BEFORE THE UNITED STATES DEPARTMENT OF ENERGY

Federal Power Act Section 202(c) Emergency Order: Midcontinent Independent System Operator (MISO)	)))))	Order No. 202-25-3

Motion to Intervene and Request for Rehearing and Stay of Sierra Club, Natural Resources Defense Council, Michigan Environmental Council, Environmental Defense Fund, Environmental Law and Policy Center, Vote Solar, Public Citizen, Union of Concerned Scientists, the Ecology Center and Urban Core Collective (collectively, "Public Interest Organizations")

INTRODUCTION

On May 23, 2025, the Secretary of Energy, on behalf of the Department of Energy (collectively the "Department" or "DOE"), issued an order pursuant to Section 202(c) of the Federal Power Act, 16 U.S.C. § 824a(c) ("Section 202(c)") instructing the Midcontinent Independent System Operator ("MISO") and Consumers Energy Company ("Consumers" or "Consumers Energy") to "take all measures necessary to ensure that" the J.H. Campbell coal-fired power plant, in West Olive, Michigan (the "Campbell Plant," or "Campbell") "is available to operate" and directing MISO "to take every step to employ economic dispatch of the Campbell Plant to minimize cost to ratepayers," until August 21, 2025. Ex. 1 at 2 (DOE Campbell Order) (the "Order"). Prior to the issuance of the Order, Consumers Energy was preparing to retire the Campbell Plant on May 31, 2025, with the approval of the Michigan Public Service Commission ("Michigan Commission") and MISO.

The Department should grant rehearing and rescind this costly, harmful, unnecessary, and unlawful order. The Order was not requested by Consumers, MISO, or the Michigan Commission. On the contrary, all of those entities—who collectively bear primary responsibility over Michigan's electric system—have confirmed that retiring the Campbell Plant is economically and environmentally beneficial, and poses no significant risk to the reliability of the electric system in Michigan or elsewhere. The Order is based on a profoundly incorrect understanding of the handful of sources it selectively quotes. Those sources, and the Order itself, do not support the Order's claim of a resource adequacy emergency in any of the various locations at which the Order ambiguously gestures. In fact, each of those areas have more resources than are projected as needed to meet demand.

The Order also fails to grapple with the Campbell Plant's inability to reliably operate even in normal circumstances, let alone an emergency. Because the Campbell Plant is at the end of its useful life and Consumers has substantially reduced capital and major maintenance investments over the past few years in anticipation of retirement, the plant would require tremendous maintenance and investment to function consistently. The Department has no authority to compel Consumers to rehabilitate (and effectively reconstruct) the increasingly unreliable plant, nor to override the state's and utility's decision to replace the plant with less expensive and cleaner sources. The Order is thus beyond the Department's authority.

On top of all these failures, the Order makes no effort to limit the significant environmental and public health harms caused by burning coal at the plant, despite explicit instruction from Congress to do so. Campbell harms its neighbors—the same Michiganders that decided to close the plant. The Department has, moreover, thus far done all this behind closed doors, without making public the information

demanded of MISO and Consumers, despite Departmental procedure requiring transparency.

At its heart, the Order represents an effort to replace the market- and state-led planning process provided by statute with an ill-advised and misinformed exercise in federal command-and-control. That effort disserves the public and violates the law. The Order must be rescinded.

I. Statement of Issues and Specification of Error

The undersigned Public Interest Organizations move to intervene and request rehearing and a stay pursuant to section 313(a) of the Federal Power Act, 16 U.S.C. § 825*l*(a), and the applicable rules of practice and procedure, U.S. Dep't of Energy, *DOE 202(c) Order Rehearing Procedures* (last visited June 18, 2025), https://www.energy.gov/ceser/doe-202c-order-rehearing-procedures (attached as Ex. 30) [hereinafter "DOE Rehearing Procedures"]; 18 C.F.R. §§ 385.214, 385.713,[1] based upon the following errors and issues:

A. The Department has not demonstrated that an emergency exists that authorizes it to issue the Order. 16 U.S.C. §§ 824a(a)–(c), 824o; 10 C.F.R. § 205.371–.375; *Emergency Interconnection of Elec. Facilities and the Transfer of Elec. to Alleviate an Emergency Shortage of Elec. Power,* 46 Fed. Reg. 39,984 (Aug. 6, 1981); *Hughes v. Talen Energy Mktg., LLC*, 578 U.S. 150 (2016); *FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120 (2000); *Jarecki v. G.D. Searle & Co.*, 367 U.S. 303 (1961); *Citizens Action Coal. v. FERC*, 125 F.4th 229 (D.C. Cir. 2025); *Conn. Dep't of Pub. Util. Control v. FERC*, 569 F.3d 477 (D.C. Cir. 2009); *Alcoa Inc. v. FERC*, 564 F.3d 1342 (D.C. Cir. 2009); *Cal. Indep. Sys. Op. Corp. v. FERC*, 372 F.3d 395 (D.C. Cir. 2004); *Richmond Power and Light v. FERC*, 574 F.2d 610 (D.C. Cir. 1978); *Otter Tail Power Co. v. Fed. Power Comm'n*, 429 F.2d 232 (8th Cir. 1970).

B. (1) Even if the emergency described by the Order did exist—it does not—the Department has not demonstrated a reasoned basis for its determination that additional dispatch of Campbell is necessary to "best meet the emergency and serve the public interest." 16 U.S.C. § 824a(c); 10 C.F.R. § 205.373; *Dep't of Homeland Sec. v. Regents of the Univ. of Calif.*, 591 U.S. 1 (2020); *Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208 (2009); *Allentown Mack Sales & Service, Inc. v. NLRB*, 522 U.S. 359 (1998); *Motor Vehicle Mfrs. Ass'n of the U.S. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S.

[1] *See* Ex. 8 (Email from Cooke to Alle-Murphy) (recommending that "a party seeking rehearing can look for procedural guidance to [Federal Energy Regulatory Commission's ("FERC")] Rules of Practice and Procedure, 18 CFR Part 385.").

29 (1983); *NAACP v. Fed. Power Comm'n*, 425 U.S. 662 (1976); *Gulf States Utils. Co. v. Fed. Power Comm'n*, 411 U.S. 747 (1973); *Otter Tail Power Co. v. United States*, 410 U.S. 366 (1973); *California v. Fed. Power Comm'n*, 369 U.S. 482 (1962); *Pa. Water & Power Co. v. Fed. Power Comm'n*, 343 U.S. 414 (1952); *Nat'l Shooting Sports Found., Inc. v. Jones*, 716 F.3d 200 (D.C. Cir. 2013); *Chamber of Com. of the U.S. v. Secs. & Exch. Comm'n*, 412 F.3d 133 (D.C. Cir. 2005); *Sierra Club v. Env't. Prot. Agency*, 353 F.3d 976, 980 (D.C. Cir. 2004); *Wabash Valley Power Ass'n, Inc. v. FERC*, 268 F.3d 1105 (D.C. Cir. 2001). And (2) the Order is unlawfully ambiguous, impermissibly vague, and does not provide fair notice of what MISO, Consumers Energy, and others are required to do. 16 U.S.C. § 824a(c); *Fed. Commc'ns Comm'n v. Fox Telev. Stations, Inc.*, 567 U.S. 239 (2012); *Grayned v. City of Rockford*, 408 U.S. 104 (1972); *Allentown Mack Sales & Service, Inc. v. NLRB*, 522 U.S. 359 (1998).

C. The Order's availability requirements exceed the Department's authority. 16 U.S.C. §§ 824(a)–(b), 824a(b)–(c); *Gallardo v. Marstiller*, 596 U.S. 420 (2022); *Hughes v. Talen Energy Mktg., LLC*, 578 U.S. 150 (2016); *FERC v. Elec. Power Supply Ass'n*, 577 U.S. 260 (2016); *Gomez-Perez v. Potter*, 553 U.S. 474 (2008); *Fed. Power Comm'n v. Fla. Power & Light Co.*, 404 U.S. 453 (1972); *Conn. Light & Power v. Fed. Power Comm'n*, 324 U.S. 515 (1945); *Conn. Dep't of Pub. Util. Control v. FERC*, 569 F.3d 477 (D.C. Cir. 2009).

D. The Department has unlawfully failed to ensure that the Order compels generation only during hours necessary to meet the emergency and serve the public interest, that operations are consistent with any applicable environmental laws to the maximum extent practicable, and that any adverse environmental impacts are minimized. 16 U.S.C. § 824a(c)(2); *Fla. Power & Light Co. v. FERC*, 88 F.3d 1239 (D.C. Cir. 1996); *City of New Orleans v. FERC*, 67 F.3d 947 (D.C. Cir. 1995).

E. The Order and the Department's continued conduct are inconsistent with Departmental procedure, depriving the public and the Public Interest Organizations of fair notice and an adequate record. *Morton v. Ruiz*, 415 U.S. 199 (1974); *Mine Reclamation Corp. v. FERC*, 30 F.3d 1519 (D.C. Cir. 1994); *United States v. Nova Scotia Food Prods. Corp.*, 568 F.2d 240 (2d Cir. 1977); DOE Rehearing Procedures.

II. INTERVENORS' INTERESTS

As further discussed below, each of the Public Interest Organizations has interests that may be directly and substantially affected by the outcome of this proceeding. Each party may therefore intervene in this proceeding. DOE Rehearing Procedures; *see also* 18 C.F.R. § 385.215.

Each of the Public Interest Organizations also demonstrates a concrete injury arising from the Order that is redressable by a favorable outcome. Each organization is therefore aggrieved by the Department's Order and may properly apply for rehearing. *See* Federal Power Act, § 313(a), 16 U.S.C. § 825*l*(a); *Wabash Valley Power Ass'n, Inc. v. FERC*, 268 F.3d 1105, 1112 (D.C. Cir. 2001); *NextEra Energy Res. v. ISO New Eng., Inc.*, 157 FERC ¶ 61,059, at P 5 (2016).

A. Sierra Club

Sierra Club and its members are aggrieved by the Order. Over 17,500 Sierra Club members reside in Michigan; over two dozen of those members reside within just three miles of the Campbell Plant and thousands more live in nearby townships and further downwind. Sierra Club members are harmed by pollution produced by operating the Campbell Plant. The Order to operate the plant beyond its planned retirement date will subject Sierra Club members to additional air and water pollution in the areas where they live and recreate. Sierra Club members also hear the plant operating and hear and see open coal trains delivering coal to the plant. The Order's impact on the health, aesthetic, and recreational interests of Sierra Club members is heightened by the Order's failure to address the Federal Power Act's requirements for environmental protection that apply even in true emergencies (discussed in section IV.D below). In addition, Sierra Club members are ratepayers who may be subject to higher electric bills as a result of the Department's Order.

Sierra Club has a demonstrated organizational commitment to the above-described interests. Sierra Club's Beyond Coal Campaign seeks to reduce the pollution currently being produced by coal-fired power plants such as Campbell, and to reduce energy bills by ensuring that ratepayers do not fund the cost of continuing to operate uneconomic coal plants like Campbell. To those ends, Sierra Club has participated in multiple regulatory proceedings relating to the Campbell Plant. *See, e.g.*, Michigan Comm'n Case No. U-21224 (Consumers application for an increase in its electricity rates); Michigan Comm'n Case No. U-21090 (Consumers 2021 Integrated Resource Plan ("IRP")); Sierra Club Comments to Michigan Dep't of Env't, Great Lakes, and Energy on Nat'l Pollution Discharge Elimination System ("NPDES") Permit No. MI10001422 (May 21, 2021); Michigan Comm'n Case No. U-20165 (Consumers 2018 IRP); Sierra Club, Earthjustice, and Great Lakes Environmental Law Center Comments to Michigan Dep't of Env't, Great Lakes, and Energy on NPDES Permit No. MI10001422 (Apr. 22, 2018).

If the Order stands, Sierra Club will sustain an independent organizational injury in addition to those sustained through its members. As described in detail below, Campbell's planned retirement date of May 31, 2025 was the result of a settlement reached in Consumers' 2021 Integrated Resource Plan proceeding before the Michigan Commission. Sierra Club was heavily involved in the Integrated Resource Plan proceeding from its earliest stages and is a signatory to the

settlement. Sierra Club invested in participating (through staff, volunteers, and members) in multiple stakeholder meetings held by Consumers in 2020 to inform its Integrated Resource Plan filing, galvanized hundreds of its members to submit comments to Consumers, formally intervened once Consumers filed its Integrated Resource Plan, and sponsored extensive expert testimony in that proceeding to demonstrate that the Campbell Plant's existing and likely future costs fully justified its closure by 2025. The Order's attempt to override the settlement undermines Sierra Club's investments in the Integrated Resource Plan proceeding and its reliance on the results of the settlement, inflicting procedural and organizational harm on Sierra Club.

B. Natural Resources Defense Council

Natural Resources Defense Council ("NRDC") is a national non-profit membership organization whose mission includes ensuring the rights of all people to clean air, clean water, and healthy communities. NRDC and its members are aggrieved by the Order, which threatens those fundamental rights. Over 15,781 NRDC members reside in Michigan and approximately 162 of those members reside within ten miles of the Campbell plant. These NRDC members are harmed by the order to operate the Campbell plant beyond its planned retirement date because continued operations will subject NRDC members to air and water pollution in the areas where they live, work, and recreate. NRDC members are also exposed to the noise and visual impacts of the plant's operation, including the delivery of coal via open coal trains. The impact of the Order on the health, aesthetic, and recreational interests of NRDC members is compounded by the Order's failure to address the Federal Power Act's requirements for environmental protection that apply even in true emergencies (discussed in section IV.D below). In addition, NRDC members are ratepayers in the MISO region who will be subject to higher electric bills as a result of the Order.

NRDC has a longstanding organizational commitment to protect the interests of its members and to reducing pollution caused by coal-fired power plants such as Campbell. To that end, NRDC has participated in multiple regulatory proceedings relating to the Campbell Plant. *See, e.g.*, Michigan Comm'n Case No. U-21224 (Consumers Energy Co. application for an increase in its electricity rates); Michigan Comm'n Case No. U-21090 (Consumers 2021 IRP); Michigan Comm'n Case No. U-20165 (Consumers 2018 IRP); Michigan Comm'n Case No. U-21585 (Consumers Electric Rate Case); Michigan Comm'n Case No. U-21816 (Consumers Renewable Energy Plan). NRDC also was a party to the 2022 settlement agreement with Consumers Energy for the closure of the Campbell Plant and the end of Consumers' use of coal by May 31, 2025.

C. Michigan Environmental Council

Michigan Environmental Council ("MEC") is a statewide environmental nonprofit organization founded in 1980 and based in Lansing, Michigan. MEC has over 100 member groups and a collective membership of over 300,000 people who live, recreate, and consume energy in Michigan. On behalf of its members, MEC advocates at the local, state, and federal level for lasting protections of its members' health and economic well-being, as well as protections for Michigan's air, water, and land. This includes promoting policies that protect Michigan residential utility ratepayers, increase adoption of clean energy sources, reduce harmful pollution, and address the causes of climate change.

Since 1999, MEC's advocacy on these issues has included participation as an intervening party in hundreds of Michigan Commission cases to represent the interests of its members in lower-cost, cleaner energy generated from renewable sources. In 2022, MEC was a party to the settlement agreement with Consumers Energy that would result in the closure of the Campbell Plant and end Consumers' use of coal by May 31, 2025. This settlement was designed to provide reliable energy at significantly lower cost, while also improving public health and reducing harmful environmental impacts.

D. Environmental Defense Fund

The Environmental Defense Fund ("EDF") is a nonprofit membership organization with hundreds of thousands of members nationwide, including more than nine thousand members in Michigan, whose mission is to build a vital Earth for everyone by preserving the natural systems on which all life depends. Guided by expertise in science, economics, law, and business partnerships, EDF seeks practical and lasting solutions to address environmental problems and protect human health, including in particular by addressing pollution from the power sector. On behalf of its members, EDF works with partners across the private and public sectors to engage in utility regulatory forums at the federal level and throughout the United States to advocate for policies that will create an affordable, reliable, and low pollution energy system. The Order harms EDF members because it will result in increased pollution that will impact the health of people and nature and because it will increase energy costs for EDF members throughout the MISO region.

E. Environmental Law and Policy Center

Environmental Law and Policy Center ("ELPC") is a not-for-profit environmental organization with members, contributors, and offices throughout the Midwest, including in Michigan. Among other things, ELPC advocates before the Michigan Commission and the Federal Energy Regulatory Commission for clean,

reliable energy generation in order to reduce ratepayer costs and improve environmental outcomes. ELPC has a long history of participating in regulatory proceedings involving Consumers. *See, e.g.*, Michigan Comm'n Case No. U-21224 (Consumers Energy Co. application for an increase in its electricity rates); Michigan Comm'n Case No. U-21090 (Consumers 2021 IRP); Michigan Comm'n Case No. U-20165 (Consumers 2018 IRP); Michigan Comm'n Case No. U-20984 (Consumers Renewable Energy Plan); Michigan Comm'n Case No. U-21585 (Consumers Electric Rate Case); Michigan Comm'n Case No. U-21816 (Consumers Renewable Energy Plan). With respect to Campbell, ELPC played a key role in the 2021 Integrated Resource Plan proceeding from its earliest stages and is a signatory to the settlement agreement in which Consumers committed to retiring the Plant by May 31, 2025.

Since the settlement, ELPC has played a role in upholding the public's interest and refining the details as to the future of the Campbell site. In partnership with other stakeholders, ELPC has engaged and will continue to engage in negotiations with Consumers and other community members in pursuit of conservation, recreation, and clean energy goals at the site. ELPC members in Michigan will be harmed by the Order, as it delays the plant's retirement and may subject members to higher electric bills. Further, the Order's attempt to override the settlement undermines ELPC's investment in the Integrated Resource Plan proceeding and its reliance on the results of the settlement, inflicting procedural and organizational harm on ELPC.

F. Vote Solar

Vote Solar is an independent 501(c)(3) nonprofit working to re-power the U.S. with clean energy by making solar power more accessible and affordable through effective policy advocacy. In over half of the country, Vote Solar seeks to promote the development of solar at every scale, from distributed rooftop solar to large utility-scale plants. Vote Solar has over 90,000 members nationally, including over 2,700 members in Michigan. Vote Solar is not a trade organization, nor does it have corporate members. Vote Solar has provided testimony and comments in many regulatory dockets in front of the Michigan Commission, including the 2021 Integrated Resource Plan proceeding. Vote Solar is committed to promoting clean, renewable energy and transitioning away from coal generation.

G. Public Citizen

Established in 1971, Public Citizen is a national, not-for-profit, non-partisan, research and advocacy organization representing the interests of household consumers. Public Citizen has over 500,000 members and supporters across the country, including those who pay electric utility bills in Michigan and in MISO. Public Citizen is active before the Federal Energy Regulatory Commission promoting just and reasonable rates, and supporting efforts for utilities to be

accountable to the public interest. Its interests in this proceeding are unique and cannot be represented by any other party. Financial details about the organization are on its website. Public Citizen, "Annual Reports," www.citizen.org/about/annual-report/.

H. Union of Concerned Scientists

The Union of Concerned Scientists ("UCS") is a national non-profit organization headquartered in Cambridge, Massachusetts, with additional offices in Washington, D.C.; Berkeley, California; and Chicago, Illinois. UCS is a public interest organization with more than 55 years of experience advocating for science-based policies, including responsible energy policy and utility oversight at the state and federal levels, and with over a decade working in Michigan on these issues. UCS has approximately 5,800 supporters, 1,800 members, and 500 Science Network members that live, use electricity, and pay electric bills in Michigan, including in Consumers Energy's service territory. UCS intervened and participated fully as a party in Consumers' 2021 Integrated Resource Plan proceeding, including authoring expert testimony and supporting resolution of that case through the settlement agreement that included retirement of Campbell.

I. The Ecology Center

The Ecology Center is a Michigan-based nonprofit organization headquartered in Ann Arbor, Michigan, with additional offices in Detroit, Michigan. Ecology Center is a public interest organization with more than 50 years of experience advocating for clean production, healthy communities, environmental justice, and a sustainable future. Ecology Center works at the local, state, and federal level. Its programs address systemic sources of poor health and environmental degradation through unique partnerships with environmental health and environmental advocates. Ecology Center has over 6000 members and supporters, that live, use electricity, and pay electric bills in Michigan, including in Consumers Energy's service territory. Ecology Center intervened and participated fully as a party in Consumers' 2021 Integrated Resource Plan proceeding, and supported resolution of that case through the settlement agreement that included retirement of Campbell.

J. Urban Core Collective

The Urban Core Collective ("UCC") is a member-based organization in Grand Rapids, Michigan. As well as advocacy in strengthening democracy, leadership development and education reform, much of UCC's work has been in climate and environmental justice, specifically in policy which moves toward a transition to renewable sources of energy, energy that is affordable and reliable and which does not contribute to climate change. Our constituents are in the front lines, being affected first and most severely by its impacts. The UCC has intervened in Michigan Public Service Commission cases such as the Consumers Energy Electric

Rate Case (U-21585), the DTE Gas Rate Case (U-21291), and will be filing to intervene in Consumers Energy's electric rate case (Case No. U-21870) recently filed.

The UCC was heavily involved in engaging community members and collaborating with other stakeholders during the last Consumers Energy Integrated Resource Plan. The UCC advocated for the closing of the Campbell Coal Plan.

The UCC contests the reopening of the Campbell coal plant. Firstly, continuing to rely on coal-fired power contradicts efforts towards environmental justice. Communities near the plant, especially in Grand Rapids and surrounding areas, face heightened exposure to health risks like respiratory issues and heart disease due to pollution. Coal plants emit significant amounts of pollutants like sulfur dioxide, nitrogen oxides, and particulate matter, which can exacerbate health problems for vulnerable populations. The decision to keep the plant operational undermines the transition to cleaner energy sources, affecting air quality and contributing to climate change.

Lastly, there are other options to provide Michigan residents and the business community with clean, reliable and affordable energy which does not come from coal such as the Campbell coal plant.

III. BACKGROUND

A. The Campbell Plant Does Not Benefit Consumers Energy's Customers.

1. Campbell Is Old, Unreliable, Dirty, and Expensive.

Located in West Olive, Michigan, 30 miles west of Grand Rapids, Campbell is a power plant that relies on burning coal to generate electricity. The plant has three generating units, which are between 45 and 63 years old. Ex. 11 at 7 (Blumenstock 2024 Direct Testimony). Units 1 and 2 are beyond the typical operational life of coal units, Ex. 3 at 15 (Powers Decl.) (*citing* Exs. 63 (Palgrave Handbook) and 64 (IEA Report)), and all three units have experienced long and recurrent outages in recent years that reflect aged, worn components that are expensive and may be difficult to repair or replace. *Id.* at 4, 15. In the tables below, and with further context in his declaration, Public Interest Organizations' expert engineer identifies the duration and reasons for the units' longest outages in the past two years based on Consumers' filings with the Michigan Commission. *Id.* at 5.

Longest 2024 Outages by Type

Unit	Outage Description	Total Duration (hours)
1	• Degraded governing valve (3 outages) • Worn leaking superheater tube (1 outage)	911 491
2	• Obsolete boiler feedwater pump failure (1 outage) • Degraded valve(s) malfunction (3 outages) • Worn equipment leaks, various (4 outages)	1,417 1,723 854
3	• Worn/failed turbine turning gear (1 outage) • Worn tube leak (1 outage)	1,104 356

The numbers above are rounded to the nearest hour.

Longest 2023 Outages by Type

Unit	Outage Description	Total Duration (hours)
1	• Worn leaking valve and superheater tube (2 outages)	661
2	• Obsolete boiler feedwater pump failure (4 outages) • Worn equipment leaks (3 outages)	3,445 571
3	• Worn leaking boiler/superheater tubes (3 outages) • Worn/vibrating turbine bearings (1 outage)	1,857 426

The numbers above are rounded to the nearest hour.

The outages demonstrate Campbell's increasing inability to consistently perform even under normal conditions, let alone to meet an emergency. All three Campbell units have been unexpectedly unable to produce power during significant portions of recent years (known as the units' "forced outage rate"[2]). *Id.* at 4 (*citing* Consumers' filings with the Michigan Commission). In 2023, the units' forced outage rates were 18.66% (Unit 1), 57.32% (Unit 2), and 22.41% (Unit 3). *Id.* In 2024, the rates were 14.84% (Unit 1), 48.07% (Unit 2), and 19.25% (Unit 3). *Id.* By contrast, the national average forced outage rate for coal-burning units is approximately 12%. *Id.*

Campbell has been a significant source of pollution. Each year when operating, the plant emitted around one hundred thousand pounds of air toxics, hundreds of thousands of pounds of particulate matter, many millions of pounds of nitrogen oxides and sulfur dioxide, and over ten billion pounds of carbon dioxide. *See* U.S. Environmental Protection Agency ("EPA"), ECHO, https://echo.epa.gov/air-pollutant-report-new?fid=110000411108 (last visited June 18, 2025); *see also* EPA, eGRID, https://www.epa.gov/egrid/egrid-pm25 (Jan. 15, 2025). In fact, the plant

[2] Consumers Energy typically uses the phrase "random outage rate" in place of "forced outage rate."

emitted more sulfur dioxide and particulate matter than any other plant in Consumers' generation fleet. Ex. 23 at 10–12 (Bilsback Direct Testimony). Campbell also used approximately *one billion gallons* of water per day from Lake Michigan while discharging significant amounts of contaminated wastewater back into the lake. *See* Ex. 3 at 21 (Powers Decl.) (*citing* Ex. 48 (2021 CWA Permit)). In 2023, for example, the plant discharged approximately 96,000 pounds of pollution, including 10,000 pounds of toxic metals, into Lake Michigan. EPA, ECHO, https://echo.epa.gov/detailed-facility-report?fid=110000411108 (last visited June 18, 2025). Additionally, burning coal at the plant creates toxic coal ash. The plant already holds roughly 6.2 million cubic yards of coal ash in an on-site landfill. Ex. 47 at 4 (2024 Campbell Coal Ash Inspection Report).

Campbell's pollution harms its neighbors. Prior expert analysis of the Campbell units' pollution found that retiring the plant would eliminate annual emissions into the air of 538 tons of particulate matter, 13 tons of volatile organic compounds, 2,918 tons of nitrogen oxides, 5,244 tons of sulfur dioxide, and 8.2 million tons of carbon dioxide emissions based on 2019 operational levels. Ex. 23 at 11 (Bilsback Direct Testimony). Each year, those emissions led to modeled mortality impacts of 36–81 premature deaths and $389–$879 million in health impact costs, including non-fatal respiratory and cardiovascular harms affecting people. *Id.* at 15. According to the Michigan Department of Environment, Great Lakes, and Energy, the census tract in which Campbell is located has far more "adverse environmental factors"—like water pollution and proximity to toxic waste dumps—than the rest of the state, and also has a high socioeconomically vulnerable population compared to the rest of the state. Mich. Dep't of Env't, Great Lakes, and Energy, MiEJScreen, https://www.michigan.gov/egle/maps-data/miejscreen (last visited June 18, 2025). Nearby Grand Rapids has communities that are significantly overburdened by environmental pollution and populations that are uniquely sensitive to pollution due to socioeconomic factors, high rates of disease, and other factors. *Id.*

Campbell is also an expensive plant to run. In 2021, Consumers projected that retiring Campbell in 2025 would avoid $365,008,000 in capital expenditures and major maintenance costs. Ex. 13 at 3–4 (Kapala Direct Testimony) (summing "avoided capital expenditures" and "avoided major maintenance expenses" for Units 1–3). At that time, the cost of power generated by Campbell—including capital, operation, maintenance, and fuel costs—was $33.64 per megawatt hour ("MWh"). Ex. 49 (2025 Energy Innovation Dataset) (compiling data from the U.S. Energy Information Administration). Campbell has gotten even more expensive to run since then. In 2024, the cost of Campbell's power rose to $40.65 per MWh, a 21% increase over the 2021 cost. *Id.* This means the cost of Campbell's power grew significantly faster than inflation (roughly 16%) over the same period. Ex. 50 at 3 (2025 Energy Innovation Coal Cost Report); *see also* Ex. 51 at 12 (2023 Energy Innovation Coal Cost Report) (describing the same methodology used in the 2025 report).

All of these harms could be avoided by retiring Campbell. As further discussed below, Consumers Energy wanted to retire the plant on May 31, 2025. The Michigan Commission and the regional grid operator MISO approved the retirement.

2. Consumers Energy Is a Utility in MISO.

Consumers Energy is the second largest electric utility in Michigan. The utility serves 1.9 million customers across a broad swath of the state's Lower Peninsula.

To meet its customers' energy needs, Consumers owns and operates, or contracts for, a wide array of resources, including gas, oil, hydroelectric, renewables, and hydro-pumped storage. *See* Ex. 27 (2028/2029 Consumers Capacity Demonstration); Ex. 11 at 7 (Blumenstock 2024 Direct Testimony). Consumers also deploys load-modifying resources that significantly reduce energy needs during periods of peak demand. Ex. 27 at PDF 50 (2028/2029 Consumers Capacity Demonstration).

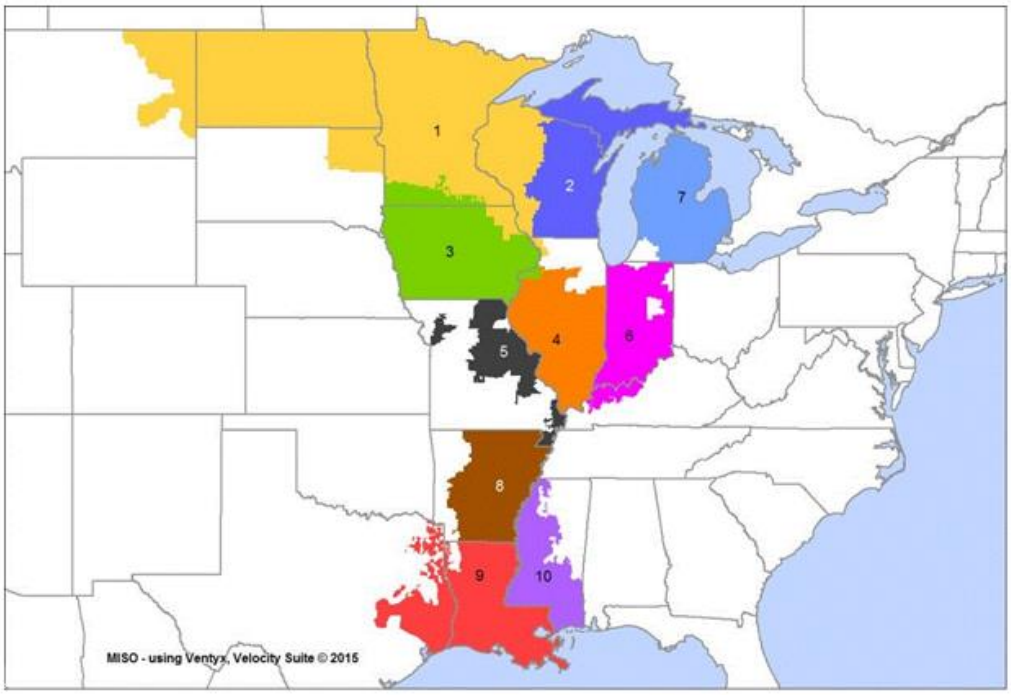
Consumers is also a MISO member, meaning among other things that it participates in MISO-run wholesale interstate markets including energy, ancillary service, and capacity markets, and that it allows MISO to operate its transmission grid. Like most other electric utilities in Michigan, Consumers elected to join MISO (then known as the Midwest Independent Transmission System Operator, Inc.) in the years that followed FERC's issuance of Order No. 888 in 1996 (creating a framework for the creation of Regional Transmission Organizations), MISO's founding in 1998, and FERC's issuance of Order No. 2000 in 1999 (encouraging transmission-owning electric utilities to join Regional Transmission Organizations). *See generally Promoting Wholesale Competition Through Open Access Non-Discriminatory Transmission Services by Public Utilities and Recovery of Stranded Costs by Public Utilities and Transmitting Utilities*, Order No. 888, 61 Fed. Reg. 21,540 (May 10, 1996); *Regional Transmission Organizations*, Order No. 2000, 89 FERC ¶ 61,285 (1999).

B. Multiple Authorities Already Protect Resource Adequacy.

As discussed below, Consumers has consistently maintained resource adequacy within its own service territory. Additionally, the resources procured by Consumers and other electric utilities in Michigan have collectively done the same throughout the Lower Peninsula of Michigan. Meanwhile, Consumers is within a larger system also overseeing and safeguarding resource adequacy.

1. MISO Protects Resource Adequacy Through Reserve Margin Requirements and a Residual Capacity Auction.

MISO is the grid operator for territory stretching roughly from North Dakota to Michigan and down to Louisiana. This territory is organized into zones numbered 1 through 10, as shown in MISO's FERC-approved tariff and reproduced below.



MISO implements resource adequacy standards across its territory to ensure it achieves a level of grid reliability meeting both industry standards and those of the North American Electric Reliability Corporation ("NERC"). To meet its resource adequacy requirements, MISO utilizes a series of interconnected mechanisms that both measure current and future system needs and help the utilities in its region secure the resources that best meet those needs at least cost. *See generally* Ex. 46 at 66–75, 87–90 (FERC Energy Primer).

i. Reserve Margin Requirements.

The foundation of MISO's resource adequacy implementation process is its Loss of Load Expectation ("LOLE") study, which measures whether available generation capacity is capable of meeting load demand under various conditions, including low probability but high impact events (such as extreme weather). *See generally* Ex. 38 (MISO LOLE Presentation). MISO runs its LOLE study every year. It utilizes a systemic model, taking inputs from the past thirty years of weather data as well as resource performance characteristics from a broad range of operating conditions. Using this wealth of information, MISO then runs thousands of simulations looking to future years. Each of the simulations examines the system at every individual hour of each year being studied. These simulations thereby identify circumstances that could most stress the system, while also predicting how the system's fleet of resources will perform. Ex. 58 (MISO Tariff Module E-1 – Resource Adequacy). MISO runs this model annually, based on the latest available data.

MISO uses its LOLE study results in conjunction with its system-wide peak demand forecast, which it develops from projections provided by each of the load-

serving entities within its territory. It combines these inputs to determine how much generating capacity is required to meet MISO's industry-standard goal of experiencing no more than one loss-of-load event every ten years. *See* Ex. 2 at 2–5 (Grid Strategies Report). The result of this calculation is a reasonable buffer of extra capacity to account for potential emergencies and other conditions, which is known as the regional Planning Reserve Margin ("Reserve Margin"). The Reserve Margin, stated as a percentage, reflects the amount of generating capacity that must be procured in each season to meet resource adequacy standards across the region. MISO develops a separate Reserve Margin for each season of the year. An illustrative calculation of a Reserve Margin is below.

Illustrative Reserve Margin Calculation

Expected Peak Demand	100,000 MW
Extra Buffer	7,000 MW
Reserve Margin	**7%**

After developing the system-wide Reserve Margin, MISO uses it to convert the peak demand projection for each zone into a capacity requirement (in accredited megawatts, or "MW") that each zone must meet for each season. The requirement for each zone is known as that zone's Planning Reserve Margin Requirement ("Reserve Margin Requirement"), which is the amount of megawatts of capacity that must be procured for each zone. These megawatts can come from inside or outside the zone, so long as they are deliverable to the zone.

As with the zonal calculation, MISO also converts each individual load-serving entity's projected peak demand into a capacity requirement using the system-wide Reserve Margin. A load-serving entity is, like Consumers, an entity that "has undertaken an obligation to serve [l]oad for end-use customers by statute, franchise, regulatory requirement or contract." *See* MISO's FERC-Approved Tariff at Module A, *available at* https://etariff.ferc.gov/TariffBrowser.aspx?tid=1162. And the Reserve Margin Requirement for each zone is, roughly speaking, the sum of all load-serving entities' obligations in that zone.

