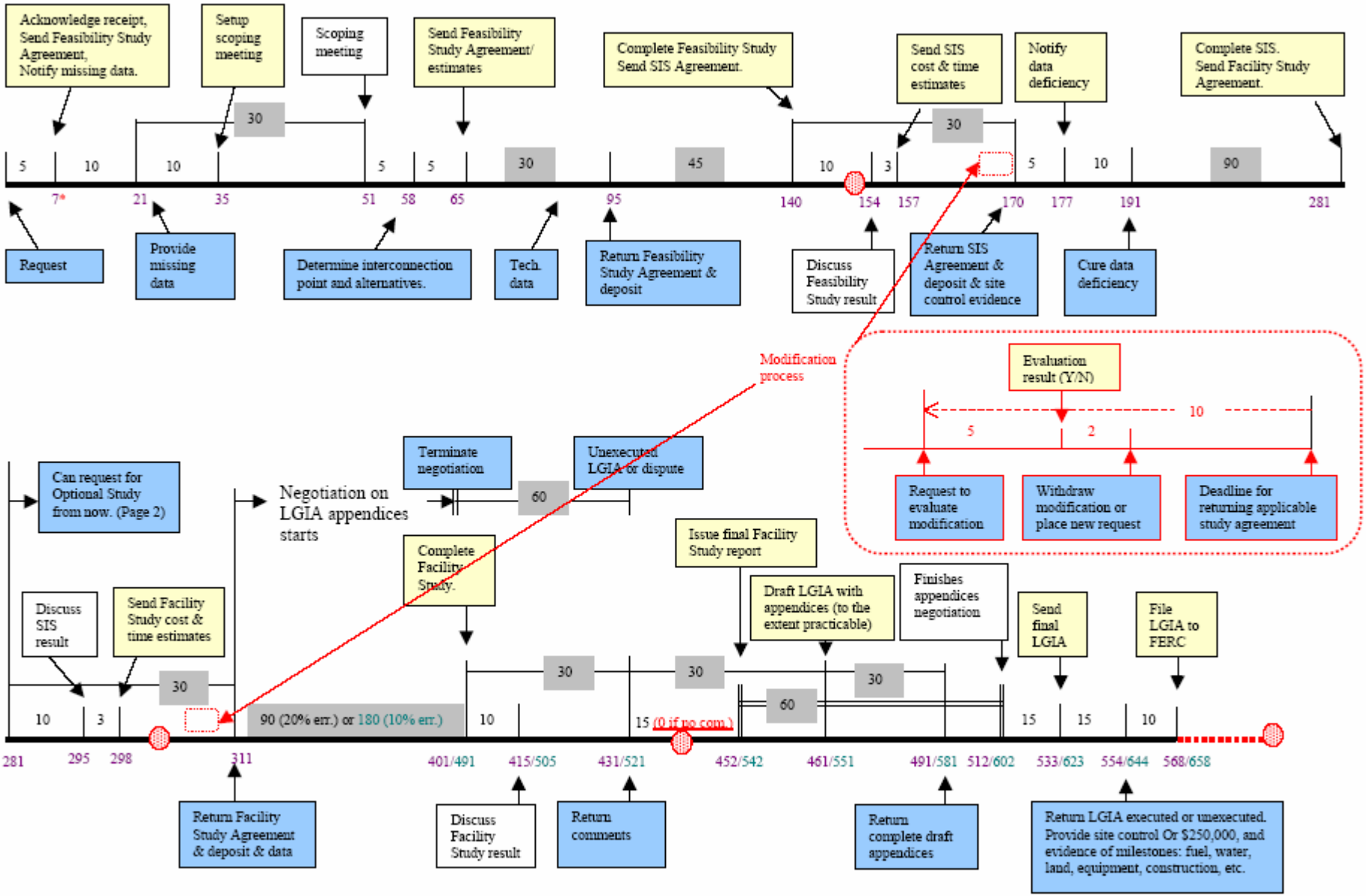
MISO has issued a statement indicating that there are too many requests in the queue for the system to handle. Upgrades will need to be made and studies will take longer than usual.



