



2019 IRP Advisory Council

May 9, 2019



Important Notice



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IRP Advisory Council Meeting

May 9, 2019



- Loss-of-load analysis
- Power system operations: summer readiness
- Idaho Power's sustainability programs
- 2019 IRP Action Plan

Loss Of Load Analysis



Scott Wright
Lead Planning Analyst
May 9, 2019

Loss of Load Definition



- NERC Definition: A **Loss of Load Expectation (LOLE)** or **Loss of Load Probability (LOLP)**, analysis is typically performed on a system to determine the amount of capacity that needs to be installed to meet the desired reliability target, commonly expressed as an expected value, or LOLE of 0.1 days/year.
- Purpose of study: hourly reliability assessment

Agenda

- Loss of Load method
- Assumptions
- Results



Loss of Load Method



- Setup: Preferred Portfolio
 - Hydro generation assumptions
 - Demand forecast assumptions
- Use Aurora to model 100 iterations with random outages
 - Generator outages
 - Transmission line outages
- Study Period: Year 2025 for all hours

Hydro Generation Assumptions



- IRP planning assumptions
 - 50% exceedance hydro conditions
 - Expected generation: 8.7 million MWh
- Loss of Load analysis
 - 90% exceedance hydro conditions
 - Expected generation: 5.8 million MWh
- Difference: reduction of **2.9** million MWh of hydro generation

Demand Assumptions



- IRP planning assumptions
 - 50th percentile
 - Expected demand: 17.3 million MWh
- Loss of Load analysis
 - 95th percentile
 - Expected demand: 17.7 million MWh
- Difference: increase of **400,000** MWh in demand.

Generator Outage Assumptions



- Generators selected for outage
 - Brownlee (Units 1-4)
 - Hells Canyon (Units 1-3)
 - Oxbow (Units 1-4)
 - Bennett Mountain
 - Danskin (Units 1-3)
 - Langley Gulch
 - Jim Bridger (Units 2-4)
 - Valmy (Unit 2)

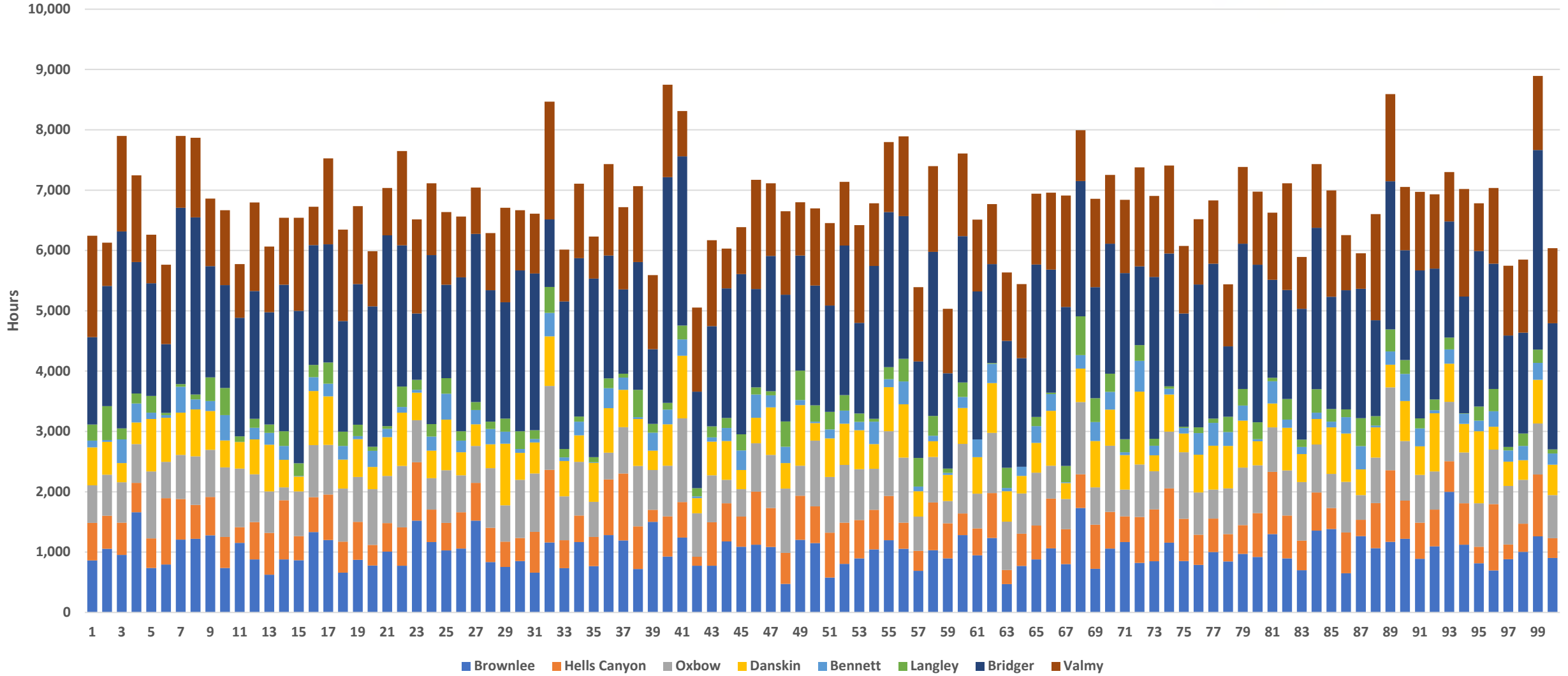
Generator Outage Assumptions (cont.)