MISO assigns to each individual resource a capacity value based on its conservative estimate of how likely that generator is to be able to provide energy during peak net demand conditions. The purpose of this estimate is to determine a percentage of resources' maximum capacity (their "accredited capacity") that can be used by load-serving entities to achieve their Reserve Margin Requirements, and it reflects that resources cannot always ensure that they will operate at their maximum possible capacity. Generally speaking, MISO's approach combines probabilistic modeling with historic and unit-specific performance. Through the capacity accreditation process, MISO fully accounts for the limitations of each resource's ability to contribute to MISO's resource adequacy during peak demand conditions or during times of overall system stress (e.g. when extreme weather affects unit performance). And MISO's capacity accreditation rules are regulated

and overseen by FERC. *See, e.g.*, *Midcontinent Indep. Sys. Op., Inc.*, 180 FERC ¶ 61,141, at P 1 (2022) (approving MISO's seasonal resource adequacy construct); *see also Midcontinent Indep. Sys. Op., Inc.*, 189 FERC ¶ 61,065, at P 1 (2024) (approving new methodology applicable to 2028/2029 delivery year).

ii. MISO's Residual Capacity Market.

Finally, once MISO has (1) established the regional Reserve Margin, (2) converted it to a Reserve Margin Requirement for each zone using peak demand projections, (3) apportioned each zone's Reserve Margin Requirement among load-serving entities, and (4) determined all eligible resources' accredited capacity, the load-serving entities must meet their capacity obligations. Load-serving entities have a few options for procuring capacity. First, they can use generating capacity they already own. Second, they can contract with another entity that owns generating capacity to promise to sell energy in the future when called upon by MISO to do so. Third, as a final fallback option they can obtain capacity through a residual capacity market run by MISO known as the Planning Resource Auction ("Planning Auction").

MISO conducts the Planning Auction every year. The Planning Auction is actually four separate simultaneous seasonal auctions. In each auction, MISO solicits operational commitments for the season from a suite of generation resources that will ensure resource adequacy. Many resources provide an "offer" identifying what price they would need to be paid to keep operational (*i.e.*, remain capable of delivering power upon command) all or part of the resource's accredited capacity for each of the four seasons. Other resources, including those already committed to operate via outside contracts, are self-scheduled into the auction process, meaning that MISO treats them as price takers or $0 offers. MISO then stacks each of these resources in ascending cost order, forming a supply curve.

The supply curve crosses a preset sloped demand curve, known as the Reliability Based Demand Curve. The sloped demand curve is designed by MISO to procure a certain amount of capacity at each price point; although it is tethered around MISO's goal of experiencing no more than one loss of load event per decade, it will obtain more capacity if it is cheaper and less if it is more expensive. This is consistent with the general principle that grid operators must always balance the tradeoff between resource adequacy and cost. *See* Ex. 2 at 2–3 (Grid Strategies Report).

The point where the supply and demand curves intersect is called the capacity market clearing price. All resources on the supply curve with offers at or below that amount are then committed to remain operational and be available for the respective season(s) in which they cleared, with the owners of those resources' capacity rights receiving the clearing price. Ex. 58 (MISO Tariff Module E-1).

2. Michigan Protects Resource Adequacy Through Integrated Resource Planning and Annual Capacity Demonstration Requirements.

MISO is not the only entity monitoring resource adequacy. Michigan, like other states in MISO, closely watches this too.

Michigan state law requires that electric utilities file an Integrated Resource Plan with the Michigan Public Service Commission at least every five years. MCL § 460.6t. Those Integrated Resource Plans serve both to ensure resource adequacy and to ensure implementation of the state's and each utility's preferred mix of generation. *See generally Pac. Gas & Elec. Co. v. State Energy Res. Conserv. & Dev. Comm'n*, 461 U.S. 190, 205 (1983) (explaining that states have characteristically governed the need for new power facilities and their economic feasibility); *Citizens Action Coal. v. FERC*, 125 F.4th 229, 239 (D.C. Cir. 2025) ("[T]he States retain authority to choose their preferred mix of energy generation resources."). Pursuant to state law, the Integrated Resource Plan is required to:

> Provide . . . a 5-year, 10-year, and 15-year projection of the utility's load obligations and a plan to meet those obligations, to meet the utility's requirements to provide generation reliability, including meeting planning reserve margin and local clearing requirements determined by the commission or the appropriate independent system operator, and to meet all applicable state and federal reliability and environmental regulations over the ensuing term of the plan.

MCL § 460.6t(3). Each Integrated Resource Plan must include a broad range of information and analysis regarding forecasted energy and capacity needs, supply-side generating resources (*i.e.*, electric generating facilities), and demand-side resources such as energy waste reduction and demand response measures. *Id.* § 460.6t(5).

The Integrated Resource Plan statute requires the Michigan Commission to establish modeling scenarios and assumptions to be used in each Integrated Resource Plan filing. *Id.* §§ 460.6t(1) (modeling scenarios and assumptions), 460.6t(3) (filing requirements). Once an Integrated Resource Plan is filed, the Michigan Commission reviews the plan through a year-long contested case process under the Michigan Administrative Procedures Act, *see id.* §§ 460.6t(7), 24.271–.288, pursuant to which interested parties may intervene, conduct discovery, submit expert testimony, and present and cross-examine witnesses at an evidentiary hearing. The Michigan Commission is statutorily required to approve an Integrated Resource Plan if it determines that "[t]he proposed integrated resource plan represents the most reasonable and prudent means of meeting the electric utility's energy and capacity needs." *Id.* § 460.6t(8)(a). In deciding whether the Integrated Resource Plan satisfies that standard, the statute directs the Michigan Commission to consider several factors, including resource adequacy and capacity to serve

anticipated peak electric load, applicable planning reserve margin, and local clearing requirement; reliability; commodity price risks; and diversity of generation supply. *Id.*

Under Michigan law, electric utilities are also required to make annual capacity demonstration filings that project the utility's capacity position over a four-year planning period. *Id.* § 460.6w. After auditing each year's submissions, the Michigan Commission Staff prepares an annual report that discusses resource adequacy throughout the state. *See, e.g.*, Ex. 28 at 16 (2028/2029 Michigan Commission Staff Capacity Demonstration Results) (finding that Michigan meets resource adequacy requirements).

3. NERC Protects Resource Adequacy Through Standards and Regular Assessments.

The North American Electric Reliability Corporation ("NERC") is the Electric Reliability Organization responsible for developing mandatory reliability standards, subject to FERC's review and approval. Ex. 2 at 7 (Grid Strategies Report). NERC also annually assesses seasonal and long-term reliability of the bulk power system and monitors system performance. *Id.* at 7–8. NERC's assessments and activities are further discussed *infra* in section IV.A.2.iii.

C. Campbell's May 31, 2025 Retirement and Resource Adequacy in Summer 2025 Have Been Carefully Planned.

1. Campbell's May 31, 2025 Retirement Was the Product of Careful Planning from Diverse Stakeholders Under a Settlement that Improves Resource Adequacy.

In 2021, Consumers Energy filed an Integrated Resource Plan that proposed retiring the Campbell Plant in 2025, acquiring the 1,176 MW New Covert gas plant in 2023, and making substantial investments in new generation and storage resources. Following a lengthy contested case process—with thousands of pages of testimony, multiple rounds of briefing, and an evidentiary hearing—the Michigan Commission approved in 2022 a comprehensive settlement agreement ("2022 Settlement") that established Consumers' long-term resource plan and provided for Campbell's May 31, 2025 retirement. Ex. 9 at PDF 95, 100–02 (Order Approving Campbell Settlement Agreement and Settlement Agreement). The 2022 Settlement was negotiated and signed by a wide array of parties in the Integrated Resource Plan case, including:

- Michigan Commission Staff;
- Michigan's Attorney General;
- Consumers Energy;
- residential ratepayer advocates;
- commercial and industrial customers;
- businesses in the energy sector;
- advocacy groups such as Sierra Club, Natural Resources Defense Council, Michigan Environmental Council, Environmental Law and Policy Center, Vote Solar, and Urban Core Collective;
- a transmission company; and
- third-party energy developers.

Id. at PDF 116–130; Ex. 18 at 5–6 (Proudfoot Rebuttal Testimony); *see also* Ex. 53 (Consumers News Release) ("A key regulatory decision today cleared the way for Consumers Energy to stop burning coal to generate electricity by 2025 — 15 years faster than previously planned — and provide reliable electricity for Michigan . . . A broad coalition of supporters for the plan includes customer groups, environmental organizations, MPSC staff, energy industry representatives and the Michigan Attorney General.").

While the 2022 Settlement included some elements of Consumers' original Integrated Resource Plan, such as acquiring the New Covert gas plant, it also made several changes that further bolstered the plan's ability to ensure resource adequacy both within the state and across MISO. In particular, as part of the 2022 Settlement, Consumers agreed to extend to 2031 the operation of two oil- and gas-fired peaker units at the utility's Karn plant from their originally proposed retirement date of 2023. Ex. 9 at PDF 101–02 (Order Approving Campbell Settlement Agreement and Settlement Agreement). Doing so added approximately 784 MW of generating capacity compared to the original plan. Ex. 56 at 21 (Blumenstock 2021 Second Rebuttal Testimony); Ex. 19 at PDF 94 (Walz Direct Testimony). Under the 2022 Settlement, Consumers would also solicit power purchase agreements to provide capacity beginning in the 2025/2026 planning year. Ex. 9 at PDF 103–04 (Order Approving Campbell Settlement Agreement and Settlement Agreement). Such solicitation would be for up to 500 MW of thermal generation, and up to 200 MW of clean energy resources. *Id.* Under the settlement, Consumers would also add new battery storage assets (a dispatchable resource) in the 2024–2027 timeframe. *Id.* at PDF 101; Ex. 57 at 18 (Jester 2021 Direct Testimony).

In approving the 2022 Settlement, the Michigan Commission specifically addressed the importance of maintaining resource adequacy. Ex. 9 at PDF 93–95 (Order Approving Campbell Settlement Agreement and Settlement Agreement). The Commission imposed requirements to consider resource adequacy for a utility's own customers, MISO zones, and other regions. *Id.* at PDF 93. It found that the plan embodied in the settlement was supported by substantial evidence and "is the

most reasonable and prudent means of meeting Consumers' energy and capacity needs and otherwise meets the requirements of" Michigan's Integrated Resource Plan statute. *Id.* at PDF 95.

A few parties challenged the 2022 Settlement on various grounds. Of note, Wolverine Power Supply Cooperative ("Wolverine"), a minority owner of Campbell Unit 3 with a stake less than 2%,[3] raised concerns about resource adequacy.

The Michigan Commission explained why objections to the settlement based on resource adequacy were unpersuasive. The Michigan Commission discussed the record evidence regarding acquisition of the 1,176 MW New Covert gas-fired power plant, extended operation of Karn units 3 and 4, new battery storage, and ongoing investments in solar, energy waste reduction, and demand response. *Id.* at PDF 90–93. The Michigan Commission then found that "the approval of the settlement agreement enhances zonal resource adequacy in the short, medium, and long term(s)." *Id.* at PDF 92. As such, the Michigan Commission found that the 2022 Settlement "provides a reasonable and prudent plan for meeting resource adequacy requirements." *Id.* at PDF 91.

Wolverine in turn appealed the Michigan Commission's decision to the Michigan Court of Appeals. The court rejected the challenge, noting in part that Wolverine "mischaracterize[d]" the Michigan Commission's handling of the resource adequacy issue, and "fail[ed] to address the substantive basis for the [Michigan Commission's] conclusion" that the 2022 Settlement properly addressed resource adequacy. *Wolverine Power Supply Coop., Inc. v. Mich. Pub. Serv. Comm'n*, No. 362294, 2023 WL 2620437, at *5 (Mich. Ct. App. Mar. 23, 2023).

2. MISO Approved Campbell's May 31, 2025 Retirement Upon Finding No Reliability Violations.

Pursuant to MISO's FERC-approved tariff, a utility within MISO seeking to suspend the operation of a generating unit must provide an "Attachment Y" notice to MISO. Ex. 60 at 1 (MISO Tariff Section 38.2.7); Ex. 61 (MISO Tariff Attachment Y); *see also* MISO's FERC-Approved Tariff at Attachment Y, *available at* https://etariff.ferc.gov/TariffBrowser.aspx?tid=1162 (containing prior versions of the

[3] Consumers owns about 93% of Unit 3, the Michigan Public Power Agency owns 4.8%, and Wolverine owns less than 2%. Ex. 24 at 2 ¶ 4 (Mich. Pub. Power Agency Petition to Intervene); Ex. 13 at 6 (Kapala Direct Testimony); Ex. 20 at PDF 28 (King Direct Testimony). The Michigan Public Power Agency did not oppose Consumers' decision to retire Unit 3. Under the ownership agreements that govern Unit 3, Consumers has the sole authority to decide when to retire it. Ex. 20 at 95 (King Direct Testimony).

tariff). The purpose of the notice is to enable MISO to evaluate the potential local grid reliability impacts of such suspension. *See* Ex. 60 at 1.

Consumers submitted the required notice to MISO in December 2021. Ex. 29 at PDF 6 (2024 Consumers ELG Annual Report). Consumers stated its intent to suspend operation of Campbell Units 1–3 effective June 1, 2025. *Id.*

In March 2022, MISO notified Consumers that it had reviewed the Campbell retirement for "power system reliability impacts," and concluded that retirement "would not result in violations of applicable reliability criteria." *Id.* at PDF 9. As such, MISO concluded that the retirement could proceed "without the need for the generators to be designated as a System Support Resource ('SSR') units [*sic*]," a designation that allows MISO to retain generators needed for reliability reasons. *See id.* MISO has not acted to revise its conclusion that Campbell could retire without implicating local reliability issues in the area around the facility.

3. Consumers Has Been Winding Down Campbell and Ramping Up Replacement Resources.

Following its filing of the Integrated Resource Plan and the Michigan Commission's approval of the 2022 Settlement, Consumers changed its approach to Campbell. Rather than invest in and maintain the plant to provide an adequate level of reliability, Consumers transitioned to a reactive, "fix it if breaks" approach to Units 1–3. Ex. 3 at 15–16 (Powers Decl.). Public Interest Organizations' expert engineer provides the following summary of the significant decline in investment and maintenance of the units. *Id.* at 6 (developed based on testimony from Consumers witnesses Kapala and Blumenstock, Exs. 10–13).

Reductions in Capital and Major Maintenance Spending at Campbell for 2022–2025

	Pre-IRP Projected Spend	Post-IRP Actual/Projected Spend	Reduction
Capital Spending			
Units 1&2	$60.6 Million	$4.1 Million	93%
Unit 3	$85.5 Million	$8.4 Million	90%
Major Maintenance Spending			
Units 1&2	$14.4 Million	$5.5 Million	62%
Unit 3	$23.5 Million	$5.1 Million	78%

The figures above are rounded to the nearest decimal shown. "IRP" refers to Consumers' 2021 Integrated Resource Plan proceeding, which concluded with the Michigan Commission's approval of the 2022 Settlement.

The expert engineer further details Consumers' canceled projects and explains the cancellations' likely impact on the units' reliability. *Id.* at 5–16. As just one example among the dozens that he identifies, Consumers canceled a $7.9 million

turbine overhaul project to maintain Unit 3 scheduled to take place in 2024. *Id.* at 13, 16. In April 2024, the turbine failed, resulting in a 46-day outage. *Id.* The turbine was eventually repaired, but *only for the limited objective of allowing Unit 3 to continue to operate until the planned retirement in May 2025*. *Id.* at 5 n.9, 13, 16.

As a result of the canceled projects and forgone maintenance and investment, it is unlikely that Campbell can reliably dispatch without significant further expense. *Id.* at 5–6, 13, 15–17. The Chair of the Michigan Commission reportedly believes the costs to render Campbell operational range from a minimum of tens of millions of dollars to close to $100,000,000. Ella Nilsen, CNN, *The Trump Admin Ordered a Coal Power Plant to Stay on Past Retirement. Customers in 15 States Will Foot the Bill* (June 6, 2025), https://www.cnn.com/2025/06/06/climate/michigan-coal-plant-energy-cost-wright.

The evidence bears out the plant's unreliability. As explained above in section III.A.1, the Campbell units have demonstrated their inability to consistently perform in recent years. This unreliability reflects the impact of worn and difficult-to-repair or replace components, causing outages that tended to be long and recurrent. Ex. 3 at 4 (Powers Decl.).

At the same time that Consumers has prepared to retire the aging and increasingly unreliable units at Campbell, Consumers has taken multiple steps over the last several years to bring substantial new generating capacity online that bolsters resource adequacy and reliability in Michigan, MISO Zone 7, and the region. In the years since the Michigan Commission approved Consumers' 2021 Integrated Resource Plan, and since MISO's considered determination that retiring Campbell did not present reliability concerns, Consumers proceeded with acquiring or constructing many of the generating assets called for under the 2022 Settlement. In 2023, Consumers completed its acquisition of the Covert plant, a three-unit combined cycle gas plant. Ex. 12 at 8 (Blumenstock 2025 Direct Testimony). By acquiring Covert and transferring the plant to MISO, Consumers added 1,090 MW of net generating capacity to MISO Zone 7. Ex. 21 at 7–9 (Bleckman Direct Testimony); *see also* Ex. 22 at 8 (Hahn Direct Testimony). Consumers has continued developing renewable assets, including a 198 MW wind facility that went into service in 2024, and several solar projects, totaling 1,421 MW, with commercial operation dates in 2026–28. Ex. 21 at 7–9 (Bleckman Direct Testimony). Ultimately, Consumers intends to develop 6.6 gigawatts ("GW") of solar and wind generation resources. *Id.* at 8. Consumers has also entered into long-term contracts for three large battery storage projects, a power purchase agreement that will provide 175 accredited MW of gas-fired generation capacity in the 2025 and 2026 MISO planning years, and another power purchase agreement providing a further 100 MW of capacity in the 2025–27 planning years. Ex. 12 at 8–9 (Blumenstock 2025 Direct Testimony).

4. Consumers Has Continued to Demonstrate Resource Adequacy.

Apart from the Integrated Resource Plan proceeding—which, as noted above, resulted in a plan that bolsters resource adequacy in MISO—Consumers has also consistently met Michigan's resource adequacy requirements to demonstrate capacity each year under MCL section 460.6w. Consumers' filings have consistently shown that the company is maintaining and procuring sufficient capacity to serve its customers, while meeting the necessary reserve margin. Ex. 25 (2026 Consumers Energy Capacity Demonstration); Ex. 26 (2027/2028 Consumers Energy Capacity Demonstration); Ex. 27 (2028/2029 Consumers Capacity Demonstration). For the Summer 2025 season—the timeframe that is the subject of DOE's Order—Consumers has surplus resources. Ex. 27 at PDF 14 (Consumers 2028/2029 Capacity Demonstration). And as discussed in its most recent annual report, issued on May 12, 2025, the Michigan Commission Staff found that Consumers meets resource adequacy requirements for both the 2025/26 year, and through the 2028/29 year. Ex. 28 at 16. As a result of the most recent MISO Planning Resource Auction, the Michigan Commission Staff noted that MISO Zone 7 "cleared above seasonal reliability targets, representing additional reliability value at cost competitive prices." *Id.*

5. MISO Has More Resources than It Needs to Ensure Resource Adequacy in Summer 2025.

MISO published the results of its LOLE study for Summer 2025—the timeframe that is the subject of DOE's Order—in mid-March. *See* Ex. 31 at 2 (MISO 2025–26 Auction Results). In that study, MISO concluded that an overall Reserve Margin of 7.9% above peak load projections would be adequate to maintain the overall resource adequacy of the MISO region. *Id.* Here is MISO's calculation.

MISO's Summer 2025 Reserve Margin Calculation

Expected Peak Demand[4]	125,313.3 MW
Extra Buffer	9,900.1 MW
Reserve Margin	**7.9%**

MISO published the results of its Planning Auction process for Summer 2025 at the end of April 2025. Those results demonstrate that MISO secured more than sufficient resources to achieve resource adequacy for Summer 2025. In fact, consistent with the design of its Reliability Based Demand Curve, MISO secured an overall 9.8% Reserve Margin—almost two percentage points more than the 7.9%

[4] The figure shown here adds approximately 2,700 MW to actual expected peak demand to account for electric energy losses as the power moves through the transmission system, consistent with MISO's approach. *See* Ex. 59 (MISO 2025–2026 Prelim. PRA Report with Final Results).

target that MISO determined was needed to meet resource adequacy requirements. Ex. 31 at 5 (MISO 2025–26 Auction Results).

MISO's Planning Auction also secured adequate local offers to maintain resource adequacy in MISO Zone 7, which covers almost the entirety of Michigan's Lower Peninsula. Specifically, Zone 7's accredited offers from local resources were over 98% of the Zone's required Reserve Margin in Summer 2025, which in combination with transmission availability from neighboring Zones was more than enough to maintain the Zone's resource adequacy. *Id.* at 18 (demonstrating that Zone 7 had sufficient local offers to easily exceed, by 1.2 GW, its Local Clearing Requirement, which is the minimum amount of local resource offers that must be located within each Zone); *see* Ex. 2 at 10. This means Zone 7 also has plenty of leftover headroom on its transmission connections with neighboring regions to meet unexpected circumstances.

Additionally, in real-time and near-term operations, MISO will be able to employ the flexibility provided by its markets, including the energy and ancillary services markets. *Id.* at 5–6. Through the ancillary services market, for instance, MISO can procure services like operating reserves from flexible resources that help balance fast variability in supply and demand. *Id.* And MISO has numerous additional tools it can employ in stepwise fashion should it encounter a risk of a generation shortage in real-time operations. *Id.* at 6–7.

6. FERC's Recent Technical Conference Confirms that MISO Has Adequate Resources for Summer 2025.

Recently, FERC held a technical conference to address, among other things, resource adequacy in MISO. Ex. 62 at 13 (FERC Technical Conference Notice). The technical conference focused on long-term planning issues, not any purported short-term emergency. *See id.* at 13–17.

To the extent short-term conditions were addressed, witnesses dispelled the notion that MISO is experiencing a resource adequacy emergency. MISO's representative testified that no capacity deficits have materialized in 2025. Ex. 34 (Ramey MISO Comments). Similarly, the Independent Market Monitor for MISO, whose job is to scrutinize the performance of MISO's markets and related procedures for efficiency and efficacy, emphasized that "MISO is *more than* adequate moving into the Summer of 2025, and [he does] not have substantial concerns about the MISO region in the near term." Ex. 35 at 2 (Patton MISO Comments) (emphasis added). The technical conference further demonstrates that normal processes are unfolding to address long-term issues.

IV. REQUEST FOR REHEARING

A. The Order Exceeds the Department's Authority Because the Department Has Not Demonstrated, and Cannot Demonstrate, an Emergency Necessitating Continued Operation of the Campbell Plant.

The Order exceeds the Department's authority because there is no emergency within the meaning of Section 202(c). Both MISO and Michigan have confirmed the absence of any immediate resource shortfall, and the sources cited by the Order only confirm that absence.

1. Section 202(c) Only Authorizes the Department to Respond to Specific, Imminent, and Temporary Events Necessitating Immediate Response.

Section 202(c) of the Federal Power Act allows the Department to order "the generation . . . of electric energy" only "[d]uring the continuance of any war in which the United States is engaged," or if "the [Department] determines that an emergency exists by reason of a sudden increase in the demand for electric energy, or a shortage of electric energy or of facilities for the generation or transmission of electric energy or of fuel or water for generating facilities, or other causes." 16 U.S.C. § 824a(c)(1). That provision's fundamental textual requirement—an "emergency"—limits the Department's authority to immediate, unexpected circumstances that cannot be otherwise avoided. An emergency is "an unforeseen combination of circumstances or the resulting state that calls for *immediate* action." Merriam Webster's Dictionary 407 (11th ed. 2009) (emphasis added).[5] And the statute's use of the present tense—"exists"—demands, at a minimum, that the emergency be imminent and certain rather than distant and contingent. *See also* 16 U.S.C. § 824a(c) (empowering Department only "during" an existing emergency).

The remainder of Section 202(c) underscores the exigency inherent in the governing term "emergency": the authority granted by Section 202(c) is, in the first instance, a war-time power. 16 U.S.C. § 824a(c) (beginning with "[d]uring the continuance of any war in which the United States is engaged"); *see Jarecki v. G.D. Searle & Co.,* 367 U.S. 303, 307 (1961) (noting that statutory terms should be interpreted in the context of nearby parallel terms "in order to avoid the giving of unintended breadth to the Acts of Congress"). An "emergency" under the statute is limited to circumstances of similar urgency: "a *sudden* increase in the demand for electric energy," for example. 16 U.S.C. § 824a(c) (emphasis added); *see Richmond*

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[5] 3 Oxford English Dictionary 119 (1st ed. 1913) (defining emergency similarly as "a state of things *unexpectedly* arising, and urgently demanding *immediate* action" (emphasis added)); *see also* Benjamin Rolsma, *The New Reliability Override*, 57 Conn. L. Rev. 789, 812 n.147 (2025) (noting that dictionaries have given the term "emergency" the "same meaning for many years").

Power and Light v. FERC, 574 F.2d 610, 615 (D.C. Cir. 1978) (holding that Section 202(c) "speaks of 'temporary' emergencies, epitomized by wartime disturbances"); S. Rep. No. 74-621, at 49 (1935) (explaining that Section 202(c) provides "temporary power designed to avoid a repetition of the conditions during the last war, when a serious power shortage arose").[6]

Section 202(c) is further limited to actions addressing temporary shortfalls in supply—it provides no power to implement long-term policy preferences, including preferences for particular sources or fuels. The statute "is aimed at situations in which demand for electricity exceeds supply and not at those in which supply is adequate but a means of fueling its production is in disfavor." *Richmond Power and Light*, 574 F.2d at 615. Nor, more fundamentally, does Section 202(c) allow the Department to override a state's choice of the appropriate mix of in-state generation. *Emergency Interconnection of Electric Facilities and the Transfer of Electricity to Alleviate an Emergency Shortage of Electric Power,* 46 Fed. Reg. 39,984, 39,985 (Aug. 6, 1981) (recognizing that the Department cannot, via Section 202(c), "replace prudent utility planning and system expansion"); *see also Hughes v. Talen Energy Mktg., LLC,* 578 U.S. 150, 154 (2016) (noting the "States' reserved authority . . . over in-state 'facilities used for the generation of electric energy'" (quoting 16 U.S.C. 824(b)(1)); *Citizens Action*, 125 F.4th at 238–39 ("[T]he States retain authority to choose their preferred mix of energy generation resources"); *Conn. Dep't of Pub. Util. Control v. FERC*, 569 F.3d 477, 481 (D.C. Cir. 2009) (upholding FERC's approval of capacity requirements because they do not interfere with the right of "[s]tate and municipal authorities . . . to require retirement of existing generators," to prefer "environmentally friendly units," or "to take any other action in their role as regulators of generation facilities without direct interference from the Commission").

The wider statutory context reinforces Section 202(c)'s tightly limited scope. First, the preceding subsections 202(a) and (b) provide cabined authority (exercised by FERC, rather than the Department) to "direct a public utility . . . to establish physical connection[,] . . . sell energy to or exchange energy" with other persons, under normal, non-emergency conditions. 16 U.S.C. § 824a(a)–(b). Those subsections establish specific standards and procedural requirements for such non-emergency orders. *Id.* Section 202(c) removes many of those requirements—but does so only during wartime or similarly extreme circumstances. *Id.* § 824a(c); *see Otter Tail Power Co. v. Fed. Power Comm'n*, 429 F.2d 232, 234 (8th Cir. 1970) (holding that Section 202(c) "enables the Commission to react to a war or national disaster," while Section 202(b) "applies to a crisis which is likely to develop in the foreseeable

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[6] While Congress amended Section 202(c) in 2015, it did not alter the Department's basic grant of emergency authority; it only addressed occasions on which a Department order might produce a conflict with other laws. *See* H.R. Rep. No. 114-357 (2015).

future"). That structure establishes a clear divide between quotidian energy-system management (even where necessary to avert a non-imminent shortage) governed by Section 202(b), and unusual, unforeseeable emergencies governed by Section 202(c).

Second, Section 215 of the Federal Power Act, added in 2005, separately addresses non-imminent reliability planning: It provides for federal reliability standards subject to discrete procedures and timeframes, and with specified enforcement mechanisms. *See generally* 16 U.S.C. § 824o. As the D.C. Circuit has recognized, the portion of the Federal Power Act that predates that section—which includes Section 202(c)—did not provide the federal government with the power to enforce requirements designed to ensure broad, long-term reliability. *Alcoa Inc. v. FERC,* 564 F.3d 1342, 1344 (D.C. Cir. 2009) (noting that prior to the Energy Policy Act of 2005, "the reliability of the nation's bulk-power system depended on participants' voluntary compliance with industry standards"). Congress added a comprehensive scheme, in Section 215, including separate and tightly cabined procedures to address non-imminent reliability concerns; that scheme precludes expanding Section 202(c)'s "emergency" authority to encompass those same concerns. S*ee FDA v. Brown & Williamson Tobacco Corp.*, 529 U.S. 120, 132–33 (2000) (noting that when interpreting broad statutory terms, courts should be particularly attentive to whether "Congress has spoken subsequently and more specifically to the topic at hand"). Reading Section 202(c) to provide such authority would bypass the limits and procedures that Congress enacted in Section 215; upset the careful balance that section strikes between federal, state, and private power; and override Congress' calibrated choice of enforcement mechanisms. *See Cal. Indep. Sys. Op. Corp. v. FERC*, 372 F.3d 395, 401–02 (D.C. Cir. 2004) ("Congress's specific and limited enumeration of [agency] power" over a particular matter in one section of the Federal Power Act "is strong evidence that [separate section] confers no such authority on [agency].").

The Department's longstanding regulations to implement Section 202(c) confirm those textual and contextual limitations. They define an "emergency" as "an unexpected inadequate supply of electric energy" resulting from "the unexpected outage or breakdown of facilities," which may result from "weather conditions, acts of God, or unforeseen occurrences not reasonably within the power of the affected 'entity' to prevent." 10 C.F.R. § 205.371. Anticipated customer demand can be an emergency only upon "a *sudden* increase" in such demand. *Id.* (emphasis added); 46 Fed. Reg. at 39,985–86 (stating that the regulation defines "emergency" such that the Department may provide "assistance [to a utility] during a period of unexpected inadequate supply of electricity," but cannot "solve long-term problems"). Those examples reflect the limited nature of the emergencies encompassed by Section 202(c): unusual, unforeseen, and unexpected events, with immediate and substantial consequences. The Department's implementing regulations further confirm that Section 202(c) does not permit the Department to use "emergency" orders to commandeer long-term planning: That "a shortage of electric energy is projected" to result from economic factors, or utility decision-making, is not an

emergency absent an "*imminent*" "inability to supply electric service." 10 C.F.R. § 205.371 (emphasis added). They confirm that Section 202(c) authorizes orders "meeting a *specific* inadequate power supply situation"—it does not allow the Department to act merely because it believes that other parties have undertaken "inadequate planning." *Id.* (emphasis added). And the regulations recognize that inadequate energy supply can form the basis of an emergency only where existing resources are "unable to meet . . . *normal* peak load requirements"—not where they merely fall short of extreme or abnormal projections—and only where those requirements cannot be met through "use of all . . . otherwise available resources." 10 C.F.R. § 205.375 (emphasis added).

2. There Is No Factual Basis Supporting the Department's Order.

The Department's determination that an emergency exists "is based on" a purported "insufficiency of dispatchable capacity" to meet "anticipated demand during the summer months." Ex. 1 at 2 (DOE Campbell Order). But none of the facts or materials it relies on indicate that a present or imminent emergency exists. Indeed, the Department's own justification does not assert that there is a present or imminent emergency, only "potential tight reserve margins" or an "elevated risk of operating reserve shortfalls." *Id.* at 1. The Order expresses concern about plant closures in Michigan and the potential temporary unavailability of the Palisades nuclear power plant, and cites to MISO's discussion of its Planning Auction results for Planning Year 2025–2026 and a NERC 2025 Summer Assessment that identifies MISO as facing an "elevated risk"—but none of these references describe factual circumstances that come close to meeting the narrow definition of "emergency" that permits Departmental action under Section 202(c). 16 U.S.C. § 824a(c)(1). As a result, the Department fails to justify its emergency determination.

As the following sections explain, the Department has misrepresented the reports on which it relies, for a few reasons: i) Both Consumers and Michigan have prepared diligently for the retirement of Campbell such that its long-planned retirement is not remotely likely to impact the state's resource adequacy; ii) MISO has already determined that its grid will be secure this summer presupposing Campbell's planned retirement; and iii) NERC's 2025 Summer Assessment does not undermine any of those determinations. To the extent the Department's vague references were intended to refer to longer-term planning issues, those would be well outside both the stated justification for this Order, and Section 202(c)'s ambit more broadly. Thus, there is no factual or legal basis for the Department's emergency declaration.

i. Michigan's Stewardship of Grid Security has Already Ensured that the Campbell Retirement Will Not Disrupt Michigan's Grid.

As explained above, nothing about the process Consumers and Michigan followed to evaluate, plan for, approve, and ultimately implement the retirement of

Campbell and its replacement with sufficient resources to maintain resource adequacy provides any factual support for the Department's emergency declaration here. Consumers and Michigan regulators have been planning for the retirement of Campbell, as well as other recent retirements cited in the Order, for years. *See supra* sections III.B.2, III.C.1, III.C.3–.4. These plans reflect the 2022 Settlement, approved by the Michigan Commission, to which many of the Public Interest Organizations are a party and which set the May 31, 2025, retirement date for the plant. *See supra* section III.C.1. Michigan has been running annual assessments of its resource adequacy to ensure that no part of its system is threatened by recent and planned retirements. *See supra* sections III.B.2, III.C.4. And MISO conducted a local reliability assessment to ensure Campbell's retirement does not even destabilize a smaller load pocket on the system. *See supra* section III.C.2. Nothing about Campbell's planned retirement was unexpected, and nobody was unprepared.

More broadly speaking, individual generator retirements simply cannot, of themselves, demonstrate a resource shortfall: they must be paired with some demonstration that those responsible for maintaining resource adequacy failed to anticipate and, if necessary, compensate for such retirements. Indeed, generators shut down on a regular basis, just as new generators open on a regular basis. As long as those responsible for the system account for those retirements (as occurred here) and ensure that system resources remain adequate, there is no basis to cite the retirement of any particular facility as evidence of an emergency on the grid. Consumers and Michigan have both provided extensive assurances of resource adequacy here; the Order fails to provide any basis to conclude that there have been any "unforeseen occurrences," or any "inadequate planning" that is expected to produce an emergency from the cited retirements. 10 C.F.R. § 205.371.

ii. MISO's Stewardship of Grid Security Across its Region has Already Ensured that It Will Not Experience an "Electricity Supply Shortfall" in Summer 2025.

MISO's multilayered resource adequacy protections have also ensured that no emergency exists within the meaning of Section 202(c). As described above, MISO followed exactly the same resource adequacy protocol for Summer 2025 as it has for over a decade, beginning with the operation of a comprehensive LOLE model analysis to identify a target Reserve Margin of 7.9%. *See supra* section III.B.1.i After developing the regional Reserve Margin for the summer, MISO then converted it to Reserve Margin Requirements based on the Zones' individual load projections, and conducted the 2025–26 Planning Auction to secure the resources necessary to meet those Reserve Margin Requirements. *See supra* section III.B.1.ii. And the results of MISO's Planning Auction for Summer 2025, published this past April, show that MISO did not just meet its 7.9% Reserve Margin, which would have meant procuring 135.2 GW of capacity across its system. Through operation of its new sloped demand curve, MISO secured an additional 2.3 GW of capacity *beyond* what it initially targeted, thereby achieving a 9.8% Reserve Margin, almost 2%

more than the 7.9% it concluded was needed to keep the grid stable. *See supra* section III.C.5. This Planning Auction was the first to procure more capacity than was needed, so MISO has actually taken *more* steps to ensure the stability of its grid for Summer 2025 than in any previous year. Ex. 31 at 5 (MISO 2025–26 Auction Results).

To the extent the Order's emergency declaration relies on an alleged shortfall in Michigan specifically, the Planning Auction results in Zone 7, which encompasses the lower peninsula of Michigan, belie any such shortfall. As explained above, Zone 7 cleared well in excess of its Local Clearing Requirement, which is the level of resources located within Zone 7 that are necessary, in conjunction with existing transmission ties to the rest of MISO, to ensure resource adequacy. In other words, Zone 7 had more than adequate resources to meet its needs through a combination of locally sourced generation and readily available out-of-Zone assets.

