



Monitoring Report SD-9: Integrated System Planning

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September 17, 2024

SD-9 Integrated System Planning Strategic Directive

Integrated System Planning is the ecosystem of planning processes used to efficiently integrate the transmission system, supply and demand side resources, and the increasingly complex distribution system. Through Integrated System Planning efforts, OPPD will continually plan for, adapt to, and enable both the needs of our customers and the rapidly transforming electric industry. Successful planning will ensure both a reliable electric system and the resiliency of the system and its components to prepare for, withstand, respond to, adapt to and quickly recover from a non-routine event.

OPPD shall:

- 1 Ensure that year-round supply-side and demand-side resource capacity exceeds forecasted load in compliance with resource adequacy and planning reserve margin requirements of OPPD's regional balancing authority.
- 2 Ensure compliance with applicable planning related North American Electric Reliability Corporation Reliability Standards including consideration of Essential Reliability Services.
- 3 Ensure planning accounts for potential extreme weather events, changes to demand-side and supply side regional resources and extended periods of low energy production by variable energy resources.
- 4 Compute resource adequacy metrics that quantify the ability of OPPD's resources to meet its forecasted electric demand:
 - Measure the frequency with which a system's demand is expected to be met by system capacity over a period of time
 - Measure the percentage of total energy that a system is projected to be able to serve over a period of time.

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- 5 Update the board on at least a quarterly basis as to its progress in developing new bulk electric system resources, engage the board in key decisions, and obtain annual board affirmation on current plans for developing new bulk electric system resources.
- 6 Achieve the following resource volumes by dates indicated:

RESOURCES (Nameplate or Peak Tested Capacity)	RANGE OF INCREMENTAL ADDITIONS (MW)
Renewable Generation	1,000 - 1,500 MW
Contracted by the end of 2024	200 MW
Contracted by the end of 2026	400 MW
Contracted by the end of 2028	300 MW
Contracted by the end of 2030	100 MW
Energy Storage	Approximately 125 MW
Contracted by the end of 2026	50MW
Contracted by the end of 2027	75MW
Dual Fuel Combustion Turbines	600 – 950 MW
Contracted by the end of 2025	600MW
Demand Response	Minimum of 32 MW
On-site fuel oil storage for year-round accreditation for approximately 320 megawatts (MW) of existing natural gas-fueled generation assets	Approximately 320 MW
Contracted by the end of 2025	320MW

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Ensure that year-round supply-side and demand-side resource capacity exceeds forecasted load in compliance with resource adequacy and planning reserve margin requirements of OPPD's regional balancing authority.

- OPPD is a member of the Southwest Power Pool (SPP), which identifies sufficient regional resource volumes which are required **to reliably serve electric demand**.
- As a member of SPP, OPPD is required to have our share of generation capacity to **meet our peak demand plus a Planning Reserve Margin (PRM)**.
- Generation capacity is qualified by testing and is known as Accredited Capacity.
- The PRM is currently set at 15% for both summer and winter periods. However, **SPP has approved a 16% Summer and 36% winter PRM to become effective in 2026** and this proposed change is currently being reviewed at the Federal Energy Regulatory Commission (FERC).

Planning Reserve Margin Today

		2020	2021	2022	2023	2024
Summer	Required	12%	12%	12%	15%	15%
	Actual	17.9%	20.8%	18.6%	16.8%	23.6%
	Difference	5.9%	8.8%	6.6%	1.8%	8.6%
Winter	Required	12%	12%	12%	15%	15%
	Actual	26.0%	26.0%	25.5%	31.8%	21.2%
	Difference	14.0%	14.0%	13.5%	16.8%	6.2%