- Outage occurrence: anytime
- Outage length: varies
- Probability of outage: varies by resource type
 - Brownlee: 1.1%–4.6% over the 100 iterations
 - Jim Bridger: 2.5%–8.5% over the 100 iterations

Example: 2% = 175 hours ($175 = 8,760 \times 0.02$)

Generator Outage Summary

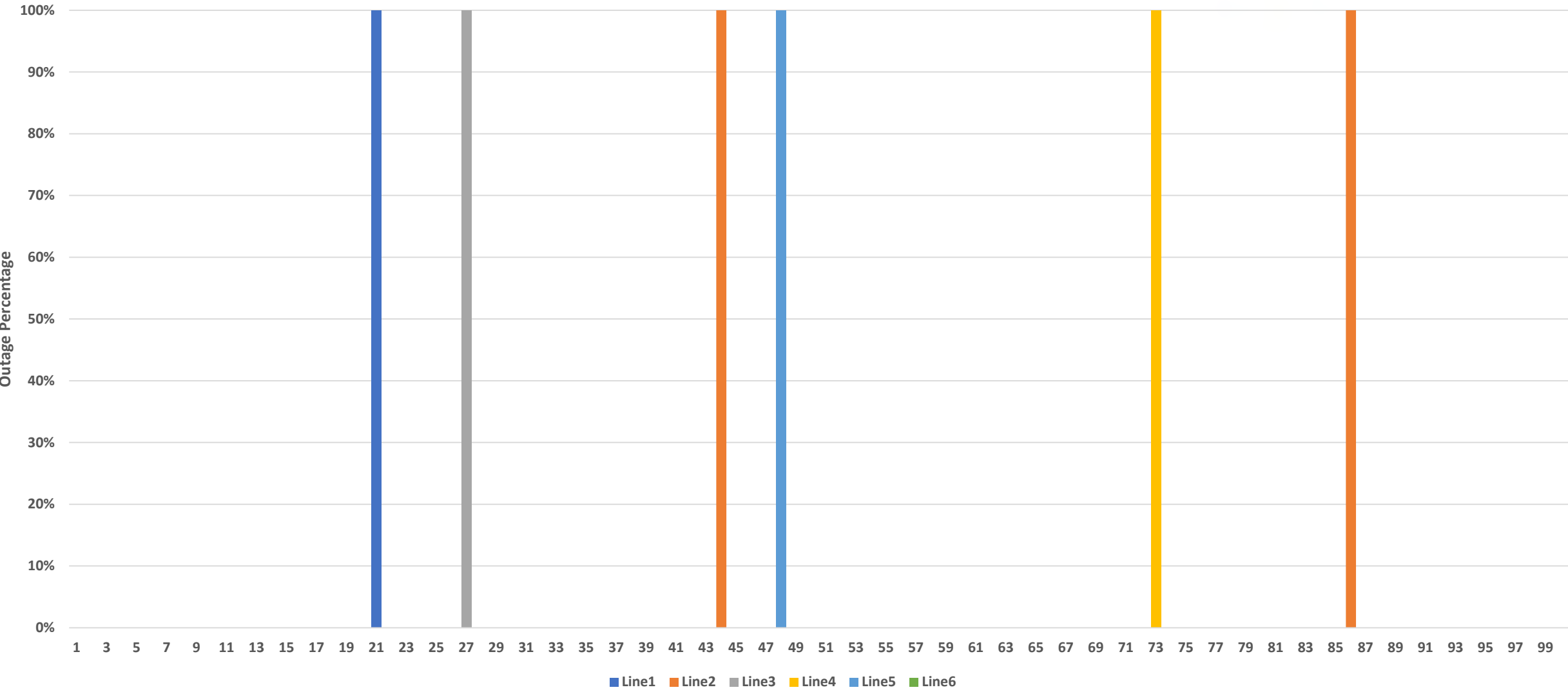


Transmission Outage Assumptions

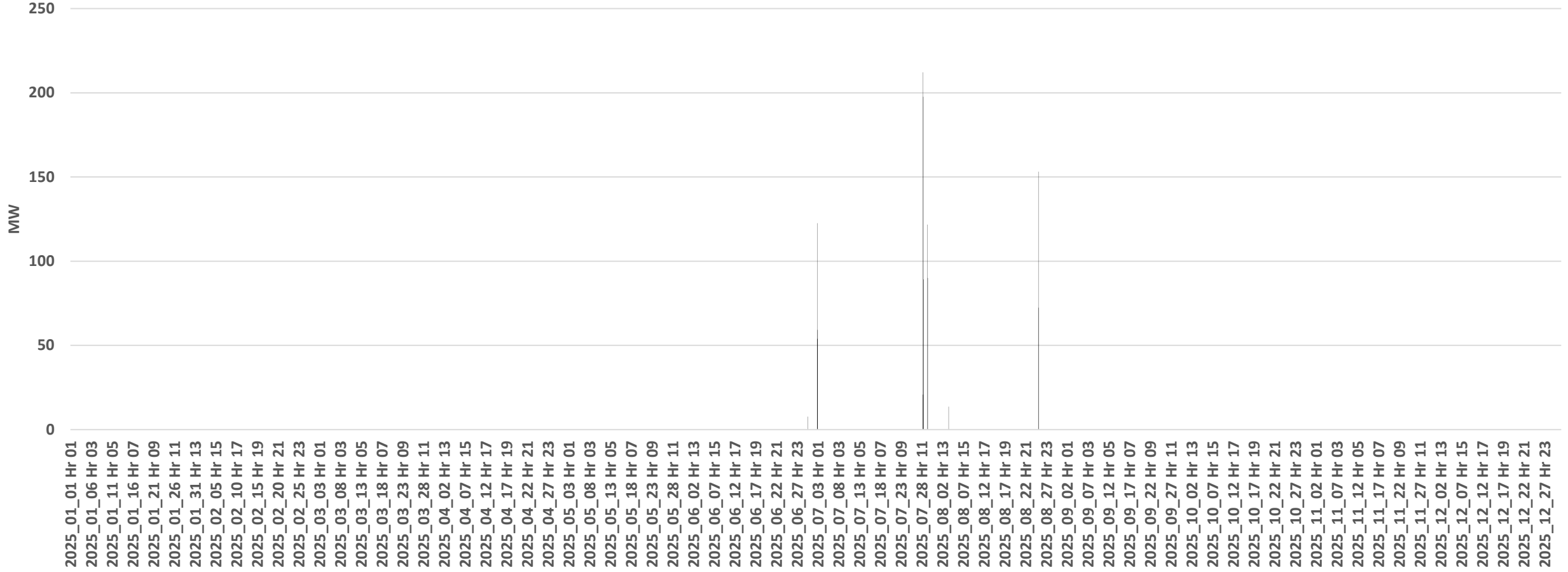


- All transmission import lines (6 lines)
 - Outage occurrence: July
 - Outage length: entire month
 - Probability of outage: <1%

