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SOAH DOCKET NO. 473-17-5481
PUC DOCKET NO. 47461

APPLICATION OF SOUTHWESTERN ELECTRIC POWER COMPANY FOR CERTIFICATE OF CONVENIENCE AND NECESSITY AUTHORIZATION AND RELATED RELIEF FOR THE WIND CATCHER ENERGY CONNECTION PROJECT IN OKLAHOMA	§	BEFORE THE STATE OFFICE OF ADMINISTRATIVE HEARINGS

DIRECT TESTIMONY
AND EXHIBITS
OF

JAMES W. DANIEL

ON BEHALF OF THE
EAST TEXAS ELECTRIC COOPERATIVE, INC.
AND
NORTHEAST TEXAS ELECTRIC COOPERATIVE, INC.

DECEMBER 4, 2017

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DIRECT TESTIMONY AND EXHIBITS OF JAMES W. DANIEL

I. EXPERIENCE AND QUALIFICATIONS

Q. PLEASE STATE YOUR NAME AND BUSINESS ADDRESS.

A. My name is James W. Daniel. My business address is 919 Congress Avenue, Suite 800, Austin, Texas 78701.

Q. PLEASE OUTLINE YOUR FORMAL EDUCATION.

A. I received the degree of Bachelor of Science from the Georgia Institute of Technology in 1973 with a major in economics.

Q. WHAT IS YOUR PRESENT POSITION?

A. I am a Vice President of the firm GDS Associates, Inc. ("GDS") and Manager of GDS's office in Austin, Texas.

Q. PLEASE STATE YOUR PROFESSIONAL EXPERIENCE.

A. From July 1974 through September 1979 and from August 1983 through February 1986, I was employed by Southern Engineering Company. During that time, I participated in the preparation of economic analyses regarding alternative power supply sources and generation and transmission feasibility studies for rural cooperatives. I participated in wholesale and retail rate and contract negotiations with investor-owned and publicly-owned utilities, prepared cost of service studies on investor-owned and publicly-owned utilities, and prepared and submitted testimony and exhibits in utility rate and other regulatory proceedings on behalf of publicly-owned utilities, industrial customers, associations, and government agencies. From October 1979 through July 1983, I was employed as a public utility consultant by R.W. Beck and Associates. During that time, I participated in rate studies for publicly-owned electric, gas, water and wastewater utilities. My primary responsibility was the development of revenue requirements, cost of service, and rate design studies as well as the preparation and submittal of testimony and exhibits

in utility rate proceedings on behalf of publicly-owned utilities, industrial customers and other customer groups. Since February 1986, I have held the position of Manager of GDS's office in Austin, Texas. In April 2000, I was elected as a Vice President of GDS. While at GDS, I have provided testimony in numerous regulatory proceedings involving electric, natural gas, and water utilities, and I have participated in generic rulemaking proceedings. I have prepared retail rate studies on behalf of publicly-owned utilities, and I have prepared utility valuation analyses. I have also prepared economic feasibility studies, and I have procured and contracted for wholesale and retail energy supplies.

Q. WOULD YOU PLEASE DESCRIBE GDS?

A. GDS is an engineering and consulting firm with offices in Marietta, Georgia; Austin, Texas; Auburn, Alabama; Manchester, New Hampshire; Madison, Wisconsin; and Orlando, Florida. GDS has over 160 employees with backgrounds in engineering, accounting, management, economics, finance, and statistics. GDS provides rate and regulatory consulting services in the electric, natural gas, water, storm, and telephone utility industries. GDS also provides a variety of other services in the electric utility industry including power supply planning, generation support services, energy procurement and contracting, energy efficiency program development, financial analysis, load forecasting, and statistical services. Our clients are primarily privately-owned utilities, publicly-owned utilities, municipalities, customers of investor-owned utilities, groups or associations of customers, and government agencies.