Transmission Service from New Generation to Load

- Two Part Process
  - Generation Interconnection
    - Evaluates the impact of the interconnection on the system
  - TSR
    - Evaluates the impact of the delivery on the system
- Does not cover state routing process

LARGE GENERATOR INTERCONNECTION PROCEDURES (Order 2003A)

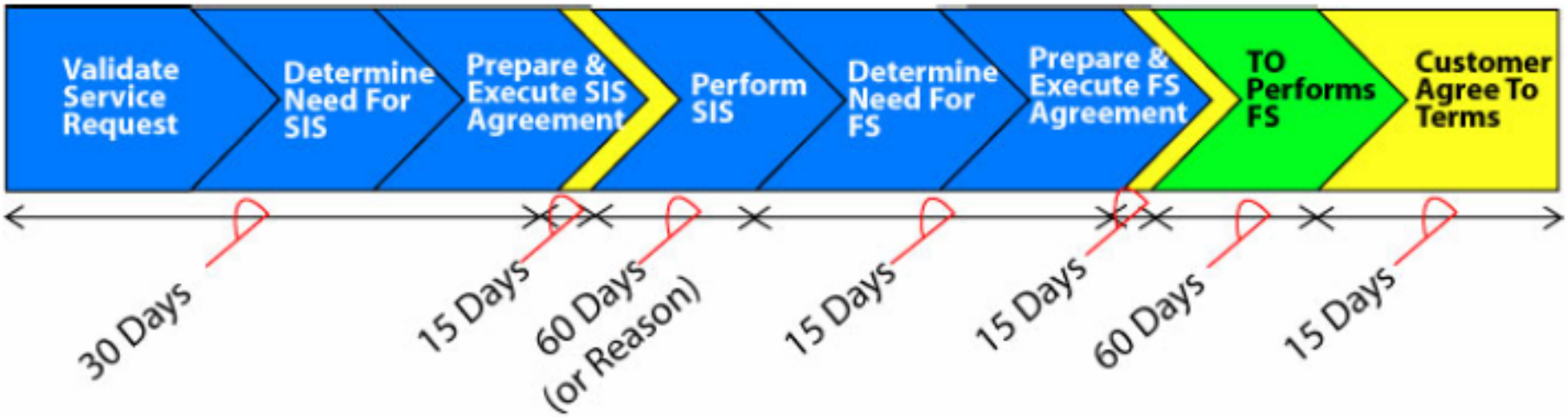


* Days information below the time line is estimated calendar days and is for information only. Many factors (e.g. optional process, early or delayed completion, holidays and weekends) can affect the actual days information.