Further confirming those determinations of resource adequacy, just this month, in testimony before FERC during the Commissioner-led Technical Conference Regarding the Challenge of Resource Adequacy in RTO and ISO Regions, MISO's representative testified that no capacity deficits have materialized in 2025. *See generally* Ex. 34 (Ramey MISO Comments). Similar testimony came from David Patton, the Independent Market Monitor for MISO, whose job it is to scrutinize the performance of MISO's markets and related procedures for efficiency and efficacy. In his testimony, Dr. Patton emphasized that "MISO is *more than* adequate moving into the Summer of 2025, and [he does] not have substantial concerns about the MISO region in the near term." Ex. 35 at 2 (Patton MISO Comments). This testimony provides further evidence disproving the existence of a resource adequacy emergency within the meaning of Section 202(c).

To reach a contrary result, the Order includes two citations to MISO's 2025–26 Planning Auction results, apparently as evidence of a resource adequacy "emergency" in the MISO region. Ex. 1 at 2 (DOE Campbell Order). But both of these citations rest on a fundamental mischaracterization of the nature and purpose of the Planning Auction and MISO's discussion of its results. First, the Order quotes MISO for the proposition that "new capacity additions were insufficient to offset the negative impacts of decreased accreditation, suspensions/retirements and external resources," *id.*—but in making this observation, MISO was in no way suggesting that there were insufficient resources to achieve resource adequacy in Summer 2025. MISO was simply explaining why the total accredited volume of resources that bid into the Planning Auction went down slightly from 2024 to 2025. Ex. 31 at 13 (MISO 2025–26 Auction Results). Indeed, the charts directly below this quotation and on the next page show that 137.8 GW of accredited capacity were available; and the chart on page 18 shows that only 135.2 MW were needed to achieve MISO's resource adequacy goals (although, as highlighted above, more were actually procured by operation of MISO's sloped demand curve). *Id.* at 13–14, 18. In

other words, the MISO system will be even more secure in Summer 2025 than the industry standard.

Meanwhile, the Order's quotation of MISO for the proposition that the summer season's "highest risk and . . . tighter supply–demand balance" "reinforce the need to increase capacity" is truncated: MISO was referring to a need to increase capacity "as demand is expected to grow with new large load additions." *Id.* at 2. This need can only realistically arise after Summer 2025; any large load additions coming online by this summer were included in the Zones' load projections for the Planning Auction. This is a crucial distinction because the entire basis for the Department's declaration of an emergency is, and only ever could be, near-term resource adequacy shortfalls. It is therefore clear that the Department's citations to MISO's Planning Auction do not indicate that an emergency exists within the meaning of the Federal Power Act Section 202(c).

The Department cannot arbitrarily invent an emergency. Yet, its reliance on MISO Planning Auction results and other statements is inapposite: MISO has made clear time and again that the vast region over which it has balancing authority is resource adequate for Summer 2025. This means that MISO is not facing any imminent shortage that might justify an emergency declaration within the meaning of Section 202(c).

iii. NERC's Identification of an "Elevated Risk" for MISO Does Not Support a Finding of an Emergency under Section 202(c).

The final citation the Department relies on to support its assertion that an emergency supposedly exists in the MISO region comes from the North American Electric Reliability Corporation's ("NERC") 2025 Summer Reliability Assessment. Specifically, the Department emphasizes NERC's conclusion that "MISO is at elevated risk of operating reserve shortfalls during periods of high demand or low resource output." Ex. 1 at 1 (DOE Campbell Order) (*citing* Ex. 41 at 16 (NERC 2025 Summer Reliability Assessment)). Once again, the Department's reliance on this Assessment is based on a foundational mischaracterization of its nature, purpose, and conclusions.

First, the NERC Assessment does not serve the purpose the Department seems to believe. The purpose of the NERC Assessment is to identify and point out to grid operators such as MISO constraints that might arise and implicate grid reliability if not mitigated appropriately. Ex. 41 at 4 (stating that the report "is intended to inform industry leaders, planners, operators, and regulatory bodies so that they are better prepared to take necessary actions to ensure [bulk power system] reliability."). This means the events flagged by NERC are not necessarily grid emergencies; they are periods of time in which MISO might need to take certain mitigation measures to maintain grid security. Crucially, the types of mitigation measures NERC endorses are readily available to MISO; they do not come close to

the extreme measures the Order demands. The Assessment's recommendations include "[r]eview[ing] seasonal operating plans and protocols for communicating and resolving potential supply shortfalls," including the "potential for higher-than-anticipated forced generator outage rates" in operating plants; entering into "conservative operations" earlier and better coordinating generator outages; and "prepar[ing] for efficient implementation of demand-side management mechanisms." *Id.* at 8. This list of interventions focuses on operational preparedness rather than resource manipulation as the most viable pathway to ensuring grid stability even in extreme scenarios; notably absent from this list of recommendations is a suggestion to interfere with previously established resource management decisions.

Second, and consistent with its foundational purpose, NERC's Assessment designates "load-modifying resources" (*i.e.*, demand response reserve resources) and "energy transfers from neighboring systems" as "operating mitigations" available to MISO rather than as "anticipated" (available) resources. *Id.* at 16; *see also* 10 C.F.R. § 205.375 ("A system may be considered to have an inadequate . . . energy supply capability when" "it is unable to meet normal peak load requirements based upon use of *all of its otherwise available resources* . . . .") (emphasis added).[7] This is consistent with the NERC Assessment—using both resource types requires advanced planning and preparedness by MISO—but it underscores the Department's misunderstanding when it cites to NERC's classification scheme without acknowledging that "risks" identified by NERC can easily be "mitigated" by these two crucial categories of resources. In other words, the "elevated risk" identified in NERC's assessment is *not* one of a grid emergency; it is instead a risk of an event that MISO could mitigate by accessing a suite of demand response resources and imports of power from neighboring regions to keep the grid operating smoothly.

The possibility that MISO might ask backup demand response resources to activate is not an "emergency" within the meaning of Section 202(c) because that is the point of such resources: they offer to curtail their use of power on demand in exchange for hefty payments. Instead, it is indicative of routine analysis and planning. Similarly, MISO's operational planning metrics already presume that most grid-straining events can be reduced or eliminated by importing large quantities of power from neighboring regions, even without firm import

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[7] The Department must incorporate demand response and other alternatives in determining whether an emergency exists, and as a condition precedent to circumstances calling for generation by a polluting resource like Campbell, a requirement consistent with Departmental practice. *See* 16 U.S.C. § 824a(c)(1)–(2); 10 C.F.R. § 205.375; *e.g.*, Ex. 39 at 4–5 (DOE Order No. 202-22-2); Ex. 45 at 2–3 (DOE Order No. 202-21-1); Ex. 17 at 3 (DOE Order No. 202-20-2).

commitments (*i.e.*, from resources that have committed in MISO's Planning Auction to principally serve MISO's load). Any "event" identified by NERC can already be addressed by the large number of transmission interconnections between MISO and its neighboring regions.

Indeed, MISO's ability to import power, both into Michigan and into its broader footprint, is one of the key resources it relies on to alleviate grid constraints. For the entire period of the Order, Zone 7 can import around 3,600 MW. Ex. 37 at 13 (MISO 2025–2026 CIL/CEL Final Results). And the MISO territory's transmission connectivity with its neighbors gives MISO approximately 24 GW of import capability[8] from other regions that, according to the NERC Assessment, are not even facing "elevated risk" this summer, including PJM, TVA, SERC, Ontario, and Manitoba. Ex. 41 at 6, fig.1 (NERC 2025 Summer Reliability Assessment); Ex. 66 at 22–35 (NERC 2024 Interregional Transfer Capability Study, Part 1). MISO has an additional almost 5 GW of import capability from SPP. *Id.* And that capability is very relevant: regions import and export power from and to neighbors on a regular basis to alleviate grid constraints—as anticipated and encouraged by Section 202(a). *See, e.g.*, Ex. 43 at § III.A.3.b (Winter Storm Elliott System Operations Inquiry) ("Despite tightening conditions on the MISO system . . . MISO maintained steadily increasing exports to TVA throughout the day."); Ex. 44 at 43 (PJM Elliott Report) (describing PJM exports of between 8 and 11 GW to TVA and other neighboring regions), 83–84 (describing PJM power exports to MISO and graphically depicting those exports over time); Ex. 36 at 6 (MISO Elliott Max. Gen. Event Overview) ("MISO consistently exported power to southern neighbors with a maximum value of nearly 5 GW."). These examples underscore that the "elevated risk" identified in the NERC assessment describes the possibility of events that MISO already has the tools to address.

Finally, even within the terminology of the Assessment, an "elevated risk" designation does not constitute an emergency because it does not indicate the possibility of imminent shortfalls; indeed, it is only the second of three risk levels offered by NERC. Since it began providing standardized "risk" assessments by region in the summer of 2021, NERC has adhered to a three-tiered assessment of risk: areas facing the least risk are "low" or "normal" risk regions, areas facing the most risk are "high" risk regions, and areas in between are "elevated" risk regions. *See id.* at 6; Ex. 42 at 74, 124, 170, 218 (2019–24 NERC Summer Reliability Assessments); *cf. id.* at 1–32. NERC's determination of "elevated" risk indicates only that there is a "[p]otential for insufficient operating reserves in above-normal conditions." Ex. 41 at 6 (NERC 2025 Summer Reliability Assessment). In other

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[8] This figure is subject to downward revisions due to the dynamics of maintaining voltage, frequency, thermal stability, and other operational issues associated with the transmission grid.

words, the only circumstances in which NERC even identifies the *possibility* of shortfalls are scenarios in which conditions that NERC itself identifies as "extreme" due to historically high outage rates among the generation fleet or demand levels that are well above utilities' maximum projections. *Id.* at 16; *see* Ex. 2 at 7–8, 10–11 (Grid Strategies Report). The Department's decision to declare a Section 202(c) emergency based on an eminently remediable shortfall that could only transpire in the first instance during historically extreme weather exceeds its lawful authority, as does its use of Section 202(c) to force a favored generation resource to stay open. *See* 10 C.F.R. § 205.375 ("A system may be considered to have an inadequate . . . energy supply capability when" "it is unable to meet *normal* peak load requirements" (emphasis added)).

The routine nature of NERC's "elevated risk" determinations further undermines the Department's framing of such determinations as "emergencies." In four of the past five years, NERC has assessed MISO as an "elevated" risk region; and in 2022, it identified MISO as a "high" risk region. *Id.* These "elevated" risk determinations are not unique to MISO: Texas's ERCOT region has been identified as an "elevated" risk region each of the past five years, and three other regions[9] have been classified as elevated or high risk in four of the past five years. *Id.* Crucially, in none of these summers, including the summer of 2022, was MISO forced to actually shed load as a result of a resource adequacy shortfall.[10] *See* Ex. 32 (MISO Emergency Declarations) (demonstrating that MISO has not faced a Market Footprint Maximum Generation Emergency Event Step of 3 or higher from 2009 to 2024); Ex. 33 at 9–26 (MISO Market Capacity Emergency) (describing Max Gen Emergency Event procedures, which only include shedding of unwilling load at Event Step 5). Thus, the NERC 2025 Summer Assessment does not provide the Department with a statutory basis for a Summer 2025 MISO emergency determination.

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The statute only permits the Department to act in the face of an imminent, exigent, short-term supply shortfall. The Order is not based on any such shortfall

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[9] These three regions roughly correspond to California (WECC-CA/MX), Arizona and New Mexico (WECC-Southwest), and New England (NPCC-New England).

[10] As Ex. 33 reveals, MISO establishes a ten-step process for addressing what it describes as a "Max Gen Emergency": for the first nine steps of this process ("1a" through "4b"), an increasing list of mitigation measures is deployed, including requesting power transfers from neighboring regions, turning on backup generators, utilizing contracted demand response resources, and asking the public for voluntary reductions. Only on the final step ("5") does any involuntary load shedding occur. *See also* Ex. 2 at 6–7 (discussing tools MISO can employ in stepwise fashion).

that is, or could be, supported by substantial evidence. Both Michigan and MISO have confirmed that the retirement of the plant creates no reliability concerns, in the near-term or otherwise. The materials cited by the Order do not provide any meaningful basis to contradict those well-supported conclusions. As a result, the Order violates the law.

B. Even if There Were a Short-Term Need—Which There is Not—the Order Does Not Comply with the Statutory Command to Set Terms that Best Meet the Emergency and Serve the Public Interest.

1. Section 202(c)(1) Only Authorizes the Department to Require Generation that Best Meets the Emergency and Serves the Public Interest.

Section 202(c)(1) demands the Department only impose requirements that (i) "best" (ii) "meet the emergency and" (iii) "serve the public interest." 16 U.S.C. § 824a(c)(1).

The term "best" demands a comparative judgment that there are no better alternatives. The word "best" is inherently a comparative term and means "that which is 'most advantageous.'" *Entergy Corp. v. Riverkeeper, Inc.*, 556 U.S. 208, 218 (2009) (*quoting* Webster's New International Dictionary 258 (2d ed.1953)); *cf. Sierra Club v. Env't. Prot. Agency*, 353 F.3d 976, 980, 983–84 (D.C. Cir. 2004) (explaining that statutory "best available control technology" requirement demands sources in a category clean up emissions to the level that peers have shown can be achieved). Consequently, the Department must, at minimum, consider alternatives and evaluate whether and to what extent a given alternative addresses the emergency and serves the public interest, including deficiencies associated with the alternative.

And as part of exercising reasoned decision-making, the Department must consider alternatives. It need not consider every conceivable alternative, but it must consider alternatives within the ambit of the existing policy as well as alternatives which are significant and viable or obvious. *See Dep't of Homeland Sec. v. Regents of the Univ. of Calif.*, 591 U.S. 1, 30 (2020); *Motor Vehicle Manufs. Ass'n of the U.S. v. State Farm Mut. Auto. Ins. Co.*, 463 U.S. 29, 51 (1983); *Nat'l Shooting Sports Found., Inc. v. Jones*, 716 F.3d 200, 215 (D.C. Cir. 2013). Intervenors and the public may also introduce information that requires the Department to evaluate alternatives and reconsider its decision to impose or maintain a requirement. *See, e.g.*, *Chamber of Com. of the U.S. v. Secs. & Exch. Comm'n*, 412 F.3d 133, 144 (D.C. Cir. 2005) (evaluating agency failure to consider alternative raised by dissenting Commissioners and introduced by commenters); *cf.* 10 C.F.R. § 205.370 (stating ability to cancel, modify, or otherwise change an order).

To be sure, the nature and extent to which the Department must consider alternatives depends on the emergency. An emergency that truly requires the

Department to act within hours, for instance, permits a more abbreviated consideration than an emergency for which the Department has days to decide.

The Department's regulations and practice identify relevant alternatives for its consideration. The regulations specify information the Department shall consider in deciding to issue an order under Section 202(c), and require an applicant for a 202(c) order to provide the information. 10 C.F.R. § 205.373. The specified information includes "conservation or load reduction actions," "efforts . . . to obtain additional power through voluntary means," and "available imports, demand response, and identified behind-the-meter generation resources selected to minimize an increase in emissions." 10 C.F.R. § 205.373(g)–(h); Ex. 5 at 5 (DOE Order No. 202-22-4).

The Department may then only choose the best alternative. The best alternative is the one which is most advantageous for meeting the stated emergency and serving the public interest.

The statutory command to take only measures that serve the public interest, including with respect to environmental considerations, further constrains the Department's authority. The public interest element demands that the Department advance, or at least consider, the various policies of the Federal Power Act. *Cf. Wabash Valley Power Ass'n*, 268 F.3d at 1115 (interpreting the "consistent with the public interest" standard in Section 203 of the Federal Power Act); *see Gulf States Utils. Co. v. Fed. Power Comm'n*, 411 U.S. 747, 759 (1973); *California v. Fed. Power Comm'n*, 369 U.S. 482, 484–86, 488 (1962). Primary policies of the Federal Power Act include protecting consumers against excessive prices; maintaining competition to the maximum extent possible consistent with the public interest; and encouraging the orderly development of plentiful supplies of electricity at reasonable prices. *NAACP v. Fed. Power Comm'n*, 425 U.S. 662, 670 (1976) (orderly development); *Otter Tail Power Co. v. United States*, 410 U.S. 366, 374 (1973) (maintaining competition); *Pa. Water & Power Co. v. Fed. Power Comm'n*, 343 U.S. 414, 418 (1952) (excessive prices). And because Section 202(c) expressly protects environmental considerations, these are part of the public interest element too. See *NAACP*, 425 U.S. at 669 ("[T]he words 'public interest' . . . . take meaning from the purposes of the regulatory legislation.").

2. The Order Fails to Impose Requirements that Best Meet the Claimed Emergency and Serve the Public Interest.

The Order determines that additional dispatch of Campbell is necessary to best meet the emergency and serve the public interest. But the Order provides no rational basis for that determination. The Order does not address the Campbell Plant's limitations or explain how, in light of those limitations, it could even meet the claimed emergency. In fact, Campbell is unlikely to be able to do so. The Order does not examine the expense of running Campbell or its environmental damage,

relevant factors which cause additional dispatch of the plant to harm, rather than serve, the public interest. And the Order does not address readily available and obvious alternatives which, in point of fact, would better compensate for the "insufficiency of dispatchable capacity" asserted (inaccurately) by the Order. Ex. 1 at 2 (DOE Campbell Order). Consequently, the Order is without support in the record and unlawful. *Allentown Mack Sales & Service, Inc. v. NLRB*, 522 U.S. 359, 374 (1998); *State Farm*, 463 U.S. at 42–43, 51.

Campbell's age, exacerbated by the last several years spent planning for its retirement, raises significant doubt that Campbell is capable of reliable operation such that it could meet the claimed emergency. Even before the planned retirement in May 2025, the Campbell plant suffered from poor reliability. Ex. 3 at 4 (Powers Decl.). In 2024, the forced outage rate for the units was approximately 15 percent (Unit 1), 48 percent (Unit 2), and 19 percent (Unit 3); in 2023, it was approximately 19 percent (Unit 1), 57 percent (Unit 2), and 22 percent (Unit 3). *Id.* (*citing* exhibits to Consumers' witness Hoffman's 2024 and 2025 testimonies). Across all units, these rates are substantially worse than the national average for coal-fired units of 12 percent. *Id.* (*citing* Ex. 40 (NERC 2024 Reliability Report)).

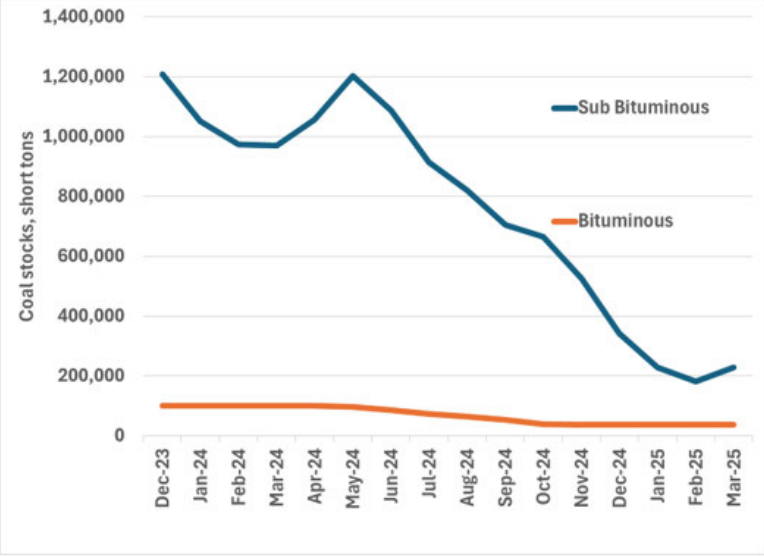
The nature of the units' outages in 2023 and 2024 "reflects the impact of worn and difficult-to-repair or replace coal unit components on operational reliability." *Id.* at 4. Outages were long and recurrent. For example, in 2023, Unit 2 experienced four outages totaling 3,445 hours—nearly 40 percent of the year—due to a pump failure, and in 2024, Unit 3 experienced an outage totaling 1,104 hours due to a failure in one of the turbine's gears. *Id.* at 5 (citing exhibits to Consumers' witness Hoffman's 2024 and 2025 testimonies). Across the units, thousands of hours of outages occurred in 2023 and 2024 due to failed and degraded parts, which "are the predictable result of old equipment, no capital investment, and minimal maintenance." *Id.* at 4–5.

The precipitous drop-off in investment at Campbell in recent years likely makes the plant even less reliable. In 2024, Consumers' witness Blumenstock testified that "[p]rojects that are targeted to improve reliability will not be considered" for Units 1 and 2 and, for Unit 3, "[c]apital projects that are targeted to improve reliability will not be considered." Ex. 11 at 19, 21 (Blumenstock 2024 Direct Testimony). Consumers' filings with the Michigan Commission show that for 2022 through 2025, the company's capital spending at Campbell Units 1 and 2 and Campbell Unit 3 is 93% and 90% lower, respectively, than what the company projected it would need to spend if it had planned to keep the plant online longer. Ex. 3 at 6 (Powers Decl.). Likewise, the company's major maintenance spending at Campbell Units 1 and 2 and at Campbell Unit 3 is 62% and 78% lower, respectively. *Id.*

Consumers' strategic decision to decrease investment in Campbell means Consumers did not undertake projects that it likely believed were necessary for reliable operation past the planned retirement date, *id.*, consistent with witness

Blumenstock's 2024 testimony that Consumers was not considering projects targeted to improve reliability, Ex. 11 at 19, 21 (Blumenstock 2024 Direct Testimony). For example, one of the projects Consumers cancelled was a $7.9 million Unit 3 turbine overhaul project originally scheduled for 2024. Ex. 3 at 16 (Powers Decl.). If that project had been undertaken before April 2024, it likely could have prevented the 1,104-hour outage at Unit 3 that occurred in late April 2024 due to a turbine gear failure. *Id.*

In addition, information from the Department and Consumers indicate that Campbell's coal supplies were already dwindling, Ex. 2 at 13–14 (Grid Strategies Report), and its employees were already relocating prior to the Order. At a minimum, Campbell's last-second pivot to continued operations, forced by the Order, is inconsistent with the long-term and orderly planning processes that utilities undertake to shore up reliable operations; at worst, it sets the plant up to scramble with inadequate resources if and when the plant is forced to run. As Public Interest Organizations' expert demonstrates with Department data in the chart reproduced below, Consumers depleted its coal stocks as it prepared for retirement. *Id.* at 14; *see also* Ex. 52 (MI State Energy Profile) (stating that "[m]ost of the coal consumed in Michigan comes by rail from the West").



Separately, the Order provides no reasoned basis to conclude that Campbell, even if fully maintained and operational, could meet the claimed emergency. Campbell is not designed to turn on quickly in response to times of extreme demand. In general, coal-fired power plants like Campbell typically take approximately 12 hours to become fully operational. Ex. 3 at 17 (Powers Decl.) (*citing* Ex. 55 (IEA Flexibility Report)). By comparison, "utility-scale battery storage can dispatch from a cold start to full power in a matter of seconds." *Id.* Campbell's long lead time makes it especially unsuitable for any Section 202(c) order: the type of grid emergency contemplated by Section 202(c)'s text and requirement of

imminence would need to be addressed on a timescale that the Campbell plant simply would not be able to start up fast enough to meet—thereby either defeating the purported purpose of keeping the plant operational past its retirement date, or forcing the plant to run constantly in anticipation of such emergencies, which would contravene the limitations set forth in Section 202(c)(2), discussed below. Thus, Campbell is plainly not the best means of meeting the range of energy emergencies MISO might plausibly face, even were there a resource adequacy problem.

The power outage in Louisiana on May 25, 2025, powerfully demonstrates this point, as well as more broadly the need for solutions tailored to particular circumstances. Inadequate transmission connectivity between southeastern Louisiana and neighboring regions prevented the copious availability of generating capability in those other regions from filling the gap that was created when a major nuclear plant had an unplanned outage. Amanda D. Cook, *MISO: New Orleans Area Outages Owed to Scant Gen, Congestion, Heat* (June 9, 2025), https://www.rtoinsider.com/106609-miso-new-orleans-outages-owed-to-scant-gen-congestion-heat. As a result, energy prices in Louisiana exceeded $2000/MWh even as prices in the neighboring Mississippi Delta dropped into the negatives, down to -$400/MWh. *Id.*

Campbell could not address events like the Louisiana outage for two key reasons. First, no additional generation (from Campbell or elsewhere) can supply power to a region that is transmission constrained. Thus, the Louisiana outage demonstrates the futility of solutions not tailored to the problem they are supposedly addressing. Second, by the time Campbell might have initiated operations, electric service had long been restored to the Louisiana customers who experienced blackouts.

Further, the expense of operating Campbell renders it unable to serve the public interest, a topic the Order does not address. As discussed in section III.A.1, Campbell has been, and continues to be, an expensive plant to run. In 2021, Consumers projected that retiring Campbell in 2025 would avoid $365,008,000 in capital expenditures and major maintenance costs. Ex. 13 at 3–4 (Kapala Direct Testimony). Campbell has gotten more expensive to run since then: the cost of Campbell's power was 21% higher in 2021 than in 2024, rising faster than inflation. Ex. 49 (2025 Energy Innovation Dataset); Ex. 50 at 3 (2025 Energy Innovation Coal Cost Report); *see also* Ex. 51 at 12 (2023 Energy Innovation Coal Cost Report).

Bringing Campbell from a cold start condition to full output to meet any claimed emergency would also be extremely expensive. The estimated cost to "cold start" a coal-fired power plant is $417 per MW of capacity. Ex. 3 at 18–19 (Powers Decl.) (*citing* Ex. 54 (NARUC Coal Report)). The total nameplate capacity of Campbell Units 1–3 is 1,561 MW. *Id.* at 18. Therefore, the estimated cost to cold start Campbell at its nameplate capacity is approximately $650,000. *Id.* at 19.

Moreover, as discussed above, Consumers has significantly decreased investment in Campbell since the Integrated Resource Plan proceeding that established the plant's May 2025 retirement date, forgoing a long list of capital and maintenance projects totaling approximately $161 million. Ex. 3 at 5–6 (Powers Decl.). As Public Interest Organizations' expert engineer states, "[i]t is reasonable to assume that much of this investment was necessary to ensure continued, nominally reliable operation of Campbell." *Id.* at 16. Consumers itself explains that, "given the ages and designs of the systems, replacement parts are not always readily available. In some instances, replacement parts do not exist at all." *Id.* at 15 (*quoting* Consumers' witness Hoffman's testimony). And as discussed *supra* in section III.A.1, operation of the Campbell plant results in significant environmental pollution. Thus, even accepting *arguendo* that an emergency exists and Campbell could address it, the Department still has not met its burden to provide a reasoned basis that the directive best meets the emergency and serves the public interest.

Other alternatives are available to the Department that better meet the claimed emergency and serve the public interest. For instance, Public Interest Organizations have highlighted above the robust transmission connectivity between MISO and neighboring regions, which MISO has accessed on a regular basis to support the stability of its grid. *See supra* section IV.A.2.iii. This is consistent with the Department's long-standing recognition that power pools and utility coordination "are a basic element in resolving electric energy shortages." 46 Fed. Reg. at 39,985–86. However, the Department's citation of the NERC 2025 Summer Assessment, which considers interregional connectivity only as a mitigation option, suggests that the Department does not have full confidence in the availability of this resource. As explained above, the Department offers no reasonable basis to question the availability of resources from neighboring regions. But even if there were some barrier to transmission from those regions, the Department has not (and likely could not) explain why the Order provides a better means of ensuring resource sufficiency than addressing those barriers directly through its power to require "interchange" and "transmission" of electric energy from those neighboring regions. 16 U.S.C. § 824a(c)(1).

Neither the Order nor its supporting memorandum includes any consideration of other alternatives. *See* Ex. 4 (DOE Campbell Memorandum). And the Order contains no reasoning demonstrating why Campbell is the best alternative, or a better alternative than other options, or is even capable of meeting the claimed emergency. As such, the Order is unlawful.

3. The Order Is Unlawfully Ambiguous, Impermissibly Vague, and Does Not Provide Fair Notice of What MISO, Consumers Energy, and Others Are Required to Do.

The Order requires MISO and Consumers Energy to "take all measures necessary to ensure that the Campbell Plant is available to operate." Ex. 1 at 2 (DOE Campbell Order). The Order further requires MISO to "take every step to employ economic dispatch of the Campbell Plant to minimize cost to ratepayers." *Id.* Those requirements are unlawfully susceptible of multiple meanings and lack necessary precision.

The availability requirement is impermissibly ambiguous and vague. The Order does not explain, for instance, whether it requires (a) only that MISO and Consumers Energy take measures so they are ready to send, receive, and respond to dispatch instructions to the extent capable with no other actions, or (b) that MISO and Consumers Energy take additional measures that enlarge their capabilities to operate (like capital investments). The Order also does not define the Campbell Plant, *see* Order at *passim*, so it is unclear whether MISO and Consumers Energy are required to take measures to ensure that each of the three units at the plant are equally "available to operate." *Id.* at 2.

The economic dispatch requirement is also impermissibly ambiguous and vague (in addition to being unlawful as discussed *infra* in section IV.D). The MISO Tariff contains provisions governing economic dispatch, *see generally* MISO's FERC-Approved Tariff at Module C & Schedules 29, 29A, *available at* https://etariff.ferc.gov/TariffBrowser.aspx?tid=1162, but those provisions generally depend on offer submissions from market participants containing a variety of parameters, *see, e.g.*, MISO, *Business Practices Manual: Energy and Operating Reserve Markets* § 4.2 (effective Sept. 30, 2024) (discussing resource offer requirements). The Order does not specify whether Consumers Energy is required to submit offers and, if so, the extent to which the utility has discretion either in the price and parameters of those offers or in the markets to which the offers are submitted. If Consumers is not required to submit offers, the Order does not specify whether MISO is required to adjudge when economic dispatch calls for dispatch of the plant, and if so on what basis.

Additionally, the Order's reference to "ratepayers" is impermissibly ambiguous and vague. For instance, does the Order refer to ratepayers in the MISO wholesale energy markets, the MISO capacity market and ancillary services markets, bilateral markets, retail ratepayers, some combination of these ratepayers, or some other set of ratepayers? The Order also contains no geographic limit on the referenced ratepayers, such that it is not clear whether MISO is directed to minimize cost to ratepayers in Michigan, across MISO, or some other area. It further contains no temporal limit, such that it is unclear whether MISO is directed to minimize cost to current ratepayers, future ratepayers, or both. Moreover, the

Order contains no standards or guidance on how MISO is to reconcile or balance countervailing tensions, like minimization of costs to current and future ratepayers.

The above defects are fatal to the Order's validity. A reasonably prudent person—regardless of whether such person is familiar with the electric industry—cannot ascertain the Order's meaning. MISO and Consumers are left in the dark as to what they are required to do. The ambiguities also make unclear the scope of activities and omissions coming within the effect of Section 202(c)(3), leaving the public and Public Interest Organizations in the dark as to what pollution is and is not allowed. As such, the Order does not give fair notice of conduct that is forbidden or required, and it is therefore unlawful. *Fed. Commc'ns Comm'n v. Fox Telev. Stations, Inc.*, 567 U.S. 239, 253 (2012); *Grayned v. City of Rockford*, 408 U.S. 104, 108–09 (1972).

In addition, the ambiguities and vagaries leave open such a wide variety of actions and interpretations by MISO and Consumers that the Department fails to state in the Order its judgment as to the requirement that will best meet the emergency and serve the public interest. As such, the Department fails to comply with Section 202(c)(1) and the Order is consequently arbitrary and capricious, an abuse of discretion, not in accordance with law, and beyond the Department's statutory authority. *Cf. Allentown Mack*, 522 U.S. at 375.

Also, the Department orders "relevant governmental authorities" to take action and make accommodations. Ex. 1 at 3 (DOE Campbell Order). This is vague, ambiguous, arbitrary, and beyond the Department's authority under Section 202(c). The Order does not identify which governmental entities, if any, are covered by the directive. Moreover, the Department does not have authority under Section 202(c) to issue directives to governmental authorities. 16 U.S.C. § 824a(c)(1).

C. The Order's Availability Requirements Exceed the Department's Statutory Authority.

In directing MISO and Consumers Energy to take "all measures" to ensure that the Campbell Plant is "available to operate," Ex. 1 at 2 (DOE Campbell Order), the Department exceeded its authority under Section 202(c) of the Federal Power Act and impermissibly intruded on the authority over generating facilities that Section 201(b) of the statute reserves to the states, 16 U.S.C. §§ 824(b)(1), 824a(c)(1). The sweeping language in the Department's Order would encompass physical and all other changes necessary to revive a generating plant that is being closed pursuant to a state-approved closure process. The Federal Power Act's language, structure, legislative history, and interpretation by the courts all confirm that the Department's Order is unlawful.

The structure and language of the Federal Power Act reflect Congress's deliberate choices to preserve the states' traditional authority over generating

facilities and to circumscribe the Department's emergency authority in light of the states' role. The first sentence of the Federal Power Act declares that federal regulation extends "only to those matters which are not subject to regulation by the States." *Id.* § 824(a). Section 201(b)(1) states that, except as otherwise "specifically" provided, federal jurisdiction does not attach to "facilities used for the generation of electric energy." *Id.* § 824(b)(1). The courts have held that Section 201(b)(1) reserves to the states authority over electric generating facilities, *see, e.g., Hughes*, 578 U.S. at 155, including the authority to order their closure, *Conn. Dep't of Pub. Util. Control*, 569 F.3d at 481 (under Section 201(b), states retain the right "to require the retirement of existing generators" or to take any other action in their "role as regulators of generation facilities."). Congress also recognized the states' exclusive authority over generating facilities in Section 202(b), which provides that FERC's interconnection authority does not include the power to "compel the enlargement of generating facilities for such purposes." 16 U.S.C. § 824a(b).

There is a clear distinction between authority to regulate generation facilities and the Department's authority under Section 202(c) to require generation of electric energy. Electric energy is an electromagnetic wave, and its "generation, delivery, interchange, and transmission" is the creation and propagation of that wave. *See* Brief *Amicus Curiae* of Electrical Engineers, Energy Economists and Physicists in Support of Respondents at 2, *New York v. FERC*, 535 U.S. 1 (2002); *see also* Edison Electric Institute Glossary of Electric Utility Terms (1991 ed.) (defining electric generation as "the act or process of transforming other forms of energy into electric energy"). Section 202(c)(1), like the rest of the Federal Power Act, is written "in the technical language of the electric art" and federal jurisdiction generally "follow[s] the flow of electric energy, an engineering and scientific, rather than a legalistic or governmental test." *Conn. Light & Power v. Fed. Power Comm'n*, 324 U.S. 515, 529 (1945); *see also Fed. Power Comm'n v. Fla. Power & Light Co.*, 404 U.S. 453, 454, 467 (1972).

The scope of the Department's emergency power under Section 202(c) is bounded both by the provision's specific language and Congress's clear intention and repeated direction in the Federal Power Act to respect the states' authority over generating facilities. When an actual emergency exists, Section 202(c)(1) authorizes the Department to require just two specific things: (1) "temporary connections of facilities" and (2) "generation, delivery, interchange, or transmission of electric energy." *Id.* § 824a(c)(1). The only reference to "facilities" in the authorizing provision of Section 202(c)(1) appears in the clause relating to temporary connections, not in the clause pertaining to "generation" of electric energy. And that clause only authorizes connections "of" facilities; it does not provide authority to regulate the facilities. The differences in Congress's word choice in these clauses—referencing "facilities" in one authorizing provision but not the other–must be given effect. *See, e.g.*, *Gallardo v. Marstiller*, 596 U.S. 420, 430 (2022); *Gomez-Perez v. Potter*, 553 U.S. 474, 486 (2008).

Given Congress's use of the term "generating facilities" elsewhere in the statute, if it had intended to give the Department authority over generating facilities in Section 202(c)(1), it would have done so explicitly. Instead, the provision conspicuously excludes authority to manage the physical characteristics of power plants. Congress purposely limited and particularized the Department's emergency powers, carefully avoiding intrusion on the states' authority over generating facilities recognized in Section 201(b)(1). *See* S. Rep. No. 74-621, at 19 (explaining that the emergency powers in Section 202(c)(1) "which were indefinite in the original bill have been spelled out with particularity"); *compare* S. 1725, Cong. Tit. II § 203(a) (providing in original, unenacted bill that control of the production and transmission of electric energy "except in time of war or other emergency declared to exist by proclamation of the President, shall, as far as practicable, be by voluntary coordination"), *with* 16 U.S.C. § 824a(c)(1) (providing particularized, specific authorities and circumstances in which the authorities may be exercised).