Q. HAVE YOU PREVIOUSLY TESTIFIED BEFORE ANY REGULATORY COMMISSIONS?

A. I have testified many times before regulatory commissions. I have submitted testimony before the following state regulatory authorities: the Public Utility Commission of Texas ("PUC" or the "Commission"), the Texas Commission on Environmental Quality, the Texas Railroad Commission, the Regulatory Commission of Alaska, the Arkansas Public

Service Commission, the Arizona Corporation Commission, the Delaware Public Service Commission, the Florida Public Service Commission, the Georgia Public Service Commission, the Illinois Commerce Commission, the State Corporation Commission of Kansas, the Louisiana Public Service Commission, the New Mexico Public Service Commission, the Oklahoma Corporation Commission, the Oregon Public Utility Commission, the Pennsylvania Public Utility Commission, the South Dakota Public Utilities Commission, the Public Service Commission of Utah, the Virginia State Corporation Commission, and the Public Service Commission of West Virginia. I have also testified before the Federal Energy Regulatory Commission ("FERC"), two Condemnation Courts appointed by the Supreme Court of Nebraska, and I have submitted an expert opinion report before the United States Tax Court on utility issues. A list of regulatory proceedings in which I have presented expert testimony is provided as Exhibit JWD-1.

II. INTRODUCTION

Q. ON WHOSE BEHALF ARE YOU TESTIFYING IN THIS PROCEEDING?

A. I am testifying on behalf of East Texas Electric Cooperative, Inc. ("East Texas" or "ETEC") a generation and transmission ("G&T") cooperative and Northeast Texas Electric Cooperative, Inc. ("NTEC"), also a G&T cooperative. Both cooperatives are currently wholesale customers of Southwestern Electric Power Company ("the Company" or "SWEPCO"). Hereinafter, both cooperatives will be referred to as the "Cooperatives."

Q. WHAT IS THE PURPOSE OF YOUR DIRECT TESTIMONY?

A. The purpose of my testimony is to address all or portions of issues 1, 2, 3, 11, 12, 13, 14, 16, 17, 24, 28, 29, 30, 31, 35, and 36.

Q. WAS YOUR TESTIMONY AND THE INFORMATION CONTAINED WITHIN IT PREPARED BY YOU OR BY KNOWLEDGEABLE PERSONS UPON WHOSE EXPERTISE, JUDGEMENT, AND OPINIONS YOU RELY UPON IN PERFORMING YOUR DUTIES?

A. Yes. All the analysis described in my testimony, that is not expressly described as being performed by SWEPCO or others, was performed by myself and GDS colleagues working under my supervision and direction.

Q. ARE THE OPINIONS AND INFORMATION CONTAINED IN YOUR TESTIMONY TRUE AND CORRECT TO THE BEST OF YOUR KNOWLEDGE AND BELIEF?

A. Yes.

Q. PLEASE SUMMARIZE THE RESULTS OF YOUR REVIEW AND ANALYSIS.

A. Based on my review and analysis, I have reached the following conclusions and recommendations to the Commission:

(1) The Commission should determine that SWEPCO's Application is not in the public interest.

(2) SWEPCO has failed to present a meaningful analysis of the impact of the proposed Wind Catcher project on customers.

(3) SWEPCO's proposed shaping of the PTCs should be rejected by the Commission.

(4) SWEPCO's jurisdictional allocation factor understates the cost that will be borne by the Texas retail customers.

(5) The depreciation ratio for the proposed wind generation facility should be based on a 30-year service life.

(6) Based on the additional risks and flawed assumptions discussed by the Cooperatives' witnesses Neil Copeland and myself, it is likely that SWEPCO's proposed project will not provide any benefits to customers and should be rejected by the Commission.

III. PUBLIC INTEREST

Q. PLEASE BRIEFLY DESCRIBE SWEPCO'S APPLICATION AND PROPOSAL.

A. SWEPCO is requesting Commission approval (1) to acquire the Wind Catcher generating facility located in the Oklahoma panhandle region and (2) to construct a 765 kV transmission tie line from the Wind Catcher facility to a proposed substation near Tulsa, Oklahoma (the Gen-Tie line). These facilities would be jointly owned by SWEPCO (70%) and Public Service Company of Oklahoma (30%). The Wind Catcher generating facility would consist of 800 wind turbine generators providing 1,900 megawatts ("MW") and MWh of delivered wind energy at an estimated plant cost of $2.9 billion. The Gen-Tie line will be approximately 350 to 380 miles long and cost an estimated $1.6 billion. The total cost of the project will be approximately $4.5 billion, of which $3.2 billion will be borne by SWEPCO.