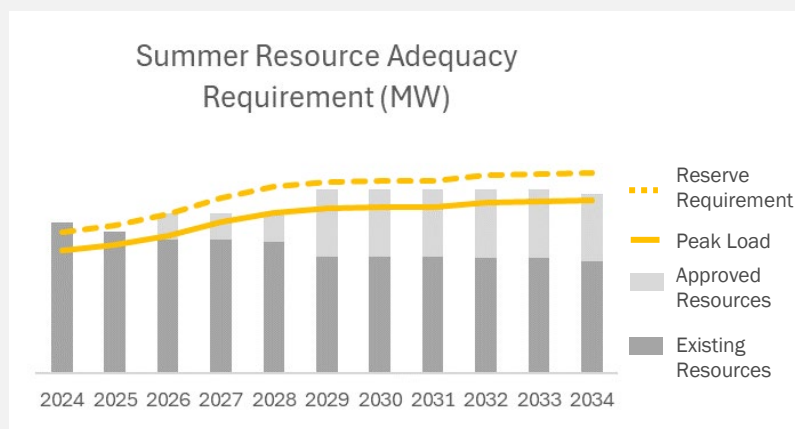
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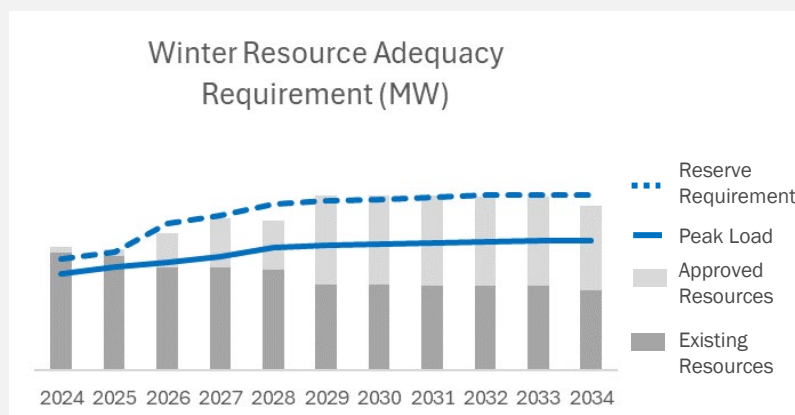
Ensure that year-round supply-side and demand-side resource capacity exceeds forecasted load in compliance with resource adequacy and planning reserve margin requirements of OPPD's regional balancing authority.

- OPPD continues to experience and forecast **unprecedented load growth in its service territory**
- OPPD's board approved resource plans to **support this future growth** as well as **anticipated increases in regional planning reserve margin requirements**
- Successfully meeting future requirements will depend on the timely execution of current resource plans **which have considerable execution challenges**
 - Short term capacity contracts may be needed in specific years as OPPD's planned resources come online

