



# Monitoring Report SD-9: Integrated System Planning

Brad Underwood

Vice President - Systems Transformation

September 19, 2023

# SD-9 Integrated System Planning

## Strategic Directive

---

Significant revisions were approved to SD-9: Resource Planning on August 17, 2022. The revisions include:

- Creating a structure for quarterly review by the Board of the progress in developing new bulk electric system resources and engaging the board in key decisions
- Creating a timeline for resource additions consistent with the near-term resources recommended in the August 2023 board resolution

*The 2022-2023 Monitoring Report reflects SD-9: Integrated System Planning prior to the August 2023 policy revision.*

# SD-9 Integrated System Planning Strategic Directive

*SD-9 Version Prior to August 2023 Revision*

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.

# SD-9 Integrated System Planning Strategic Directive

SD-9 Version Prior to August 2023 Revision

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.

- OPPD is a member of the Southwest Power Pool (SPP), which ensures sufficient resources are available regionally **to reliably serve electric demand**.
- As a member of SPP, **OPPD is required to have generation capacity** to meet its 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 the summer, however, **OPPD expects this requirement to increase in coming years**.

**Planning Reserve Margin**

		2019	2020	2021	2022	2023
Summer	Required	12%	12%	12%	12%	15%
	Actual	16.1%	17.9%	20.8%	18.6%	16.8%
	Difference	4.1%	5.9%	8.8%	6.6%	1.8%
Winter	Required	12%	12%	12%	12%	15%
	Actual	32.6%	26.0%	26.0%	25.5%	31.8%
	Difference	20.6%	14.0%	14.0%	13.5%	16.8%

# SD-9 Integrated System Planning Strategic Directive

SD-9 Version Prior to August 2023 Revision

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.

- OPPD must plan new resources over an extended time horizon considering:

## Load Growth:

OPPD's system is experiencing **unprecedented load growth** with growing load across all customer classes, and especially among large industrial loads

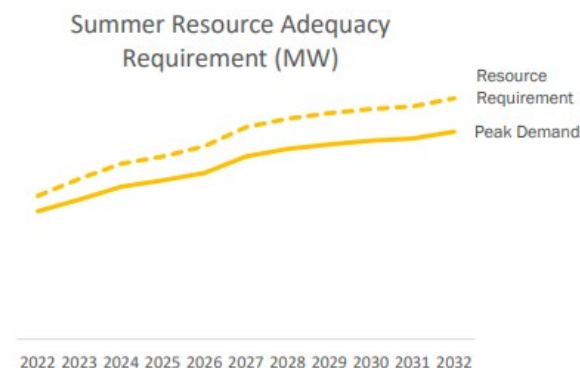
## Lead Time:

The current supply chain backlogs and interconnection process mean adding **new generation could take 5-8 years.**

## Changing Regional Policy

OPPD expects **increasing regional reserve requirements** for both the summer and winter seasons along with **adjustments to generation accreditation methodology** for both conventional and variable energy resources.

- Summer PRM is expected to increase to at least 16%.
  - Requires **664MW** of reserve capacity.
  - Creates a need for 1% higher summer capacity, or **41MW** of additional accredited capacity.



- Winter PRM is expected to increase to approximately 25%.
  - Requires **746MW** of reserve capacity.
  - Creates a need for **298MW** of additional accredited capacity.



# SD-9 Integrated System Planning Strategic Directive

SD-9 Version Prior to August 2023 Revision

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.

- In 2023 OPPD undertook a comprehensive resource planning effort to plan new generation resources to meet projected future needs
- OPPD's resource planning process optimized for least cost while maintaining and enhancing system reliability and resource adequacy
- OPPD recommended and received board approval for the addition of significant new quantities of generation resources
- Over 90% of energy generated from the new resources is projected from renewable sources, supporting OPPD's mission of providing affordable, reliable, and environmentally sensitive energy service to its customers

Resources (Nameplate or Peak Tested Capacity)	Range of Incremental Additions (MW)
Renewable Generation	1,000 – 1,500 MW
Energy Storage	Approximately 125 MW
Dual Fuel Combustion Turbines	600 – 950 MW
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

OPPD's Near-Term Generation Plan approved under Resolution No. 6582 on August 17<sup>th</sup>, 2023