MISO Transmission Service Request Process

TSR Process Overview

Tariff Specified Times

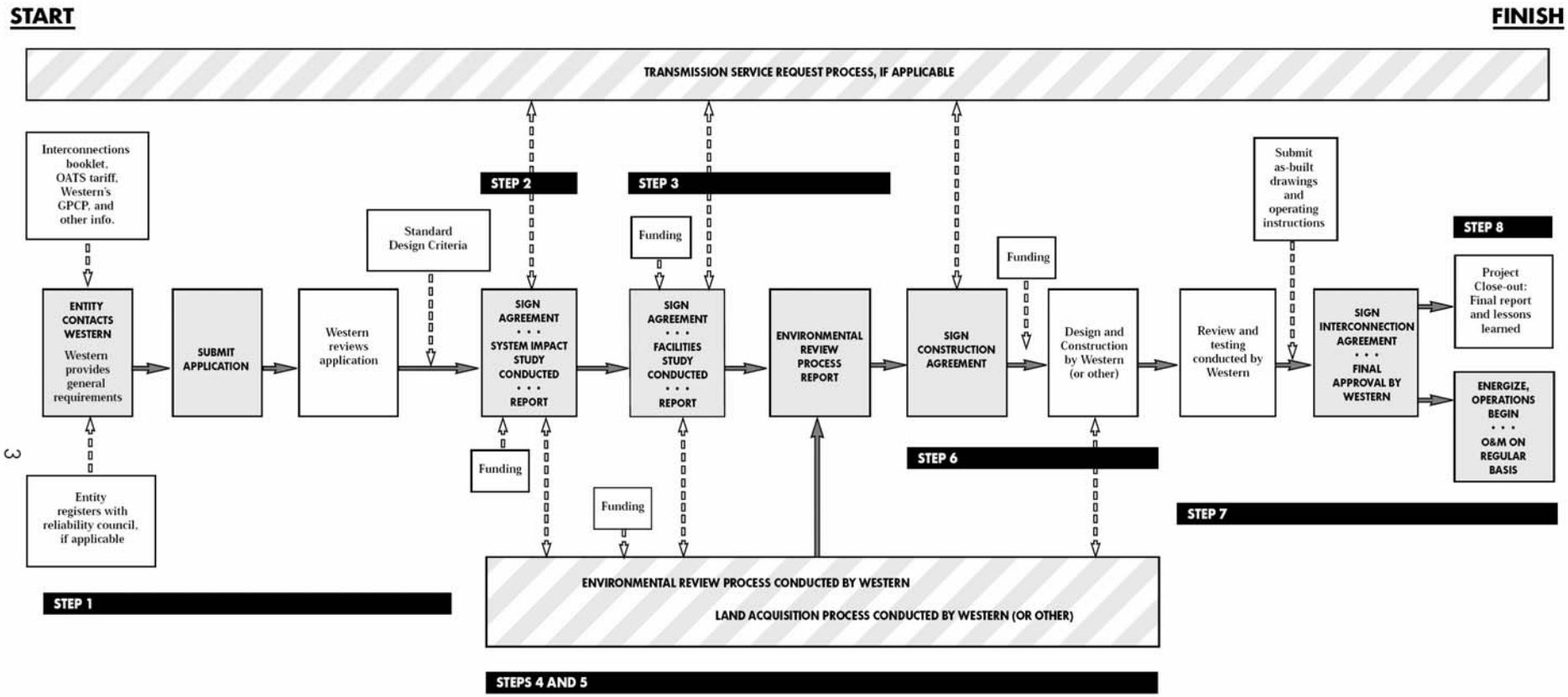


Delivery Service = 195 Days

MAPP Process

- Request service
- Validate Request – 7 days
- MAPP Request Evaluation Process – 7 days
  - Determines impact on constrained paths and available ATC
- Execute System Impact Study Agreement – 15-30 days
- Perform System Impact Study – 60 days
  - Determines reliability issues
- Execute Facilities Study Agreement – 15-30 days
- Perform Facilities Study – 120 days
  - Determines upgrades needed to fix reliability issues

WAPA Interconnection and TSR Process



STEP 1. Contact Western and submit application

STEP 2. System impact study and agreement

STEP 3. Facilities study and agreement

STEP 4. Environmental review process

STEP 5. Land acquisition process

STEP 6. Design and construction

STEP 7. Interconnection agreement, review and testing, and energize

STEP 8. Project close-out

LEGEND

- Standard process flow
- Information, funding, or other input into process flow
- Milestone
- Supporting action process
- Separate but parallel process (transmission service, environmental review and land acquisition)

NOTE: This diagram shows the full standard process for interconnection in a general chronological order. In actuality, the steps may overlap, be consolidated or otherwise be expedited, when appropriate.

The interconnection process does not guarantee transmission service, which is a separate but parallel process detailed within Western's Open Access Transmission Service Tariff. It is not a substitute for formally requesting transmission service through the Tariff.

