

# Western Area Power Administration

MoRAST Presentation

March 25, 2009

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# Western's Customers

More than 300 customers

Municipal utilities – 191

Rural electric cooperatives – 34

Public utility districts – 2

Federal agencies – 1

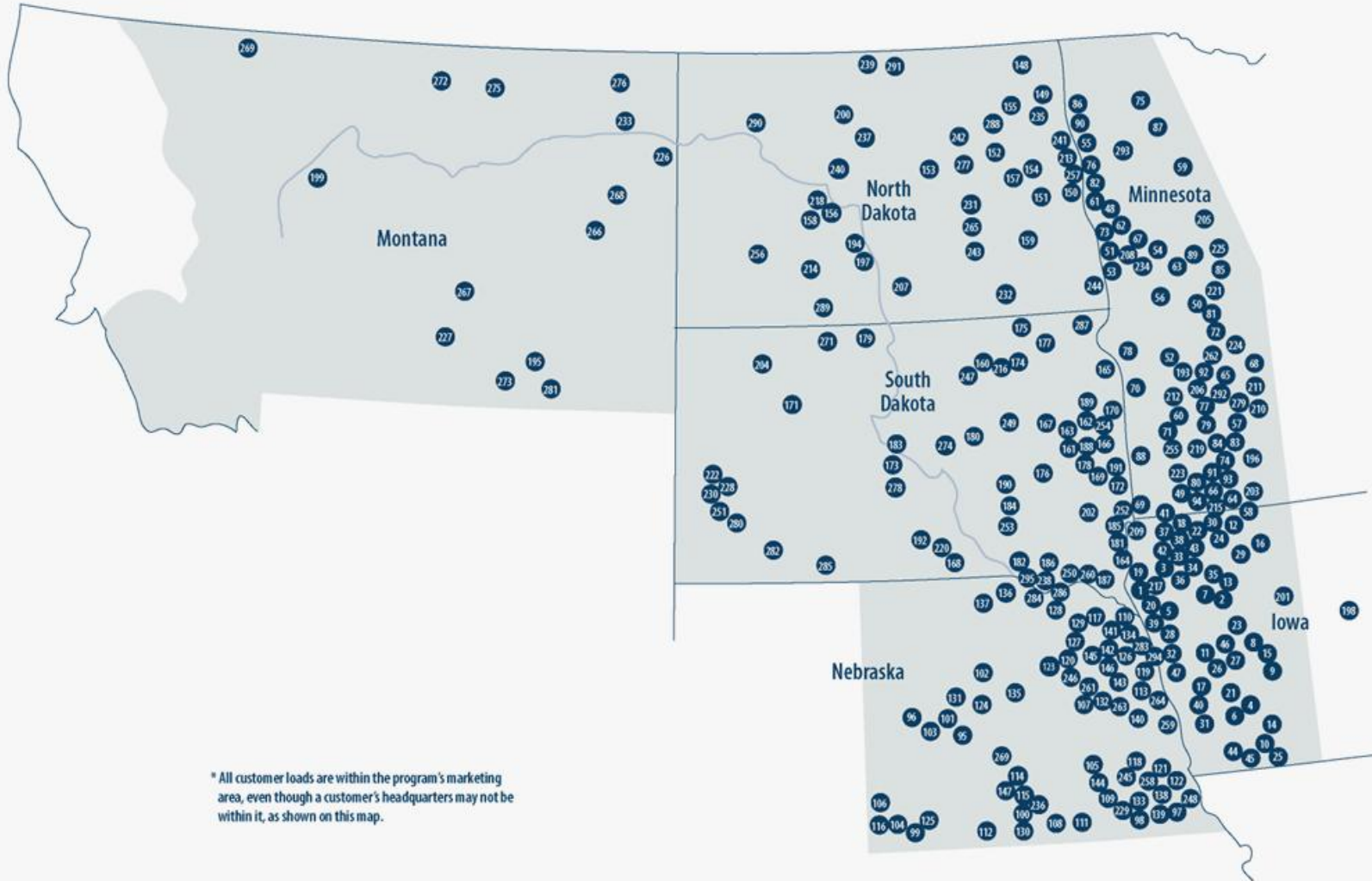
State agencies – 34

Irrigation districts – 4

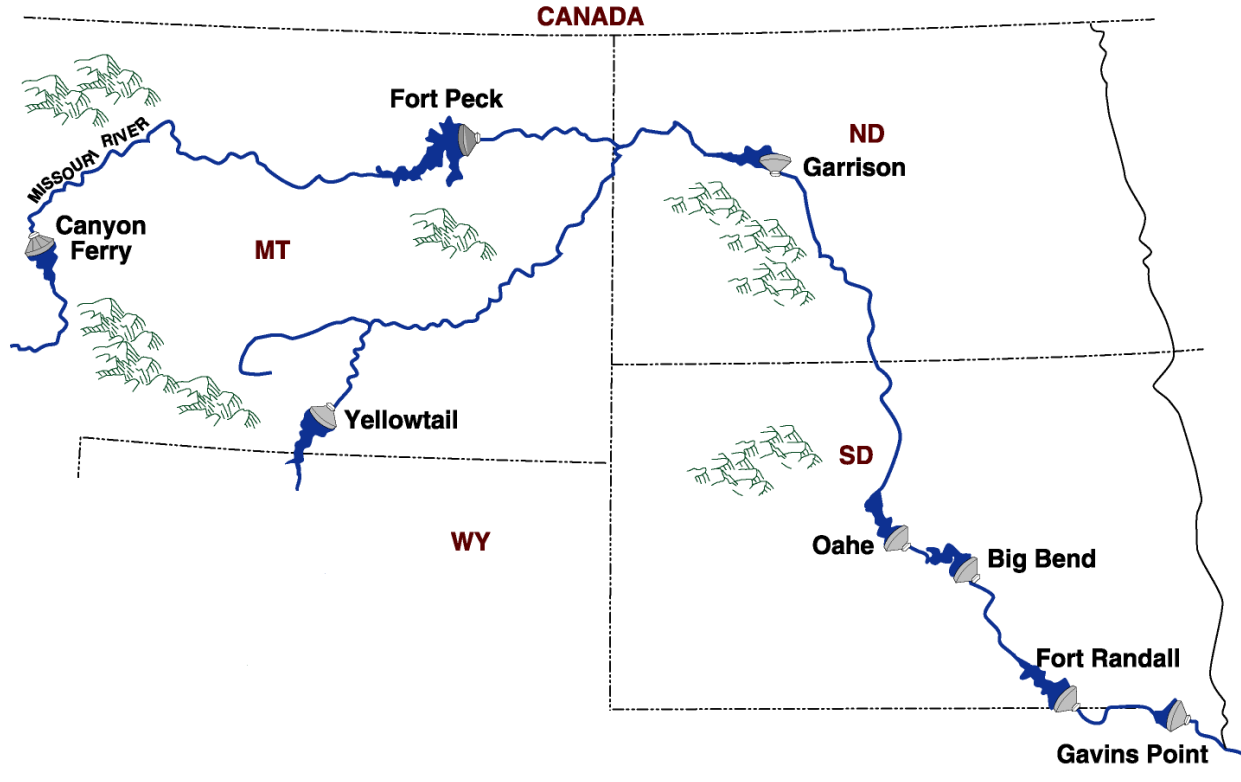
Native American tribes – 27

Project use – 34

# Western's Loads

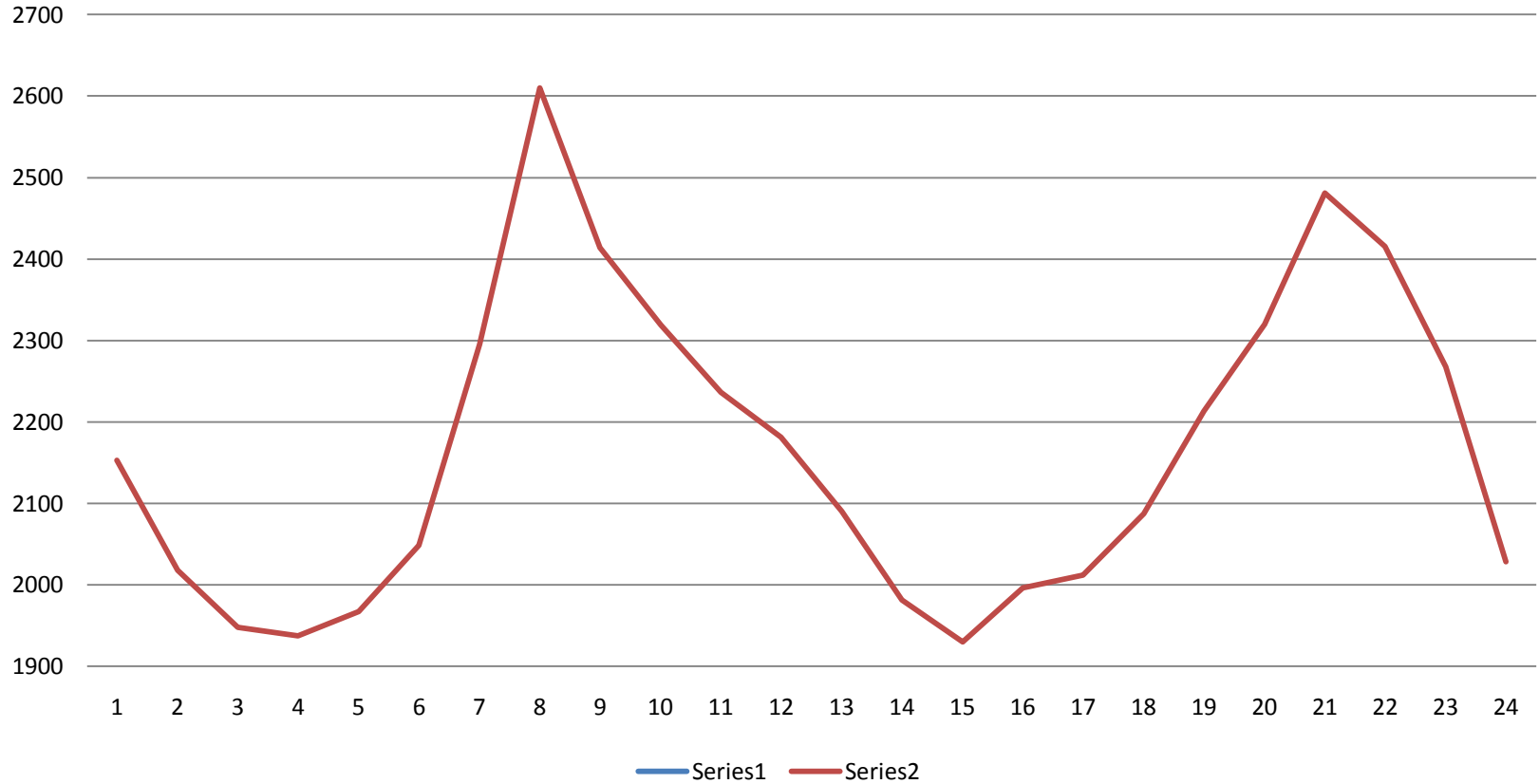


# Western's Resources



# 24 Hour JMP Load

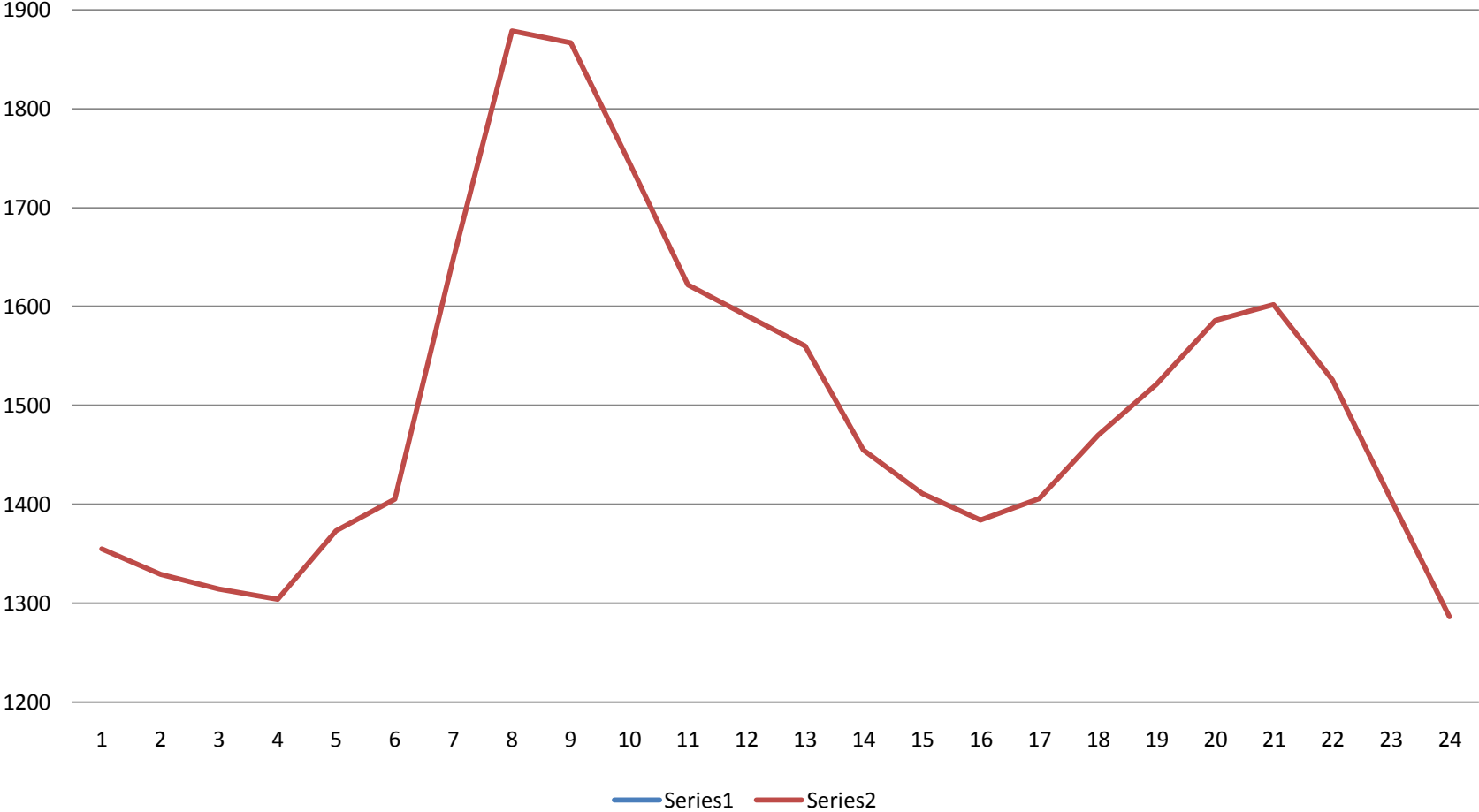