The Department may require generation of electric power, and a utility may properly take steps at the facility to produce the power. It is commonplace in the electric sector for the federal regulator properly acting within its authority to cause effects in a state regulator's jurisdictional sphere, and vice versa. *See FERC v. Elec. Power Supply Ass'n*, 577 U.S. 260, 281 (2016). But the federal regulator may neither directly regulate generation facilities nor impose requirements aimed at the facilities, even if nominally regulating within its sphere. *See id.* at 281–82; see also *Hughes*, 578 U.S. at 164–65. Such encroachment is impermissible, even in a real emergency or in a wrongly claimed one. *See Conn. Light & Power*, 324 U.S. at 530 ("Congress is acutely aware of the existence and vitality of these state governments. It sometimes is moved to respect state rights and local institutions even when some degree of efficiency of a federal plan is thereby sacrificed."). Thus, the Department may not require generation which necessitates the utility taking steps reserved to state authority, such as building a new generating unit or refurbishing a broken one.

Congress did not give the Department sweeping authority to order "all measures" needed to make a generation facility "available to operate." *See* Ex. 1 at 2 (DOE Campbell Order). Nowhere does the statute empower the Department to order "all" steps that may be needed to resuscitate the Campbell Plant, which could include repairs or modifications to physical facilities and other measures going far beyond electric power generation. Because the plant is at the end of its useful life, with years of forgone maintenance and investment, rendering it capable of meeting a short-term supply shortfall could essentially require rebuilding significant parts of the plant. On its face, the Department's Order is *ultra vires*. The Order also contravenes Congress's repeated direction in the Federal Power Act to respect the states' authority over generating facilities, which includes the authority that

Michigan exercised to approve the Campbell Plant's closure. The Order therefore is unlawful and should be withdrawn.[11]

D. The Order Fails to Provide the Conditions Necessary to Override Environmental Standards Under Section 202(c)(2).

The Order purports to authorize operations that may "conflict with environmental standards and requirements." Ex. 1 at 2 (DOE Campbell Order). Where an order may produce such a conflict, Section 202(c)(2) requires the Department to "ensure:" (1) that it compels "generation, delivery, interchange, or transmission of electric energy only during hours necessary to meet the emergency and serve the public interest;" (2) that operations are "to the maximum extent practicable . . . consistent with any applicable Federal, State or local environmental laws;" and (3) that it minimizes any adverse environmental impact, regardless of the facility's compliance (or non-compliance) with environmental standards. 16 U.S.C § 824a(c)(2). The Order here violates all three of those statutory obligations—a failure with especially severe consequences given the pollution produced by the Campbell Plant.

1. The Order Lacks the Conditions Required by Section 202(c)(2).

First, the Order directly contradicts the Department's obligation to require generation "only during hours necessary to meet the emergency." *Id.* The Order instead states: "For the duration of this order, MISO is directed to take every step to employ *economic dispatch* of the Campbell Plant to *minimize cost* to ratepayers." Ex. 1 at 2 (DOE Campbell Order) (emphasis added). The "emergency" nominally described by the Order is "the potential loss of power to homes and local businesses in the areas that may be affected by curtailments or outages," during the upcoming summer. *Id.* Even if the Department had substantiated that emergency (which it has not) the Act would allow the Department to compel generation only when such losses would occur absent operation of the Campbell Plant. 16 U.S.C. 824a(c)(2); *see, e.g.*, Ex. 6 at 9 (DOE Order No. 202-17-4 Summary of Findings) ("authorizing operation of" units subject to emergency order "only when called upon . . . for reliability purposes," according to "dispatch methodology" approved by Department). "Economic dispatch," in sharp contrast, requires "the lowest-cost resources [to] run first," in pursuit of "the lowest-cost energy available." *City of New Orleans v. FERC,* 67 F.3d 947, 948–49 (D.C. Cir. 1995)*; see also Fla. Power & Light Co. v. FERC,* 88 F.3d 1239, 1241 (D.C. Cir. 1996) (noting distinction between

[11] A utility that takes steps subject to state authority cannot point to a Section 202(c) order as the basis for a right to recover associated costs. *See* 16 U.S.C. § 824a(c)(1) (providing for compensation or reimbursement to be paid based on just and reasonable terms for carrying out an authorized order).

economic dispatch and reserve capacity rules). By directing MISO to dispatch the plant along those cost-based principles, rather than "only during the hours necessary to meet the emergency" forming the basis for its Order, the Department has violated Section 202(c)(2). 16 U.S.C. § 824a(c)(2).[12]

Second, the Order fails to ensure that the Campbell Plant operates, "to the maximum extent practicable," in conformity with applicable environmental rules. *Id.* The Order paraphrases the statutory text—that "operation of the Campbell Plant must comply with applicable environmental requirements . . . to the maximum extent feasible," but fails to specify *who* bears that responsibility or *what* such operation entails. Ex. 1 at 3 (DOE Campbell Order). It imposes no further conditions beyond requiring Consumers Energy to "pay fees or purchase offsets or allowances for emissions." *Id.* The direction to "comply . . . to the maximum extent feasible" is, as a result, wholly unenforceable; the Order provides no basis for the Department, or anyone else, to determine whether the plant is in fact complying or who might face the consequences of any failure to do so. *See* Ex. 5 at 5–6 (DOE Order No. 202-22-4) (requiring, *inter alia,* reporting of "number and actual hours each day" of operation "in excess of permit limits or conditions," and information describing how generators met requirement to comply with environmental requirements to maximum extent feasible). As such, the Order does not meet the Department's statutory obligation to "*ensure*" the maximum feasible compliance with applicable environmental standards. 16 U.S.C. § 824a(c)(2) (emphasis added).

Third, the Order fails to provide any conditions at all to "minimize[] any adverse environmental impacts." 16 U.S.C. § 824a(c)(2). That mandate is textually and substantively distinct from the Department's (also unfulfilled) obligation to ensure maximum practicable compliance with environmental standards. *Id.* The Order fails, most importantly, to include measures that would mitigate impacts when compliance with environmental standards proves impracticable—measures that have been routinely included in past orders. *See, e.g.*, Ex. 6 at 4 (DOE Order No. 202-17-4 Summary of Findings) (permitting non-compliant operation only during specified hours, and requiring exhaustion of "all reasonably and practicably available resources," including available imports, demand response, and identified behind-the-meter generation resources selected to minimize an increase in emissions); Ex. 5 at 7 (DOE Order No. 202-22-4) (requiring "reasonable measures to inform affected communities" of non-compliant operations); Ex. 6 (DOE Order No. 202-17-4 Summary of Findings). At a minimum the statute requires the Department to include sufficiently detailed reporting obligations to ascertain what impacts result from emergency operations; without such reporting, the Department has no ability to "ensure" that adverse impacts are minimized. *See, e.g.*, U.S. Dep't

[12] That direction further fails to conform to the statute's command to compel only the generation that will "best meet the emergency." 16 U.S.C. § 824(c)(1).

of Energy, Order No. 202-24-1, at 5 (Oct. 9, 2024) (requiring detailed data on emissions of pollutants). The Order here instead gestures towards "such additional information" as the Department, in the future, may (or may not) "request[] . . . from time to time." Order at 3. That possibility of future, unspecified inquiry cannot satisfy the statute's demand that the Department "ensure" that its Order minimizes environmental impacts. 16 U.S.C. § 824a(c)(2).

2. The Campbell Plant's Pollution and Lack of Maintenance Mean that the Absence of Effective Environmental Conditions Will Have Especially Severe Effects.

The absence of enforceable conditions—coupled with the inadequate limits on when Campbell can operate—is especially concerning here for two reasons: the significant environmental impacts of coal-fired power generation; and the apparent disrepair of the plant's pollution controls.

Coal-fired power plants like Campbell are a significant source of air and water pollution and waste. *See, e.g.*, *National Emission Standards for Hazardous Air Pollutants: Coal- and Oil-Fired Electric Utility Steam Generating Units Review of the Residual Risk and Technology Review*, 88 Fed. Reg. 24,854, 24,857 (Apr. 23, 2023) ("[C]oal- and oil-fired [power plants] remain the largest domestic emitter of [mercury] and many other [hazardous air pollutants]."). Air emissions from coal plants can cause serious human health and environmental impacts. *See, e.g.*, *id.*; EPA, *Health and Environmental Effects of Particulate Matter* (PM);[13] EPA, *Effects of NO_2*.[14] Wastewater discharges from coal plants "contain toxic metals such as mercury, arsenic, lead, and selenium, which bioaccumulate in fish, accumulate in lake and reservoir sediment, and pollute drinking water supplies. People who eat the tainted fish or drink the tainted water can suffer negative health consequences such as cancer, cardiovascular disease, neurological disorders, kidney and liver damage, and lowered IQs (in children)." *Sw. Elec. Power Co. v. EPA*, 920 F.3d 999, 1007 (5th Cir. 2019). Likewise, coal ash—the waste product that results from burning coal—"contain[s] myriad carcinogens and neurotoxins that contribute to increased rates of 'cancer in the skin, liver, bladder, and lungs,' 'neurological and psychiatric effects,' 'damage to blood vessels,' and 'anemia' in people exposed to them" while also "pos[ing] risks to plant and animal wildlife, including '[e]levated selenium levels in migratory birds, wetland vegetative damage, fish kills, amphibian deformities, . . . [and] plant toxicity.'" *Elec. Energy, Inc. v. Env't Prot.*

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[13] Available at https://www.epa.gov/pm-pollution/health-and-environmental-effects-particulate-matter-pm (last visited June 18, 2025).

[14] Available at https://www.epa.gov/no2-pollution/basic-information-about-no2#Effects (last visited June 18, 2025).

Agency, 106 F.4th 31, 35 (D.C. Cir. 2024) (alterations in original) (quoting EPA rulemakings on coal ash). Campbell will produce this environmentally damaging and health-harming pollution if it continues to operate. Ex. 3 at 21 (Powers Decl.).

Moreover, Consumers' filings at the Michigan Commission indicate that the plant may no longer be able to meet certain legal limits on its pollution due to deferred investment and maintenance. The company planned to conduct multiple capital and maintenance projects related to Campbell's air pollution control equipment *if* the plant operated past 2025. *Id.* at 19–20. However, after committing to retire Campbell in May 2025, the company did not undertake many of these projects. *Id.* The following table from Public Interest Organizations' expert engineer shows these cancelled projects. *Id.* at 20.

Cancelled Capital Projects at Campbell from 2022–2025 for Air Quality Control

Year	Unit	Project	Budget ($)
2022	2	• (SCR) catalyst management	1,120,000
	3	• Fabric filter bag(s) & cleaning air manifold replacement	3,994,601
2023	1	• Fabric filter bag replacement	1,514,100
	2	• SCR reactor catalyst replacement	2,000,000
	3	• Fabric filter bag(s) & cleaning air manifold replacement	3,263,331
2025	3	• SCR reactor catalyst management	3,000,000
		• Air quality control sys. (AQCS) equip. repair/replacement	1,000,000

The dollar figures shown above are as presented in Ex. 13 at 14–18 (Kapala Direct Testimony).

Without that critical upkeep, Campbell's air pollution controls may no longer work effectively and the plant may no longer be able to meet its air permit limits. *Id.* at 19–20.

Ordering a heavily polluting coal-fired power plant to operate when its pollution controls have fallen into disrepair plainly would not be consistent with the requirement that Section 202(c) orders are, "to the maximum extent practicable," consistent with environmental requirements and that the Department minimize any adverse environmental impact. 16 U.S.C. § 824a(c)(2). Robust reporting requirements and tight limits on Campbell's operations are therefore especially necessary to effectuate the Department's statutory duty. The Department's Order will be responsible for the plant's additional pollution: If Campbell retired on May 31, 2025 as planned, its air emissions, coal ash production, and much of its wastewater discharges would have ceased. But for the Order, that new air and water pollution and waste creation—and the associated environmental impacts—would not occur. This makes it all the more important for the Department to closely track and aggressively mitigate Campbell's adverse environmental impacts. As such, the Department should require verification from Consumers that its air

pollution control systems are functioning properly before authorizing Campbell to operate under emergency demand conditions. Ex. 3 at 20 (Powers Decl.). Further, if the units' continuous air pollution monitors detect any exceedance of permit limits during operation, DOE should require the offending unit(s) to shut down. *Id.*

E. The Order and the Department's Continued Conduct Are Inconsistent with Departmental Procedure, Depriving the Public and the Public Interest Organizations of Fair Notice and an Adequate Record.

According to the Department's procedures, the agency will use "best efforts" to post filings on a specified website within 24 hours of receipt. DOE Rehearing Procedures (linking to U.S. Dep't of Energy, *DOE's Use of Federal Power Act Emergency Authority* (last visited June 18, 2025), https://www.energy.gov/ceser/does-use-federal-power-act-emergency-authority [hereinafter "DOE 202(c) Website"]).

The Department has received, and is supposed to receive, materials related to this proceeding that it has not posted. On June 10, 2025, the Department "received a letter from counsel for Consumers which stated that MISO and Consumers have not been able to reach agreement on the rate issues relating to the May 23, 2025 Order. Ex. 16 (DOE Letter to FERC). Additionally, in the May 23 Order, the Department ordered MISO to "provide a daily notification to the Department (via AskCR@hq.doe.gov) reporting whether the Campbell Plant has operated in compliance with the allowances contained in this Order." Ex. 1 at 3 (DOE Campbell Order). The Department further ordered MISO to provide, by June 15, 2025, "information concerning the measures it has taken and is planning to take to ensure the operational availability and economic dispatch of the Campbell Plant consistent with the public interest." *Id.* Additionally, the Department ordered that "MISO shall also provide such additional information regarding the environmental impacts of this Order and its compliance with the conditions of this Order, in each case as requested by the Department of Energy from time to time." *Id.*

None of those materials are posted on the DOE 202(c) Website. The Department's letter to FERC indicates that it has reviewed the letter it received from Consumers; the letter nevertheless does not appear on the website, and the Department has not indicated there the docket or other locations in which to find Consumers' letter and similar materials.

The Department must follow its own procedures. *See Morton v. Ruiz*, 415 U.S. 199, 235 (1974); *Mine Reclamation Corp. v. FERC*, 30 F.3d 1519, 1524 (D.C. Cir. 1994). The Department's failure to follow its procedures deprives the public and Public Interest Organizations of fair notice and an adequate record. *See United States v. Nova Scotia Food Prods. Corp.*, 568 F.2d 240, 249 (2d Cir. 1977).

V. REQUEST FOR STAY

Public Interest Organizations further move the Department for a stay of the Order until the conclusion of judicial review. 18 C.F.R. § 385.212.[15] The Department has the authority to issue such a stay under the Administrative Procedure Act and should do so where "justice so requires." 5 U.S.C. § 705. In deciding whether to grant a request for stay, agencies consider (1) whether the party requesting the stay will suffer irreparable injury without a stay; (2) whether issuing a stay may substantially harm other parties; and (3) whether a stay is in the public interest. *Nken v. Holder*, 556 U.S. 418, 434, 436 (2010); *Ohio v. EPA*, 603 U.S. 279, 291 (2024); *see, e.g.*, *Midcontinent Indep. Sys. Operator, Inc.,* 184 FERC ¶ 61,020, at P 41 (2023); *ISO Eng. Inc.*, 178 FERC ¶ 61,063, at P 13 (2022), *rev'd on other grounds sub nom. In re NTE Conn., LLC*, 26 F.4th 980, 987–88 (D.C. Cir. 2022).

Injuries under this standard must be actual, certain, imminent, and beyond remediation. *Mexichem Specialty Resins, Inc. v. EPA*, 787 F.3d 544, 555 (D.C. Cir. 2015); *Wis. Gas Co. v. FERC*, 758 F.2d 669, 674 (D.C. Cir. 1985); *ANR Pipeline Co.*, 91 FERC ¶ 61,252, at 61,887 (2000); *City of Tacoma*, 89 FERC ¶ 61,273, at 61,795 (1999) (recognizing that, absent a stay, options for "meaningful judicial review would be effectively foreclosed"). Financial injury is only irreparable where no "adequate compensatory or other corrective relief will be available at a later date, in the ordinary course of litigation." *Wis. Gas Co.*, 758 F.2d at 674 (*quoting Va. Petroleum Jobbers Ass'n v. Fed. Power Comm'n*, 259 F.2d 921, 925 (D.C. Cir. 1958)); *see also In re NTE Conn., LLC*, 26 F.4th 980, 991 (D.C. Cir. 2022). Environmental injury, however, "can seldom be adequately remedied by money damages and is often permanent or at least of long duration, *i.e.*, irreparable. If such injury is sufficiently likely, therefore, the balance of harms will usually favor the issuance of an injunction to protect the environment." *Amoco Prod. Co. v. Vill. of Gambell*, 480 U.S. 531, 545 (1987).

Under those standards, a stay of the Order is appropriate.

A. Intervenors Are Irreparably Harmed by the Order.

A stay is necessary to ensure that Consumers does not continue with activities that are already causing irreparable harm to Public Interest Organizations, their members, and the public as a result of the Department's Order. *See Consumers Energy v. Midwestern Independent Sys. Operator, Inc.*, Complaint Requesting Fast Track Processing, FERC Docket No. EL25-90, 2 (June 6, 2025), Accession No. 20250606-5231 ("[T]he Campbell Plant is currently being offered into the MISO

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[15] Pursuant to FPA Section 313 and Rule 713(e) of the applicable rules, the filing of a request for rehearing does not automatically stay a Department Order. 16 U.S.C. § 825*l*, 18 C.F.R. § 385.713(e).

market and is producing energy when dispatched."). As noted extensively above in Section III.A.1, during its time of operation, Michiganders' health and environment have been profoundly and irreparably harmed by pollution from the Campbell Plant. Along with the highest emissions of sulfur dioxide, carbon dioxide, and volatile organic compounds of any plant in Consumers' generation fleet, it was also a major source of water pollution in its area. Ex. 23 at 11 (Bilsback Direct Testimony); EPA, ECHO, https://echo.epa.gov/detailed-facility-report?fid=110000411108 (last visited June 18, 2025). Campbell's closure is set to eliminate 538 tons of particulate matter, 13 tons of volatile organic compounds, 2,918 tons of nitrogen oxides, 5,244 tons of sulfur dioxide, and 8.2 megatons of carbon dioxide emissions per year based on 2019 operational levels. Ex. 23 at 11. This translates to ending 36–81 premature deaths and $389–$879 million in health impact costs *every year*. *Id.* at 15. These harms, which flow directly from the Department's Order, are actual, specific, imminent, and deadly. They will affect the lives and well-being of Public Interest Organizations and their members. The stark public health stakes of Public Interest Organizations' request for stay require the Department to pause implementation of its Order until a Court reviews its validity.

Moreover, the economic impacts of complying with this Order will be steep. This planned retirement represented major cost savings for ratepayers stemming directly from the closure of the unreliable and highly expensive Campbell plant. *See, e.g.*, Ex. 53 (Consumers News Release). Without a stay, the Department will needlessly force Consumers to divert attention and investment dollars away from compliance with the 2022 Settlement, thereby exceeding its jurisdiction and denying Public Interest Organizations' members the benefits of Michigan energy policies they and the public are designed to benefit from. 16 U.S.C. § 824; *see also Hughes*, 578 U.S. at 154 ("Under the FPA, FERC has exclusive authority to regulate 'the sale of electric energy at wholesale in interstate commerce' . . . 'But the law places beyond FERC's power, and leaves to the States alone, the regulation of "any other sale"—most notably, any retail sale—of electricity.'") (*quoting* 16 U.S.C. § 824(b)(1) *and Elec. Power Supply Ass'n*, 577 U.S. at 265). The states' reserved authority includes control over in-state "facilities used for the generation of electric energy." 16 U.S.C. §824(b)(1); *see Pac. Gas & Elec.*, 461 U. S. at 205 ("Need for new power facilities, their economic feasibility, and rates and services, are areas that have been characteristically governed by the States."). In forcing ratepayers to reopen and operate an uneconomic, unreliable, and obsolete resource that the state, stakeholders, and owner want to close, *see supra* sections III.A.1, III.C.1, the Department's Order jeopardizes the diversification of generating resources the Department itself has said increases grid reliability and will inherently and unjustifiably add to ratepayer costs. DOE, *Energy Reliability and Resilience,* https://www.energy.gov/eere/energy-reliability-and-resilience (last visited June 18, 2025). As there is no clear recourse to recovering these costs from the Department should Public Interest Organizations prevail in their challenge, a stay pending judicial review is necessary to protect ratepayers from unwarranted energy costs increases—especially at a time when energy prices are already on the rise. *See, e.g.,*

Stan Huxley, *Average Cost of Utilities in Michigan* (June 1, 2025), https://realestates.network/data-research/average-cost-of-utilities-in-michigan; Kyle Davidson, Michigan Advance, *Detroit Households Face High Energy Costs, Study Says* (Sept. 16, 2024), https://michiganadvance.com/2024/09/16/detroit-households-face-high-energy-costs-study-says.

Estimates of cost savings from the plant closure are substantial. *See, e.g.*, *supra* section III.A.1; Ex. 53 (Consumers News Release) (describing total cost savings from 2022 updates to Consumers Clean Energy Plan, including Campbell's closure). These are savings that are already being reinvested in newer, more reliable facilities. Because of the age of the Campbell Plant and the unreasonably short notice and lack of warning around the Order's issuance, the facility has had to scramble not just to try and procure coal, but to hire new operators and perform highly expensive maintenance necessary to operate the units. *See, e.g., supra* section IV.B.2. Consumers reports to FERC that it is taking steps in response to the Order, and it has also filed for cost recovery with FERC. *Consumers Energy v. Midwestern Indep. Sys. Operator, Inc.*, Complaint Requesting Fast Track Processing, FERC Docket No. EL25-90, (June 6, 2025), Accession No. 20250606-5231. If Consumers' filing is granted, costs will be borne by Michigan and MISO ratepayers, and the Department does not identify any clear recourse for a refund in the event the Order is declared unlawful.

B. A Stay Would Not Result in Harm to Any Other Interested Parties.

No other interested parties would be harmed by a stay. The issuance of a stay would not harm end-use electricity consumers because the lack of an actual emergency means that a stay would not disrupt the provision of electricity. *See supra* sections III.B–C, IV.A. Furthermore, because Consumers and MISO have both already planned for the closure of the Campbell Plant, a stay would only have the effect of relieving them of the administrative, compliance, and planning burdens imposed by the Order. *See, e.g.*, Ex. 1 at 2–3 (DOE Campbell Order). On the balancing of equities, there is therefore no meaningful countervailing harm that would follow from a stay.

C. A Stay is in the Public Interest Given the Significant Evidence Demonstrating There is No Factual or Legal Support for This Order, and the Harm it Produces to the Broader Public.

There is no public interest served by the Order, and a stay will only benefit the public. First, the Order exceeds the Department's authority; it has provided no reasonable grounds to substantiate any near-term or imminent shortfall in electricity supply that would justify Campbell's continued operation. *See League of Women Voters v. Newby*, 838 F.3d 1, 12 (D.C. Cir. 2016) (noting "there is a substantial public interest 'in having governmental agencies abide by the federal

laws that govern their existence and operations'") (quoting *Washington v. Reno*, 35 F.3d 1093, 1103 (6th Cir. 1994)). Second, the Order overrides Michigan's exercise of its "authority to choose [its] preferred mix of energy generation resources." *Citizens Action*, 125 F.4th at 239. And third, it would protect the broader public—beyond Public Interest Organizations and their members—from the onerous costs, and dangerous pollution, produced by unnecessary operation of the Campbell Plant.

VI. CONCLUSION

For the reasons set forth above, the undersigned Public Interest Organizations respectfully request that the Department grant intervention; grant rehearing and rescind the Order (and any renewals of the Order); and stay the Order.

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Attachment: Index of Exhibits

Index of Exhibits

Exhibit No.	Exhibit Name	Document Name	URL
1	DOE Campbell Order	DOE Order No. 202-25-3 (May 23, 2025)	https://www.energy.gov/sites/default/files/2025-05/Midcontinent%20Independent%20System%20Operator%20%28MISO%29%20202%28c%29%20Order_1.pdf
2	Grid Strategies Report	Michael Goggin, *A Review of DOE's 202(c) Order for the Campbell Coal Plant* (June 18, 2025)	
3	Powers Decl.	Declaration of Bill Powers, P.E. (June 15, 2025) (including attachments)	
4	DOE Campbell Memorandum	DOE, Decision Order Pursuant to Section 202(c) of the Federal Power Act for J.H. Campbell Power Plant (May 23, 2025)	https://www.documentcloud.org/documents/25956475-cuiprivileged-department-of-energy-memorandum-re-jh-campbell-coal-plant-in-michigan-section-202c-federal-power-act-order-may-2025/
5	DOE Order No. 202-22-4	DOE, Order No. 202-22-4 (Dec. 24, 2022)	https://www.energy.gov/sites/default/files/2022-12/PJM%20202%28c%29%20Order.pdf
6	DOE Order No. 202-17-4 Summary of Findings	Summary of Findings DOE Order No. 202-17-4 (Sep. 14, 2017)	https://www.energy.gov/sites/default/files/2017/09/f36/Order%20202-17-4%20Summary%20of%20Findings.pdf
7	DOE Order No. 202-02-1	DOE, Order No. 202-02-1 (Aug. 16, 2002)	https://www.energy.gov/sites/default/files/202%28c%29%20order%20202-02-1%20August%2016%2C%202002%20-%20CSC.pdf
8	Cooke Email to Alle-Murphy	Email from Lot Cooke, DOE to Linda Alle-Murphy Re: Rehearing procedures for DOE Order No. 202-05-3	https://www.energy.gov/oe/articles/question-and-answer-procedural-questions-application-rehearing-order-no-202-05-02?nrg_redirect=397676

Exhibit No.	Exhibit Name	Document Name	URL
9	Order Approving Campbell Settlement Agreement and Settlement Agreement	MPSC Case No. U-21090, Order Approving Settlement Agreement (June 23, 2022)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000003KjSDAA0
10	Blumenstock 2023 Direct Testimony	MPSC Case No. U-21389, Direct Testimony & Exhibits of Richard T. Blumenstock on Behalf of Consumers Energy Company (May 2023) (excerpted from larger transcript)	**Testimony**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y00000ACpRQAA1 **Exhibits**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y00000ACV7bAAH
11	Blumenstock 2024 Direct Testimony	MPSC Case No. U-21585, Direct Testimony & Exhibits of Richard T. Blumenstock on Behalf of Consumers Energy Company (May 2024) (excerpted from larger transcript)	**Testimony**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000KfWrgAAF **Exhibits**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000KLJlzAAH
12	Blumenstock 2025 Direct Testimony	MPSC Case No. U-21870, Direct Testimony & Exhibits of Richard T. Blumenstock on Behalf of Consumers Energy Company (June 2025) (excerpted from larger filing)	**Testimony**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000s6UQyAAM **Exhibits**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000s7CdKAAU

Exhibit No.	Exhibit Name	Document Name	URL
13	Kapala Direct Testimony	MPSC Case No. U-21090, Revised Direct Testimony of Norman J. Kapala on Behalf of Consumers Energy Company (Oct. 2021) (excerpted from larger transcript)	**Testimony**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000001QqldAAC **Exhibits**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000001OZHpAAO
14	Hoffman 2024 Direct Testimony	MPSC Case No. U-21258, Direct Testimony and Exhibits of Nathan J. Hoffman on Behalf of Consumers Energy Company (Mar. 2024) (excerpted from larger transcript)	**Testimony**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000ljeStAAI **Exhibits**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000g8QemAAE
15	Hoffman 2025 Direct Testimony	MPSC Case No. U-21424, Direct Testimony & Exhibits of Nathan J. Hoffman on Behalf of Consumers Energy Company (Mar. 2025) (excerpted from larger filing)	**Testimony and exhibits**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000hjHqNAAU
16	DOE Letter to FERC	Holly Rachel Smith, Deputy Gen. Counsel, U.S. Dep't of Energy to Debbie-Anne A. Reese, Secretary, FERC (dated June 13, 2025, filed June 16, 2025)	https://elibrary.ferc.gov/eLibrary/filelist?accession_num=20250616-4000

Exhibit No.	Exhibit Name	Document Name	URL
17	DOE Order No. 202-20-2	Department of Energy Order No. 202-20-2 (Sept. 6. 2020)	https://www.energy.gov/oe/articles/federal-power-act-section-202c-caiso-september-2020?nrg_redirect=454296
18	Proudfoot Rebuttal Testimony	MPSC Case No. U-21090, Rebuttal Testimony of Paul Proudfoot in Support of the Settlement Agreement on behalf of MPSC Staff (May 13, 2022) (excerpted from larger transcript)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000002z5EqAAI
19	Walz Direct Testimony	MPSC Case No. U-21090, Revised Direct Testimony & Exhibits of Sara T. Walz on Behalf of Consumers Energy Company (June 2021) (excerpted from larger transcript)	**Testimony**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000001OEXnAAO **Exhibits**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068t000000NibWaAAJ
20	King Direct Testimony	MPSC Case No. U-21090, Direct Testimony & Exhibits of Thomas King Jr. on Behalf of Wolverine Power Supply Cooperative, Inc. (2021) (excerpted from larger transcript)	**Testimony**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000002paWpAAI **Exhibits**: https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068t000000Vibb0AAB

Exhibit No.	Exhibit Name	Document Name	URL
21	Bleckman Direct Testimony	MPSC Case No. U-21816, Direct Testimony of Marc R. Bleckman on Behalf of Consumers Energy Company (Nov. 2024) (excerpted from larger transcript)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000nPekYAAS
22	Hahn Direct Testimony	MPSC Case No. U-21592, Direct Testimony of Joshua W. Hahn on Behalf of Consumers Energy Company (Sept. 2024) (excerpted from larger transcript)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000CFqsPAAT
23	Bilsback Direct Testimony	MPSC Case No. U-21090, Direct Testimony of Kelsey Bilsback on Behalf of ELPC, Ecology Center, UCS, and Vote Solar (Oct. 2021) (excerpted from larger transcript)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000002paWpAAI
24	Mic. Pub. Power Agency Petition to Intervene	MPSC Case No. U-21090, Michigan Public Power Agency's Petition to Intervene (July 19, 2021)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068t000000Qf5I7AAJ

Exhibit No.	Exhibit Name	Document Name	URL
25	2026 Consumers Energy Capacity Demonstration	MPSC Case No. U-21225, Consumers Energy Company's Capacity Demonstration for Planning Year 2026 (Dec. 21, 2022)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000005iOnPAAU
26	2027/2028 Consumers Energy Capacity Demonstration	MPSC Case No. U-21393, Consumers Energy Company's Capacity Demonstration for Planning Year 2027/2028 (Feb. 22, 2022)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y00000C8NDHAA3
27	2028/2029 Consumers Capacity Demonstration	MPSC Case No. U-21775, Consumers Energy Company's Capacity Demonstration for Planning Year 2028/2029 (Feb. 24, 2025)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000bz8crAAA
28	2028/2029 MPSC Staff Capacity Demonstration Results	MPSC Case No. U-21775, Michigan Public Service Commission Staff, Capacity Demonstration Results: Planning Year 2028/29 (May 12, 2025)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000ocKc4AAE

Exhibit No.	Exhibit Name	Document Name	URL
29	2024 Consumers ELG Annual Report	Consumers Energy, Notice of Planned Participation; Annual Progress Report Pursuant to 40 C.F.R. 423.19(g)(3); Consumers Energy Company, JH Campbell Complex NPDES Permit No. MI0001422, Steam Electric Effluent Limitations Guidelines (Dec. 16, 2024)	https://www.consumersenergy.com/-/media/CE/Documents/sustainability/coal-combustion-residuals/jhc/2024/2024-seeg-jhc-nopp-annual-progress%20Report_FINAL.pdf
30	DOE Rehearing Procedures	U.S. Dep't of Energy, DOE 202(c) Order Rehearing Procedures (last visited June 17, 2025)	https://www.energy.gov/ceser/doe-202c-order-rehearing-procedures
31	MISO 2025–26 Auction Results	MISO, Planning Resource Auction, Results for Planning Year 2025-2026 (Apr. 2025)	https://cdn.misoenergy.org/2025%20PRA%20Results%20Posting%2020250529_Corrections694160.pdf
32	MISO Emergency Declarations	MISO, Maximum Generation Emergency Declarations through June 2024 (Aug. 30, 2024)	https://www.oasis.oati.com/woa/docs/MISO/MISOdocs/Capacity_Emergency_Historical_Information.pdf
33	MISO Market Capacity Emergency	MISO, Market Capacity Emergency, SO-P-EOP-11-002 Rev: 21 (Mar. 3, 2025)	https://cdn.misoenergy.org/SO-P-EOP-11-002%20Rev%2021%20MISO%20Market%20Capacity%20Emergency683501.pdf

Exhibit No.	Exhibit Name	Document Name	URL
34	Ramey MISO Comments	Comments of Todd Ramey on Behalf of Midcontinent ISO, Inc. (May 28, 2025), Docket No. AD24-11-000, Accession No. 20250528-4032	https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20250528-4032&optimized=false&sid=4f4f3475-8309-4416-8289-2aee6d84c1a8
35	Patton MISO Comments	Technical Conference Comments of David B. Patton, Ph.D., MISO Independent Market Monitor (May 28, 2025), Docket No. AD25-7-000, Accession No. 20250528-4006	https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20250528-4006&optimized=false&sid=2c5ac909-a7f0-47eb-9bb3-c35f89976250
36	MISO Elliott Max. Gen. Event Overview	MISO, Overview of Winter Storm Elliott December 23, Maximum Generation Event (Jan. 17, 2023)	https://cdn.misoenergy.org/20230117%20RSC%20Item%2005%20Winter%20Storm%20Elliott%20Preliminary%20Report627535.pdf
37	MISO 2025-2026 CIL/CEL Final Results	MISO, 2025-2026 PY Seasonal CIL/CEL Final Results (Oct. 24, 2024)	https://cdn.misoenergy.org/20241024%20LOLEWG%20Item%2004%20PY%202025-2026%20Final%20CIL_CEL%20Results654989.pdf
38	MISO LOLE Presentation	MISO, *LOLE 101: Probabilistic Analyses*	https://cdn.misoenergy.org/LOLE%20101%20Training624875.pdf
39	DOE Order No. 202-22-2	Department of Energy Order No. 202-22-2 (Sept. 4, 2022)	https://www.energy.gov/ceser/federal-power-act-section-202c-banc-september-2022
40	NERC 2024 Reliability Report	NERC, 2024 State of Reliability (June 2024) (excerpt)	https://www.nerc.com/pa/RAPA/PA/Performance%20Analysis%20DL/NERC_SOR_2024_Technical_Assessment.pdf
41	NERC 2025 Summer Reliability Assessment	NERC, 2025 Summer Reliability Assessment (May 2025)	https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2025.pdf

Exhibit No.	Exhibit Name	Document Name	URL
42	2019–24 NERC Summer Reliability Assessments	NERC, Summer Reliability Assessments for 2019-2024 (Compiled)	2019 Reliability Assessment: https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2019.pdf 2020 Reliability Assessment: https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2020.pdf 2021 Reliability Assessment: https://nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC%20SRA%202021.pdf 2022 Reliability Assessment: https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2022.pdf 2023 Reliability Assessment: https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2023.pdf 2024 Reliability Assessment: https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2024.pdf
43	Winter Storm Elliott System Operations Inquiry	FERC, NERC, and Regional Entity Staff Report, *Inquiry into Bulk-Power System Operations During December 2022 Winter Storm Elliott* (Oct. 2023)	https://www.ferc.gov/media/winter-storm-elliott-report-inquiry-bulk-power-system-operations-during-december-2022#