Q. DID SWEPCO SUBMIT ITS APPLICATION AS AN APPLICATION FOR SALE, TRANSFER, OR MERGER?

A. Yes. SWEPCO is seeking authorization to acquire the Wind Catcher Facility and to amend its certificate of convenience and necessity ("CCN") for the Wind Catcher Facility and Gen-Tie transmission line. Attachment A to the Company's application is SWEPCO's completed "Application for Sale, Transfer, or Merger" ("STM") form required by the Commission.

Q. DOES SWEPCO BELIEVE THAT THE COMMISSION MUST DETERMINE THAT THE PROPOSED ACQUISITION OF THE WIND CATCHER FACILITY AND CONSTRUCTION OF THE GEN-TIE LINE ARE IN THE PUBLIC INTEREST.

A. No. The footnote on page 1 of its STM application states that "it is SWEPCO's position that PURA §14.101 does not apply to this Petition." However, the footnote also states that SWEPCO claims its proposal is in the public interest.

Q. DO YOU AGREE WITH SWEPCO'S CLAIM THAT A PUBLIC INTEREST FINDING IS NOT REQUIRED?

A. No. I believe that the Commission should determine whether or not SWEPCO's proposal is in the public interest. I also believe that SWEPCO has failed to demonstrate that its proposal is in the public interest or that its proposal lowers the cost to serve customers particularly under varying assumptions regarding the cost of energy from the Project or from alternatives in the SPP market.

Q. WHAT IS THE BASIS FOR SWEPCO'S CLAIM THAT A PUBLIC INTEREST FINDING BY THE COMMISSION IS NOT REQUIRED IN ORDER TO APPROVE ITS PROPOSAL?

A. Since the Wind Catcher facility and Gen-Tie line are not located in Texas, SWEPCO does not believe PURA §14.101 applies to its proposal and, therefore, a public interest finding is not necessary.

Q. WHY DO YOU DISAGREE WITH SWEPCO'S CLAIM THAT A PUBLIC INTEREST FINDING IS NOT REQUIRED

A. I disagree for several reasons. First, in similar certification applications for out of state generation facilities, the Commission has determined that the proposed facility must meet the public interest standard. For example, in a prior generation certification proceeding for a combined cycle unit located in Arkansas in Docket No. 43958, the Commission determined that the application should be reviewed under the public interest standard of PURA § 14.101. *See* Preliminary Order (Mar. 10, 2015), Issue No. 15. Similarly, the Commission found that PURA § 14.101 applies to transmission facilities located outside of Texas if those facilities are part of a system that is used to serve Texas customers, as well as part of the integrated system of the Southwest Power Pool ("SPP"). *See* Docket No. 45291, *Application of Southwestern Public Service Company for Approval of Transaction with Xcel Energy Southwest Transmission Company, LLC and Related Approvals*, Preliminary Order (Mar. 25, 2016). Second, Southwestern Public Service Company ("SPS") has a pending certification proceeding for a wind generation facility located in New Mexico in PUCT Docket No. 46936 and has not made a similar claim that a public interest finding is not required. Third, from a practical perspective, it is unreasonable for

SWEPCO to expect that the Commission would approve the Company's $4.5 billion project without finding that it is in the public interest.

IV. COSTS IMPACTS

Q. IS SWEPCO CLAIMING THAT THE PROPOSED WIND CATCHER FACILITY ACQUISITION AND GEN-TIE LINE PROJECT WILL RESULT IS SAVINGS TO CUSTOMERS?

A. Yes. Based upon SWEPCO's assumptions and analysis the proposed project will provide an estimated $750 million in net present value (NPV) savings to SWEPCO's Texas retail customers. The claimed savings are not consistent from year-to-year over the service life of the wind generators but fluctuate significantly.

Q. DID SWEPCO ALSO SHOW THE IMPACTS ON CUSTOMER BILLS?

A. No. SWEPCO witness John Aaron only provides the estimated average percent reduction in total charges for four general customer groups (residential, commercial, industrial and lighting) for the first three years of operation of the proposed project.

Q. DOES MR. AARON'S CLASS IMPACT ANALYSIS PROVIDE AN ACCURATE INDICATION OF CUSTOMER BILL IMPACTS?

A. No. As I will further discuss below, when more reasonable assumptions are used in SWEPCO's analysis SWEPCO's total claimed net benefits are wiped out and proposed Wind Catcher project results in a net cost of customers.