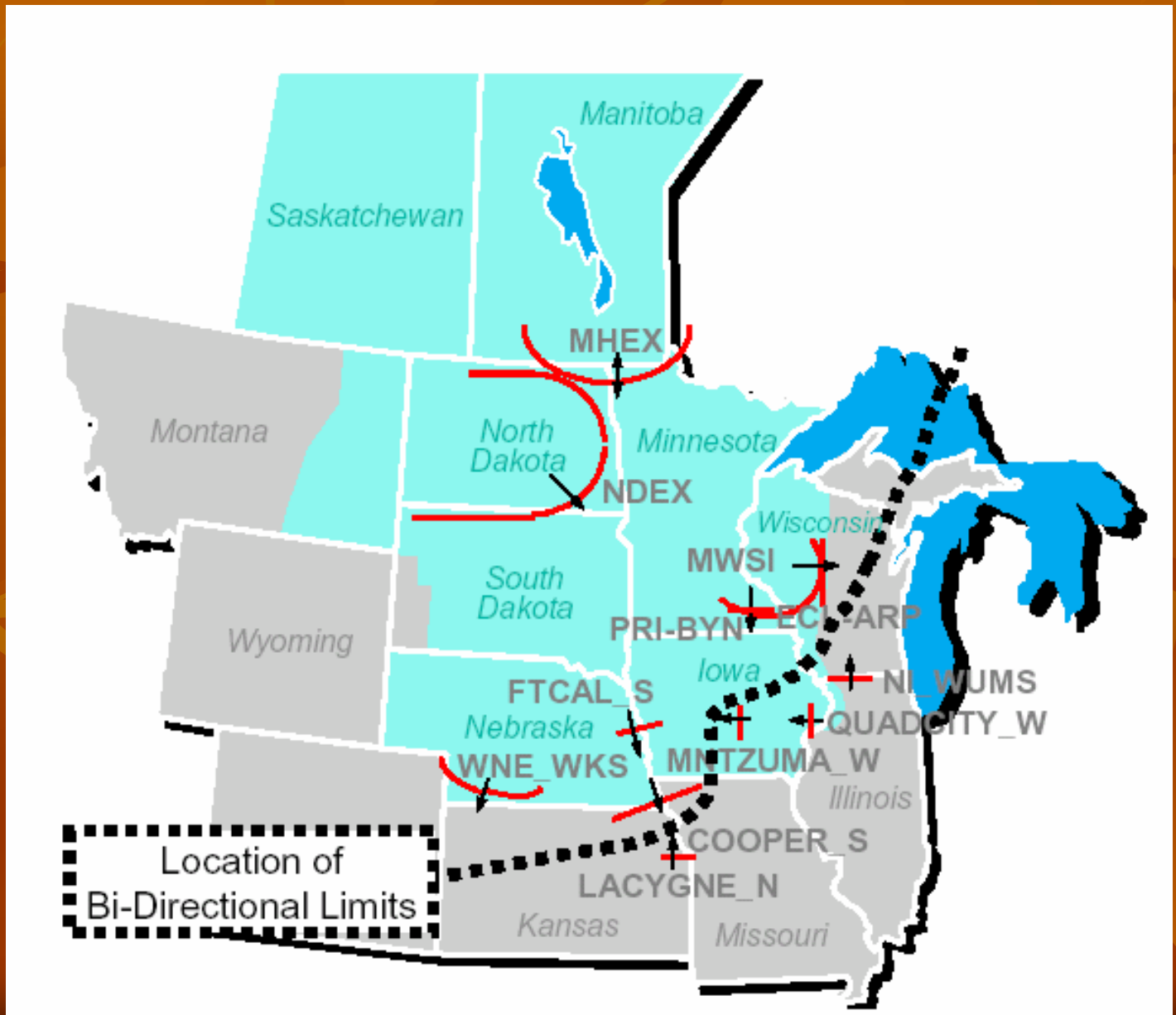
Comparison of Processes

- MISO
  - TSR ~ 200 days
  - GI ~ 600 days
- MAPP
  - TSR ~ 180 days
  - GI ~ 300 days
- WAPA (generally performed in coordination w/ MAPP process)
  - TSR ~ 180 days
  - GI ~ 300 days