Exhibit No.	Exhibit Name	Document Name	URL
44	PJM Elliott Report	PJM, *Winter Storm Elliott: Event Analysis and Recommendation Report* (July 17, 2023)	https://www.pjm.com/-/media/DotCom/library/reports-notices/special-reports/2023/20230717-winter-storm-elliott-event-analysis-and-recommendation-report.pdf?ref=blog.gridstatus.io
45	DOE Order No. 202-21-1	Department of Energy Order No. 202-21-1 (Feb. 14, 2021)	https://www.energy.gov/oe/articles/federal-power-act-section-202c-ercot-february-2021?nrg_redirect=364318
46	FERC Energy Primer	FERC, Energy Primer: A Handbook of Energy Market Basics (Dec. 2023) (excerpt)	https://www.ferc.gov/media/energy-primer-handbook-energy-market-basics
47	2024 Coal Ash Inspection Report	J.H. Campbell Generating Facility 2024 Facility Inspection Report (Oct. 2024)	https://www.consumersenergy.com/-/media/CE/Documents/sustainability/coal-combustion-residuals/jhc/2024/2024_JH-Campbell_Dry-Ash-Landfill_Inspection-Report_10-06-24.pdf
48	2021 CWA Permit	J.H. Campbell National Pollutant Discharge Elimination System Permit No. MI000142 (Oct. 2021)	https://mienviro.michigan.gov/nsite/map/results/detail/6241586858212305105/documents (type "Notice of NPDES permit issuance" within the "file" field, which should automatically filter results to one file dated 10/21/2021 and titled "CECO-J H Campbell Power Plt -- Notice NPDES permit issuance -- Major modification.pdf"; click the file name to download)
49	2025 Energy Innovation Dataset	Energy Innovation, dataset for Coal Power 28 Percent More Expensive In 2024 Than In 2021 (June 5, 2025)	https://energyinnovation.org/report/coal-power-28-percent-more-expensive-in-2024-than-in-2021/

Exhibit No.	Exhibit Name	Document Name	URL
50	2025 Energy Innovation Coal Cost Report	Energy Innovation, Coal Power 28 Percent More Expensive In 2024 Than In 2021 (June 5, 2025)	https://energyinnovation.org/wp-content/uploads/Coal-Cost-Update.pdf
51	2023 Energy Innovation Coal Cost Report	Energy Innovation, Coal Cost Crossover 3.0 (Jan. 2023)	https://energyinnovation.org/wp-content/uploads/Coal-Cost-Crossover-3.0-2.pdf
52	MI State Energy Profile	U.S. EIA, Michigan State Energy Profile (Oct. 17, 2024)	https://www.eia.gov/state/print.php?sid=mi
53	Consumers News Release	Consumers Energy, *Landmark Plan to Accelerate End of Coal Era, Provide Reliability and Protect Environment Earns Approval* (June 23, 2022)	https://www.consumersenergy.com/news-releases/news-release-details/2022/06/23/20/43/plan-to-accelerate-end-of-coal-era-provide-reliability-and-protect-environment-earns-approval
54	NARUC Coal Report	National Association of Regulatory Utility Commissioners, Recent Changes to U.S. Coal Plant Operations and Current Compensation Practices (Jan. 2020) (excerpt)	https://www.osti.gov/servlets/purl/1869928
55	IEA Flexibility Report	C. Henderson, International Energy Agency, Increasing the flexibility of coal-fired power plants (Sept. 2014) (excerpt)	https://usea.org/sites/default/files/092014_Increasing%20the%20flexibility%20of%20coal-fired%20power%20plants_ccc242.pdf

Exhibit No.	Exhibit Name	Document Name	URL
56	Blumenstock 2021 Second Rebuttal Testimony	MPSC Filing No. U-21090, Second Rebuttal Testimony of Richard T. Blumenstock on Behalf of Consumers Energy Company (May 9, 2022) (excerpted from larger transcript)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000002z5EqAAI
57	Jester 2021 Direct Testimony	MPSC Filing No. U-21090, Testimony of Douglas B. Jester in Support of Settlement Agreement on Behalf of the Michigan Environmental Council, Natural Resources Defense Council, Sierra Club, and Citizens Utility Board of Michigan (May 9, 2022) (excerpted from larger transcript)	https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000002z5EqAAI
58	MISO Tariff Module E-1	MISO Tariff Module E-1 – Resource Adequacy	https://docs.misoenergy.org/miso12-legalcontent/Module_E-1_-_Resource_Adequacy.pdf
59	MISO 2025–2026 Prelim. PRA Report with Final Results	MISO PY 2025-2026 Seasonal Preliminary PRA Report with Final Results (June 16, 2025)	https://cdn.misoenergy.org/PY 2025_2026 Seasonal Preliminary PRA Report 03_18_25686471.xlsxhttps://cdn.misoenergy.org/PY%202025_2026%20Seasonal%20Preliminary%20PRA%20Report%20with%20Final%20Results%2006_15_25703532.xlsx

Exhibit No.	Exhibit Name	Document Name	URL
60	MISO Tariff Section 38.2.7	MISO Tariff Section 38.2.7	https://docs.misoenergy.org/miso12-legalcontent/TariffAsFiledVersion.pdf
61	MISO Tariff Attachment Y	MISO Tariff Attachment Y	https://docs.misoenergy.org/miso12-legalcontent/Attachment_Y_-_Notification_of_Potential_Resource_-_SCU_Change_of_Status.pdf
62	FERC Technical Conference Notice	FERC, *Meeting the Challenge of Resource Adequacy in Regional Transmission Organization and Independent System Operator Regions* (June 2, 2025)	https://elibrary.ferc.gov/eLibrary/filelist?accession_number=20250602-3068&optimized=false&sid=457eb824-f5ed-41fa-a043-a0cd8c55cb4b
63	Palgrave Handbook	M. Hafner & G. Luciana, Palgrave Handbook of International Economics (2022) (excerpt)	https://link.springer.com/book/10.1007/978-3-030-86884-0
64	IEA Report	International Energy Agency, The role of CCUS in low-carbon power systems (2020) (excerpt)	https://www.iea.org/reports/the-role-of-ccus-in-low-carbon-power-systems
65	DOE Transmission Planning Study	DOE, Nat'l Transmission Planning Study, Ch. 2: Long-Term U.S. Transmission Planning Scenarios (2024)	https://www.energy.gov/sites/default/files/2024-10/NationalTransmissionPlanningStudy-Chapter2.pdf

Exhibit No.	Exhibit Name	Document Name	URL
66	NERC 2024 Interregional Transfer Capability Study, Part 1	NERC, Interregional Transfer Capability Study: (ITCS) Strengthening Reliability Through the Energy Transformation, Transfer Capability Analysis (Part 1) (Aug. 2024)	https://www.nerc.com/pa/RAPA/Documents/ITCS_Part_1_Results.pdf

BEFORE THE UNITED STATES DEPARTMENT OF ENERGY

Federal Power Act Section 202(c) Emergency Order: Midcontinent Independent System Operator (MISO)	)))))	Order No. 202-25-3

Exhibit to
Motion to Intervene and Request for Rehearing and Stay of
Public Interest Organizations

Filed June 18, 2025

Exhibit 2

Grid Strategies Report

A Review of DOE's 202(c) Order for the Campbell Coal Plant

Michael Goggin

June 18, 2025

I. Executive Summary

On May 23, 2025, the U.S. Department of Energy ("DOE") issued an order under Section 202(c) of the Federal Power Act directing the Midcontinent Independent System Operator ("MISO") and utility Consumers Energy to take "all measures necessary" to ensure the continued availability of the J.H. Campbell coal power plant in Michigan for three months, past its scheduled retirement date on May 31, 2025.[1] The DOE order claims there is an emergency due to insufficient "dispatchable capacity" in MISO. The order does not define dispatchable capacity and does not clearly indicate the basis on which the Energy Secretary believes there is a shortfall of dispatchable resources. In my experience, "dispatchable" generally refers to generating resources that can change their level of output on command, and a stated lack of "capacity" is a claim that there will be insufficient electricity supply during periods of peak demand, a need often referred to as "resource adequacy."

This report is organized into four sections. First, it provides brief background on the methods grid planners use to ensure electricity supply is adequate to meet demand. Next, it reviews how utilities, state regulators, regional grid operators, and reliability regulators use planning, regulatory, and market mechanisms to ensure electricity generating supply is adequate to meet demand. Third, it reviews the determinations Consumers Energy, Michigan, and MISO have already made that the Campbell plant is not necessary for meeting anticipated electricity demand this summer, in large part because MISO has a summer capacity surplus of more than 2,600 MW. That section also documents why the North American Electric Reliability Corporation ("NERC") Summer Reliability Assessment that DOE cites to justify its order does not indicate that an emergency exists in the MISO region. Finally, the report explains why the aging Campbell plant is a poor choice for meeting electricity demand this summer, as evidenced by its low availability rates during recent summer peak demand periods.

II. Background on Resource Adequacy Methods

At the outset, it is helpful to explain some relevant terms. "Resource adequacy" generally means having enough supply during periods of peak net system need from generators and from other resources like demand response (programs by which electricity users are compensated for reducing consumption) and energy storage.

There is no one correct amount of resource adequacy: what level is appropriate depends in part on what system planners, regulators, industry, utilities, customers, government, and other stakeholders want to pay for. This question is one of risk versus reward. More resources can always be added to achieve more resource adequacy, but there are diminishing returns if more is invested. As a result, the usual benchmark for acceptable risk of such events occurring is one day of lost load in ten years. In other words, system planners typically seek to have a set of

[1] U.S. DOE, *Order No. 202-25-3*, (May 23, 2025) available at https://www.energy.gov/sites/default/files/2025-05/Midcontinent%20Independent%20System%20Operator%20%28MISO%29%20202%28c%29%20Order_1.pdf

resources such that the system can expect to experience no more than one day containing an outage in ten years. Utilities, state regulators, and regional grid operators have coalesced around this benchmark, and have generally concluded that it appropriately balances the cost of building and maintaining generating capacity versus the cost of potential generation shortfalls. Many state regulators use the one day in ten years criterion to ensure profit-maximizing utilities do not burden ratepayers with the cost of excessive generating capacity. This is largely due to the diminishing marginal returns from a higher planning reserve margin,[2] which is the amount of extra generating capacity that exists in a system above peak load projections, expressed as a percentage of peak load.

To calculate the target reserve margin that achieves a specific risk threshold, planners use sophisticated statistical analyses to simulate electricity demand and supply availability scenarios based on decades of historical weather patterns. The reserve margin thus accounts for interannual variability in peak electricity demand due to extreme weather events and other factors. Planners also use these sophisticated methods to determine the expected contribution of each resource towards meeting peak needs, often called a resource's "capacity value" or "accredited capacity." These methods account for how weather patterns affect the timing of wind and solar output, and how unplanned outages and other factors can cause any resource to have reduced availability during periods of need.[3] Thus, planners account for all of these risks in setting the target reserve margin.

II. Existing State and Regional Measures Already Ensure Reliability and Resource Adequacy.

The regulation and oversight of power grid reliability and resource adequacy have become far more sophisticated and robust since Section 202(c) of the FPA was enacted in 1935. For most of the past century, states and the electric utilities they regulate have had front-line responsibility for ensuring that adequate resources are available to serve the electric power needs of customers in their jurisdictions. In recent decades, two key developments have layered regional and national assurance mechanisms onto the existing state resource adequacy regulations.

First, the Federal Energy Regulatory Commission ("FERC") approved the formation of Regional Transmission Organizations ("RTOs") and Independent System Operators ("ISOs"),

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[2] For example, see K. Carden and A. Dombrowsky, *Estimation of the Market Equilibrium and Economically Optimal Reserve Margins for the ERCOT Region for 2024 (Final),* (January 2021) available at https://www.ercot.com/files/docs/2021/01/15/2020_ERCOT_Reserve_Margin_Study_Report_FINAL_1-15-2021.pdf, at 34-40; and PJM, *2023 PJM Reserve Requirement Study*, (October 2023) available at https://www.pjm.com/-/media/DotCom/committees-groups/committees/mc/2023/20231115/20231115-consent-agenda-b---2-2023-pjm-reserve-requirement-study-report-final.ashx, at 27.

[3] MISO, *Planning Year 2025-2026 Loss of Load Expectation Study Report*, available at https://cdn.misoenergy.org/PY%202025-2026%20LOLE%20Study%20Report685316.pdf?v=20250313114401, at 20-23.

such as MISO. The RTOs and ISOs operate the bulk power transmission system within their service areas – which in several cases (including MISO) cover multiple states – and manage wholesale electricity markets that help ensure resource adequacy.

Second, Congress enacted Section 215 of the FPA in 2005, creating a new reliability regulatory regime overseen by FERC. Pursuant to Section 215, FERC designated NERC as the national Electric Reliability Organization, with responsibility for setting and enforcing national reliability standards, subject to FERC approval. NERC also designates "Regional Entities" that help implement the national standards in their regions and develop region-specific standards, subject to FERC and NERC approval. ReliabilityFirst Corporation ("RFC") is the Regional Entity for Michigan and most of eastern MISO. Together, state utility regulators, ISOs and RTOs, NERC and its subsidiary regional reliability organizations, and FERC share responsibility for assuring the electric grid operates reliably.

A. States and Utilities

The states are responsible for ensuring that the utilities they regulate have adequate resources to meet demand for electric power. In most states, including Michigan, utility regulators have processes through which they evaluate utilities' plans to add new generators, retire old generators, and undertake a host of other activities, with the goal being to identify a prudent resource plan that minimizes costs and risks for ratepayers. I have participated in many of these "integrated resource plan" or "IRP" proceedings, which are detailed, fact-intensive processes in which the regulator and other stakeholders closely review a utility's proposed assumptions and methods. A primary focus of IRP proceedings is ensuring resource adequacy. State regulators have strong incentives to ensure resource adequacy, as a generation shortfall in a state can result in localized blackouts or increased costs for ratepayers.

B. MISO

MISO plays two important roles in ensuring resource adequacy. First, as discussed further below, MISO is a designated Planning Coordinator responsible for implementing the resource adequacy planning standard adopted by RFC. Pursuant to that standard, MISO performs and documents an annual resource adequacy analysis, which is based on the "one day in ten years" loss of load standard. MISO uses that analysis to determine a planning reserve margin for the region, for each season of the upcoming year. MISO then applies that margin to each zone's load projections to determine the planning reserve margin requirement for each zone and season.

Second, MISO runs a residual capacity market that allows utilities and generators to buy and sell capacity to meet each of their four seasonal planning reserve margin requirements. MISO and other grid operators also use energy markets and other tools to ensure that electricity supply meets demand at all times. Each of these markets is discussed in more detail below.

1. Capacity Market

First, MISO sets the planning reserve margin that it determines is required to meet the "one day in ten years" benchmark, and determines resources' capacity accreditation, as discussed above. MISO then applies the planning reserve margin to each zone of MISO. As part of this, MISO uses power flow models to assess how transmission constraints affect the need for generation in each zone in the MISO region.[4] This ensures that there are sufficient resources to meet demand in each zone, after accounting for the transmission capacity available to import power from other zones.

Based on these inputs and zonal requirements, MISO then conducts an annual capacity market auction, and this price signal provides an additional mechanism to incentivize the development and construction of new generation to help meet future resource adequacy needs. The core elements of MISO's capacity market processes have been approved by FERC under its authority to ensure that rates are just, reasonable, and not unduly discriminatory under Section 205 of the Federal Power Act.[5]

If a utility falls short of its resource adequacy obligation to meet its needs plus MISO's reserve margin, it must make up for that shortfall through purchases in the capacity market. If supply is short or import purchases begin to approach the import limit MISO has calculated for a given zone, the price of capacity in that zone will increase. State regulators are cognizant of that risk, and thus have a strong incentive to ensure their utilities have adequate supplies in advance.

2. Real-Time and Near-Term Operations

Each day MISO runs a day-ahead energy market in which generators offer to produce electricity each hour of the next day at a certain price. MISO then compares this supply curve of offers to its demand forecast for the next day, and then "commits" the generators that can meet this demand forecast at lowest cost subject to reliability and transmission constraints. Generators that are committed but were offline start and take other steps required to be online by the next day. The vast majority of electricity is procured in the day-ahead market, but MISO also runs a real-time energy market to fine-tune deviations in supply and demand that occur after the day-ahead market has concluded. The energy markets play an important role in ensuring supply is adequate to meet demand by sending a powerful price signal for generators to maximize their output and for utilities to import power from neighboring regions during periods of need.

MISO also operates "ancillary services" markets, which procure other services like operating reserves from flexible resources that help balance fast variability in supply and demand. Prices in these markets are typically very low as MISO has a large supply of flexible

[4] *Id.* at 36-55.
[5] FERC Docket Nos. 11-4081; EL15-70 *et al.*; ER22-495; ER23-2977; ER24-1638.

resources,[6] and that supply is increasing as batteries and other flexible resources replace inflexible coal and nuclear generators.

As a result, there is no indication of a need for "dispatchable" resources, as claimed by DOE's Order, to provide additional flexibility in MISO. If a need for more flexibility arose at any point in time, prices for ancillary services would simply increase, spurring flexible generators that were offline to start up and provide flexibility until the need has passed. Regardless, coal plants like Campbell are not very dispatchable compared to other generating resources, with long startup times, slow output ramp rates, and high minimum output levels. This can also reduce their capacity contribution to meeting peak demand needs, particularly those that arise on short notice.

If MISO encounters a risk of a generation shortage in real-time operations, it has numerous additional tools that it can deploy in a stepwise fashion to help ensure supply is adequate to meet demand.[7] The impact of many of these steps is not fully accounted for in MISO's loss of load analysis, making that planning conservative.

Days in advance of expected extreme heat, cold, or other severe weather, MISO can issue an alert or declare Conservative System Operations, directing transmission and generating resources on planned outages to return to service and make other preparations.[8] NERC notes this step helped ensure resource adequacy in MISO last summer.[9] As noted below, NERC's "elevated risk" designation for MISO is based on the assumption that many generators are on outage, so by taking steps to reduce generator outages MISO can reduce that risk.

Next, MISO can progress to issuing a capacity warning, which activates numerous additional steps to increase supply, including activating emergency pricing, and curtailing non-firm exports.[10] If the event then progresses to step 1a, MISO activates demand response resources, which are customers that are compensated for reducing their demand during periods of need. If an event progresses to step 1b, generating units are directed to operate at their

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[6] Potomac Economics, 2023 State of the Market Report for the MISO Electricity Markets, (June 2024) available at https://www.potomaceconomics.com/wp-content/uploads/2024/06/2023-MISO-SOM_Report_Body-Final.pdf, at 8-9.

[7] MISO, *MISO Market Capacity Emergency*, available at https://cdn.misoenergy.org/SO-P-EOP-11-002%20Rev%2021%20MISO%20Market%20Capacity%20Emergency683501.pdf, at 37-39.

[8] MISO, *Conservative System Operations*, available at https://cdn misoenergy.org/SO-P-NOP-00-449%20Rev%2010%20Conservative%20System%20Operations688847.pdf

[9] NERC, *2025 Summer Reliability Assessment*, (May 2025) available at https://www nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2025.pdf, at 51, referring to summer 2024: "MISO experienced peak electricity demand during late August. Demand was between the normal and 90/10 summer peak forecast levels. Wind and solar resource output at the time of peak demand were near expectations for summer on-peak contributions. Forced outages of thermal units, however, were lower than expected. On the day prior to MISO's peak demand, operators issued advisories to maximize generation. Similar advisories were issued earlier in the summer, coinciding with above-normal temperatures and periods of high generator forced outages."

[10] MISO, *MISO Market Capacity Emergency*, available at https://cdn.misoenergy.org/SO-P-EOP-11-002%20Rev%2021%20MISO%20Market%20Capacity%20Emergency683501.pdf, at 10-12.

emergency maximum limits. If the event escalates further, MISO can then progress through additional steps including activating additional tiers of demand response resources, issuing public conservation requests, procuring emergency energy, and directing resources with environmental de-rates to request waivers, all before load is shed.[11]

C. NERC

Pursuant to Section 215 of the Federal Power Act, FERC certified NERC as the Electric Reliability Organization responsible for developing mandatory reliability standards, subject to FERC's review and approval. NERC also annually assesses seasonal and long-term reliability of the bulk power system and monitors system performance.

1. Mandatory Reliability Standards

NERC Regional Entity RFC has imposed a mandatory standard for Planning Resource Adequacy Analysis, Assessment, and Documentation for the region that includes Michigan. As the Planning Coordinator for Michigan, MISO is required to annually calculate the planning reserve margin required to meet the one day in ten years benchmark.[12] The standard also requires certain methods for the load forecast and the capacity accreditation for resources and imports.

Like other NERC and Regional Entity standards, this requirement is enforceable with fines of up to $1 million per day per violation. This further ensures MISO conducts robust and standardized resource adequacy planning, and each year MISO extensively documents that its planning methods fully meet this standard.[13]

2. Reliability Assessments

NERC also conducts periodic assessments of reliability in the country, including a summer, winter, and long-term reliability assessment every year. In the seasonal assessments, NERC groups regions into three categories for risk of resource adequacy shortfalls, as shown in the NERC figure below.[14] MISO's categorization as "elevated" risk in this year's NERC Summer Reliability Assessment is the middle of three risk categories, below "high" and above

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[11] *Id.* at 38-39.
[12] NERC, *Standard BAL-502-RFC-02*, available at https://www.nerc.com/pa/Stand/Reliability%20Standards/BAL-502-RFC-02.pdf
[13] *See, e.g.,* MISO, *Planning Year 2025-2026 Loss of Load Expectation Study Report*, available at https://cdn.misoenergy.org/PY%202025-2026%20LOLE%20Study%20Report685316.pdf?v=20250313114401, at 56-60.
[14] NERC, *2025 Summer Reliability Assessment*, (May 2025) available at https://www nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2025.pdf, at 10.

"normal." In its 2023[15] and 2024[16] Summer Reliability Assessments, NERC respectively identified 8 and 5 out of 13 U.S. regions as having elevated risk. Despite half of U.S. regions being designated as having elevated risk, there were no resource adequacy shortfalls in either summer.

Table 1: Seasonal Risk Assessment Summary

Category	Criteria[1]
High Potential for insufficient operating reserves in normal peak conditions	• Planning Reserve Margins do not meet Reference Margin Levels; or • Probabilistic indices exceed benchmarks (e.g., LOLH of 2.4 hours over the season); or • Analysis of the risk hour(s) indicates resources will not be sufficient to meet operating reserves under **normal peak-day demand and outage scenarios**[2]
Elevated Potential for insufficient operating reserves in above-normal conditions	• Probabilistic indices are low but not negligible (e.g., LOLH above 0.1 hours over the season); or • Analysis of the risk hour(s) indicates resources will not be sufficient to meet operating reserves under **extreme peak-day demand with normal resource scenarios** (i.e., typical or expected outage and derate scenarios for conditions);[2] or • Analysis of the risk hour(s) indicates resources will not be sufficient to meet operating reserves under **normal peak-day demand with reduced resources** (i.e., extreme outage and derate scenarios)[3]
Normal Sufficient operating reserves expected	• Probabilistic indices are negligible • Analysis of the risk hour(s) indicates resources will be sufficient to meet operating reserves under normal and extreme peak-day demand and outage scenarios[4]

Table Notes:
[1]The table provides general criteria. Other factors may influence a higher or lower risk assessment.
[2]**Normal resource scenarios** include planned and typical forced outages as well as outages and derates that are closely correlated to the extreme peak demand.
[3]**Reduced resource scenarios** include planned and typical forced outages and low-likelihood resource scenarios, such as extreme low-wind scenarios, low-hydro scenarios during drought years, or high thermal outages when such a scenario is warranted.
[4]Even in normal risk assessment areas, extreme demand and extreme outage scenarios that are not closely linked may indicate risk of operating reserve shortfall.

Figure 1: NERC table showing categories used for regions' seasonal risk

III. There Is No Evidence Consumers Energy, Michigan, or MISO Has a Resource Adequacy Emergency this Summer.

Michigan utility regulators and Consumers Energy have determined that Campbell was not needed to meet resource adequacy needs, a conclusion confirmed by MISO's resource adequacy analysis and capacity market results showing a capacity surplus for this summer. Moreover, NERC's Summer Reliability Assessment does not indicate MISO has a supply emergency.

[15] NERC, *2023 Summer Reliability Assessment*, (May 2023) available at https://www nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2023.pdf, at 6.
[16] NERC, *2024 Summer Reliability Assessment*, (May 2024) available at https://www nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2024.pdf, at 6.

A. Michigan

Consumers Energy completed comprehensive reliability and economic modeling in its 2021 IRP, overseen by the Michigan Public Service Commission with robust engagement from stakeholders. As explained above, a cornerstone of this and all IRPs is ensuring resource adequacy needs are met. The utility,[17] the Commission,[18] and other stakeholders concluded that it was more economic and reliable to replace Campbell with a variety of other resources, including by (1) acquiring the nearby 1,200 MW gas-fired Covert Generating Station, which Consumers Energy subsequently purchased in May 2023, and (2) adding nearly 1,600 MW of demand response and energy efficiency by 2025.[19]

Michigan utilities are also bound by the state's Public Act 341 of 2016, which requires them to demonstrate to the Michigan Public Service Commission that they have sufficient generating capacity to meet their capacity obligations. The Commission can impose a state reliability mechanism capacity charge on utilities that fail to meet that requirement. In June 2022, the Commission approved Consumers Energy's demonstration for the 2025/2026 planning year,[20] and more recently Consumers successfully made this demonstration for the 2027/2028 planning year[21] and filed its demonstration for 2028/2029.[22]

Confirming that state and regional officials stand by their determination that the Campbell plant is not needed, the Chair of the Michigan Public Service Commission recently indicated that MISO, Michigan, and Consumers Energy did not ask to keep the Campbell plant online.[23]

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[17] CMS Energy, *Integrated Resource Plan*, (June 2021) available at https://s26.q4cdn.com/888045447/files/doc_presentations/2021/06/2021-Integrated-Resource-Plan.pdf

[18] Michigan Public Service Commission, *Exhibit A: Settlement Agreement*, https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000003KjSDAA0 (beginning at page 98 in the pdf)

[19] *Id.* at 4 (101 in the pdf).

[20] See the discussion of Case No. U-21099 at Michigan Public Service Commission, *MPSC approves Consumers Energy integrated resource plan settlement agreement, takes additional steps to boost electric capacity*, (June 2022) available at https://www.michigan.gov/mpsc/commission/news-releases/2022/06/23/mpsc-approves-consumers-irp_takes-steps-improve-capacity

[21] Michigan Public Service Commission, *Order*, Case Nos. U-21393 and U-21775, (August 2024) available at https://mi-psc my.site.com/sfc/servlet.shepherd/version/download/068cs000005gPyUAAU

[22] Consumers Energy, *Redacted Version of Consumers Energy Company's Capacity Demonstration for Planning Year 2028/2029,* (February 2025) available at https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/068cs00000bz8crAAA

[23] C. Brown and H. Stevens, *Coal and Gas Plants Were Closing. Then Trump Ordered Them to Keep Running*, (June 2025) available at https://www nytimes.com/2025/06/06/climate/trump-coal-gas-plants-energy-emergency html

B. MISO

Based on the loss of load analysis discussed above, MISO has concluded that it has "surplus capacity" for this summer, without Campbell.[24] The 2025/26 capacity auction yielded summer capacity supplies 2,623 MW or 2.2 percentage points above the summer reserve margin target of 7.9%, which was calibrated to meet the one day in ten years loss of load benchmark.[25] In other words, MISO would still meet this stringent reliability benchmark this summer even if an additional 2,623 MW of additional capacity unexpectedly were unavailable, and retaining Campbell would only increase MISO's already-generous capacity surplus for this summer beyond 4 GW. As noted above, capacity supply above the reserve margin target provides diminishing marginal returns.

The zonal results from MISO's 2025/26 capacity auction also confirm there is no resource adequacy shortfall this summer in Zone 7, which is the MISO footprint in Michigan's Lower Peninsula. Zone 7 has 1.2 GW of supplies above the summer Local Clearing Requirement, which is the amount of capacity that MISO has concluded must come from within Zone 7 after accounting for transmission constraints.[26]

C. NERC's Summer Reliability Assessment Does Not Indicate a Supply Emergency.

The NERC Summer Reliability Assessment that DOE cites in an attempt to justify the Campbell 202(c) order is based on information reported by MISO and other regional grid operators. Thus, the NERC assessment does not contradict MISO's conclusion that it has a capacity surplus above what it needs to meet its reliability target. In fact, NERC notes that for MISO, "Expectations for load loss and unserved energy are less than these amounts because MISO's resources are above the Reference Margin Level," which is MISO's reserve margin target calibrated to achieve a loss of load risk of one day in 10 years.[27]

NERC including MISO in the "elevated" summer risk category does not indicate a supply emergency. This year's Summer Reliability Assessment identifies four U.S. regions as having elevated risk, plus one region each in Canada and Mexico. As noted above, across the 2023 and 2024 Summer Reliability Assessments NERC identified half of U.S. regions as having elevated risk, yet there were no resource adequacy shortfalls in either summer.

This year's Summer Reliability Assessment finds that MISO has a 24.7% reserve margin, which NERC calculates corresponds to a 9.3% reserve margin with typical generator outage

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[24] MISO, *Planning Resource Auction Results for Planning Year 2025-26 (Corrections, reposted 05/29/25)*, available at https://cdn misoenergy.org/2025%20PRA%20Results%20Posting%2020250529_Corrections694160.pdf at 4.
[25] *Id.* at 3, 4, 37.
[26] *Id.* at 18.
[27] NERC, *2025 Summer Reliability Assessment*, (May 2025) available at https://www nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2025.pdf, at 12.

rates. NERC's finding of elevated risk only indicates a "Potential for insufficient operating reserves in above-normal conditions."[28] NERC finds that MISO would only see a generation shortfall with a perfect storm of 90th percentile demand (*i.e.*, demand is higher than expected in 9 out of 10 years) at the same time that MISO sees its highest historical rate for generator outages and derates due to "extreme conditions," and even in that worst case scenario it would only have a 1.9% shortfall.[29] By way of comparison, NERC's 2023 and 2024 Summer Reliability Assessments projected MISO would have a 6.9% and 6.3% shortfall under that worst case scenario, respectively, yet NERC still did not designate the risk as "high," and MISO ultimately had more than adequate supplies in both summers.

As explained above, MISO and utility reserve margins are already designed to accommodate wide interannual variability in electricity demand and generator outages, and MISO has calibrated its summer reserve margin to the stringent requirement that it only experience one day of shortfall in 10 years. Moreover, NERC notes that Michigan and the rest of MISO have the lowest risk of any region for seeing above average temperatures this summer.[30]

D. The NERC and MISO resource adequacy studies are likely conservative.

NERC's Summer Reliability Assessment and MISO's loss of load analysis both use conservative assumptions for the availability of imports and renewable output in MISO.

NERC's analysis does not fully account for MISO's ability to import power during periods of need, even though MISO successfully tapped into the supply and demand diversity provided by its neighbors to import more than 13 GW during Winter Storm Uri[31] and 4.5 GW during Winter Storm Elliott.[32] Other studies have documented significant diversity between MISO and its neighbors in the timing of peak demand, lulls in renewable output, and correlated thermal generator outage and derate events, including summer heat waves.[33] These geographic diversity benefits are due to inherent climate and weather diversity, and the fact that extreme heat and cold events are only at their most severe in small geographic areas that move over the course of an event.

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[28] *Id.* at 6.
[29] *Id.* at 10, 16.
[30] *Id.* at 9.
[31] M. Goggin, *Transmission Makes the Power System Resilient to Extreme Weather*, (July 2021) available at https://gridstrategiesllc.com/wp-content/uploads/2024/05/transmission-makes-the-power-system-resilient-to-extreme-weather.pdf, at 7.
[32] M. Goggin and Z. Zimmerman, *The Value of Transmission During Winter Storm Elliott*, (February 2023) available at https://acore.org/wp-content/uploads/2023/02/The-Value-of-Transmission-During-Winter-Storm-Elliott-ACORE.pdf
[33] A. Brooks, A. Silverstein, and R. Gramlich, *Resource Adequacy Value of Interregional Transmission*, (June 2025) available at https://gridstrategiesllc.com/wp-content/uploads/GridStrategies_RAValueInterregionalTx_250601.pdf; M. Goggin, Z. Zimmerman, and A. Sherman, *Quantifying a Minimum Interregional Transfer Capability Requirement*, (May 2023) available at https://gridstrategiesllc.com/wp-content/uploads/2023/05/GS_Interregional-Transfer-Requirement-Analysis-final54.pdf

DOE's National Transmission Planning Study documented the geographic diversity phenomenon with a compelling set of maps.[34] Those maps show that during the event when MISO saw the highest demand in the period 2007-2013, the Southwest Power Pool and the Southeast had significantly lower demand. Similar maps in the study show significant diversity in when MISO and its neighbors experience lulls in wind or solar output.[35]

NERC has previously noted that "MISO benefits from significant transfer capacity with neighboring assessment areas…"[36] Data in NERC's 2025 Summer Reliability Assessment documents that these neighboring grid operators have large reserve margin surpluses this summer, which further increases the availability of imports from those regions. NERC projects the summer reserve margin surplus under typical generator outage rates for the Southwest Power Pool at 18.2%, Ontario at 23.4%, PJM at 15.0%, the SERC Central region at 12.7%, and Manitoba at 11.2%.[37] As a result, at least some of those regions are highly likely to have surplus generating resources if MISO experiences periods of high demand or low supply this summer.

When calculating the reserve margin needed to meet the 1 day in 10 year target, MISO's loss of load study also makes conservative assumptions for the availability of imports from other regions. While MISO conducts robust statistical modeling of historical import availability, this analysis is conservative because hours in which MISO was exporting or minimally importing due to a lack of need are included in the dataset, even though MISO likely could have imported or at least reduced exports in those hours if needed.[38]

If there were a true resource adequacy emergency in MISO, a potential solution would be to issue a Section 202(c) order to facilitate interchange with neighboring grid operators. As the MISO independent market monitor[39] and others[40] have documented, inefficient pricing of market transactions along MISO's seams with neighboring grid operators can interfere with the efficient flow of power during shortage events. DOE could work with MISO and other stakeholders to improve the efficient flow of power across MISO's seams, improving the availability of imports during periods of peak need.

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[34] DOE, *National Transmission Planning Study: Chapter 2*, (October 2024) available at https://www.energy.gov/sites/default/files/2024-10/NationalTransmissionPlanningStudy-Chapter2.pdf, at 53.
[35] *Id.* at 51 and 52.
[36] NERC, *2024 Long Term Reliability Assessment,* (December 2024) available at https://www nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_Long%20Term%20Reliability%20Assessment_2024.pdf, at 44.
[37] NERC, *2025 Summer Reliability Assessment*, (May 2025) available at https://www nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2025.pdf, at 10.
[38] MISO, *Planning Year 2025-2026 Loss of Load Expectation Study Report*, available at https://cdn.misoenergy.org/PY%202025-2026%20LOLE%20Study%20Report685316.pdf?v=20250313114401, at 33.
[39] Potomac Economics, *2023 State of the Market Report*, (June 2024) available at https://cdn.misoenergy.org/2023%20State%20of%20the%20Market%20Report636641.pdf, at xiv-xv.
[40] J. Pfeifenberger and N. Bay, *Intertie Optimization: Efficient Use of Interregional Transmission (Update),* (April 2024) available at https://www.brattle.com/wp-content/uploads/2024/04/Intertie-Optimization-Efficient-Use-of-Interregional-Transmission-Update.pdf

If DOE's claim of resource adequacy risk in MISO were true, facilitating interchange with neighboring grid operators would be more appropriately tailored to address the risk. This is because loss of load probability is concentrated into a narrow slice of hours on a small number of days when high demand coincides with low supply. Increased interchange can occur during just those hours, tapping into diversity in the timing of peak need between MISO and its neighbors. In contrast, retaining the Campbell coal plant for the entire summer is not well-tailored for meeting DOE's claimed emergency.[41]

MISO and NERC also appear not to have accounted for the fact that low wind speed events are negatively correlated with low solar output events. For example, wind speeds tend to be low during high pressure heat dome events, which tend to cause high solar output because there are fewer clouds during such events. Conversely, stormy conditions that result in reduced solar output due to clouds tend to be correlated with high wind output. As NERC notes, MISO has over 31 GW of wind and 18 GW of solar, so one resource can make up for shortfalls of the other.[42] As noted above, there is also significant diversity in when MISO and its neighboring regions experience lulls in renewable output. MISO meteorologists have also "projected normal to above-normal wind generation" for this summer.[43]

IV. Consumers Energy May Need to Buy Coal to Comply with DOE's Order.

The DOE data shown below indicate that coal supplies at the plant appear to have been drawn down in advance of its anticipated retirement, with enough coal remaining onsite as of the end of March 2025 to operate the plant for only about two to three weeks.[44] The DOE data indicate the plant is supplied via rail deliveries from a coal mine in Wyoming.[45]

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[41] As DOE's Campbell order notes, "FPA section 202(c) requires the Secretary of Energy to ensure that any 202(c) order that may result in a conflict with a requirement of any environmental law be limited to the "hours necessary to meet the emergency and serve the public interest, and, to the maximum extent practicable," be consistent with any applicable environmental law and minimize any adverse environmental impacts." U.S. DOE, *Order No. 202-25-3*, (May 23, 2025) https://www.energy.gov/sites/default/files/2025-05/Midcontinent%20Independent%20System%20Operator%20%28MISO%29%20202%28c%29%20Order_1.pdf, at 2.