Also, Mr. Aaron's analysis would only indicate the total change for the "average" customer in his four generic customer groups. It does not show impacts on customer bills by rate class for various customer sizes, or by base rates. In addition, Mr. Aaron's analysis

only shows the impacts for SWEPCO's base case. SWEPCO has not presented impacts for its low fuel price forecast case.

SWEPCO's proposal will result in a known large base rate increase that may be offset by a speculative reduction in fuel charges. Since the base rate increases are not proportionate to the potential decreases to fuel charges, the net impacts on different types and sizes of customers will be different than that shown on SWEPCO's analysis. I believe this additional customer bill impact information is important for the Commission to consider when deciding whether to approve SWEPCO's Application.

Q. HAS SWEPCO PROVIDED THE INFORMATION NEEDED TO DETERMINE ESTIMATED CUSTOMER BILL IMPACTS?

A. No.

Q. HAVE YOU REVISED SWEPCO'S ANALYSIS OF THE AVERAGE IMPACTS ON THE FOUR GENERIC CUSTOMER GROUPS USING MORE REASONABLE ASSUMPTIONS?

A. I have not reran SWEPCO's model to reflect forecasted gas prices in the latest NYMEX Futures Gas Price Index or other more reasonable assumptions. However, based on SWEPCO's response to CARD RFI No. 2-58 and on the information presented above and in the Cooperatives' witness Neil Copeland's testimony, SWEPCO's proposed project will likely result in a net cost to customers rather that the net savings claimed by SWEPCO.

V. PTC SHAPING

Q. IS SWEPCO PROPOSING TO FLOW THROUGH THE ANNUAL BENEFITS OF PRODUCTION TAX CREDITS (PTCS) AS THEY ARE RECEIVED?

A. No. Instead of flowing through the benefits of PTCs to ratepayers in each of the ten years that SWEPCO receives the PTCs, SWEPCO is proposing to spread out the benefits of the PTCs over an 18-year period. As described in the testimony of SWEPCO witness Kelly Pearce, a portion of the PTCs received in the years 2024 – 2030 would not be flowed through to ratepayers until the years 2031 – 2038.

Q. WHAT IS SWEPCO'S REASON FOR DELAYING THE FLOW THROUGH OF PTC BENEFITS TO RATEPAYERS?

A. SWEPCO refers to its PTC deferral as its "shaping" proposal. As explained in SWEPCO witness Kelly Pearce's testimony, the Company's shaping proposal is intended to mitigate the rate impact of the expiration of the PTCs in 2030. Without its shaping proposal, SWEPCO claims customers will realize a significant increase in rates in the year after the PTCs expire.

Q. DO YOU AGREE WITH SWEPCO'S PTC SHAPING PROPOSAL?

A. No. SWEPCO has not compared the impact on customer bills with and without its shaping proposal. However, based on Table III in Kelly Pearce's testimony, it does not appear that the deferred PTC credit in 2031 of $104.1 million[1] will provide a significant impact on

[1] The amount of deferred PTC credits gradually decrease to zero from 2031 to 2039.

customer bills. In my opinion, customers would prefer to receive the benefits of the PTCs in the year SWEPCO received the benefit rather than postponing the benefits.

Q. SHOULD THE COMMISSION APPROVE SWEPCO'S PTC SHAPING PROPOSAL?

A. No. The Commission should not allow SWEPCO to retain a portion of the PTC benefits in the years the Company receives the benefits and then defer flowing those benefits through to customers in subsequent years. SWEPCO's shaping proposal is not necessary and should be rejected by the Commission.

VI. JURISDICTIONAL ALLOCATIONS

Q. HAS SWEPCO PRESENTED A JURISDICTIONAL ALLOCATION METHODOLOGY FOR THE PROPOSED WIND CATCHER PROJECT?

A. Yes. SWEPCO witness John Aaron states that the base rate revenue requirement of the proposed project should be allocated using a demand allocation factor. For purposes of allocating those costs in his customer impact analysis, he uses forecasted 2021 demand for developing both his jurisdictional and customer class allocation factors.