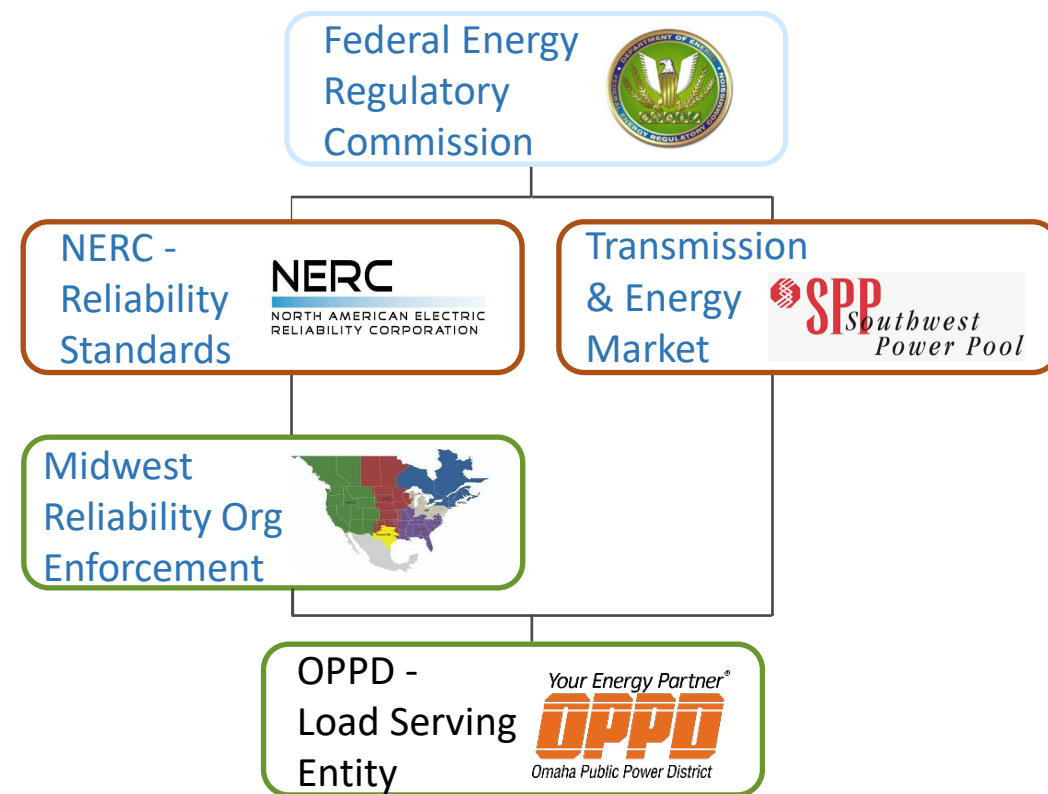
# SD-9 Integrated System Planning Strategic Directive

SD-9 Version Prior to August 2023 Revision

2

Ensure compliance with applicable planning related 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



# SD-9 Integrated System Planning Strategic Directive

*SD-9 Version Prior to August 2023 Revision*

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.

## Regional Policy

- OPPD is actively engaged in SPP policy efforts that will enhance regional reliability during extreme events including:
  - Improving regional resource adequacy and transmission system modeling to better predict system risks and establish system reserve requirements
  - Establishing fuel assurance requirements for conventional units
  - Create incentives for reliability through performance-based accreditation (PBA)
  - Accurately value the contribution of renewables and storage through Effective Load Carrying Capability (ELCC)

## OPPD Resources

- Design considerations for new firm dispatchable generation will specifically address resource adequacy in critical times of need:
  - Turtle Creek Station and Standing Bear Lake will have a design basis of -40F to ensure reliable operation in extreme cold conditions along with on-site fuel storage
  - Addition of on-site fuel storage for 320MW of existing generation will both ensure winter accreditation and improved resiliency of operations during regional natural gas limitations
  - Refueling strategy is being developed for OPPD's new facilities to mitigate supply imitations



# SD-9 Integrated System Planning Strategic Directive

SD-9 Version Prior to August 2023 Revision

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.

- 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

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

# 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 additional reflections on  
what has been  
accomplished ... or  
challenges or gaps**