[42] NERC, *2025 Summer Reliability Assessment*, (May 2025) available at https://www nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2025.pdf, at 16.

[43] MISO, *2025 Summer Readiness Workshop*, (May 2025) available at https://cdn.misoenergy.org/20250508%20Summer%20Readiness%20Workshop%20Items%2002-04%20Presentation695282.pdf, at 17.

[44] DOE Energy Information Administration, *EIA-923 March 2025*, (May 2025) available at https://www.eia.gov/electricity/data/eia923/, with monthly stocks calculated by taking coal stock data as of December 2023 and then subtracting monthly consumption and adding monthly deliveries.

[45] *Id.*

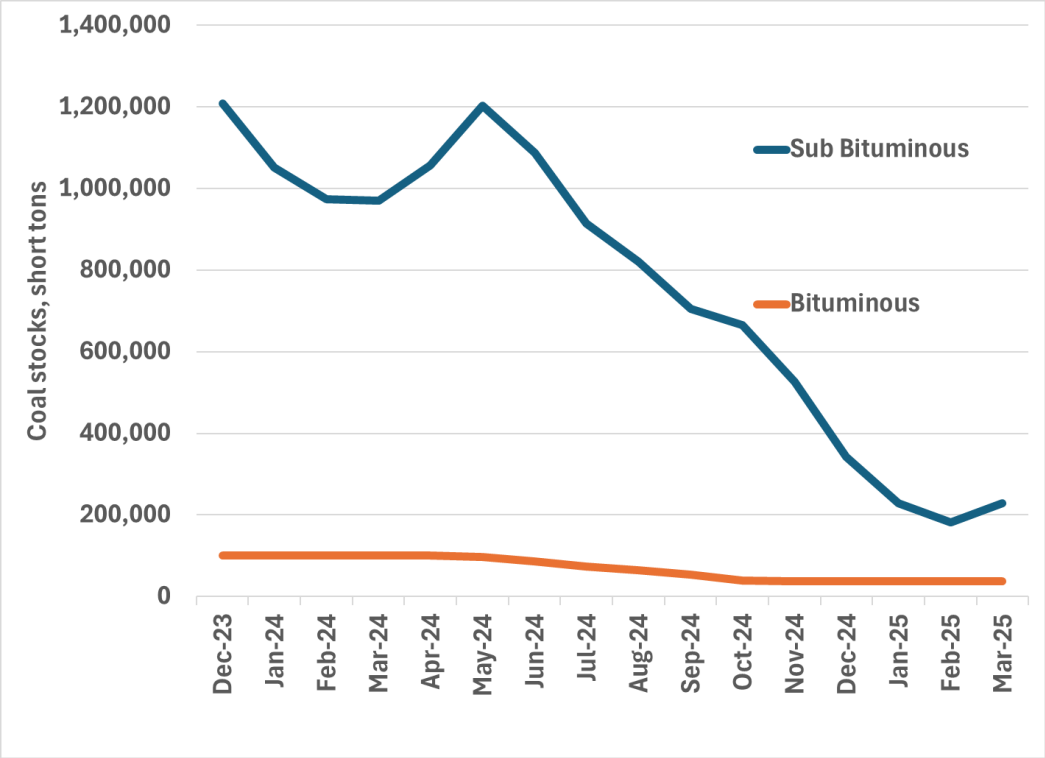


Figure 2: Coal supplies at Campbell, per DOE data

V. Qualifications of Michael Goggin

Michael Goggin has worked on electricity market and reliability issues for over 20 years. At Grid Strategies he serves as an expert on those topics for a range of clients including state utility regulators, grid operators, and non-profit organizations. He has testified as an expert in dozens of proceedings before state utility commissions in Arizona, Colorado, Georgia, Iowa, Illinois, Indiana, Wisconsin, Louisiana, Michigan, Minnesota, Missouri, Montana, Nevada, New Mexico, North Carolina, Ohio, Oklahoma, South Carolina, Virginia, Washington, and Wisconsin, as well as before FERC.

For the preceding ten years Michael worked at the American Wind Energy Association (now known as the American Clean Power Association), where he provided technical analysis regarding renewable energy, transmission, and wholesale electricity markets, including directing the organization's research and analysis team from 2014-2018. Prior to the American Wind Energy Association, he worked at a firm serving as a consultant to DOE, and at two environmental groups.

In the course of that work, Michael has co-authored more than one hundred filings to FERC; served as a technical reviewer for over a dozen national laboratory reports, academic articles, and renewable integration studies; published academic articles and conference presentations on renewable integration, transmission, and policy; and been elected to the Standards, Operating, and Planning Committees of NERC. He graduated with honors from Harvard University. His recent publications are available at https://gridstrategiesllc.com/reports/.

VI. Sources

The principal documents I relied on in preparing this report include the materials listed below and in footnotes. To the extent feasible, relevant documents are included in the Appendix of the Request for Rehearing.

-MISO, *Planning Year 2025-2026 Loss of Load Expectation Study Report*, available at https://cdn.misoenergy.org/PY%202025-2026%20LOLE%20Study%20Report685316.pdf?v=20250313114401

-MISO, *Planning Resource Auction Results for Planning Year 2025-26 (Corrections, reposted 05/29/25)*, available at https://cdn.misoenergy.org/2025%20PRA%20Results%20Posting%2020250529_Corrections694160.pdf

-MISO, *MISO Market Capacity Emergency*, available at https://cdn.misoenergy.org/SO-P-EOP-11-002%20Rev%2021%20MISO%20Market%20Capacity%20Emergency683501.pdf

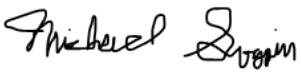
-U.S. EPA, *Continuous Emission Monitoring Systems: Custom Data Download*, available at https://campd.epa.gov/data/custom-data-download

-NERC, *Standard BAL-502-RFC-02*, available at https://www.nerc.com/pa/Stand/Reliability%20Standards/BAL-502-RFC-02.pdf

-NERC, *2025 Summer Reliability Assessment*, (May 2025) available at https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/NERC_SRA_2025.pdf

-Michigan Public Service Commission, *Exhibit A: Settlement Agreement*, https://mi-psc.my.site.com/sfc/servlet.shepherd/version/download/0688y000003KjSDAA0 (beginning at page 98 in the pdf)

DOE Energy Information Administration, *EIA-923 March 2025*, (May 2025) available at https://www.eia.gov/electricity/data/eia923/



Michael Goggin
Vice President
Grid Strategies, LLC

BEFORE THE UNITED STATES DEPARTMENT OF ENERGY

Federal Power Act Section 202(c) Emergency Order: Midcontinent Independent System Operator (MISO)	)))))	Order No. 202-25-3

Exhibit to
Motion to Intervene and Request for Rehearing and Stay of
Public Interest Organizations

Filed June 18, 2025

Exhibit 3

Powers Decl.

DECLARATION OF BILL POWERS, P.E.

I, Bill Powers, P.E., declare as follows:

1. I am the principal of Powers Engineering, an engineering firm that consults on issues related to the operation of, and control of pollution from, power plants, including coal-fired power plants. My office is located in San Diego, California. My professional and educational experience is summarized in the curriculum vitae attached to this declaration (Attachment A).

2. I received a Bachelor of Science degree from Duke University in Mechanical Engineering and a Master of Public Health degree in Environmental Sciences from the University of North Carolina. I am a registered engineer in the state of California.

3. I have been an independent engineering consultant with a focus on power systems since 1994. In prior employment, I received "Engineer of the Year" awards from ENSR Consulting and Engineering in 1991 (before ENSR merged with AECOM) and from the Naval Energy and Environmental Support Activity ("NEESA") office within the U.S. Navy in 1986 (before NEESA was subsumed by the Naval Facilities Engineering Service Center). I also received a "Productivity Award of Excellence" from the U.S. Department of Defense in 1985. I worked extensively on Navy and Marine Corps shore installation of coal-fired power plants in the 1980s as a Navy civilian engineer.

4. I have over 40 years of experience in the fields of power plant operations and environmental engineering. My technical specialties include, among others: combustion equipment permitting, testing, and monitoring; air emission control assessments; air pollution control equipment retrofit design/performance; and power plant cooling system conversion.

5. I have served as an engineering expert for a wide array of clients, including private companies, non-profits, and government entities, including the cities of Carlsbad, California and Houston and Dallas, Texas. In this role, I have provided expert testimony, conducted feasibility studies, and consulted on power plant engineering issues in a number of states, including Arkansas, California, Connecticut, Florida, Georgia, Kentucky, Maryland, Missouri, Nevada, North Carolina, New York, and Tennessee.

6. I have extensive experience with coal-fired power plants. For example, in 2022 I provided expert testimony before the North Carolina Public Utility Commission regarding Duke Energy's proposed plan to maintain coal-fired units in its electric supply portfolio—a proposal that was justified in part on the company's belief that those units were necessary to meet winter peak demand. Throughout my career, I have consulted on the operation of, and control of pollution from, coal-fired power plants. Examples include serving as the lead engineer on a system and performance audit of continuous emissions monitoring systems at a coal-fired power plant in Nevada, and on a project to assess and address the root causes of opacity exceedances at Ameren Missouri's Labadie, Meramec, and Rush Island coal-fired power plants. I have also frequently provided expert testimony on coal-fired power plants. For example, I testified on air pollution controls at a coal-fired power plant in Massachusetts, and on the correlation between a Georgia coal-fired power plant's particulate matter emissions and opacity excursions, among other issues. I also served as a testifying expert on an evaluation of the air emissions limits and control technologies for a proposed coal-fired power plant in Arkansas.

7. I am very familiar with "peaking" units that are intended to ramp up and provide electricity during times of peak demand, such as during hot summer months. For example, in 2001, I prepared all aspects of the air permit applications for five 50 MW simple-cycle gas

turbine installations in response to an emergency request by the California state government for additional peaking power.

8. I am familiar with the U.S. Department of Energy's ("DOE") May 23, 2025 order regarding Consumers Energy Company's ("CECo") J.H. Campbell coal-fired power plant (Order No. 202-25-3) ("Order").

9. The J.H. Campbell coal-fired power plant ("Campbell") consists of three coal-fired generating units. The in-service dates for Units 1, 2, and 3 are 1962, 1967, and 1980 respectively.[1] The nameplate capacity for Unit 1 is 265.2 MW; for Unit 2 is 378.8 MW; and for Unit 3 is 916.8 MW.[2] Under CECo's 2021 integrated resource plan ("IRP"), which was approved with modifications by the Michigan Public Service Commission ("Michigan PSC") in 2022, the Campbell units were scheduled to retire on or before May 31, 2025.

10. I was asked by Earthjustice to develop an opinion on: (A) the extent to which Campbell can operate reliably after May 31, 2025; (B) whether Campbell can operate effectively as a peaking unit; and (C) easily attainable steps DOE can require to ensure Campbell's operations are consistent with environmental requirements and minimize adverse environmental impacts. A list of materials I reviewed in developing my opinion is attached (Attachment B).

11. While there may be alternatives to Campbell available to DOE to address the circumstances DOE describes in the Order, I do not opine on these alternatives. I also do not opine on the claimed energy emergency described in the Order.

[1] Michigan PSC Case No. U-21585, Direct Testimony of Richard T. Blumenstock on Behalf of CECo, p. 7, Tbl. 1 (May 2024).
[2] EIA, Preliminary Monthly Electric Generator Inventory (based on Form EIA-860M as a supplement to Form EIA-860) (Apr. 2025), https://www.eia.gov/electricity/data/eia860m/ (showing nameplate capacity).

A. The extent to which Campbell can operate reliably beginning June 1, 2025

12. In my professional opinion, it is unlikely that Campbell can be depended upon to operate reliably in its current state as of June 2025.[3] This is especially true if the plant is required to run for extended periods of time; is required to stop and start numerous times; or attempts to start up at an accelerated rate in response to extreme demand conditions.

13. Even before the scheduled retirement date of May 31, 2025, Campbell suffered from poor reliability. Nationally, the average coal unit forced outage rate in 2023 was 12.0 percent.[4] In contrast, Campbell Units 1-3 had forced outage rates in 2024 of 14.84 percent, 48.07 percent, and 19.25 percent, respectively[5]—well above the average coal unit forced outage rate. The forced outage rates in 2023 were similarly high: Units 1-3 had forced outage rates of 18.66 percent, 57.32 percent, and 22.41 percent, respectively.[6]

14. "Availability" is a measure of the percent of time a unit is not in planned or forced outage and is available to generate electricity. Campbell has lower availability than coal units of comparable size. When CECo compared the availability of the Campbell units in 2019-2023 to similarly sized and fueled generating units, the company found that "[t]he availability of Campbell Units 1, 2, and 3 were all below the five-year comparisons."[7]

15. The nature of the Unit 1-3 outages in 2023 and 2024 reflects the impact of worn and difficult-to-repair or replace coal unit components on operational reliability. Outages tended to be long and recurrent. Tables 1 and 2 document the longest Unit 1-3 outages by description and duration in 2024 and 2023, respectively. The long outages on Units 1 and 2, and the types of

[3] CECo filed testimony regarding Campbell on June 2, 2025, in its most recent rate case before the Michigan PSC.
[4] NERC, *2024 State of Reliability*, p. 59 (June 2024).
[5] Michigan PSC Case No. U-21424, Direct Testimony of Nathan J. Hoffman on Behalf of CECo, Ex. A-15 (Mar. 2025).
[6] Michigan PSC Case No. U-21258, Direct Testimony of Nathan J. Hoffman on Behalf of CECo, Ex. A-14 (Mar. 2024).
[7] U-21424, Hoffman Direct Testimony, p. 22 & Ex. A-16.

failures, are the predictable result of old equipment, no capital investment, and minimal maintenance.

Table 1. Longest 2024 Outages by Type, Units 1-3 - Description and Duration[8]

Unit	Outage description	Total duration (hours)
1	• degraded governing valve (3 outages) • worn leaking superheater tube (1 outage)	911 491
2	• obsolete boiler feedwater pump failure (1 outage) • degraded valve(s) malfunction (3 outages) • worn equipment leaks, various (4 outages)	1,417 1,723 854
3	• worn/failed turbine turning gear[9] (1 outage) • worn tube leak (1 outage)	1,104 356

Table 2. Longest 2023 Outages by Type, Units 1-3 - Description and Duration[10]

Unit	Outage description	Total duration (hours)
1	• worn leaking valve and superheater tube (2 outages)	661
2	• obsolete boiler feedwater pump failure (4 outages) • worn equipment leaks (3 outages)	3,445 571
3	• worn leaking boiler/superheater tubes (3 outages) • worn/vibrating turbine bearings (1 outage)	1,857 426

16. In my professional opinion, Campbell will continue to degrade in 2025 due to the continued lack of capital investment and minimal major maintenance spending.

17. CECo dramatically reduced capital and major maintenance spending on Units 1-3 following the IRP that established a May 2025 retirement date. CECo reduced its capital spending on the units in the 2022-2025 period by approximately 91 percent compared to the amount the company projected to spend in the same period if Units 1-2 operated until 2031 and Unit 3 operated until 2039 (the retirement dates CECo originally proposed in its IRP). Likewise, CECo reduced its major maintenance spending on the units in the 2022-2025 period by 62-78

[8] U-21424, Hoffman Direct Testimony, Ex. A-11.
[9] *Ibid.*, Ex. A-13. The stated scope of the turbine turning gear repair was to "[f]abricate replacement planetary gears and drive shaft to allow for unit operation until the planned retirement in 2025."
[10] U-21258, Hoffman Direct Testimony, Ex. A-10.

percent (approximately 72% total across all three units). The reductions in capital and major maintenance spending are summarized in Table 3.[11]

Table 3. Reductions in CECo Capital and Major Maintenance Spending on Campbell Units 1-3, 2022-2025

Capital spending	Pre-IRP projected spend 2022-25 ($MM)	Post-IRP actual/projected spend 2022-25 ($MM)	% reduction
Units 1&2	60.6	4.1	93
Unit 3	85.5	8.4	90
Major maintenance spending			
Units 1&2	14.4	5.5	62
Unit 3	23.5	5.1	78

18. Some of the capital and major maintenance projects that CECo cancelled in 2022-2025 were reliability projects, while others were air emission control system projects. Regarding the reliability projects that CECo originally planned to carry out (before deciding to retire Units 1-3 in May 2025), CECo likely believed they were necessary to maintain adequate unit reliability and that failure to carry out the projects could compromise that reliability. But CECo then determined that those projects were unnecessary with the May 2025 retirement. Therefore, it is unlikely that Campbell can reliably dispatch given this deferred capital and major maintenance spending.

19. A detailed listing of the 2022-2025 capital projects that CECo projected carrying out before deciding to retire the units in May 2025 is shown in the left-hand column of Tables 4a (Units 1 and 2) and 4b (Unit 3).[12] As can be seen from the middle column in these tables,[13] CECo did not carry out most of those projects.

[11] Table 3 summarizes the information presented in Tables 4a, 4b, 5a, and 5b, which are based on CECo filings with the Michigan PSC.

[12] Information in the left-hand column is from witness Kapala's testimony in CECo's 2021 IRP case. *See* Michigan PSC Case No. U-21090, Revised Direct Testimony of Norman J. Kapala, pp. 13-18 (Oct. 2021).

[13] Information in the middle column is from witness Blumenstock's testimony in CECo's 2023-2025 rate cases. *See* Ex. A-12 to the Direct Testimony of Richard T. Blumenstock in Michigan PSC Case Nos. U-21389 (May 2023), U-21585 (May 2024), and U-21870 (June 2025).

20. Table 4a compares (i) the capital projects CECo proposed carrying out for Units 1 and 2 before deciding to retire those units in May 2025 with (ii) those projects CECo has actually carried out, or plans to carry out, after making that retirement decision. Capital spending dropped by two-thirds on Units 1 and 2 in 2022, from the proposed $12.6 million to $4.1 million. No capital spending occurred in 2023-2024, and no capital spending has yet occurred or is expected to occur in 2025 as of CECo's June 2025 rate case filing. Cancelled capital projects with a direct impact on unit reliability include, among others, partial replacement of the Unit 1 superheat outlet pendant and replacement of the Unit 2 burner assemblies and horizontal reheat system.

Table 4a. Units 1&2 Capital Spend: CECo pre-IRP projection vs. post-IRP actuals/projections

Pre-IRP projection	Post-IRP actuals/projections	Difference
2022 projected spend (in 2021): $12,556,500 $7,300,000 at Campbell Unit 1, including: • PJFF Bag Replacement ($1,578,000) • Superheat Outlet Pendant – partial replacement ($3,490,000) • Five additional projects totaling $2,232,000 $5,256,500 at Campbell Unit 2, including: • Catalyst Management ($1,120,000) • Replace Burner Assemblies ($1,350,000) • Six additional projects totaling $2,786,500	**2022 actual expenditure: $4,067,000** The 2022 actual capital expenditure primarily consisted of two projects, both on Unit 1: air preheater baskets and seals ($1,819,000), and pulse jet fabric filter bags ($1,040,000).	**$8,489,500**
2023 projected spend (in 2021): $16,686,700 $7,214,680 at Campbell Unit 1, including: • PJFF Filter Bag Replacement ($1,514,100) • Replace Air Preheater Baskets and Seals ($1,113,400) • Distributed Control System and Simulator Upgrade ($1,500,000) • Ashpit Rebuild ($1,000,000) • Twelve additional projects totaling $2,087,180 $9,472,020 at Campbell Unit 2, including: • Horizontal Reheat Replacement ($5,053,000) • SCR Reactor Catalyst Replacement ($2,000,000) • Nine additional projects totaling $2,419,020	**2023 actual expenditure: $0** The precise value reported in CECo's filing is negative (-$1,479,000). This is likely due to accounting treatment. For purposes of this analysis, I treat negative investment as $0.	**$16,686,700**
2024 projected spend (in 2021): $21,005,000 $9,753,000 at Campbell Unit 1, including: • Replace Burners Corner 1-8 ($2,700,000) • Replace Air Preheater Baskets and Seals ($1,137,100) • Boiler Component Replacement ($3,000,000) • Balance of Plant Equipment Replacement ($1,500,000) • Six additional projects totaling $1,415,900 $11,252,000 at Campbell Unit 2, including: • Horizontal Reheat Replacement ($7,952,000) • Distributed Control System and Simulator Upgrade ($1,500,000) • Four additional projects totaling $1,800,000	**2024 actual expenditure: $0** The precise value reported in CECo's filing is negative (-$1,510,000). This is likely due to accounting treatment. For purposes of this analysis, I treat negative investment as $0, which is consistent with 2024 testimony from CECo witness Blumenstock stating that the company did not plan to invest any capital in the Campbell units in 2024.[14]	**$21,005,000**
2025 projected spend (in 2021): $10,350,000 $2,550,000 at Campbell Unit 1, including four projects that do not exceed $669,000 individually $7,800,000 at Campbell Unit 2, including: • Replace turbine right side Reheat Stop Valve body ($1,850,000) • Boiler Component Replacement ($3,000,000) • Five additional projects totaling $2,950,000	**2025 projected expenditure: $0** CECo projected no capital expenditures at Unit 1 or Unit 2 in 2025.	**$10,350,000**
	TOTAL	**$56,531,200**

[14] *See* U-21585, Blumenstock Direct Testimony, p. 62.

21. Table 4b compares the capital projects CECo proposed carrying out for Unit 3 before deciding to retire that unit in May 2025 with those projects CECo has actually carried out, or plans to carry out, after making that retirement decision. Capital spending dropped by more than half on Unit 3 in 2022, from a proposed $17.1 million to $7.9 million, and dropped almost entirely in 2023, from a proposed $20.5 million to less than $0.5 million. No capital spending occurred in 2024, and no capital spending has yet occurred or is expected to occur in 2025 as of CECo's June 2025 rate case filing. Cancelled Unit 3 capital projects with a direct impact on unit reliability include, among others, complete coal mill overhauls, boiler wall panel replacements, and fuel handling repairs.

Table 4b. Unit 3 Capital Spend: CECo pre-IRP projection vs. post-IRP actuals/projections

Pre-IRP projection	Post-IRP actuals/projections	Difference
2022 projected spend (in 2021): $17,125,333 • PJFF Bag & Cleaning Air Manifold Replacement ($3,994,601) • SCR Reactor Catalyst Management ($1,866,200) • Complete Mill Overhauls ($1,264,800) • Replace CO-O2 Monitors ($967,400) • Design and Install New Large Particle Ash Screen ($1,485,100) • Fuel Handling & Infrastructure Repairs ($1,500,000) • Sixteen additional projects totaling $6,047,032	**2022 actual expenditure: $7,935,000** The 2022 actual capital expenditure included three projects: air compressor replacement ($1,207,000); selective catalytic reduction catalyst management ($1,196,000); and diesel generator controls ($1,172,000). The actual expenditure represented about 46 percent of the pre-IRP projection.	**$9,190,333**
2023 projected spend (in 2021): $20,478,187 • PJFF Bag & Cleaning Air Manifold Replacement ($3,263,331) • Complete Mill Overhauls ($1,295,300) • Design and Install New Large Particle Ash Screen ($1,008,700) • Secondary Air Heater basket & seal replacement ($2,425,000) • High Pressure Feedwater Heater 8A replacement ($5,039,800) • Fuel Handling & Infrastructure Repairs ($1,500,000) • Seventeen additional projects totaling $6,954,257	**2023 actual expenditure: $456,000** The actual capital expenditure represented about 2 percent of the pre-IRP projection.	**$20,022,187**
2024 projected spend (in 2021): $33,395,569 • SCR Reactor Catalyst Management ($1,959,510) • Turbine Drain Modifications ($2,535,000) • Superheat Terminal Drain Replacement ($3,023,100) • Replace Boiler Sidewall Panels ($2,425,000) • Replace Boiler Front And Rear Wall Panels ($2,482,900) • Secondary Air Heater basket & seal replacement ($1,562,000) • Fuel Handling & Infrastructure Repairs ($1,500,000) • Cell Construction and Permitting ($5,482,830) • and twenty-one additional projects totaling $12,425,229	**2024 actual expenditure: $0** The precise value reported in Consumers' filing is negative (-$1,264,000). This is likely due to accounting treatment. For purposes of this analysis, I treat negative investment as $0, which is consistent with 2024 testimony from CECo witness Blumenstock stating that the company did not plan to invest any capital in the Campbell units in 2024.	**$33,395,569**
2025 projected spend (in 2021): $14,512,045 • GSU Replacement ($6,485,045) • SCR Reactor Catalyst Management ($3,000,000) • AQCS Equipment repair/replacement ($1,000,000) • Cell Construction and Permitting ($2,000,000) • and four additional projects totaling $2,027,000	**2025 projected expenditure: $0** CECo projected no Unit 3 capital budget in 2025.	**$14,512,045**
	TOTAL	**$77,120,134**

22. A detailed listing of the 2022-2025 major maintenance projects that CECo projected carrying out before deciding in 2022 to retire the units in May 2025 is shown in the left-hand column of Tables 5a (Units 1 and 2) and 5b (Unit 3).[15] As can be seen from the middle column in these tables,[16] CECo did not carry out most of those projects.

23. Table 5a compares the major maintenance projects CECo proposed carrying out for Units 1 and 2 before deciding to retire those units in May 2025 with those projects CECo has actually carried out, or plans to carry out, after making that retirement decision. Major maintenance spending declined by a total of 62 percent across 2022-2025, from a proposed total of $14.4 million to $5.5 million. CECo does not specify the nature of most of its major maintenance projects in its rate case filings. However, one cancelled major maintenance project with a direct impact on unit reliability is the Unit 2 turbine valve inspection project.

[15] Information in the left-hand column is from witness Kapala's testimony in CECo's 2021 IRP case. *See* Michigan PSC Case No. U-21090, Revised Direct Testimony of Norman J. Kapala, pp. 28-30 (Oct. 2021).
[16] Information in the middle column is from witness Blumenstock's testimony in CECo's 2023-2025 rate cases. *See* Ex. A-41 to the Direct Testimony of Richard T. Blumenstock in Michigan PSC Case No. U-21389 (May 2023) and Ex. A-43 to witness Blumenstock's testimony in Case Nos. U-21585 (May 2024), and U-21870 (June 2025).

Table 5a. Units 1&2 Major Maintenance Spend: CECo pre-IRP projection vs. post-IRP actuals/projections

Pre-IRP projection	Post-IRP actuals/projections	Difference
2022 projected spend (in 2021): $3,537,000 • Campbell 1 and 2 Periodic Outage Maintenance ($1,248,000) • Thirteen additional projects totaling $2,289,000	**2022 actual expenditure: $3,307,000** The 2022 actual maintenance expenditure was slightly less than the Unit 1&2 maintenance budget projected by CECo in 2021.	**$230,000**
2023 projected spend (in 2021): $2,905,000 • Covering 10 projects	**2023 actual expenditure: $1,054,000** The 2023 actual maintenance expenditure was approximately one-third the Unit 1&2 maintenance budget proposed for 2023 by CECo in 2021.	**$1,851,000**
2024 projected spend (in 2021): $3,405,167 • Covering 12 projects	**2024 actual expenditure: $903,000** The 2024 actual maintenance expenditure was approximately 27 percent of the Unit 1&2 maintenance budget proposed for 2024 by CECo in 2021.	**$2,502,167**
2025 projected spend (in 2021): $4,569,000 • Campbell 2 Turbine Valve Inspection ($1,300,000) • Seven additional projects totaling $3,269,000	**2025 projected expenditure:**[17] **$268,000** The 2025 projected maintenance expenditure was approximately 6 percent of the Unit 1&2 maintenance budget proposed for 2025 by CECo in 2021.	**$4,301,000**
	TOTAL	**$8,884,167**

[17] *See* U-21585, Ex. A-43 to Blumenstock Direct Testimony. This exhibit shows the "Projected Test Year 12 Months Ending 02/28/26." This 12-month cost projection covers most of the 5-month 2025 operational period (1/1/25 – 5/31/25) for Campbell Units 1&2 as well as the additional months those units would not be operational. From the information I reviewed, this is the best source of information regarding CECo's actual and projected 2025 major maintenance spending.

24. Table 5b compares the major maintenance projects CECo proposed carrying out for Unit 3 before deciding to retire that unit in May 2025 with those projects CECo has actually carried out, or plans to carry out, after making that retirement decision. Major maintenance spending declined by a total of 78 percent across 2022-2025, from a proposed total of $23.5 million to $5.1 million. CECo does not specify most of its major maintenance projects in its rate case filings. However, as discussed in more detail below, one cancelled major maintenance project with a direct impact on unit reliability is the $7.9 million Unit 3 turbine overhaul project. The project was originally scheduled to take place in 2024. The turbine failed in April 2024 resulting in a 46-day forced outage.[18]

[18] *See infra* Tbl. 1.

Table 5b. Unit 3 Major Maintenance Spend: CECo pre-IRP projection vs. post-IRP actuals/projections

Pre-IRP projection	Post-IRP actuals/projections	Difference
2022 projected spend (in 2021): $4,208,040 • Boiler Feed Pump Turbine Inspection ($1,680,000) • Fourteen additional projects totaling $2,528,040	**2022 actual expenditure: $3,196,000** The 2022 actual maintenance expenditure was sufficient to do about 75 percent of the Unit 3 maintenance projects budgeted for 2022 by CECo in 2021.	**$1,012,040**
2023 projected spend (in 2021): $2,523,970 • Covering 12 projects	**2023 actual expenditure: $995,000** The actual expenditure represented about 40 percent of the pre-IRP projection.	**$1,528,970**
2024 projected spend (in 2021): $12,954,250 • Campbell 3 Turbine Overhaul ($7,931,350) • Campbell 3 Boiler Chemical Cleaning ($1,429,000) • Campbell 3 Base Outage Boiler and Critical Maintenance ($1,000,000) • Campbell 3 Periodic Outage Maintenance ($933,100) • Eight additional projects totaling $1,660,800	**2024 actual expenditure: $591,000** The 2024 projected actual maintenance expenditure was sufficient to do about 5 percent of the Unit 3 maintenance projects budgeted for 2024 by CECo in 2021. The highest cost proposed 2024 project, the Campbell 3 Turbine Overhaul ($7,931,350), was not carried out. The turbine failed in April 2024 resulting in a 46-day forced outage.	**$12,363,250**
2025 projected spend (in 2021): $3,810,600 • Campbell 3 Turbine Valve Inspection ($1,200,000) • Campbell 3 Base Outage Boiler and Critical Maintenance ($1,100,000) • Six additional projects totaling $1,410,600	**2025 projected expenditure:[19] $277,000** The actual expenditure represented about 7 percent of the pre-IRP projection.	**$3,533,600**
	TOTAL	**$18,437,860**

[19] *See* U-21585, Ex. A-43 to Blumenstock Direct Testimony. This exhibit shows the "Projected Test Year 12 Months Ending 02/28/26." This 12-month cost projection covers most of the 5-month 2025 operational period (1/1/25 – 5/31/25) for Campbell Unit 3 as well as the additional months that unit would not be operational. From the information I reviewed, this is the best source of information regarding CECo's actual and projected 2025 major maintenance spending.

25. It is unlikely that Campbell can reliably dispatch given this deferred capital and major maintenance spending.

26. Moreover, Campbell Units 1 and 2 were built in the 1960s. Units 1 and 2 are beyond both a typical coal unit economic design life of 30-40 years and a typical operational lifetime of 40-50 years.[20,21]

27. Replacement parts are not readily available or do not exist for Units 1 and 2, as described by CECo witness Hoffman: "Some of these units were built in the 1960s, and given the ages and designs of the systems, replacement parts are not always readily available. In some instances, replacement parts do not exist at all. The start-up boiler feed pump ("SUBFP") at Campbell Unit 2 is one of those systems. Keeping spare parts on hand is neither cost effective nor practical since replacements do not exist."[22]

28. CECo witness Blumenstock states that CECo discontinued capital investment in Units 1-3 in 2023 and is only doing sufficient maintenance to keep Units 1-3 operable through May 2025: "The Company does not plan to invest any capital in the Campbell units during the bridge period [2024 and early 2025] or test year . . . [T]he Company has projected modest amounts of major maintenance to ensure that these units are able to operate through their retirement date of May 31, 2025."[23] Witness Blumenstock also indicates that Unit 1 would be retired early, on April 1, 2025.[24]

29. In my professional opinion, witness Blumenstock is describing CECo's transition from a preventative capital investment and maintenance structure, intended to maintain the

[20] M. Hafner, G. Luciani, *The Palgrave Handbook of International Energy Economics*, p. 127 (2022).
[21] International Energy Agency, *The role of CCUS in low-carbon power systems*, p. 18 (2020).
[22] U-21424, Hoffman Direct Testimony, p.6.
[23] U-21585, Blumenstock Direct Testimony, p. 62.
[24] *Ibid*., p. 20.

Campbell units' long-term reliability, to a reactive, "fix it if breaks" approach to operating Units 1-3. CECo's objective shifted from maintaining long-term reliability to keeping the units operating—to the extent possible with little or no spending—*up until* May 31, 2025 *and no longer.* CECo's objective was *not* to achieve the high level of Unit 1-3 reliability that would be necessary for the units to ramp up and work reliably under emergency demand conditions.

30. A case in point is the cancelled $7.9 million Unit 3 turbine overhaul project that was originally scheduled for 2024.[25] In late April 2024, the Unit 3 turbine suffered a turning gear failure that resulted in a 1,104-hour (46 day) forced outage.[26] The turbine turning gear was repaired to achieve the limited objective of allowing Unit 3 to continue to operate until the planned retirement in (May) 2025.[27] It is reasonable to assume that the turning gear failure would not have occurred if the Unit 3 turbine had already been overhauled. This failure incident calls into question how many other Unit 3 components are vulnerable to near-term failure due to lack of investment and preventative maintenance by CECo. Given the limited maintenance, it would be unreasonable for DOE to assume that Unit 3 can run much longer without CECo doing a substantial amount of deferred maintenance.

31. While it is not possible based on publicly available information to put an exact price tag on the cost of ensuring that Campbell could reliably operate at full capacity, CECo cancelled **approximately $161 million** in planned capital and major maintenance projects at Campbell over the past four years ($133.6 million in capital projects; $27.3 million in major maintenance projects). It is reasonable to assume that much of this investment was necessary to ensure continued, nominally reliable operation of Campbell. It is also reasonable to assume that

[25] U-21090, Kapala Revised Direct Testimony, p. 29.
[26] U-21424, Ex. A-11 to Hoffman Direct Testimony.
[27] *Ibid*., Ex. A-13.

some of this investment was necessary to ensure compliance with environmental requirements, as discussed more below. Those capital and major maintenance investments are what *CECo determined* in 2021 that it would need to spend on a year-to-year basis to operate the Campbell units reliably and in conformance with environmental requirements in 2022-2025, if these units were to continue to operate past May 2025 (i.e. until 2031 for Units 1 and 2 and until 2039 for Unit 3).

B. Whether Campbell can operate effectively as a peaking unit

32. In my opinion, Campbell cannot operate effectively as a peaking unit that would be dispatched with only a few hours of notice to meet an extreme demand condition.