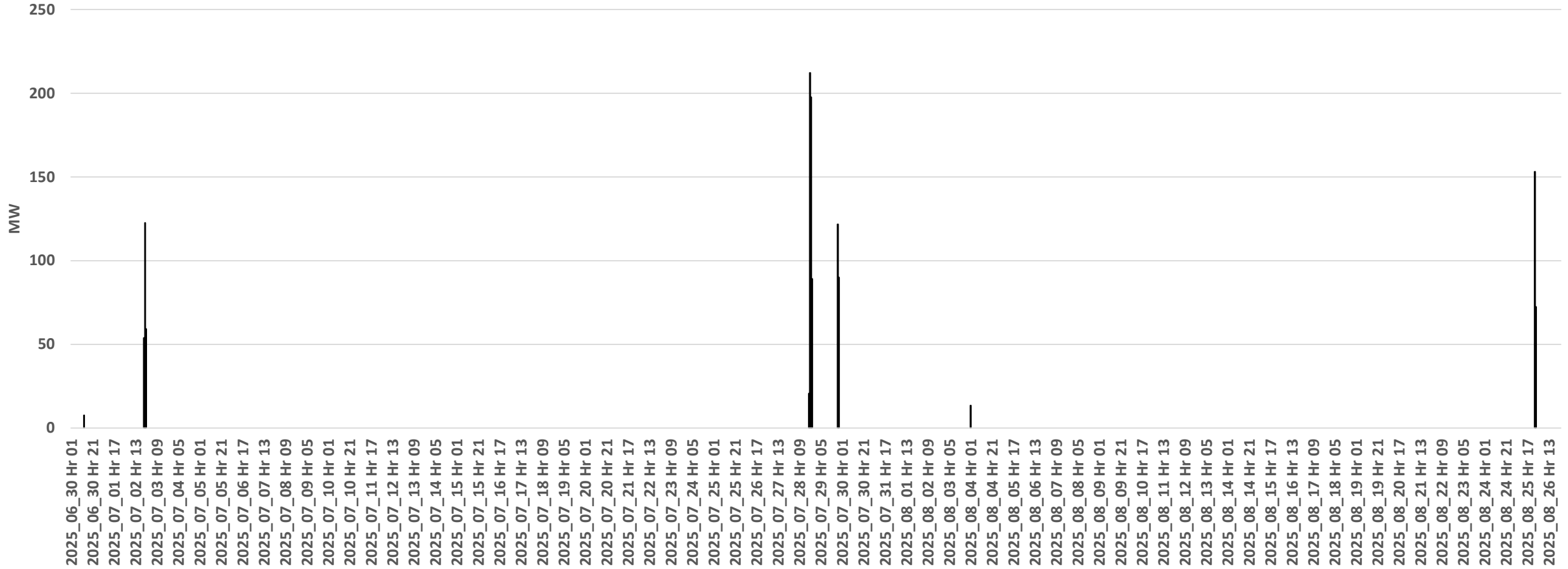
Transmission Outage Summary



Results



Results (cont.)




Results (cont.)



Month	Day	Hour	MW
June	30	13	8
July	2	21	54
July	2	22	123
July	2	23	59
July	28	18	21
July	28	19	212
July	28	20	198
July	28	21	89
July	29	21	122
July	29	22	90
August	4	1	14
August	25	24	153
August	26	1	72

Results (cont.)



- Acceptable reliability Loss of Load results
 - 0.1 days/year
- Preferred portfolio Loss of Load results
 - 0.01 days/year

2019 Summer Readiness



Ben Brandt
Load Serving Operations Director

Patrols and Maintenance



Infrastructure Investments

- Transmission Upgrades
 - Kinport – Populous: 345kV series capacitor replacement project
 - Increased transfer capacity
 - Willis – Lansing – Star: 138kV transmission line project
 - Increased reliability and load serving capacity
 - Skyway and Eldridge: new 138kV substations
 - Load serving capacity

Demand and Resources (2019 Outlook)



