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BEFORE THE
PUBLIC SERVICE COMMISSION OF WISCONSIN

Application of Wisconsin Electric Power Company; Wisconsin)
Energy Corporation; and W.E. Power, LLC; for a Certificate of) Docket No. 05-CE-130
Public Convenience and Necessity for Construction of Three)
Large Electric Generation Facilities, the Elm Road Generating)
Station, and Associated High Voltage Transmission)
Interconnection Facilities to be Located in Milwaukee and)
Racine Counties)

**DIRECT TESTIMONY OF KRISTINE M. KRAUSE
ON BEHALF OF APPLICANTS**

19 **Q. Please state your name, business address and occupation.**

20 A. My name is Kristine M. Krause, and my business address is 231 W. Michigan Street,
21 Milwaukee, Wisconsin 53202. I am Vice President – Environmental of Wisconsin
22 Energy Corporation ("WEC").

23 **Q. Please describe your educational and business experience.**

24 A. I have a Bachelor of Science degree in Civil Engineering from Michigan Technological
25 University, a Master of Science degree from Marquette University and a Master of
26 Business Administration degree from University of Wisconsin, Milwaukee. I am a
27 registered Professional Engineer in the State of Wisconsin. I have been employed by
28 Wisconsin Electric since 1978 and have served in various capacities related to
29 engineering and operations of power plants until 1995 when I was named Vice President
30 of Fossil Operations. At that time I had responsibility for environmental matters
31 concerning Wisconsin Electric's power plants. In 2000, I was named to my current
32 position overseeing environmental matters for Wisconsin Energy.

1 **Q. What is the purpose of your testimony?**

2 A. The purpose of my testimony is to describe a number of the environmental aspects of the
3 proposed supercritical pulverized coal units and integrated gasification combined cycle
4 unit at the proposed Elm Road site (“project” or “Elm Road Site”).

5 **Q. Please describe Exhibit _____ (KMK-1)**

6 A. Exhibit _____ (KMK-1) contains engineering and environmental information relating to
7 the Elm Road project from the original CPCN application and subsequent relevant
8 supplements to that information.

9 **Q. What will the effect be on the emissions from the combined Elm Road and Oak
10 Creek Power Plant sites specifically, if the proposed new units are built and the
11 existing units continue to operate?**

12 A. They will be reduced.

13 **Q. How is that possible?**

14 A. Power The Future (PTF) proposes to build new coal power plants at a site close to the
15 existing Oak Creek power plant that will be equipped with the best available emission
16 controls and have much lower emissions than any of our existing coal power plants. PTF
17 also proposes to improve the environmental performance of our existing coal power
18 plants, including those at Oak Creek. By building very low emitting new units and
19 reducing emissions from our existing units, our overall emissions will be lower as a result
20 of PTF.

21 Since we announced our PTF proposal in 2000, we have invested more than \$50
22 million at the Oak Creek power plant in projects that are lowering emissions from the
23 existing units. For example, investments have been made to: 1) allow units 5&6 to burn

1 100% lower sulfur Western coal, and 2) replace the coal burners for units 7&8 with low
2 nitrogen oxide (NOx) burners. As a result of these and other projects, emissions from the
3 existing units will be reduced enough to offset expected emissions from the new units so
4 that emissions from the site will be lower after PTF is fully implemented in 2012 than
5 before PTF was proposed in 2000. Exhibit _____ (KMK-2) compare emissions at
6 Oak Creek power plant in 2000, prior to our investing in additional pollution controls,
7 with emissions after our work at Oak Creek power plant and the construction of the Elm
8 Road units.

9 **Q. Have you entered into any agreements that commit you to decreasing emissions**
10 **from the Oak Creek site as a result of PTF?**

11 A. On September 30, 2002, we entered in a voluntary integrated, multi-emission agreement
12 with the Wisconsin Department of Natural Resources (WDNR). The agreement commits
13 us to reducing SO₂, NO_x, and mercury emissions from our existing Wisconsin coal
14 power plant by about 50% over the next ten years.

15 On the same day, we voluntarily joined the U.S. Environmental Protection
16 Agency's (USEPA) Climate Leaders Initiative. We are currently working with USEPA to
17 define our greenhouse gas emission inventory and expect to negotiate with USEPA to
18 establish a greenhouse gas emission target once our inventory is finalized.

19 On March 31, 2003, we finalized an agreement with the City of Oak Creek to cap
20 aggregate emissions of SO₂, NO_x, PM, Hg, VOC, HCl, HF, and H₂SO₄ from the sites.
21 This cap is now in effect and limits emissions from the existing and new units to no more
22 than 38,400 tons per year for the emissions listed in the previous sentence.