Q. DO YOU HAVE ANY ISSUES WITH SWEPCO'S JURISDICTIONAL ALLOCATION FACTORS?

A. Yes. SWEPCO's forecasted 2021 demands will under allocate costs of the proposed project to the Texas retail jurisdiction. Therefore, the Company's customer impact analysis will understate the increase on Texas retail base rates.

Q. PLEASE EXPLAIN THE PROBLEM WITH USING FORECASTED 2021 DEMANDS TO ESTIMATE TEXAS RETAIL CUSTOMER IMPACTS.

A. SWEPCO's load forecast appears to include all of its existing wholesale customers. At least one wholesale customer in Texas has publicly stated their plan to move all or some of their load from SPP to ERCOT. When this occurs, the jurisdictional demand allocation factor for SWEPCO's Texas retail jurisdictional will increase. This will then result in a larger base rate impact than those reflected in SWEPCO's customer impact analysis.

VII. DEPRECIATION RATE

Q. WHAT DOES THE COMPANY PROPOSE REGARDING DEPRECIATION RATES FOR THE WIND CATCHER PROJECT ASSETS?

A. The Wind Catcher Project includes wind generation facilities and the Gen-Tie Line. Currently SWEPCO does not own wind facilities and therefore does not have an applicable depreciation rate. SWEPCO requests that the Commission approve depreciation rates based on a 25-year life for the wind generators and a 50-year life for the Gen-Tie line. Company's witness Aaron in his workpapers for calculation of revenue requirement uses 2.268% depreciation rate for Gen-Tie Line and 3.815% for wind generation.

Q. DO YOU AGREE WITH THE COMPANY'S PROPOSAL FOR A 50-YEAR LIFE OF ITS GEN-TIE LINE FACILITY?

A. Yes. I agree. The 50-year useful life of transmission facilities is reasonable.

Q. DO YOU AGREE WITH THE COMPANY'S PROPOSAL FOR A 25-YEAR LIFE OF ITS WIND GENERATION FACILITY?

A. No.

Q. PLEASE EXPLAIN.

A. Considering the modern technology, construction, and maintenance of wind generation equipment, the service life of wind turbines is expected to be greater than 25 years. This acknowledgement of a longer life span is addressed in industry studies and reports.

Q. WHAT INFORMATION ARE YOU RELYING ON TO SUPPORT A LIFE SPAN LONGER THAN 25 YEARS?

A. I have found that there is consensus that wind turbines can remain operational beyond 25 years. For example, Burns & McDonnell, one of the leading firms that have provided engineering and consulting services on more than 200 projects and 50 gigawatts of wind capacity, conducted a wind farm life expectancy evaluation on the Meridian Way Wind Farm in Cloud County, Kansas and concluded that the wind farm would have an estimated service life of 30 years or more. Additionally, Dr. Magdalena Kurkowska in her article *A Business Case for Wind Farm Life Extension* states that "Industry experts believe, if carefully planned, the life of a wind farm can be extended even up to 40 years". Mr. Romberg, author for German renewable energy magazine "Ernuerbare Energien", also claims that wind farms "can stay in operation for at least 25 years and even reach the ripe old age of 40 with retrofits and replacement components". A copy of these articles is provided in my Exhibit JWD-2. Based on my research, I recommend that the Company extend the service life of the wind generation facilities to 30 years for purposes of determining a depreciation rate.

Q. WHAT EFFECT WILL INCREASING THE SERVICE LIFE OF WIND GENERATION FACILITIES HAVE ON THE DEPRECIATION RATE AND ANNUAL EXPENSE?

A. The wind generation facility depreciation rate would be reduced from 3.815% to 3.161%. Below is the comparison of the rate based on 25-year versus the 30-year service life.

	25-Year	30-Year
Depreciable Plant	$2,902,000,000	$2,902,000,000
Net Salvage	($134,247,239)	($150,045,145)
Depreciable Basis	$2,767,752,761	$2,751,954,855
Depreciation Expense	$110,710,110	$91,731,829
Depreciation Rate	**3.815%**	**3.161%**

Using this lower depreciation rate will reduce the depreciation expenses on the proposed wind generation facility by approximately $19 million per year. Accordingly, if the Commission decides to set depreciation rates for the production-related assets to be included in this project in this docket, I recommend a 30-year service life be used.