- Summer PRM is increasing **from 15% to 16%** starting in 2026



- Winter PRM is increasing **from 15% to 36%** starting in 2026/27

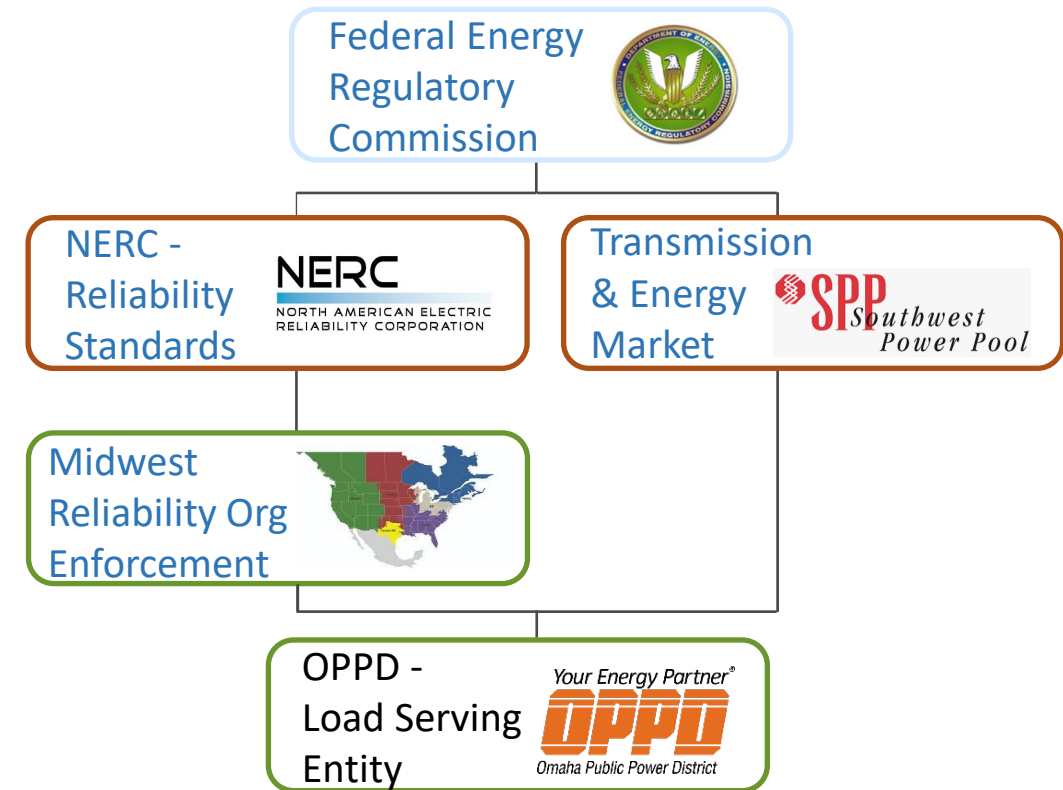


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Ensure compliance with applicable planning related to North American Electric Reliability Corporation Reliability Standards including consideration of Essential Reliability Services.

- Federal NERC Reliability Standards define the reliability requirements for planning and operating the North American bulk power system
- ✓ No enforceable NERC violations for the planning standards since the last SD-9 update
 - ✓ Various transmission system expansion plans identified and in-progress to support compliance
- ✓ Essential Reliability Services incorporated into generation expansion planning
 - ✓ Voltage support
 - ✓ Frequency Response
 - ✓ Load ramping/balancing
- **FERC issued Order 896 which directs NERC to develop a new standard by Q1 2025 to address reliability concerns related to extreme temperature events**



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Ensure planning accounts for potential extreme weather events, changes to demand-side and supply side regional resources and extended periods of low energy production by variable energy resources.

- OPPD continues to be actively engaged in SPP policy efforts that will **enhance regional reliability** during extreme events including:
 - **Increased Planning Reserve Margin:** Improving regional resource adequacy and transmission system modeling to better predict system risks and establish system reserve requirements - **Pending filing at FERC**
 - **Performance Based Accreditation (PBA):** Accrediting conventional generation resources based on historical unit reliability and creating incentives for reliability improvement - **Filed with FERC**
 - **Effective Load Carrying Capability (ELCC):** Accurately value the contribution of renewables and energy storage according to how they perform when needed most by the regional system, creating proper signals for a diverse energy mix - **Filed with FERC**
 - **Fuel Assurance (FA):** Establishing a mechanisms for incenting reliability during extreme periods by more significantly weighting unit accreditation during these periods - **Pending filing at FERC**



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Ensure planning accounts for potential extreme weather events, changes to demand-side and supply side regional resources and extended periods of low energy production by variable energy resources.

- OPPD continues to identify opportunities to **harden its existing generation and transmission system** to withstand extreme weather events. These include:
 - Planning for the addition of **dual fuel capability and fuel oil storage** at Cass County Station
 - **Improved heat trace monitoring and enhancing heating** at Sarpy County Station
 - **Adding enclosures to mitigate freezing and enhancing building protection** at Nebraska City Station
 - **Transmission line rebuilds** including: 108th & Blondo to 123rd & Pacific, and South 180th St.
 - OPPD is pursuing potential strategies with the US Army Corps of Engineers, Western Area Power Administration and SPP and other utilities to **mitigate frozen Missouri River conditions** affecting regional generation



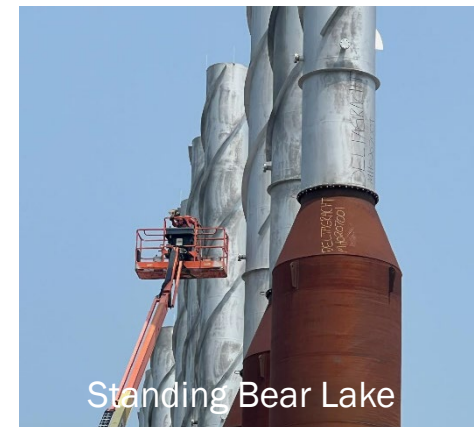
Cass County Station

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Ensure planning accounts for potential extreme weather events, changes to demand-side and supply side regional resources and extended periods of low energy production by variable energy resources.