JMP Load



March 3, 2009

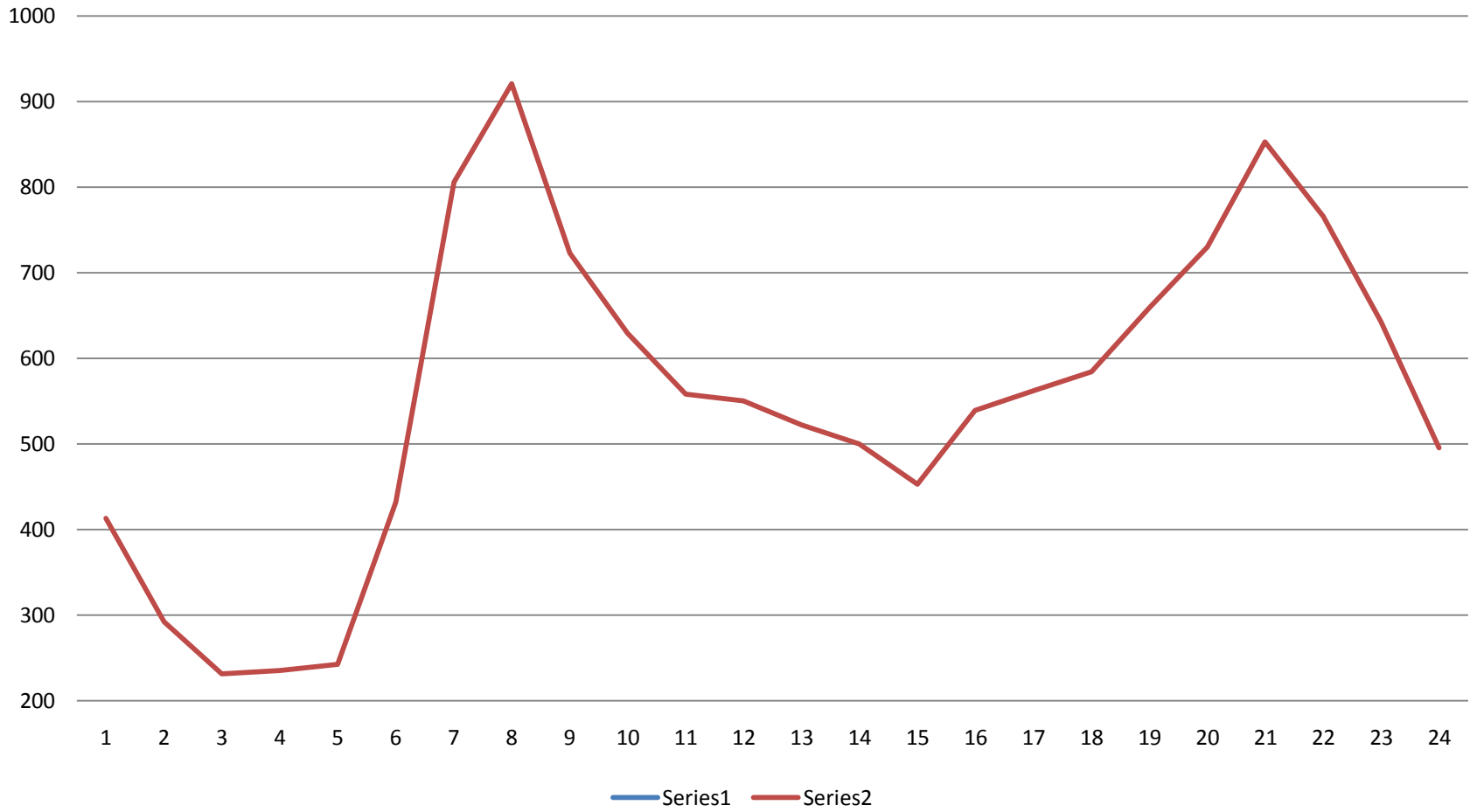
# 24 Hour WAPA Load

WAPA Load



# Hydro Total

## Hydro Gen



# Operating Restrictions

- Fort Peck = 1100 MW w/+ 300 -100
- Garrison = 2450MW w/+ and -300
- OAHE/BB = 3400, 1750MW w/3 to 1 split
- FR = 3600MW w/+ 100 -200
- GP =1700 MW w/WT
- Day total of 14000 MW



# Garrison Standing Order ST-2, 1983

Period	Minimum Energy for Period
4 hours	300 MWh
5 hours	400 MWh
6 hours	550 MWh
7 hours	700 MWh
8 hours	850 MWh

# Fort Randall Standing Order ST-5, 1983

- Power plant may be operated at zero load for up to 22 consecutive hours except when