33. Coal units generally, and Campbell's three units specifically, cannot serve as peaking units that respond to extreme peak demand on short notice. Coal units are designed for baseload, round-the-clock operation.[28] Coal units started "cold" (room temperature) typically take approximately 12 hours to reach full load operation.[29] The ramp rate is slow to avoid excessive thermal stress on components exposed to heat. In contrast, utility-scale battery storage can dispatch from a cold start to full power in a matter of seconds.[30] Similarly, combustion gas turbines, designed for fast-response peaking duty, can go from a cold start to full power in 5 to 10 minutes.[31]

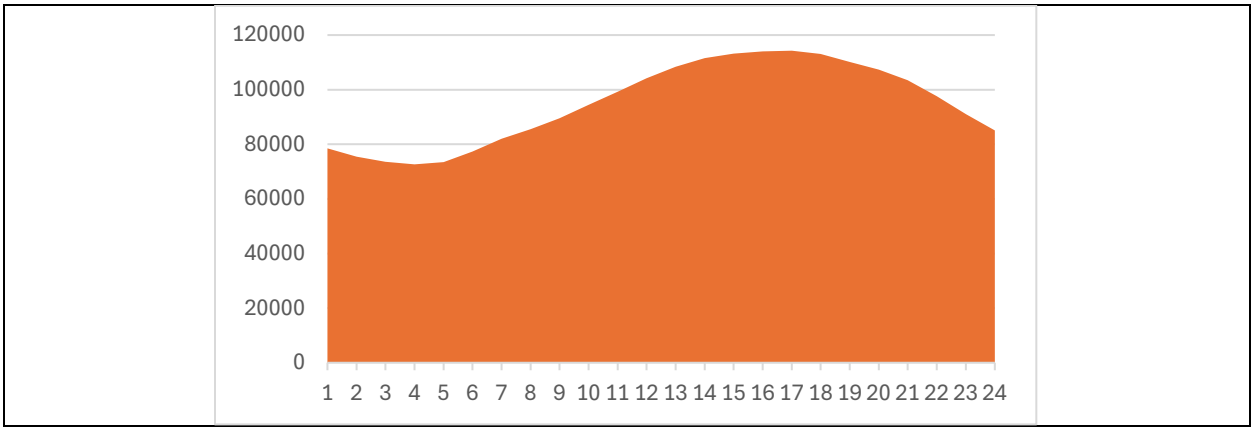
34. Coal units cannot respond to extreme demand events unless they are fully online several hours before the high demand situation occurs. In other words, coal units need

[28] U-21258, Hoffman Direct Testimony, pp. 4-5.
[29] IEA Clean Coal Centre, *Increasing the flexibility of coal-fired power plants*, p. 26 (Sept. 2014).
[30] NERC, *Energy Storage: Overview of Electrochemical Storage*, p. 1 (Feb. 2021). https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/Master_ESAT_Report.pdf ("BESS are a well suited technology to provide short-term grid contingency support (tens of seconds) . . . .").
[31] General Electric, *Get to know the LM6000* (webpage) (2025), https://www.gevernova.com/gas-power/products/gas-turbines/lm6000. ("With around five minutes to ramp up from start-up to full power . . . .").

substantial lead time to be fully operational at or before an extreme peak demand is reached. They cannot be dispatched from an offline "cold" status to address extreme emergency demand if an emergency is declared only a few hours before the demand must be met.

35. Grid demand often increases rapidly on peak demand days. MISO may have only a few hours of notice that an extreme peak demand day is developing. The need to bring on additional generation resources to meet an extreme peak may be uncertain until the period immediately prior to the actual peak. An example of this can be seen in Figure 1, which shows a 24-hour demand curve for the MISO control area on the high demand summer day of September 5, 2023.[32] MISO actual demand was rising as fast as 5,000 MW per hour during the day, adding the equivalent of Campbell's 1,561 MW capacity every 20 minutes to meet demand.

Figure 1. MISO 24-hour demand curve (MW), September 5, 2023



36. Bringing Campbell from a cold start condition to full output to meet extreme demand would also be expensive. According to the National Association of Regulatory Utility Commissioners, the estimated cost to "cold start" a coal-fired power plant is $417 per MW of capacity.[33] The total nameplate capacity of Campbell Units 1-3 is 1,561 MW. Therefore, the

[32] Figure 1 was developed using data from U.S. EIA, csv dataset, "MISO_load-temp_hr_2023" (accessed June 13, 2025).
[33] NARUC, *Recent Changes to U.S. Coal Plant Operations and Current Compensation Practices*, p. 16 (Jan. 2020).

estimated cost to start up Campbell from a cold start condition would be approximately $650,000. (1,561 MW × $417 per MW = $650,937).

37. Alternatively, instead of starting cold, CECo could be forced to run Campbell for hours unnecessarily solely to be prepared for a potential near-term high-peak demand. That approach would be expensive and polluting.

C. Easily attainable steps DOE can require to ensure Campbell's operations are consistent with environmental requirements and minimize adverse environmental impacts

38. In my opinion, for DOE's order to be consistent with environmental requirements, CECo must demonstrate, prior to restarting Units 1-3, that (1) the pulse jet fabric filters on Units 1-3 are in sound, leak-free condition, and (2) the SCRs on Units 2 and 3 have sufficient remaining catalyst life to adequately control NO_x emissions.

39. As noted above, some of the capital and major maintenance projects cancelled in 2022-2025 were air emission control system projects. Cancelled capital projects with a direct impact on maintaining environmental compliance included, among others, PJFF filter bag(s) replacement on Unit 1 (for particulate/opacity control); SCR reactor catalyst replacement on Unit 2 (for nitrogen oxide control); and replacement of PJFF filter bag(s), "cleaning air manifold," and SCR reactor catalyst on Unit 3.[34] These projects were planned likely because CECo believed they were necessary to maintain adequate air emission control system performance and that failure to carry out the projects could compromise that performance.

40. Table 6 shows the multiple air emission control system capital projects that were cancelled in 2022-2025. The implications of these cancelled air quality control system projects are: (1) degraded fabric filter performance on Units 1 and 3, potentially resulting in particulate

[34] *See infra* Tables 4a and 4b.

and/or opacity exceedances, and (2) degraded performance of nitrogen oxide (NO_x) control systems (SCR) on Units 2 and 3, potentially resulting in NO_x exceedances. Degraded fabric filter performance, caused by torn or improperly secured filter bags, could lead to elevated levels of opacity and particulate emissions. A degraded SCR catalyst could lead to poor NO_x conversion and elevated NO_x emissions at the stack.

Table 6. Cancelled 2022-2025 Campbell Unit 1-3 air quality control capital projects

Year	Unit	Project[35]	Budget ($)
2022	2 3	• (SCR) catalyst management • Fabric filter bag(s) & cleaning air manifold replacement	1,120,000 3,994,601
2023	1 2 3	• Fabric filter bag replacement • SCR reactor catalyst replacement • Fabric filter bag(s) & cleaning air manifold replacement	1,514,100 2,000,000 3,263,331
2025	3	• SCR reactor catalyst management • Air quality control system (AQCS) equipment repair/replacement	3,000,000 1,000,000

41. In light of these cancelled projects, DOE should require that CECo demonstrate that the Campbell Unit 1-3 pulse jet fabric filters are currently leak free prior to authorizing further operation. DOE also should require that CECo provide records demonstrating that the catalysts in the Units 2 and 3 SCRs have sufficient remaining useful life to reasonably assure compliance with NO_x limits.

42. It is my opinion that DOE should require verification of the good working order of the Unit 1-3 air emission control systems before authorizing Campbell to operate under extreme demand conditions. DOE should also require that any Campbell unit that exceeds air permit limits for opacity, NO_x, or SO_2 that occur during operation of Units 1-3, as registered on the continuous opacity, NO_x, or SO_2 monitors installed on each unit, be shut down.

[35] *See* U-21090, Kapala Revised Direct Testimony; U-21389, Blumenstock Direct Testimony, Ex. A-12 (not listed as carried-out); U-21585, Blumenstock Direct Testimony, A-12 (not listed as carried-out).

43. It is also my opinion that there are alternatives to running Campbell to meet an extreme peak demand that would produce far less environmental harm.

44. Any air emissions that result from running Campbell would not occur if the plant is retired. Additionally, according to its NPDES wastewater discharge permit, Campbell is cooled with ~1 billion gallons per day of Lake Michigan water in a once-through cooling configuration (NPDES permit). Therefore, the plant will use up to 1 billion gallons per day if called to operate. That is a potentially significant impact on Lake Michigan marine fauna that does not occur if Campbell is retired. Finally, any coal burned will produce coal ash that will have to be stored/disposed of onsite. That is another impact that would not occur if Campbell is retired.

45. In my opinion, a coal unit would be the last alternative to consider for a peaking power application due to its slow ramp time and high environmental impact.

I declare under penalty of perjury under the laws of the United States, pursuant to 28 U.S.C. § 1746, that the foregoing is true and correct to the best of my knowledge.

Executed on this 15th day of June 2025, in San Diego, California.

Bill Powers, P.E.

Bill Powers, P.E.
Powers Engineering
4452 Park Blvd., Suite 209
San Diego, CA 92116

Attachment A

BILL POWERS, P.E.

PROFESSIONAL HISTORY

Powers Engineering, San Diego, CA 1994-
ENSR Consulting and Engineering, Camarillo, CA 1989-93
Naval Energy and Environmental Support Activity, Port Hueneme, CA 1982-87
U.S. Environmental Protection Agency, Research Triangle Park, NC 1980-81

EDUCATION

Bachelor of Science – Mechanical Engineering, Duke University
Master of Public Health – Environmental Sciences, University of North Carolina

PROFESSIONAL AFFILIATIONS

Registered Professional Mechanical Engineer, California (Certificate M24518)
Registered Professional Engineer, Missouri (Certificate 2018039156)
American Society of Mechanical Engineers
Institute of Electrical and Electronics Engineers

TECHNICAL SPECIALTIES

Forty years of experience in:

- Air quality and utility commission proceedings - expert witness
- Distributed solar photovoltaics (PV) siting and regional renewable energy planning
- Power plant cooling system conversion and air emission control assessments
- Combustion equipment permitting, testing and monitoring
- Air pollution control equipment retrofit design/performance testing
- Petroleum refinery air engineering and testing
- Latin America environmental project experience

RECENT AIR QUALITY AND UTILITY COMMISSION PROCEEDINGS

Compressor Station Gas Turbine Air Emission Controls. Assessed the air emission controls and siting issues related to two proposed pipeline compressor station projects in the vicinity of Nashville, Tennessee utilizing Solar Turbines, Inc Titan gas turbines. The result, based on application of a Reasonably Available Control Technology (RACT) requirement, was the reduction of the proposed air permit nitrogen oxides (NOx) emission limit from 25 parts per million (ppm) to 9 ppm.

Combined Heat and Power Plant Gas Turbine Air Emission Controls. Evaluated the air emission controls proposed for a combined heat and power (CHP) plant at Duke University that would utilize Solar Turbines, Inc Titan gas turbine. Applicant proposed a 25 ppm NO_x limit using dry low-NO_x combustion as Best Available Control Technology (BACT) in its Certificate of Public Convenience and Necessity (CPCN) application to the North Carolina Utilities Commission. Argued that NO_x BACT for the CHP plant should be use of selective catalytic reduction (SCR) to achieve a 2 ppm NO_x emission limit. Applicant withdrew its CPCN application.

SDG&E 36-Inch Transmission Pipeline. Expert witness for non-profit client advocating that existing 16-inch pipeline did not require replacement with new $600 million 36-inch pipeline. Underscored in testimony that SDG&E had recently completed extensive inline inspection of existing 16-inch pipeline and found that pipeline was in good condition for long-term operation at 512 psig transmission pressure. Demonstrated that reduction of pressure to 320 psig would not increase safety of existing pipeline, as ILI could no longer be done periodically at lower pressure. Commission accepted this reasoning and denied SDG&E's application.

Cove Point LNG Export Terminal. Expert witness in two separate administrative proceedings before the Maryland Public Service Commission, in 2014 and 2017, regarding air permit conditions for the proposed Cove Point LNG export. The plant site is located in a non-attainment area for ozone. Testimony addressed deficiencies in the proposed air emission limits and proposed control technology for combustion equipment – including gas turbines, auxiliary boilers, and flares, fugitive emission sources, and marine loading vapor recovery systems.

Corpus Christi LNG Expert Terminal. Expert witness in Texas Commission on Environmental Quality contested air permit proceeding in 2013 before the State Office of Administrative Hearings. Testimony addressed deficiencies in the proposed control technology for compressor-drive gas turbines, flares, and fugitive emission sources, and marine loading vapor recovery systems.

DISTRIBUTED SOLAR PV SITING AND REGIONAL RENEWABLE ENERGY PLANNING

Roadmap to 100 Percent Local Solar by 2030 in the City of San Diego. Author of the May 2020 *Roadmap to 100 Percent Local Solar Build-Out by 2030 in the City of San Diego* strategic energy plan for San Diego. The *Roadmap* outlines a strategy to maximize the use of solar energy and battery storage in the City of San Diego (City) to provide 100 percent clean electricity to all San Diegans by 2030. The City's Climate Action Plan sets a mandatory target of 100 percent clean electricity by 2035. The *Roadmap* describes how the City can best deliver lower-cost electricity and provide local job growth by choosing local solar power paired with battery storage, complemented by smart energy efficiency and demand response programs, to reach 100 percent clean energy.

North Carolina Clean Path 2025 Plan. Author of the August 2017 *North Carolina Clean Path 2025* strategic energy plan for North Carolina. *NC Clean Path 2025* implements local solar power, battery storage, and energy efficiency measures to rapidly replace fossil fuel-generated electricity in the state. The plan is substantially less costly than the $40 billion expansion of natural gas infrastructure, nuclear power, and transmission infrastructure being planned for North Carolina. Implementation of *NC Clean Path 2025* would reduce power generated by coal- and natural gas-fired plants by about 60 percent by 2025, and 100 percent by 2030. All in-state coal-fired plants would be closed and gas-fired plants would be used only for backup supply. Existing transmission and distribution infrastructure would be maintained and not expanded.

Bay Area Smart Energy 2020 Plan. Author of the March 2012 *Bay Area Smart Energy 2020* strategic energy plan for the nine-county region surrounding San Francisco Bay. This plan uses the zero net energy building targets in the *California Energy Efficiency Strategic Plan* as a framework to achieve a 60 percent reduction in GHG emissions from Bay Area electricity usage, and a 50 percent reduction in peak demand for grid electricity, by 2020. The 2020 targets in the plan include: 25 percent of detached homes and 20 percent of commercial buildings achieving zero net energy, adding 200 MW of community-scale microgrid battery storage and 400 MW of utility-scale battery storage, reduction in air conditioner loads by 50 percent through air conditioner cycling and targeted incentive funds to assure highest efficiency replacement units, and cooling system modifications to increase power output from The Geysers geothermal production zone in Sonoma County.

Solar PV technology selection and siting for SDG&E Solar San Diego project. Served as PV technology expert in California Public Utilities Commission proceeding to define PV technology and sites to be used in San Diego Gas & Electric (SDG&E) $250 million "Solar San Diego" project. Recommendations included: 1) prioritize use of roof-mounted thin-film PV arrays similar to the SCE urban PV program to maximize the installed PV capacity, 2) avoid tracking ground-mounted PV arrays due to high cost and relative lack of available land in the urban/suburban core, 3) and incorporate limited storage in fixed rooftop PV arrays to maximizing output during peak demand periods. Suitable land next to SDG&E substations capable of supporting 5 to 40 MW of PV (each) was also identified by Powers Engineering as a component of this project.

Rooftop PV alternative to natural gas-fired peaking gas turbines, Chula Vista. Served as PV technology expert in California Energy Commission (CEC) proceeding regarding the application of MMC Energy to build a 100 MW peaking gas turbine power plant in Chula Vista. Presented testimony that 100 MW of PV arrays in the Chula Vista area could provide the same level of electrical reliability on hot summer days as an equivalent amount of peaking gas turbine capacity at approximately the same cost of energy. The final decision issued by the CEC in the case denied the application in part due to failure of the applicant or CEC staff to thoroughly evaluate the PV alternative to the proposed turbines.

San Diego Smart Energy 2020 Plan. Author of October 2007 *San Diego Smart Energy 2020*, an energy plan that focuses on meeting the San Diego region's electric energy needs through accelerated integration of renewable and non-renewable distributed generation, in the form of combined heat and power (CHP) systems and solar photovoltaic (PV) systems. PV would meet approximately 28 percent of the San Diego region's electric energy demand in 2020. Annual energy demand would drop 20 percent in 2020 relative to 2003 through use all cost-effective energy efficiency measures. Existing utility-scale gas-fired generation would continue to be utilized to provide power at night, during cloudy weather, and for grid reliability support.

COOLING SYSTEM CONVERSION AND POWER PLANT EMISSION CONTROL ASSESSMENTS

Closed-Cycle Cooling Alternative at California Nuclear Plant.
Lead engineer on review of Bechtel assessment of wedgewire screens and closed-cycle cooling for Diablo Canyon nuclear plant. Demonstrated that wedgewire screens were not likely to be effective in substantially reducing entrainment at the site, and that lower cost closed-cycle retrofit alternatives could be utilized to allow a "cost reasonable" cooling tower retrofit. Plume-abated back-to-back cooling towers located in secondary parking lots to the southeast of the turbine building were identified as the most cost-effective alternative.

Closed-Cycle Cooling Alternative at Florida Nuclear Plant.
Evaluated closed cycle cooling tower feasibility assessment for Turkey Point Nuclear Units 3 and 4. Closed-cycle cooling would replace the existing closed-cycle cooling canals. Wet cooling towers for Units 3 and 4 are feasible and could be operational within four years of submittal of applications for the necessary permits.

Utility Boilers – Conversion of Existing Once-Through Cooled Boilers to Wet Towers, Parallel Wet-Dry Cooling, or Dry Cooling. Provided expert testimony and preliminary design for the conversion of four natural gas and/or coal-fired utility boilers (Unit 4, 235 MW; Unit 3, 135 MW; Unit 2, 65 MW; and Unit 1,65 MW) from once-through river water cooling to wet cooling towers, parallel wet-dry cooling, and dry cooling. Major design constraints were available land for location of retrofit cooling systems and need to maintain maximum steam turbine backpressure at or below 5.5 inches mercury to match performance capabilities of existing equipment. Approach temperatures of 12 ^{o}F and 13 ^{o}F were used for the wet towers. SPX Cooling Technologies F-488 plume-abated wet cells with six feet of packing were used to achieve approach temperatures of 12 ^{o}F and 13 ^{o}F. Annual energy penalty of wet tower retrofit designs is approximately 1 percent. Parallel wet-dry or dry cooling was determined to be technically feasible for Unit 3 based on straightforward access to the Unit 3 surface condenser and available land adjacent to the boiler.

Utility Boiler – Assessment of Air Cooling and Integrated Gasification/Combined Cycle for Proposed 500 MW Coal-Fired Plant. Provided expert testimony on the performance of air-cooling and IGCC relative to the conventional closed-cycle wet cooled, supercritical pulverized coal boiler proposed by the applicant. Steam Pro™ coal-fired power plant design software was used to model the proposed plant and evaluate the impacts on performance of air cooling and plume-abated wet cooling. Results indicated that a conservatively designed air-cooled condenser could maintain rated power output at the design ambient temperature of 90 ^{o}F. The IGCC comparative analysis indicated that unit reliability comparable to a conventional pulverized coal unit could be achieved by including a spare gasifier in the IGCC design, and that the slightly higher capital cost of IGCC was offset by greater thermal efficiency and reduced water demand and air emissions.

Utility Boiler – Assessment of Closed-Cycle Cooling Retrofit Cost for 1,200 MW Oil-Fired Plant. Prepared an assessment of the cost and feasibility of a closed-cycle wet tower retrofit for the 1,200 MW Roseton Generating Station. Determined that the cost to retrofit the Roseton plant with plume-abated closed-cycle wet cooling was well established based on cooling tower retrofit studies performed by the original owner (Central Hudson Gas & Electric Corp.) and subsequent regulatory agency critique of the cost estimate. Also determined that elimination of redundant and/or excessive budgetary line items in owners cost estimate brings the closed-cycle retrofit in line with expected costs for comparable new or retrofit plume-abated cooling tower applications.

Nuclear Power Plant – Assessment of Closed-Cycle Cooling Retrofit Cost for 2,000 MW Plant. Prepared an assessment of the cost and feasibility of a closed-cycle wet tower retrofit for the 2,000 MW Indian Point Generating Station. Determined that the most appropriate arrangement for the hilly site would be an inline plume-abated wet tower instead of the round tower configuration analyzed by the owner. Use of the inline configuration would allow placement of the towers at numerous sites on the property with little or need for blasting of bedrock, greatly reducing the cost of the retrofit. Also proposed an alternative circulating cooling water piping configuration to avoid the extensive downtime projected by the owner for modifications to the existing discharge channel.

Power Plant Dry Cooling Symposium – Chair and Organizer. Chair and organizer of the first symposium held in the U.S. (May 2002) that focused exclusively on dry cooling technology for power plants. Sessions included basic principles of wet and dry cooling systems, performance capabilities of dry cooling systems, case studies of specific installations, and reasons why dry cooling is the predominant form of cooling specified in certain regions of North America (Massachusetts, Nevada, northern Mexico).

Ameren Missouri Coal Units – Causes of Opacity and Opacity Reduction Alternatives. Lead engineer to assess the root causes of opacity exceedances and evaluate potential alternatives to eliminate opacity violations from the Labadie, Meramec, and Rush Island power plants.

Utility Boilers – Evaluation of Correlation Between Opacity and PM_{10} Emissions at Coal-Fired Plant. Provided expert testimony on whether correlation existed between mass PM_{10} emissions and opacity during opacity excursions at large coal-fired boiler in Georgia. EPA and EPRI technical studies were reviewed to assess the correlation of opacity and mass emissions during opacity levels below and above 20 percent. A strong correlation between opacity and mass emissions was apparent at a sister plant at opacities less than 20 percent. The correlation suggests that the opacity monitor correlation underestimates mass emissions at opacities greater than 20 percent, but may continue to exhibit a good correlation for the component of mass emissions in the PM_{10} size range.

IGCC as BACT for Air Emissions from Proposed 960 MW Coal Plant. Presented testimony on IGCC as BACT for air emissions reduction from 960 MW coal plant. Applicant received air permit for a pulverized coal plant to be equipped with a baghouse, wet scrubber, and wet ESP for air emissions control. Use of IGCC technology at the emission rates permitted for two recently proposed U.S. IGCC projects, and demonstrated in practice at a Japanese IGCC plant firing Chinese bituminous coal, would substantially reduce potential emissions of NO_x, SO_2, and PM. The estimated control cost-effectiveness of substituting IGCC for pulverized coal technology in this case was approximately $3,000/ton.

Analysis of Proposed Air Emission Limits for 600 MW Pulverized Coal Plant. Project engineer tasked with evaluating sufficiency of air emissions limits and control technologies for proposed 600 MW coal plant Arkansas. Determined that the applicant had: 1) not properly identified SO_2, sulfuric acid mist, and PM BACT control levels for the plant, and 2) improperly utilized an incremental cost effectiveness analysis to justify air emission control levels that did not represent BACT.

Eight Pulverized Coal Fired 900 MW Boilers – IGCC Alternative with Air Cooling. Provided testimony on integrated gasification combined cycle (IGCC) as a fully commercial coal-burning alternative to the pulverized coal (PC) technology proposed by TXU for eight 900 MW boilers in East Texas, and East Texas as an ideal location for CO2 sequestration due to presence of mature oilfield CO2 enhanced oil recovery opportunities and a deep saline aquifer underlying the entire region. Also presented testimony on the major increase in regional consumptive water use that would be caused by the evaporative cooling towers proposed for use in the PC plants, and that consumptive water use could be lowered by using IGCC with evaporative cooling towers or by using air-cooled condensers with PC or IGCC technology. TXU ultimately dropped plans to build the eight PC plants as a condition of a corporate buy-out.

Utility Boilers – Retrofit of SCR and FGD to Existing Coal-Fired Units.
Expert witness in successful effort to compel an existing coal-fired power plant located in Massachusetts to meet an accelerated NO_x and SO_2 emission control system retrofit schedule. Plant owner argued the installation of advanced NO_x and SO_2 control systems would generate > 1 ton/year of ancillary emissions, such as sulfuric acid mist, and that under Massachusetts Dept. of Environmental Protection regulation ancillary emissions > 1 ton/year would require a BACT evaluation and a two-year extension to retrofit schedule. Successfully demonstrated that no ancillary emissions would be generated if the retrofit NO_x and SO_2 control systems were properly sized and optimized. Plant owner committed to accelerated compliance schedule in settlement agreement.

Utility Boilers – Retrofit of SCR to Existing Natural Gas-Fired Units.
Lead engineer in successful representation of interests of California coastal city to prevent weakening of an existing countywide utility boiler NO_x rule. Weakening of NO_x rule would have allowed a merchant utility boiler plant located in the city to operate without installing selective catalytic reduction (SCR) NO_x control systems. This project required numerous appearances before the county air pollution control hearing board to successfully defend the existing utility boiler NO_x rule.

Biomass Plant NO_x and CO Air Emissions Control Evaluation. Lead engineer for evaluation of available nitrogen oxide (NO_x) and carbon monoxide (CO) controls for a 45 MW Aspen Power biomass plant in Texas where proponent had identified selective non-catalytic reduction (SNCR) for NO_x and good combustion practices for CO as BACT. Identified the use of tail-end SCR for NO_x control at several operational U.S. biomass plants, and oxidation catalyst in use at two of these plants for CO and VOC control, as BACT for the proposed biomass plant. Administrative law judge concurred in decision that SCR and oxidation catalyst is BACT. Developer added SCR and oxidation catalyst to project in subsequent settlement agreement.

Biomass Plant Air Emissions Control Consulting. Lead expert on biomass air emissions control systems for landowners that will be impacted by a proposed 50 MW biomass to be built by the local East Texas power cooperative. Public utility agreed to meet current BACT for biomass plants in Texas, SCR for NO_x and oxidation catalyst for CO, in settlement agreement with local landowners.

Combined-Cycle Power Plant Startup and Shutdown Emissions. Lead engineer for analysis of air permit startup and shutdown emissions minimization for combined-cycle power plant proposed for the San Francisco Bay Area. Original equipment was specified for baseload operation prior to suspension of project in early 2000s. Operational profile described in revised air permit was load following with potential for daily start/stop. Recommended that either fast start turbine technology be employed to minimize start/stop emissions or that "demonstrated in practice" operational and control software modifications be employed to minimize startup/shutdown emissions.

NON-WIRES ALTERNATIVES TO TRANSMISSION LINES

Ameren Missouri Mark Twain 345 kV Transmission Line. Responsible for evaluating: 1) the expected peak load growth of Ameren Missouri (MO) in general and in Northeast MO specifically over the next decade, 2) the likelihood of wind projects moving forward in the Northeast MO over the next decade, 3) the feasibility and cost of reconductoring with high capacity composite conductors the three 161 kV line segments that would experience NERC violations if 450 to 500 MW of wind power was constructed in Northeast MO, and 4) the feasibility and cost-effectiveness of substituting local solar for wind power to allow Ameren MO to meet its 2021 Renewable Portfolio Standard (RPS) obligation without building the proposed 345 kV transmission line or upgrading the three existing 161 kV lines interconnecting at the Adair Substation.

American Transmission Corporation Badger-Coulee 345 kV Line. Responsible for evaluating: 1) the expected peak load growth of Wisconsin utilities over the next decade, and 2) the feasibility and cost-effectiveness of alternatives including load management, energy efficiency, local solar, biogas, and energy storage as viable no-wires alternatives to the proposed ATC Badger-Coulee 345 kV transmission line.

San Diego Gas & Electric Wood Pole to Steel Pole Replacement Project.
Lead engineer assessing need and alternatives to replacement of existing wooden 69 kV poles with larger steel 69 kV poles as a response to the fire hazard potential of wooden poles in rural, high fire risk areas. Wooden poles in good condition and not a source of fire ignition. Utility would continue to shut off power to customers during low humidity, high wind conditions. Prepared alternative, solar with batteries for the ~10,000 affected customer meters, to allow customers to ride-through high fire hazard preventive grid power shut-offs at far less cost than replacing wood poles with steel poles.

San Diego Gas & Electric 500 kV Sunrise Transmission Line.
Lead engineer assessing the validity of load growth forecasts used by the utility to justify the need for the 500 kV line, and for developing a no-wires alternative, net-metered solar power with some battery support, to meet the identified reliability need at little or no net cost to the utility customer base.

COMBUSTION EQUIPMENT PERMITTING, TESTING AND MONITORING

EPRI Gas Turbine Power Plant Permitting Documents – Co-Author.
Co-authored two Electric Power Research Institute (EPRI) gas turbine power plant siting documents. Responsibilities included chapter on state-of-the-art air emission control systems for simple-cycle and combined-cycle gas turbines, and authorship of sections on dry cooling and zero liquid discharge systems.

Air Permits for 50 MW Peaker Gas Turbines – Six Sites Throughout California.
Responsible for preparing all aspects of air permit applications for five 50 MW FT-8 simple-cycle turbine installations at sites around California in response to emergency request by California state government for additional peaking power. Units were designed to meet 2.0 ppm NO_x using standard temperature SCR and innovative dilution air system to maintain exhaust gas temperature within acceptable SCR range. Oxidation catalyst is also used to maintain CO below 6.0 ppm.

Kauai 27 MW Cogeneration Plant – Air Emission Control System Analysis. Project manager to evaluate technical feasibility of SCR for 27 MW naphtha-fired turbine with once-through heat recovery steam generator. Permit action was stalled due to questions of SCR feasibility. Extensive analysis of the performance of existing oil-fired turbines equipped with SCR, and bench-scale tests of SCR applied to naphtha-fired turbines, indicated that SCR would perform adequately. Urea was selected as the SCR reagent given the local availability of urea. Unit is first known application of urea-injected SCR on a naphtha-fired turbine.

Microturbines – Ronald Reagan Library, Ventura County, California.
Project manager and lead engineer or preparation of air permit applications for microturbines and standby boilers. The microturbines drive the heating and cooling system for the library. The microturbines are certified by the manufacturer to meet the 9 ppm NO_x emission limit for this equipment. Low-NO_x burners are BACT for the standby boilers.

Hospital Cogeneration Microturbines – South Coast Air Quality Management District.
Project manager and lead engineer for preparation of air permit application for three microturbines at hospital cogeneration plant installation. The draft Authority To Construct (ATC) for this project was obtained two weeks after submittal of the ATC application. 30-day public notification was required due to the proximity of the facility to nearby schools. The final ATC was issued two months after the application was submitted, including the 30-day public notification period.

Gas Turbine Cogeneration – South Coast Air Quality Management District. Project manager and lead engineer for preparation of air permit application for two 5.5 MW gas turbines in cogeneration configuration for county government center. The turbines are equipped with selective catalytic reduction (SCR) and oxidation catalyst to comply with SCAQMD BACT requirements. Aqueous urea is used as the SCR reagent to avoid trigger hazardous material storage requirements. The NO_x and CO continuous emissions monitoring systems are covered by a separate permit.

Peaker Gas Turbines – Evaluation of NO_x Control Options for Installations in San Diego County.
Lead engineer for evaluation of NO_x control options available for 1970s vintage simple-cycle gas turbines proposed for peaker sites in San Diego County. Dry low-NO_x (DLN) combustors, catalytic combustors, high-temperature SCR, and NO_x absorption/conversion ($SCONO_x$) were evaluated for each candidate turbine make/model. High-temperature SCR was selected as the NOx control option to meet a 5 ppm NO_x emission requirement.

Hospital Cogeneration Plant Gas Turbines – San Joaquin Valley Unified Air Pollution Control District.
Project manager and lead engineer for preparation of air permit application and Best Available Control Technology (BACT) evaluation for hospital cogeneration plant installation. The BACT included the review of DLN combustors, catalytic combustors, high-temperature SCR and $SCONO_x$. DLN combustion followed by high temperature SCR was selected as the NO_x control system for this installation. The high temperature SCR is located upstream of the heat recovery steam generator (HRSG) to allow the diversion of exhaust gas around the HRSG without compromising the effectiveness of the NO_x control system.

1,000 MW Coastal Combined-Cycle Power Plant – Feasibility of Dry Cooling.
Expert witness in on-going effort to require use of dry cooling on proposed 1,000 MW combined-cycle "repower" project at site of an existing 1,000 MW utility boiler plant. Project proponent argued that site was two small for properly sized air-cooled condenser (ACC) and that use of ACC would cause 12-month construction delay. Demonstrated that ACC could easily be located on the site by splitting total of up to 80 cells between two available locations at the site. Also demonstrated that an ACC optimized for low height and low noise would minimize or eliminate proponent claims of negative visual and noise impacts.

Industrial Cogeneration Plant Gas Turbines – Upgrade of Turbine Power Output.
Project manager and lead engineer for preparation of Best Available Control Technology (BACT) evaluation for proposed gas turbine upgrade. The BACT included the review of DLN combustors, catalytic combustors, high-, standard-, and low-temperature SCR, and $SCONO_x$. Successfully negotiated air permit that allowed facility to initially install DLN combustors and operate under a NO_x plantwide "cap." Within two major turbine overhauls, or approximately eight years, the NO_x emissions per turbine must be at or below the equivalent of 5 ppm. The 5 ppm NO_x target will be achieved through technological in-combustor NO_x control such as catalytic combustion, or SCR or SCR equivalent end-of-pipe NO_x control technologies if catalytic combustion is not available.

Gas Turbines – Modification of RATA Procedures for Time-Share CEM.
Project manager and lead engineer for the development of alternate CO continuous emission monitor (CEM) Relative Accuracy Test Audit (RATA) procedures for time-share CEM system serving three 7.9 MW turbines located in San Diego. Close interaction with San Diego APCD and EPA Region 9 engineers was required to

receive approval for the alternate CO RATA standard. The time-share CEM then passed the annual RATA without problems as a result of changes to some CEM hardware and the more flexible CO RATA standard.

Gas Turbines – Evaluation of NO_x Control Technology Performance. Lead engineer for performance review of dry low-NO_x combustors, catalytic combustors, high-, standard-, and low-temperature selective catalytic reduction (SCR), and NO_x absorption/conversion ($SCONO_x$). Major turbine manufacturers and major manufacturers of end-of-pipe NO_x control systems for gas turbines were contacted to determine current cost and performance of NO_x control systems. A comparison of 1993 to 1999 "$/kwh" and "$/ton" cost of these control systems was developed in the evaluation.

Lead engineer for evaluation for proposed combined cycle gas turbine NO_x and CO control systems. Project was in litigation over contract terms, and there was concern that the GE Frame 7FA turbine could not meet the 3 ppm NO_x permit limit using a conventional combustor with water injection followed by SCR. Operations personnel at GE Frame 7FA installatins around the country were interviewed, along with principal SCR vendors, to corroborate that the installation could continuously meet the 3 ppm NO_x limit.

Gas Turbines – Title V "Presumptively Approvable" Compliance Assurance Monitoring Protocol. Project manager and lead engineer for the development of a "presumptively approval" NO_x parametric emissions monitoring system (PEMS) protocol for industrial gas turbines. "Presumptively approvable" means that any gas turbine operator selecting this monitoring protocol can presume it is acceptable to the U.S. EPA. Close interaction with the gas turbine manufacturer's design engineering staff and the U.S. EPA Emissions Measurement Branch (Research Triangle Park, NC) was required to determine modifications necessary to the current PEMS to upgrade it to "presumptively approvable" status.

Environmental Due Diligence Review of Gas Turbine Sites – Mexico. Task leader to prepare regulatory compliance due diligence review of Mexican requirements for gas turbine power plants. Project involves eleven potential sites across Mexico, three of which are under construction. Scope involves identification of all environmental, energy sales, land use, and transportation corridor requirements for power projects in Mexico. Coordinator of Mexican environmental subcontractors gathering on-site information for each site, and translator of Spanish supporting documentation to English.

Development of Air Emission Standards for Gas Turbines - Peru. Served as principal technical consultant to the Peruvian Ministry of Energy in Mines (MEM) for the development of air emission standards for Peruvian gas turbine power plants. All major gas turbine power plants in Peru are currently using water injection to increase turbine power output. Recommended that 42 ppm on natural gas and 65 ppm on diesel (corrected to 15% O_2) be established as the NO_x limit for existing gas turbine power plants. These limits reflect NO_x levels readily achievable using water injection at high load. Also recommended that new gas turbine sources be subject to a BACT review requirement.

Gas Turbines – Title V Permit Templates. Lead engineer for the development of standardized permit templates for approximately 100 gas turbines operated by the oil and gas industry in the San Joaquin Valley. Emissions limits and monitoring requirements were defined for units ranging from GE Frame 7 to Solar Saturn turbines. Stand-alone templates were developed based on turbine size and NO_x control equipment. NO_x utilized in the target turbine population ranged from water injection alone to water injection combined with SCR.