1 Finally, on April 28, 2003, we reached an agreement with the USEPA that will
2 result in further reductions.

3 **Q. Please describe how the overall system-wide emissions will be lower as a result of**
4 **PTF.**

5 A. Emissions of sulfur dioxide (SO₂), NO_x, particulate matter (PM), and mercury (Hg) from
6 all of our coal power plants will be reduced by more than 99,000 tons as a result of PTF.
7 We propose to build new, advanced power plants with the best available emission
8 controls and reduce emissions from our existing coal power plants, including Oak Creek.
9 PTF will result in lower emissions from all of our power plants, including the new ones,
10 by: about 60% for SO₂ and NO_x, more than 20% for PM, and more than 35% for Hg.
11 Please refer to Exhibit ____ (KMK-3) for a comparison.

12 **Q. Please describe the emission control equipment that will be installed on the new coal**
13 **units and how the equipment came to be proposed as meeting regulatory**
14 **requirements for various emission limitations (e.g., BACT, LAER, MACT).**

15 A. According to prevention of significant deterioration (PSD) and non-attainment new
16 source review (NNSR) air quality permitting requirements, we performed a best available
17 control technology (BACT) analysis for SO₂, NO_x, PM₁₀, CO, Pb, Hg, F, and H₂SO₄; a
18 lowest achievable emission rate (LAER) analysis for VOC; and a case-by-case maximum
19 achievable control technology (MACT) determination for mercury.

20 As a result of these analyses, the proposed new supercritical pulverized coal units
21 will install low NO_x burners for NO_x control, selective catalytic reduction for additional
22 NO_x control, a fabric filter baghouse for large and small particulate matter and mercury
23 control, a wet flue gas desulfurization device for SO₂, acid gas, and mercury control, and

1 a wet electrostatic precipitator for H₂SO₄ and fine particle control. Taking into account
2 the type of coal to be utilized, and the levels of BACT we are proposing, the capability of
3 the technologies are reasonably well understood.

4 **Q. Please describe the evaluation that you went through to ensure that ambient air**
5 **quality standards designed to protect public health will be met even with the**
6 **addition of the new coal units.**

7 A. We performed air dispersion modeling for the emissions subject to PSD to determine the
8 air quality impacts once the new coal units become operational. The modeling meets the
9 requirements of WDNR's modeling guidance. The modeling analysis results show that
10 the ambient air quality standard, or increment, will remain in compliance with the
11 operation of the proposed new coal units, in conjunction with other air emission sources
12 operating in the area. These standards are designed to protect public health.

13 **Q. What are the key emissions that we should look at with respect to the air quality**
14 **issues of concern today and in the future?**

15 A. The key emissions are sulfur dioxide, nitrogen oxides, particulate matter, and mercury.

16 Today's environmental issues (e.g., ozone non-attainment, fine particles) are
17 regional in nature, with emissions and pollutants transported from county to county, state
18 to state, and even country to country, over hundreds of miles or more. PTF will improve
19 the environment in Oak Creek, southeastern Wisconsin, and throughout the region. PTF
20 will reduce our emissions of the key pollutants described above from our power plants
21 throughout southeast Wisconsin while at the same time adding the generation necessary
22 to meet the needs of our customers for low cost, reliable electric supply.

1 Our region will be better positioned to meet the requirements of existing and new
2 air quality standards as a result of the reductions that will be achieved by PTF, and our
3 approach will support control strategies that are effective in addressing regional air
4 quality issues. The regulatory solutions needed to address these problems are consistent
5 with our approach under PTF.

6 **Q. In the economic modeling described in Jeff Knitter’s testimony, a value is placed on**
7 **carbon dioxide emissions. Please explain how that value was determined and on**
8 **what basis you think it is accurate.**

9 A. The dates and price scenarios we chose are consistent with the range of potential
10 outcomes that may be possible on this issue. The range of possible outcomes includes no
11 requirements ever being imposed in the United States. For the foreseeable future, it is the
12 outcome with the greatest likelihood for US companies, including electric utilities. An
13 upper bound of \$3/ton was also evaluated as a less likely scenario that could occur within
14 the next 10 years if the US were to regulate CO2 emissions.

15 We recognize climate change as an important issue and are taking action as a
16 fossil fueled electric utility to appropriately manage our risks related to climate change
17 and other environmental issues. We are involved in a number of activities related to this
18 topic. For example, we developed two of the first seven projects selected for approval by
19 the U.S. International Joint Implementation, one located in Belize and another in the
20 Czech Republic, designed to demonstrate carbon sequestration and reduction projects,
21 respectively. We have participated in the U.S. Department of Energy’s “Climate
22 Challenge” voluntary greenhouse gas reporting program (1605(b)) since its inception in

1 the mid 90's and have reported greenhouse gas emission reductions in excess of 27
2 million tons.