Hydro Conditions

	Brownlee Inflow Volume (MAF)	Hydro Generation (GWh)
2018	12.6	8.7
2019	12.7*	8.2
30-Year Median	11.1	7.1

* Projected (April 2019 long-term stream flow forecast)

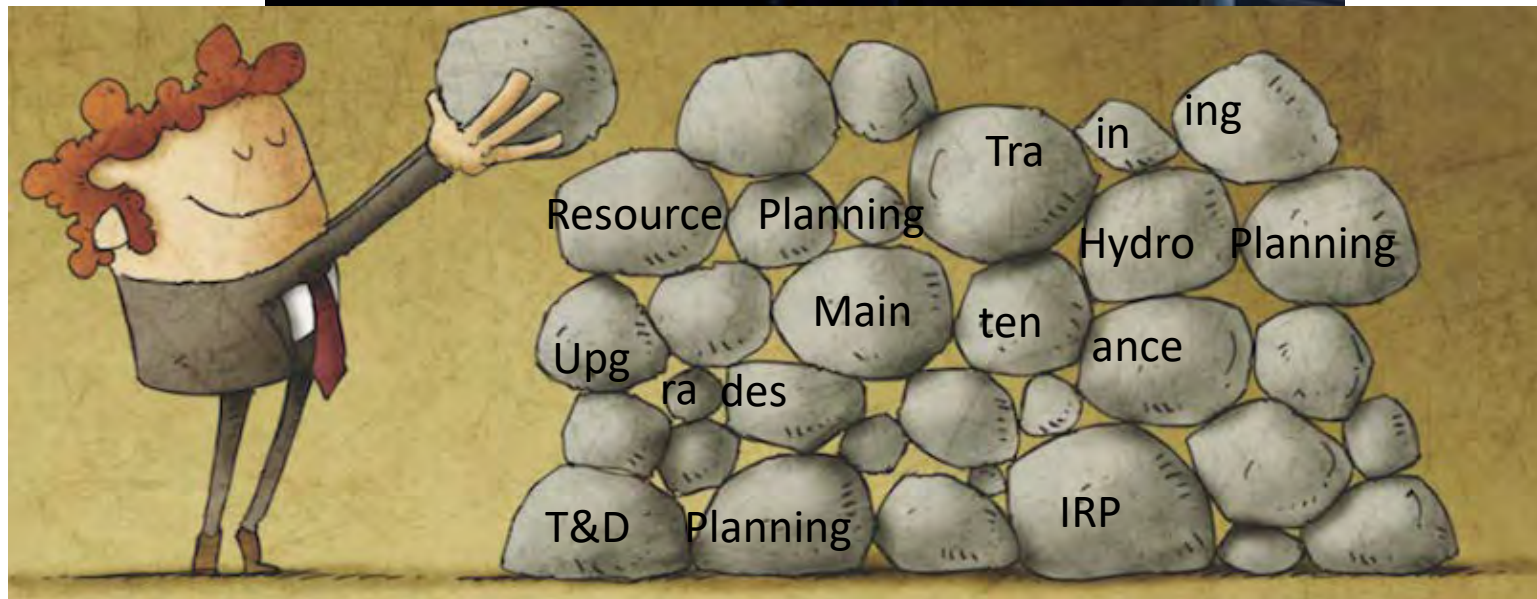
Demand 2019 in MW

	June-19	July-19	Aug-19
Forecasted system peak	3,635	3,634	3,416
Demand response	(390)	(390)	(337)
Contingency reserve	<u>207</u>	<u>206</u>	<u>198</u>
Total obligation	3,452	3,450	3,276
Available resources	3,250	3,282	3,176
2019 forecasted surplus/(deficit)			
1/20	(202)	(168)	(100)
1/10	29	63	135

Training

- Curriculum
 - Safety
 - Every day operations
 - Interconnection operations (IROLs)
 - Emergency operations
 - Seasonal operations
 - New tools and technology
- Simulations and scenarios
 - Dispatcher training simulator
 - Tabletop exercises
 - Coordinated regional exercises