minimum hourly generation is specified in the daily orders. If the power plant is at zero load for 22 consecutive hours at least 35 MW for one hour should occur before resuming zero generation

# NERC Standard BAL-001-0.1a

## Real Power Balancing Control Performance

- CPS1 – ACE must be assisting to correct Frequency measured each minute.
- CPS2 – The average ACE must average less than 50 MW ( $L_{sub10}$ ) over a 10 minute period.

# NERC Standard BAL-002-0

## Disturbance Control Performance

- DCS1 – The ACE must return to pre-disturbance level or zero within the Disturbance Recovery Period (15 minutes)
- DCS2 – Must restore reserves within the Contingency Reserve Restoration Period (90 minutes). This begins at the end of the Disturbance Recovery Period.

# Operating Reserves

- Regulating Reserves – Swing (50 MW)
- Contingency Reserves – Emergencies (117 MW)

Spinning Reserves - 40% of 117 MW

Supplemental Reserves – 60% of 117 MW

**TOTAL Reserve Obligation = 167 MW**

# MRO Standard RES-501-MRO-01

## Planned Resource Adequacy Assessment

- Planning Reserves – NERC requires entities to have adequate Planning Reserves (0 to 10 years).
- Reserves held by Load Serving Entities (LSE) or Planning Reserve Sharing Groups (PRSG)
- WAPA belongs to MRO PRSG (10%) and also MISO PRSG (14.2%)
- Planning Reserves = Percentage of capacity exceeding Firm Load obligation.

# Accredited Capacity

- Western's Total Hydro Resources = 2600MW

With Full Reservoirs

Western's Total Hydro Resources Today = 2370  
MW

- Western's Total Peak Load = 2070 MW
- Capacity Needed for Planning Reserves = 2364  
MW (114.2% of peak load)

# Capacity

- Capacity is based on Urge tests performed annually on the Hydro units. (2370 MW)
- Limitations on capacity - Usable Capacity
  - Unit outages
  - Bird peaking
  - Operating Criteria such as Run of River