3 We joined the U.S. Environmental Protection Agency's (USEPA) Climate
4 Leaders Initiative on September 30, 2002 and are in the process of finalizing the emission
5 inventory that would serve as our baseline for participation. Once the inventory is
6 finalized, we will negotiate a greenhouse gas reduction goal with USEPA. We also
7 belong to a number of other organizations that are actively involved in monitoring
8 ongoing developments and conducting research related to climate change and other
9 environmental issues. Examples of these groups include Generators for Clean Air, the
10 Pew Center on Climate Change's Business Environmental Leadership Council, the US
11 Climate Partnership Association, the Electric Power Research Institute, and the Edison
12 Electric Institute.

13 The PTF proposal considered as a whole represents a comprehensive plan for
14 greenhouse gas emission reduction. The plan includes features supported by many
15 environmental groups such as retiring/repowering old coal power plants, building new
16 advanced technology power plants, building more renewable energy generation, and
17 investing more in energy efficiency, demand-side management, and carbon mitigation. If
18 the plan is approved in total, the CO2 emission intensity of We Energies will be reduced,
19 which is a step toward mass emission reduction.

20 **Q. Have you done an analysis to assess the impact of PTF on regional ozone and fine
21 particulate?**

22 **A.** Yes, initial results strongly suggest that the proposed PTF will not negatively impact
23 regional ozone or PM concentrations and in fact show that it is more likely that PTF will

1 lead to improved air quality. From the perspective that air quality will be generally
2 improved, while increasing energy output several fold, the overall picture is favorable
3 for Southeastern Wisconsin.

4 For a view of the region studied, refer to Exhibit _____ (KMK-4).

5 **Q. In Al Mihm's testimony several accommodations were described regarding locating**
6 **the coal storage and handling areas within the rail loop and utilizing one 550 foot**
7 **chimney rather than two six hundred and seventy five foot chimneys. Have the**
8 **overall environmental impacts of these accommodations been evaluated?**

9 A. Yes, an air quality modeling analyses was performed to incorporate these
10 accommodations. The results of the air quality impact analysis demonstrate that the
11 accommodations meet the National Ambient Air Quality Standards (NAAQS) and PSD
12 increment requirements. Enclosed as Exhibit ____ (KMK-5) are the modeling results for
13 NAAQS and PSD increment for the primary site and the primary site with the
14 accommodations. The accommodations are permissible.

15 Other environmental impacts such as changes to impacts to wetlands,
16 environmental corridors, site grading, storm water and other land impacts have also been
17 evaluated. Enclosed as Exhibit _____ (KMK-6) are various suggested revisions to
18 sections of the Draft Environmental Impact Statement, including updated drawings that
19 describe the impacts associated with these accommodations.

20 **Q. Will the Elm Road Generating Station inhibit economic development in Racine**
21 **County due to consuming nearly 90% of the PM10 –24 hour PSD increment?**

1 A. No, increment impacts are very localized at specific locations around the plant site and
2 are not regional in nature. Ambient air quality modeling results indicate that the amount
3 of increment consumed by the Elm Road Generating Station will drop to less than 50 %
4 of the PSD standard within 800 yards of the plant site. The probability that a new PM10
5 source would impact the same specific locations at the Elm Road site is very
6 remote. For example, a modeling analysis was performed to determine if a new PM10
7 source could be located within Racine County. The modeling analysis assumed that the
8 current largest particulate matter emitter in Racine county is located as a new source in
9 the Caledonia Business Park which is approximately 4 miles from the Elm Road site.
10 This is a conservation assumption since any significant new source of particulate matter
11 would need to install best available controls as part of the permit process. The PSD
12 increment modeling results show that this new source would not have a measurable
13 impact on the specific high increment locations around the Elm Road site. Therefore, the
14 Elm Road Generating Station would not affect this new source or any other major source
15 of PM from being able to obtain an air permit.

16 **Q. What about VOC offsets?**

17 A. The Elm Road facility will require approximately 400 tons of VOC offsets, which takes
18 into account the 1.3 multiplier required. These offsets are currently owned by Wisconsin
19 Energy. As described in my rebuttal testimony during the Port Washington hearings, the
20 retirement of these offsets will improve the air quality in the area. Additional offsets will
21 become available if any of the existing Oak Creek units are retired.

22 **Q. Does this conclude your pre-filed direct testimony?**

23 A. Yes, it does.