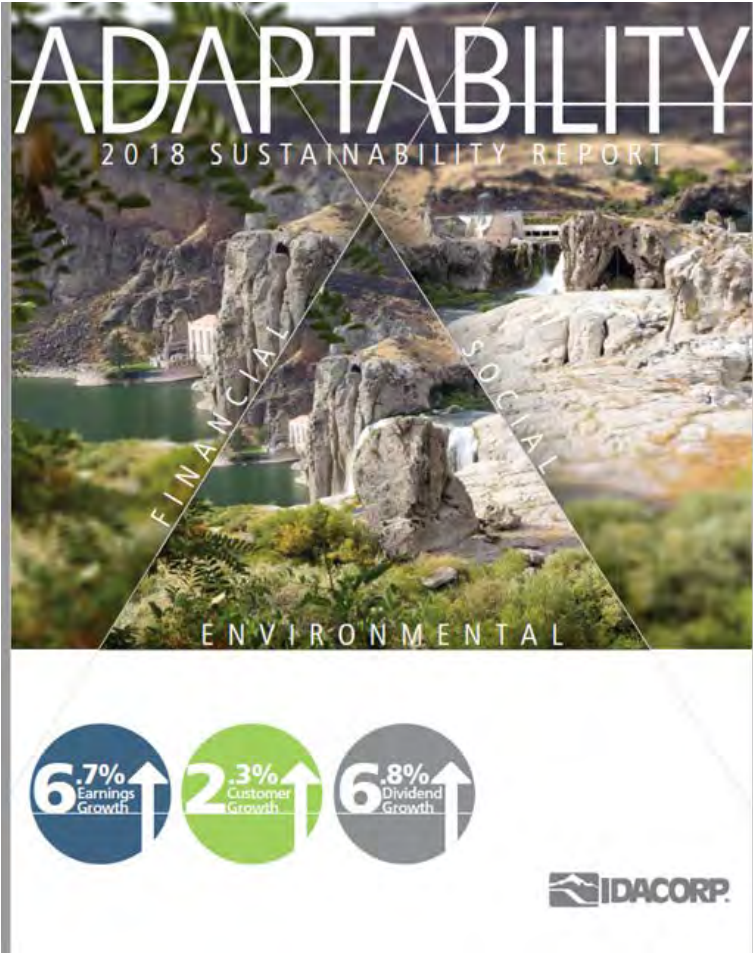
Questions ?

Sustainability at Idaho Power



John Bernardo, Sustainability Strategist
IRPAC Meeting – May 9, 2019

2018 Sustainability Report




ESG

- ▶ Environmental
- ▶ Social
- ▶ Governance
- ▶ Where's the Finance?




In Annual Report and Form 10-K



ADAPTABILITY

2018 Annual Report

6.7% Earnings Growth ↑	2.3% Customer Growth ↑	6.8% Dividend Growth ↑
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 IDACORP

Ongoing Sustainability Initiatives



- ▶ CHQ and Plaza I basement lighting
- ▶ Mini-Cassia Operations Center yard and garage lighting
- ▶ Continued promotion of EVs in fleet
 - ▶ Sedans: Nissan Leafs, Chevy Bolts
 - ▶ Trucks: Ford F-150 Hybrids
 - ▶ Forklifts
 - ▶ Utility Vehicles



Continued Development of a Climate Change Adaptation Plan

- ▶ Hydroelectric generation
- ▶ Electricity demand
- ▶ Wildfires
- ▶ Environmental compliance



2019 IRP

Action Plan (2019-2026)

Action Plan 2019-2026

- Jim Bridger early exit planning and coordination (2019-2022)
 - Plan and coordinate for targeted early exits 2022 and 2026
 - Continue to evaluate and coordinate for timing of exit/closure of remaining units
- Jackpot Solar PPAs (2019)
- North Valmy Unit 1 (2019)
- B2H
 - Permitting activities (2019-2021)
 - Preliminary construction activities, long-lead materials acquisition, construction (2019-2026)
- Prepare to issue contingent all-source RFP (2019-2021)
- Boardman (2020)
- Jim Bridger early exit (2022)
- Jackpot Solar (2022)
- Franklin Solar (2023)
- Contingent all-source RFP – procure or construct (2023-2026)
- North Valmy Unit 2 (2025)
- Jim Bridger early exit (2026)
- Demand response resource (2026)