Gas Turbines – Evaluation of NO_x, SO_2 and PM Emission Profiles. Performed a comparative evaluation of the NO_x, SO_2 and particulate (PM) emission profiles of principal utility-scale gas turbines for an independent power producer evaluating project opportunities in Latin America. All gas turbine models in the 40 MW to 240 MW range manufactured by General Electric, Westinghouse, Siemens and ABB were included in the evaluation.

Stationary Internal Combustion Engine (ICE) RACT/BARCT Evaluation. Lead engineer for evaluation of retrofit NO_x control options available for the oil and gas production industry gas-fired ICE population in the San Joaquin Valley affected by proposed RACT and BARCT emission limits. Evaluation centered on lean-burn compressor engines under 500 bhp, and rich-burn constant and cyclically loaded (rod pump) engines under 200 bhp. The results of the evaluation indicated that rich burn cyclically-loaded rod pump engines comprised 50 percent of the affected ICE population, though these ICEs accounted for only 5 percent of the uncontrolled gas-fired stationary ICE NO_x emissions. Recommended retrofit NO_x control strategies included: air/fuel ratio adjustment for rod pump ICEs, Non-selective catalytic reduction (NSCR) for rich-burn, constant load ICEs, and "low emission" combustion modifications for lean burn ICEs.

Development of Air Emission Standards for Stationary ICEs - Peru. Served as principal technical consultant to the Peruvian Ministry of Energy in Mines (MEM) for the development of air emission standards for Peruvian stationary ICE power plants. Draft 1997 World Bank NO_x and particulate emission limits for stationary ICE power plants served as the basis for proposed MEM emission limits. A detailed review of ICE emissions data provided in PAMAs submitted to the MEM was performed to determine the level of effort that would be required by Peruvian industry to meet the proposed NO_x and particulate emission limits. The draft 1997 WB emission limits were revised to reflect reasonably achievable NO_x and particulate emission limits for ICEs currently in operation in Peru.

Air Toxics Testing of Natural Gas-Fired ICEs. Project manager for test plan/test program to measure volatile and semi-volatile organic air toxics compounds from fourteen gas-fired ICEs used in a variety of oil and gas production applications. Test data was utilized by oil and gas production facility owners throughout California to develop accurate ICE air toxics emission inventories.

AIR ENGINEERING/AIR TESTING PROJECT EXPERIENCE – GENERAL

Reverse Air Fabric Filter Retrofit Evaluation – Coal-Fired Boiler. Lead engineer for upgrade of reverse air fabric filters serving coal-fired industrial boilers. Fluorescent dye injected to pinpoint broken bags and damper leaks. Corrosion of pneumatic actuators serving reverse air valves and inadequate insulation identified as principal causes of degraded performance.

Pulse-Jet Fabric Filter Performance Evaluation – Gold Mine. Lead engineer on upgrade of pulse-jet fabric filter and associated exhaust ventilation system serving an ore-crushing facility at a gold mine. Fluorescent dye used to identify bag collar leaks, and modifications were made to pulse air cycle time and duration. This marginal source was in compliance at 20 percent of emission limit following completion of repair work.

Pulse-Jet Fabric Filter Retrofit - Gypsum Calciner. Lead engineer on upgrade of pulse-jet fabric filter controlling particulate emissions from a gypsum calciner. Recommendations included a modified bag clamping mechanism, modified hopper evacuation valve assembly, and changes to pulse air cycle time and pulse duration.

Wet Scrubber Retrofit – Plating Shop. Project engineer on retrofit evaluation of plating shop packed-bed wet scrubbers failing to meet performance guarantees during acceptance trials, due to excessive mist carryover. Recommendations included relocation of the mist eliminator (ME), substitution of the original chevron blade ME with a mesh pad ME, and use of higher density packing material to improve exhaust gas distribution. Wet scrubbers passed acceptance trials following completion of recommended modifications.

Electrostatic Precipitator (ESP) Retrofit Evaluation – MSW Boiler. Lead engineer for retrofit evaluation of single field ESP on a municipal solid waste (MSW) boiler. Recommendations included addition of automated power controller, inlet duct turning vanes, and improved collecting plate rapping system.

ESP Electric Coil Rapper Vibration Analysis Testing - Coal-Fired Boiler. Lead engineer for evaluation of ESP rapper effectiveness test program on three field ESP equipped with "magnetically induced gravity return" (MIGR) rappers. Accelerometers were placed in a grid pattern on ESP collecting plates to determine maximum

instantaneous plate acceleration at a variety of rapper power setpoints. Testing showed that the rappers met performance specification requirements.

Aluminum Remelt Furnace Particulate Emissions Testing. Project manager and lead engineer for high temperature (1,600 ºF) particulate sampling of a natural gas-fired remelt furnace at a major aluminum rolling mill. Objectives of test program were to: 1) determine if condensable particulate was present in stack gases, and 2) to validate the accuracy of the in-stack continuous opacity monitor (COM). Designed and constructed a customized high temperature (inconel) PM_{10}/Mtd 17 sampling assembly for test program. An onsite natural gas-fired boiler was also tested to provide comparative data for the condensable particulate portion of the test program. Test results showed that no significant levels of condensable particulate in the remelt furnace exhaust gas, and indicated that the remelt furnace and boiler had similar particulate emission rates. Test results also showed that the COM was accurate.

Aluminum Remelt Furnace CO and NO_x Testing. Project manager and lead engineer for continuous week-long testing of CO and NO_x emissions from aluminum remelt furnace. Objective of test program was to characterize CO and NO_x emissions from representative remelt furnace for use in the facility's criteria pollution emissions inventory. A TECO Model 48 CO analyzer and a TECO Model 10 NO_x analyzer were utilized during the test program to provide $\pm$1 ppm measurement accuracy, and all test data was recorded by an automated data acquisition system.

PETROLEUM REFINERY AIR ENGINEERING/TESTING EXPERIENCE

Big West Refinery Expansion EIS. Lead engineer on comparative cost analysis of proposed wet cooling tower and fin-fan air cooler for process cooling water for the proposed clean fuels expansion project at the Big West Refinery in Bakersfield, California. Selection of the fin-fin air-cooler would eliminate all consumptive water use and wastewater disposal associated with the cooling tower. Air emissions of VOC and PM_{10} would be reduced with the fin-fan air-cooler even though power demand of the air-cooler is incrementally higher than that of the cooling tower. Fin-fan air-coolers with approach temperatures of 10 ºF and 20 ºF were evaluated. The annualized cost of the fin-fin air-cooler with a 20 ºF approach temperature is essentially the same as that of the cooling tower when the cost of all ancillary cooling tower systems are considered.

Criteria and Air Toxic Pollutant Emissions Inventory for Proposed Refinery Modifications. Project manager and technical lead for development of baseline and future refinery air emissions inventories for process modifications required to produce oxygenated gasoline and desulfurized diesel fuel at a California refinery. State of the art criteria and air toxic pollutant emissions inventories for refinery point, fugitive and mobile sources were developed. Point source emissions estimates were generated using onsite criteria pollutant test data, onsite air toxics test data, and the latest air toxics emission factors from the statewide refinery air toxics inventory database. The fugitive volatile organic compound (VOC) emissions inventories were developed using the refinery's most recent inspection and maintenance (I&M) monitoring program test data to develop site-specific component VOC emission rates. These VOC emission rates were combined with speciated air toxics test results for the principal refinery process streams to produce fugitive VOC air toxics emission rates. The environmental impact report (EIR) that utilized this emission inventory data was the first refinery "Clean Fuels" EIR approved in California.

Development of Air Emission Standards for Petroleum Refinery Equipment - Peru. Served as principal technical consultant to the Peruvian Ministry of Energy in Mines (MEM) for the development of air emission standards for Peruvian petroleum refineries. The sources included in the scope of this project included: 1) SO_2 and NO_x refinery heaters and boilers, 2) desulfurization of crude oil, particulate and SO_2 controls for fluid catalytic cracking units (FCCU), 3) VOC and CO emissions from flares, 4) vapor recovery systems for marine unloading, truck loading, and crude oil/refined products storage tanks, and 5) VOC emissions from process fugitive sources such as pressure relief valves, pumps, compressors and flanges. Proposed emission limits were developed for new and existing refineries based on a thorough evaluation of the available air emission control technologies for the affected refinery sources. Leading vendors of refinery control technology, such as John Zink and Exxon Research, provided estimates of retrofit costs for the largest Peruvian refinery, La Pampilla,

located in Lima. Meetings were held in Lima with refinery operators and MEM staff to discuss the proposed emission limits and incorporate mutually agreed upon revisions to the proposed limits for existing Peruvian refineries.

Air Toxic Pollutant Emissions Inventory for Existing Refinery. Project manager and technical lead for air toxic pollutant emissions inventory at major California refinery. Emission factors were developed for refinery heaters, boilers, flares, sulfur recovery units, coker deheading, IC engines, storage tanks, process fugitives, and catalyst regeneration units. Onsite source test results were utilized to characterize emissions from refinery combustion devices. Where representative source test results were not available, AP-42 VOC emission factors were combined with available VOC air toxics speciation profiles to estimate VOC air toxic emission rates. A risk assessment based on this emissions inventory indicated a relatively low health risk associated with refinery operations. Benzene, 1,3-butadiene and PAHs were the principal health risk related pollutants emitted.

Air Toxics Testing of Refinery Combustion Sources. Project manager for comprehensive air toxics testing program at a major California refinery. Metals, Cr^{+6}, PAHs, H_2S and speciated VOC emissions were measured from refinery combustion sources. High temperature Cr^{+6} stack testing using the EPA Cr^{+6} test method was performed for the first time in California during this test program. Representatives from the California Air Resources Board source test team performed simultaneous testing using ARB Method 425 (Cr^{+6}) to compare the results of EPA and ARB Cr^{+6} test methodologies. The ARB approved the test results generated using the high temperature EPA Cr^{+6} test method.

Air Toxics Testing of Refinery Fugitive Sources. Project manager for test program to characterize air toxic fugitive VOC emissions from fifteen distinct process units at major California refinery. Gas, light liquid, and heavy liquid process streams were sampled. BTXE, 1,3-butadiene and propylene concentrations were quantified in gas samples, while BTXE, cresol and phenol concentrations were measured in liquid samples. Test results were combined with AP-42 fugitive VOC emission factors for valves, fittings, compressors, pumps and PRVs to calculate fugitive air toxics VOC emission rates.

OIL AND GAS PRODUCTION AIR ENGINEERING/TESTING EXPERIENCE

Air Toxics Testing of Oil and Gas Production Sources. Project manager and lead engineer for test plan/test program to determine VOC removal efficiency of packed tower scrubber controlling sulfur dioxide emissions from a crude oil-fired steam generator. Ratfisch 55 VOC analyzers were used to measure the packed tower scrubber VOC removal efficiency. Tedlar bag samples were collected simultaneously to correlate BTX removal efficiency to VOC removal efficiency. This test was one of hundreds of air toxics tests performed during this test program for oil and gas production facilities from 1990 to 1992. The majority of the volatile air toxics analyses were performed at in-house laboratory. Project staff developed thorough familiarity with the applications and limitations of GC/MS, GC/PID, GC/FID, GC/ECD and GC/FPD. Tedlar bags, canisters, sorbent tubes and impingers were used during sampling, along with isokinetic tests methods for multiple metals and PAHs.

Air Toxics Testing of Glycol Reboiler – Gas Processing Plant. Project manager for test program to determine emissions of BTXE from glycol reboiler vent at gas processing facility handling 12 MM/cfd of produced gas. Developed innovative test methods to accurately quantify BTXE emissions in reboiler vent gas.
Air Toxics Emissions Inventory Plan. Lead engineer for the development of generic air toxics emission estimating techniques (EETs) for oil and gas production equipment. This project was performed for the Western States Petroleum Association in response to the requirements of the California Air Toxics "Hot Spots" Act. EETs were developed for all point and fugitive oil and gas production sources of air toxics, and the specific air toxics associated with each source were identified. A pooled source emission test methodology was also developed to moderate the cost of source testing required by the Act.

Fugitive NMHC Emissions from TEOR Production Field. Project manager for the quantification of fugitive Nonmethane hydrocarbon (NMHC) emissions from a thermally enhanced oil recovery (TEOR) oil production field in Kern County, CA. This program included direct measurement of NMHC concentrations in storage tank

vapor headspace and the modification of available NMHC emission factors for NMHC-emitting devices in TEOR produced gas service, such as wellheads, vapor trunklines, heat exchangers, and compressors. Modification of the existing NMHC emission factors was necessary due to the high concentration of CO_2 and water vapor in TEOR produced gases.

Fugitive Air Emissions Testing of Oil and Gas Production Fields. Project manager for test plan/test program to determine VOC and air toxics emissions from oil storage tanks, wastewater storage tanks and produced gas lines. Test results were utilized to develop comprehensive air toxics emissions inventories for oil and gas production companies participating in the test program.

Oil and Gas Production Field – Air Emissions Inventory and Air Modeling. Project manager for oil and gas production field risk assessment. Project included review and revision of the existing air toxics emission inventory, air dispersion modeling, and calculation of the acute health risk, chronic non-carcinogenic risk and carcinogenic risk of facility operations. Results indicated that fugitive H_2S emissions from facility operations posed a potential health risk at the facility fenceline.

TITLE V PERMIT APPLICATION/MONITORING PLAN EXPERIENCE

Title V Permit Application – San Diego County Industrial Facility. Project engineer tasked with preparing streamlined Title V operating permit for U.S. Navy facilities in San Diego. Principal emission units included chrome plating, lead furnaces, IC engines, solvent usage, aerospace coating and marine coating operations. For each device category in use at the facility, federal MACT requirements were integrated with District requirements in user friendly tables that summarized permit conditions and compliance status.

Title V Permit Application Device Templates - Oil and Gas Production Industry. Project manager and lead engineer to prepare Title V permit application "templates" for the Western States Petroleum Association (WSPA). The template approach was chosen by WSPA to minimize the administrative burden associated with listing permit conditions for a large number of similar devices located at the same oil and gas production facility. Templates are being developed for device types common to oil and gas production operations. Device types include: boilers, steam generators, process heaters, gas turbines, IC engines, fixed-roof storage tanks, fugitive components, flares, and cooling towers. These templates will serve as the core of Title V permit applications prepared for oil and gas production operations in California.

Title V Permit Application - Aluminum Rolling Mill. Project manager and lead engineer for Title V permit application prepared for largest aluminum rolling mill in the western U.S. Responsible for the overall direction of the permit application project, development of a monitoring plan for significant emission units, and development of a hazardous air pollutant (HAP) emissions inventory. The project involved extensive onsite data gathering, frequent interaction with the plant's technical and operating staff, and coordination with legal counsel and subcontractors. The permit application was completed on time and in budget.

Title V Model Permit - Oil and Gas Production Industry. Project manager and lead engineer for the comparative analysis of regional and federal requirements affecting oil and gas production industry sources located in the San Joaquin Valley. Sources included gas turbines, IC engines, steam generators, storage tanks, and process fugitives. From this analysis, a model applicable requirements table was developed for a sample device type (storage tanks) that covered the entire population of storage tanks operated by the industry. The U.S. EPA has tentatively approved this model permit approach, and work is ongoing to develop comprehensive applicable requirements tables for each major category of sources operated by the oil and gas industry in the San Joaquin Valley.

Title V Enhanced Monitoring Evaluation of Oil and Gas Production Sources. Lead engineer to identify differences in proposed EPA Title V enhanced monitoring protocols and the current monitoring requirements for oil and gas production sources in the San Joaquin Valley. The device types evaluated included: steam generators, stationary ICEs, gas turbines, fugitives, fixed roof storage tanks, and thermally enhanced oil recovery (TEOR) well vents. Principal areas of difference included: more stringent Title V O&M requirements

for parameter monitors (such as temperature, fuel flow, and O_2), and more extensive Title V recordkeeping requirements.

RACT/BARCT/BACT EVALUATIONS

RACT/BARCT Reverse Jet Scrubber/Fiberbed Mist Eliminator Retrofit Evaluation. Project manager and lead engineer on project to address the inability of existing wet electrostatic precipitators (ESPs) and atomized mist scrubbers to adequately remove low concentration submicron particulate from high volume recovery boiler exhaust gas at the Alaska Pulp Corporation mill in Sitka, AK. The project involved thorough on-site inspections of existing control equipment, detailed review of maintenance and performance records, and a detailed evaluation of potential replacement technologies. These technologies included a wide variety of scrubbing technologies where manufacturers claimed high removal efficiencies on submicron particulate in high humidity exhaust gas. Packed tower scrubbers, venturi scrubbers, reverse jet scrubbers, fiberbed mist eliminators and wet ESPs were evaluated. Final recommendations included replacement of atomized mist scrubber with reverse jet scrubber and upgrading of the existing wet ESPs. The paper describing this project was published in the May 1992 TAPPI Journal.

Aluminum Smelter RACT Evaluation - Prebake. Project manager and technical lead for CO and PM_{10} RACT evaluation for prebake facility. Retrofit control options for CO emissions from the anode bake furnace, potline dry scrubbers and the potroom roof vents were evaluated. PM_{10} emissions from the coke kiln, potline dry scrubbers, potroom roof vents, and miscellaneous potroom fugitive sources were addressed. Four CO control technologies were identified as technologically feasible for potline CO emissions: potline current efficiency improvement through the addition of underhung busswork and automated puncher/feeders, catalytic incineration, recuperative incineration and regenerative incineration. Current efficiency improvement was identified as probable CO RACT if onsite test program demonstrated the effectiveness of this approach. Five PM_{10} control technologies were identified as technologically feasible: increased potline hooding efficiency through redesign of shields, the addition of a dense-phase conveying system, increased potline air evacuation rate, wet scrubbing of roof vent emissions, and fabric filter control of roof vent emissions.

RACT/BACT Testing/Evaluation of PM_{10} Mist Eliminators on Five-Stand Cold Mill. Project manager and lead engineer for fiberbed mist eliminator and mesh pad mist eliminator comparative pilot test program on mixed phase aerosol (PM_{10})/gaseous hydrocarbon emissions from aluminum high speed cold rolling mill. Utilized modified EPA Method 5 sampling train with portion of sample gas diverted (after particulate filter) to Ratfisch 55 VOC analyzer. This was done to permit simultaneous quantification of aerosol and gaseous hydrocarbon emissions in the exhaust gas. The mesh pad mist eliminator demonstrated good control of PM_{10} emissions, though test results indicated that the majority of captured PM_{10} evaporated in the mesh pad and was emitted as VOC.

Aluminum Remelt Furnace/Rolling Mill RACT Evaluations. Lead engineer for comprehensive CO and PM_{10} RACT evaluation for the largest aluminum sheet and plate rolling mill in western U.S. Significant sources of CO emissions from the facility included the remelt furnaces and the coater line. The potential CO RACT options for the remelt furnaces included: enhanced maintenance practices, preheating combustion air, installation of fully automated combustion controls, and energy efficiency modifications.

BARCT Low NO_x Burner Conversion – Industrial Boilers. Lead engineer for evaluation of low NO_x burner options for natural gas-fired industrial boilers. Also evaluated methanol and propane as stand-by fuels to replace existing diesel stand-by fuel system. Evaluated replacement of steam boilers with gas turbine co-generation system.

BACT Packed Tower Scrubber/Mist Eliminator Performance Evaluations. Project manager and lead engineer for Navy-wide plating shop air pollution control technology evaluation and emissions testing program. Mist eliminators and packed tower scrubbers controlling metal plating processes, which included hard chrome, nickel, copper, cadmium and precious metals plating, were extensively tested at three Navy plating shops.

Chemical cleaning and stripping tanks, including hydrochloric acid, sulfuric acid, chromic acid and caustic, were also tested. The final product of this program was a military design specification for plating and chemical cleaning shop air pollution control systems. The hydrochloric acid mist sampling procedure developed during this program received a protected patent.

BACT Packed Tower Scrubber/UV Oxidation System Pilot Test Program. Technical advisor for pilot test program of packed tower scrubber/ultraviolet (UV) light VOC oxidation system controlling VOC emissions from microchip manufacturing facility in Los Angeles. The testing was sponsored in part by the SCAQMD's Innovative Technology Demonstration Program, to demonstrate this innovative control technology as BACT for microchip manufacturing operations. The target compounds were acetone, methylethylketone (MEK) and 1,1,1-trichloroethane, and compound concentrations ranged from 10-100 ppmv. The single stage packed tower scrubber consistently achieved greater than 90% removal efficiency on the target compounds. The residence time required in the UV oxidation system for effective oxidation of the target compounds proved significantly longer than the residence time predicted by the manufacturer.

BACT Pilot Testing of Venturi Scrubber on Gas/Aerosol VOC Emission Source. Technical advisor for project to evaluate venturi scrubber as BACT for mixed phase aerosol/gaseous hydrocarbon emissions from deep fat fryer. Venturi scrubber demonstrated high removal efficiency on aerosol, low efficiency on VOC emissions. A number of VOC tests indicated negative removal efficiency. This anomaly was traced to a high hydrocarbon concentration in the scrubber water. The pilot unit had been shipped directly to the jobsite from another test location by the manufacturer without any cleaning or inspection of the pilot unit.

Pulp Mill Recovery Boiler BACT Evaluation. Lead engineer for BACT analysis for control of SO_2, NO_x, CO, TNMHC, TRS and particulate emissions from the proposed addition of a new recovery furnace at a kraft pulp mill in Washington. A "top down" approach was used to evaluate potential control technologies for each of the pollutants considered in the evaluation.

Air Pollution Control Equipment Design Specification Development. Lead engineer for the development of detailed Navy design specifications for wet scrubbers and mist eliminators. Design specifications were based on field performance evaluations conducted at the Long Beach Naval Shipyard, Norfolk Naval Shipyard, and Jacksonville Naval Air Station. This work was performed for the U.S. Navy to provide generic design specifications to assist naval facility engineering divisions with air pollution control equipment selection. Also served as project engineer for the development of Navy design specifications for ESPs and fabric filters.

CONTINUOUS EMISSION MONITOR (CEM) PROJECT EXPERIENCE

Process Heater CO and NO_x CEM Relative Accuracy Testing. Project manager and lead engineer for process heater CO and NO_x analyzer relative accuracy test program at petrochemical manufacturing facility. Objective of test program was to demonstrate that performance of onsite CO and NO_x CEMs was in compliance with U.S. EPA "Boiler and Industrial Furnace" hazardous waste co-firing regulations. A TECO Model 48 CO analyzer and a TECO Model 10 NO_x analyzer were utilized during the test program to provide $\pm$1 ppm measurement accuracy, and all test data was recorded by an automated data acquisition system. One of the two process heater CEM systems tested failed the initial test due to leaks in the gas conditioning system. Troubleshooting was performed using O_2 analyzers, and the leaking component was identified and replaced. This CEM system met all CEM relative accuracy requirements during the subsequent retest.

Performance Audit of NO_x and SO_2 CEMs at Coal-Fired Power Plant. Lead engineer on system audit and challenge gas performance audit of NO_x and SO_2 CEMs at a coal-fired power plant in southern Nevada. Dynamic and instrument calibration checks were performed on the CEMs. A detailed visual inspection of the CEM system, from the gas sampling probes at the stack to the CEM sample gas outlet tubing in the CEM trailer, was also conducted. The CEMs passed the dynamic and instrument calibration requirements specified in EPA's Performance Specification Test - 2 (NO_x and SO_2) alternative relative accuracy requirements.

LATIN AMERICA ENVIRONMENTAL PROJECT EXPERIENCE

Assessment of operational deficiencies of Camisa pipeline – Peru. Project leader of multi-year assessment of root causes of ruptures on Camisea 14-inch natural gas liquids pipeline for non-profit client. Determined that primary causes of hurried construction in difficult and unstable terrain, unstable right-of-way in the jungle sector due to inadequate erosion control practices, and inadequate pipe wall thickness to withstand external lateral forces. Two assessments were developed during the course of the project documenting deficiencies and recommending remedial actions.

Evaluation of U.S.-Mexico Border Region Copper Smelter Compliance with Treaty Obligations – Mexico. Project manager and lead engineer to evaluate compliance of U.S. and Mexican border region copper smelters with the SO_2 monitoring, recordkeeping and reporting requirements in Annex IV [Copper Smelters] of the La Paz Environmental Treaty. Identified potential problems with current ambient and stack monitoring practices that could result in underestimating the impact of SO_2 emissions from some of these copper smelters. Identified additional source types, including hazardous waste incinerators and power plants, that should be considered for inclusion in the La Paz Treaty process.

Development of Air Emission Limits for ICE Cogeneration Plant - Panamá. Lead engineer assisting U.S. cogeneration plant developer to permit an ICE cogeneration plant at a hotel/casino complex in Panama. Recommended the use of modified draft World Bank NO_x and PM limits for ICE power plants. The modification consisted of adding a thermal efficiency factor adjustment to the draft World Bank NO_x and PM limits. These proposed ICE emission limits are currently being reviewed by Panamanian environmental authorities.

Mercury Emissions Inventory for Stationary Sources in Northern Mexico. Project manager and lead engineer to estimate mercury emissions from stationary sources in Northern Mexico. Major potential sources of mercury emissions include solid- and liquid-fueled power plants, cement kilns co-firing hazardous waste, and non-ferrous metal smelters. Emission estimates were provided for approximately eighty of these sources located in Northern Mexico. Coordinated efforts of two Mexican subcontractors, located in Mexico City and Hermosillo, to obtain process throughput data for each source included in the inventory.

Translation of U.S. EPA Scrap Tire Combustion Emissions Estimation Document – Mexico. Evaluated the Translated a U.S. EPA scrap tire combustion emissions estimation document from English to Spanish for use by Latin American environmental professionals.

Environmental Audit of Aluminum Production Facilities – Venezuela. Evaluated the capabilities of existing air, wastewater and solid/hazardous waste control systems used by the aluminum industry in eastern Venezuela. This industry will be privatized in the near future. Estimated the cost to bring these control systems into compliance with air, wastewater and solid/hazardous waste standards recently promulgated in Venezuela. Also served as technical translator for team of U.S. environmental engineers involved in the due diligence assessment.

Assessment of Environmental Improvement Projects – Chile and Peru. Evaluated potential air, water, soil remediation and waste recycling projects in Lima, Peru and Santiago, Chile for feasibility study funding by the U.S. Trade and Development Agency. Project required onsite interaction with in-country decisionmakers (in Spanish). Projects recommended for feasibility study funding included: 1) an air quality technical support project for the Santiago, Chile region, and 2) soil remediation/metals recovery projects at two copper mine/smelter sites in Peru.

Air Pollution Control Training Course – Mexico. Conducted two-day Spanish language air quality training course for environmental managers of assembly plants in Mexicali, Mexico. Spanish-language course manual prepared by Powers Engineering. Practical laboratory included training in use of combustion gas analyzer, flame ionization detector (FID), photoionization detector (PID), and occupational sampling.

Stationary Source Emissions Inventory – Mexico. Developed a comprehensive air emissions inventory for stationary sources in Nogales, Sonora. This project requires frequent interaction with Mexican state and federal environmental authorities. The principal Powers Engineering subcontractor on this project is a Mexican firm located in Hermosillo, Sonora.

VOC Measurement Program – Mexico. Performed a comprehensive volatile organic compound (VOC) measurements program at a health products fabrication plant in Mexicali, Mexico. An FID and PID were used to quantify VOCs from five processes at the facility. Occupational exposures were also measured. Worker exposure levels were above allowable levels at several points in the main assembly area.

Fluent in Spanish. Studied at the Universidad de Michoacán in Morelia, Mexico, 1993, and at the Colegio de España in Salamanca, Spain, 1987-88. Have lectured (in Spanish) on air monitoring and control equipment at the Instituto Tecnológico de Tijuana. Maintain contact with Comisión Federal de Electricidad engineers responsible for operation of wind and geothermal power plants in Mexico, and am comfortable operating in the Mexican business environment.

PUBLICATIONS

Bill Powers, "*More Distributed Solar Means Fewer New Combustion Turbines*," Natural Gas & Electricity Journal, Vol. 29, Number 2, September 2012, pp. 17-20.

Bill Powers, "*Federal Government Betting on Wrong Solar Horse*," Natural Gas & Electricity Journal, Vol. 27, Number 5, December 2010,

Bill Powers, "*Today's California Renewable Energy Strategy—Maximize Complexity and Expense*," Natural Gas & Electricity Journal, Vol. 27, Number 2, September 2010, pp. 19-26.

Bill Powers, "*Environmental Problem Solving Itself Rapidly Through Lower Gas Costs*," Natural Gas & Electricity Journal, Vol. 26, Number 4, November 2009, pp. 9-14.

Bill Powers, "*PV Pulling Ahead, but Why Pay Transmission Costs?*" Natural Gas & Electricity Journal, Vol. 26, Number 3, October 2009, pp. 19-22.

Bill Powers, "*Unused Turbines, Ample Gas Supply, and PV to Solve RPS Issues*," Natural Gas & Electricity Journal, Vol. 26, Number 2, September 2009, pp. 1-7.

Bill Powers, "*CEC Cancels Gas-Fed Peaker, Suggesting Rooftop Photovoltaic Equally Cost-Effective*," Natural Gas & Electricity Journal, Vol. 26, Number 1, August 2009, pp. 8-13.

Bill Powers, "*San Diego Smart Energy 2020 – The 21st Century Alternative*," San Diego, October 2007.

Bill Powers, "*Energy, the Environment, and the California – Baja California Border Region*," Electricity Journal, Vol. 18, Issue 6, July 2005, pp. 77-84.

W.E. Powers, *"Peak and Annual Average Energy Efficiency Penalty of Optimized Air-Cooled Condenser on 515 MW Fossil Fuel-Fired Utility Boiler,"* presented at California Energy Commission/Electric Power Research Institute Advanced Cooling Technologies Symposium, Sacramento, California, June 2005.

W.E. Powers, R. Wydrum, P. Morris, *"Design and Performance of Optimized Air-Cooled Condenser at Crockett Cogeneration Plant,"* presented at EPA Symposium on Technologies for Protecting Aquatic Organisms from Cooling Water Intake Structures, Washington, DC, May 2003.

P. Pai, D. Niemi, W.E. Powers, *"A North American Anthropogenic Inventory of Mercury Emissions,"* presented at Air & Waste Management Association Annual Conference in Salt Lake City, UT, June 2000.

P.J. Blau and W.E. Powers, *"Control of Hazardous Air Emissions from Secondary Aluminum Casting Furnace Operations Through a Combination of: Upstream Pollution Prevention Measures, Process Modifications and End-of-Pipe Controls,"* presented at 1997 AWMA/EPA Emerging Solutions to VOC & Air Toxics Control Conference, San Diego, CA, February 1997.

W.E. Powers, et. al., *"Hazardous Air Pollutant Emission Inventory for Stationary Sources in Nogales, Sonora, Mexico ,"* presented at 1995 AWMA/EPA Emissions Inventory Specialty Conference, RTP, NC, October 1995.

W.E. Powers, *"Develop of a Parametric Emissions Monitoring System to Predict NO_x Emissions from Industrial Gas Turbines,"* presented at 1995 AWMA Golden West Chapter Air Pollution Control Specialty Conference, Ventura, California, March 1995.

W. E. Powers, et. al., *"Retrofit Control Options for Particulate Emissions from Magnesium Sulfite Recovery Boilers,"* presented at 1992 TAPPI Envr. Conference, April 1992. Published in *TAPPI Journal*, July 1992.

S. S. Parmar, M. Short, W. E. Powers, *"Determination of Total Gaseous Hydrocarbon Emissions from an Aluminum Rolling Mill Using Methods 25, 25A, and an Oxidation Technique,"* presented at U.S. EPA Measurement of Toxic and Related Air Pollutants Conference, May 1992.

N. Meeks, W. E. Powers, *"Air Toxics Emissions from Gas-Fired Internal Combustion Engines,"* presented at AIChE Summer Meeting, August 1990.

W. E. Powers, *"Air Pollution Control of Plating Shop Processes,"* presented at 7th AES/EPA Conference on Pollution Control in the Electroplating Industry, January 1986. Published in *Plating and Surface Finishing* magazine, July 1986.

H. M. Davenport, W. E. Powers, *"Affect of Low Cost Modifications on the Performance of an Undersized Electrostatic Precipitator,"* presented at 79th Air Pollution Control Association Conference, June 1986.

AWARDS

Engineer of the Year, 1991 – ENSR Consulting and Engineering, Camarillo
Engineer of the Year, 1986 – Naval Energy and Environmental Support Activity, Port Hueneme
Productivity Excellence Award, 1985 – U. S. Department of Defense

PATENTS

Sedimentation Chamber for Sizing Acid Mist, Navy Case Number 70094

Attachment B

List of reviewed materials

1. U.S. Energy Information Administration, Preliminary Monthly Electric Generator Inventory (based on Form EIA-860M as a supplement to Form EIA-860) (Apr. 2025), https://www.eia.gov/electricity/data/eia860m/.

2. U.S. EIA, Form EIA-923 detailed data with previous form data (EIA-906/920) (Apr. 2025), https://www.eia.gov/electricity/data/eia923/.

3. U.S. EIA, csv dataset, "MISO_load-temp_hr_2023" (accessed June 13, 2025).

4. Michigan PSC Case No. U-21090, Revised Direct Testimony and Exhibits of Norman J. Kapala on Behalf of Consumers Energy Company (Dec. 2021)

5. Michigan PSC Case No. U-21389, Direct Testimony and Exhibits of Richard T. Blumenstock on Behalf of Consumers Energy Company (May 2023)

6. Michigan PSC, Case No. U-21258, Direct Testimony and Exhibits of Nathan J. Hoffman on Behalf of Consumers Energy Company (Mar. 2024).

7. Michigan PSC Case No. U-21585, Direct Testimony and Exhibits of Richard T. Blumenstock on Behalf of Consumers Energy Company (May 2024)

8. Michigan PSC, Case No. U-21424, Direct Testimony and Exhibits of Nathan J. Hoffman on Behalf of Consumers Energy Company (Mar. 2025).

9. Michigan PSC Case No. U-21870, Direct Testimony and Exhibits of Richard T. Blumenstock on Behalf of Consumers Energy Company (June 2025)

10. M. Hafner, G. Luciani, *The Palgrave Handbook of International Energy Economics* (2022).

11. International Energy Agency, *The Role of CCUS in Low-Carbon Power Systems* (2021).

12. NERC, 2024 State of Reliability (June 2024).

13. International Energy Agency, *Increasing The Flexibility of Coal-Fired Power Plants* (Sept. 2014).

14. NERC, *Energy Storage: Overview of Electrochemical Storage* (Feb. 2021), https://www.nerc.com/pa/RAPA/ra/Reliability%20Assessments%20DL/Master_ESAT_Report.pdf.

15. General Electric, *Get to know the LM6000* (2025) https://www.gevernova.com/gas-power/products/gas-turbines/lm6000.

16. National Association of Regulatory Utility Commissioners ("NARUC"), *Recent Changes to U.S. Coal Plant Operations and Current Compensation Practices* (Jan. 2020).

17. Energy Innovation, *Coal Power 28 Percent More Expensive in 2024 Than in 2021* (June 5, 2025)

18. Campbell National Pollutant Discharge Elimination System Permit No. MI000142 (Oct. 2021)

19. Campbell Renewable Operating Permit No. MI-ROP-B2835-2020b and Permit to Install (MI-PTI-B2835-2020b)

20. Air permitting documents uploaded to the Michigan Department of Environment, Great Lakes, and Energy ("EGLE") webpage for Campbell between May 28, 2025 and June 6, 2025 (available at https://mienviro.michigan.gov/nsite/map/results/detail/-9777121897116394 21/documents)

    a. PM and HCI 40 CFR 63 Subpart UUUUU Test Protocol EUBOILER1 (uploaded May 28, 2025)

    b. Air Quality Test Observation Report (uploaded May 29, 2025)

    c. Air Quality Test Observation Form (uploaded June 3, 2025)

    d. Hg CEMS Relative Accuracy Test Audit Test Protocol EUBOILER1 (uploaded June 5, 2025)

    e. CEMS Relative Accuracy Test Protocol EUBOILER1 (uploaded June 6, 2025)

    f. Two letters approving Protocol for Emissions Testing (both uploaded June 6, 2025)