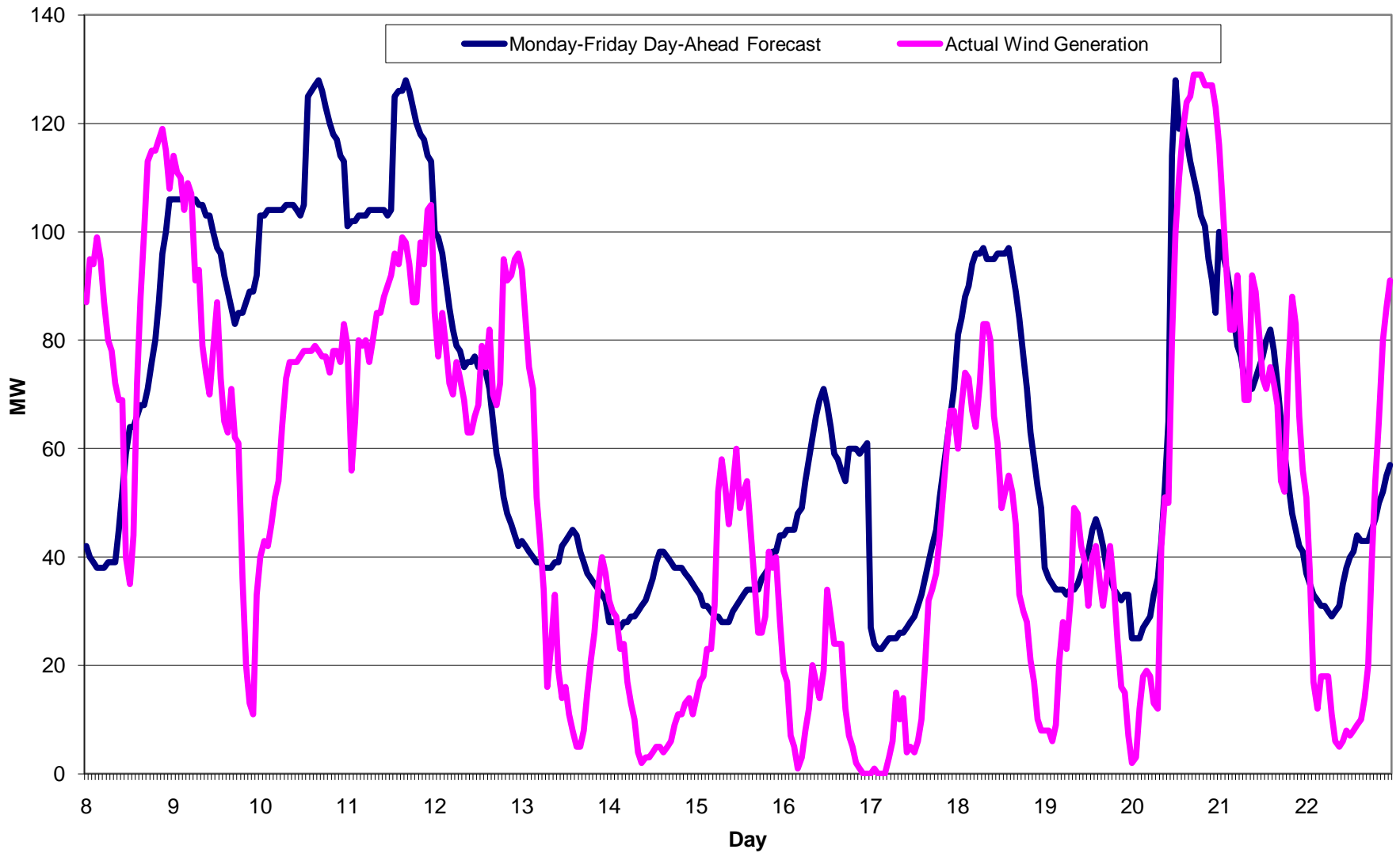
# Mandatory Criteria

- Planning Reserves =  $2370 - 2364 = 6\text{MW}$
- Operating Reserves =  $2070 + 167 = 2237\text{ MW}$   
Minus restrictions for outages, bird peaking or operating criteria ( $2370 - 2237 = 133\text{ MW}$ )

# Wind in the BA

- UGPM has contracted for 500 MW.
- Basin has contracted for 456 MW.
- HCPD has contracted for 50 MW.
- NWPS has contracted for 50 MW.
- CBPC has contracted for 156 MW.
- Total of over 1200 MW of JMP wind in the next 2 years.
- Other wind development in the WAUE BA.....?

# 137 MW of Wind Generation



# 137 MW of Wind Generation

## Percent Deviation from Forecast