- OPPD is also incorporating lessons learned from experience with existing generation to **enhance resilience of future facility design**. Expansion of local generation and transmission system will allow greater ability to withstand localized and regional events. Examples include:
 - Turtle Creek Station & Standing Bear Lake
 - Design basis of **-40F for Standing Bear Lake and -30F for Turtle Creek**
 - **Dual fuel capability with 72 hours of on-site fuel storage**
 - **New transmission lines** (Cass to Sarpy, Sarpy Southwest Transmission Project)
 - New natural gas generation, including TCS and SBL **will not be affected by Missouri River conditions**, including freezing and flooding.
 - New solar and wind generation **do not require water for operation**, increasing system resilience to drought



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Compute resource adequacy metrics that quantify the ability of OPPD’s resources to meet its forecasted electric demand:

- Measure the frequency with which a system’s demand is expected to be met by system capacity over a period of time
- Measure the percentage of total energy that a system is projected to be able to serve over a period of time.

- As part of its Near-Term Generation Planning, OPPD conducted detailed resource adequacy modeling to quantify the reliability of its current and future systems
- Resource adequacy modeling simulates the capability of OPPD’s resources to meet OPPD’s electric demands under a large range of:
 - Weather conditions (over 40 years of historical weather)
 - Renewable production scenarios
 - Conventional unit reliability scenarios
- While OPPD’s current portfolio has degraded resource adequacy due to delays in adding new generation, the system will be restored with the completion of its new generation and near term resource plan
- **As a result of evaluating a large volume of new resources, OPPD did not perform a new Loss of Load/Expected Underserved Energy study for 2024 and is using the 2023 results.**

Resource Adequacy Reliability	2023	2030 with Near Term Generation
Frequency Basis (1-LOLE)	92.05%	99.99%
Energy Basis (1-EUE)	99.83%	99.99%

Note: The completion of OPPD’s Turtle Creek Station, Standing Bear Lake Station, and Platteview Solar facilities will meaningfully improve these local system resource adequacy metrics as early as 2024, but is dependent on transmission interconnection study results

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Update the board on at least a quarterly basis as to its progress in developing new bulk electric system resources, engage the board in key decisions, and obtain annual board affirmation on current plans for developing new bulk electric system resources

- OPPD provided updates on a quarterly basis or more frequently throughout 2023 and 2024

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- Complete
- On Track
- Challenged
- Delayed

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Achieve the following resource volumes by dates indicated:

Resources	Year	Contracted Target	Status	
Renewable Generation	2024	200MW	●	Complete: Executed High Banks Wind Farm capacity contract
	2026	400MW	●	Complete: Executed High Banks Wind Farm capacity contract
	2028	300MW	●	Complete: Executed Milligan Wind Purchase Power Agreement
	2030	100MW	●	On Track: K Junction development rights; additional project negotiations
Energy Storage	2026	Approx. 50MW	●	On Track: Commenced design feasibility study in 2024
	2027	Approx. 75MW	●	On Track: Commenced design feasibility study in 2024
Dual Fuel Combustion Turbines	2025	600MW	●	On Track: Equipment contract signed, EPC sourcing underway
Demand Response		Min. of 32MW	●	On Track: Currently obtained 13.2 of 32MW with plans in place to achieve full amount by 2025.
On-Site Fuel Storage	2025	Approx. 320MW	●	On Track: Equipment contract signed, EPC sourcing underway

Recommendation

- The System Management Committee has reviewed and accepted this Monitoring Report for SD-9 and recommends that the Board find OPPD to be sufficiently in compliance with the Board Policy SD-9 that was in effect prior to the August 17, 2023 policy revision.

Any reflections on

**what has been
accomplished, challenges
and/or strategic
implications?**