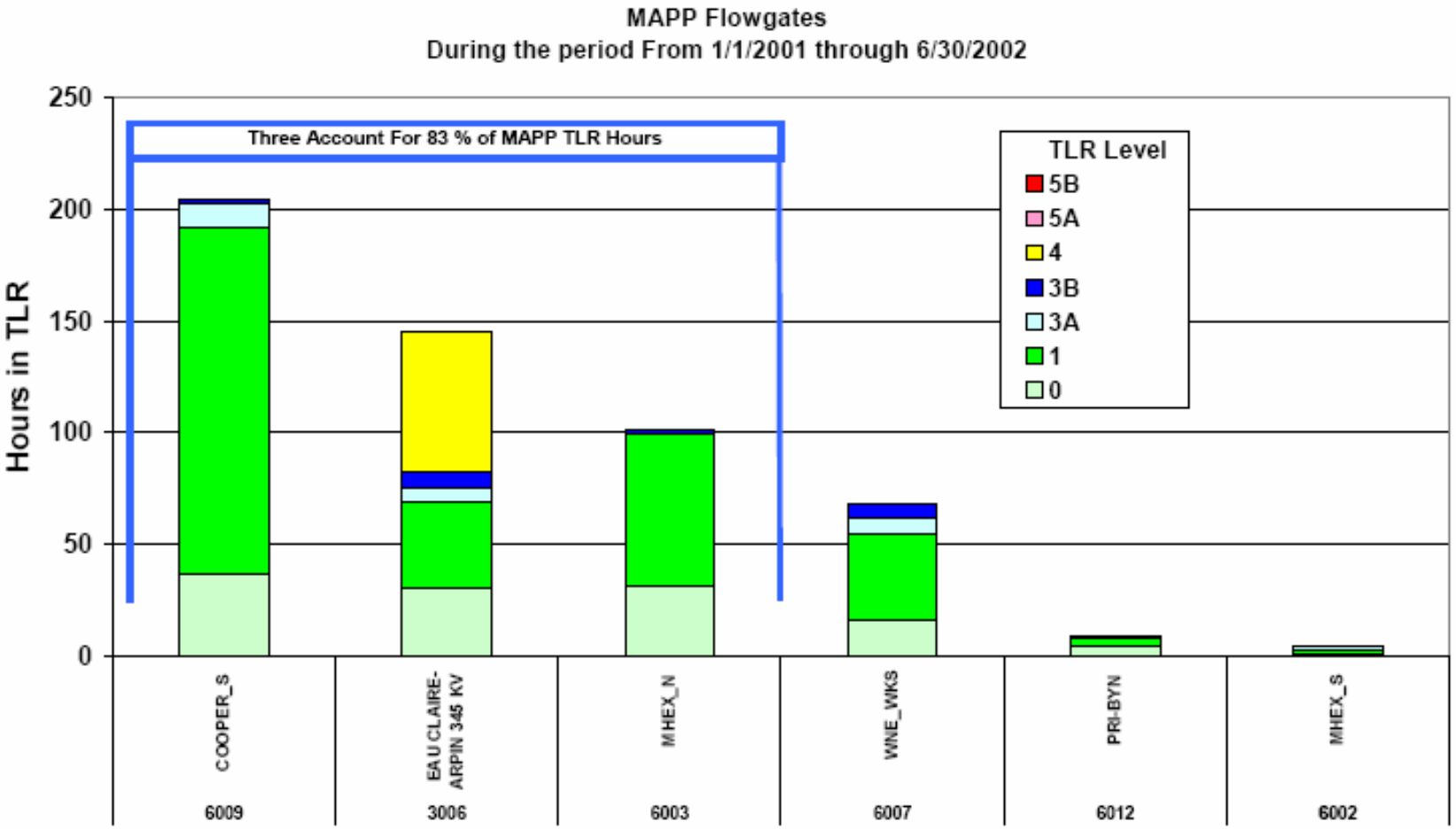
New Generation in SD

- Angus Anson III
  - 205 MW Gas unit
  - Expected to be online in 2005
- Big Stone II
  - Up to 600 MW of Coal
  - Expected to be online in 2011
- Coal Coalition
  - Up to 600 MW of Coal
  - Expected to be online in 2013
  - Sites include; Leland Olds ND, Gascoyne ND, Selby SD, Yankton SD, and Modale IA
- Wind
  - Numerous projects proposed in the eastern and central parts of the state
  - WAPA is currently studying what upgrades would be needed to support various amounts of wind

MAPP Constraints



MAPP TLRs


MAPP Flowgates
During the period From 1/1/2001 through 6/30/2002
Three Account For 83 % of MAPP TLR Hours
TLR Level
5B
5A
4
3B
3A
1
0
Hours in TLR
250
200
150
100
50
0
COOPER_S
6009
EAU CLAIRE-ARPIN 345 KV
3006
MHEX_N
6003
WNE_WKS
6007
PRI-BYN
6012
MHEX_S
6002
Flowgate Name and ID Number

Transmission Projects

- Split Rock to Lakefield 345 kV line
  - Associated with the Buffalo Ridge Wind
- White-Yankee-Buffalo Ridge 115 kV
  - Associated with the Buffalo Ridge Wind
- Watertown to Brookings to Sioux Falls 115 kV reconductor
  - Will be built to 230 kV standards for future upgrades
- Rapid City DC tie
  - 200 MW tie between the East and Western interconnects
  - Online in October of 2003

Observations

- Any major generation project will have to get transmission service out of SD
- Any major generation projects in SD will require transmission into MISO footprint
- SD generation will have to follow process in MAPP and MISO
- MISO market will create barriers to SD generation

Questions