VIII. SUMMARY AND CONCLUSIONS

Q. PLEASE SUMMARIZE YOUR CONCLUSIONS AND RECOMMENDATIONS REGARDING SWEPCO'S APPLICATION.

A. Based on my review and analysis, I have reviewed reached the following conclusions and make the following recommendations to the Commission:

(1) The Commission should determine that SWEPCO's Application is not in the public interest.

(2) SWEPCO has failed to present a meaningful analysis of the impact of the proposed Wind Catcher project on customers.

(3) SWEPCO's proposed shaping of the PTCs should be rejected by the Commission.

(4) SWEPCO's jurisdictional allocation factor understates the cost that will be borne by the Texas retail customers.

(5) The depreciation ratio for the proposed wind generation facility should be based on a 30-year service life.

(6) Based on the additional risks and flawed assumptions discussed by the Cooperatives' witnesses Neil Copeland and myself, it is likely that SWEPCO's proposed project will not provide any benefits to customers and should be rejected by the Commission.

Q. DOES THIS CONCLUDE YOUR DIRECT TESTIMONY?

A. Yes, it does.

LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
10/76	Federal Power Commission	ER76-450	Arizona Public Service Company
2/76	South Dakota Public Utilities Commission	F-3055	Northwestern Public Service Company
5/79	Federal Energy Regulatory Commission	[illegible]	Indiana & Michigan Electric Company
11/80	New Mexico Public Service Commission	627	Kit Carson Electric Cooperative (Direct Testimony)
6/81	Arizona Corporation Commission	9962-U-1032	Citizens Utilities Company
9/8	Federal Energy Regulatory Commission	ER81-179	Arizona Public Service Commission (Direct Testimony)
3/84	Texas Public Utility Commission	5640	Texas Utilities Electric Company
4/2/1984	Public Utility Commission of Texas	5560	Gulf States Utility Company (Direct Testimony)
7/3/84	Texas Public Utility Commission	5640	Texas Utilities Electric Company (Direct Testimony)
11/15/1984	Texas Public Utility Commission	5709	Texas Utilities Electric Company (Direct Testimony)
1/85	Federal Energy Regulatory Commission	[illegible]	Gulf States Utilities Company (Direct Testimony)
11/20/1985	Federal Energy Regulatory Commission	[illegible]	Gulf States Utilities Company (Direct Testimony)
1/7/86	Louisiana Public Service Commission	[illegible]	Central Louisiana Electric Company (Direct Testimony)
5/6/86	Texas Public Utility Commission	[illegible]	Texas Utilities Electric Company
3/14/86	Federal Energy Regulatory Commission	[illegible]	Gulf States Utilities Company (Rebuttal and Supplemental Testimony)
6/[illegible]/88	[illegible]	[illegible]	[illegible] (Direct Testimony)
[illegible]	[illegible]	[illegible]	[illegible]

LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
3/90	Texas Public Utility Commission	9165	El Paso Electric Company (Direct Testimony)
4/12/90	Texas Public Utility Commission	9300	Texas Utilities Electric Company (Direct Testimony - Revenue Requirements Phase)
5/4/90	Texas Public Utility Commission	9300	Texas Utilities Electric Company (Direct Testimony - Phase II - Rate Design)
7/6/90	Texas Public Utility Commission	9300	Texas Utilities Electric Company (Supplemental Testimony - Revenue Requirements)
7/30/90	Texas Public Utility Commission	9427	Lower Colorado River Authority (Direct Testimony - Rate Design)
7/30/90	Texas Public Utility Commission	9427	Lower Colorado River Authority (Rebuttal Testimony - Rate Design)
8/23/90	Texas Public Utility Commission	9567	Central Power & Light Company (Direct Testimony - Rate Design)
1/11/91	Texas Public Utility Commission	9427	Lower Colorado River Authority (Rebuttal Testimony)
9/24/91	Texas Public Utility Commission	10401	Guadalupe Valley Electric Cooperative (Direct Testimony)
2/92	Rate Area 2&3 Nebraska Municipalities	N/A	Peoples Natural Gas Company
7/31/92	Texas Public Utility Commission	10960	Guadalupe-Blanco River Authority (Direct Testimony)
8/92	State Corporation Commission of Kansas	[illegible]	Peoples Natural Gas Company Direct Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	Guadalupe-Blanco River Authority (Direct Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	Gulf States Utilities Company (Direct Testimony)
	Texas Public Utility Commission	[illegible]	Texas Utilities Electric Company (Rebuttal Testimony)
	[illegible]	[illegible]	[illegible]

LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
09/18/93	State Corporation Commission of Kansas	86,363-[illegible]	KN Energy (Direct Testimony)
09/94	State Corporation Commission of Kansas	190,[illegible]-U	Kansas Natural Pipeline and Kansas Natural Partnership (Direct Testimony)
10/17/94	Texas Public Utility Commission	12820	Central Power and Light Company (Direct Testimony)
11/15/1994	City of Houston	NA	Houston Lighting and Power Company (Direct Testimony)
11/15/1994	Texas Public Utility Commission	12065	Houston Lighting and Power Company (Direct Testimony - Revenue Requirements Phase)
12/12/1994	Texas Public Utility Commission	12820	Central Power & Light Company (Supplemental Testimony)
1/10/1995	Texas Public Utility Commission	12065	Houston Lighting & Power Company (Direct Testimony - Rate Design Phase)
5/23/95	Federal Energy Regulatory Commission	EX94-4-000	Texas Utilities Electric Company and Southwestern Electric Service (Affidavit)
8/[illegible]/95	Texas Public Utility Commission	13369	West Texas Utilities Company (Rebuttal Testimony - Rate Design Phase)
10/31/95	Texas Public Utility Commission	[illegible]435	Southwestern Electric Power Company (Direct Testimony)
1-95	[illegible] Nebraska Municipal [illegible]	N/A	[illegible] Natural Gas Company ([illegible] Report)
[illegible]	Federal Energy Regulatory Commission	[illegible]	[illegible] ([illegible])
[illegible]	Texas Public Utility Commission	[illegible]	Central Power & Light Company ([illegible])
[illegible]	[illegible]	[illegible]	[illegible] Power & Light Company ([illegible])
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
08/07/96	State of Illinois Commerce Commission	[illegible] & 96-0218	Commonwealth Edison Company (Direct Testimony)
[illegible]	Texas Public Utility Commission	15643	Central Power & Light Company and West Texas Utilities Company (Direct Testimony)
09/17/1996	Texas Public Utility Commission	15296	City of Bryan, Texas (Rebuttal Testimony)
[illegible]/96	Texas Public Utility Commission	15638	Texas Utilities Electric Company (Direct Testimony)
10/22/96	Texas Natural Resource Conservation Commission	96-0652-UCR	Longbranch Associates, L.P. (Direct Testimony)
08/05/97	Arkansas Public Service Commission	97-019-U	Arkansas Western Gas Company (Direct Testimony)
08/06/97	Texas Public Utility Commission	16705	Entergy Texas (Direct Testimony)
08/25/97	Texas Public Utility Commission	16705	Entergy Texas (Rebuttal Testimony - Rate Design Phase)
09/23/97	Arkansas Public Service Commission	97-019-U	Arkansas Western Gas Company (Surrebuttal Testimony)
09/30/97	Texas Public Utility Commission	16705	Entergy Texas (Direct Testimony - Competitive Issue Phase)
[illegible]	United States Tax Court	[illegible]	[illegible] (Report)
[illegible]	[illegible]	[illegible]	[illegible]
[illegible] 1997	[illegible]		[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
10/98	Federal Energy Regulatory Commission	EL 99-5-000	Entergy Gulf States, Inc. (Affidavit)
10/?/1998	Federal Energy Regulatory Commission	598	Gulf States Utilities Company (Affidavit)
12/31/1998	Texas Public Utility Commission	[illegible]	Sharyland Utilities, L.P. (Direct Testimony)
3/?/1999	Texas Public Utility Commission	20292	Sharyland Utilities, L.P. (Supplemental Testimony)
1/20/1999	Texas Public Utility Commission	20292	Sharyland Utilities, L.P. (Rebuttal Testimony)
7/16/1999	Texas Public Utility Commission	19265	Central and South West Corporation and American Electric Power Company, Inc. (Direct Testimony)
11/1/1999	Texas Public Utility Commission	2159[illegible]	Sharyland Utilities, L.P. (Direct Testimony)
11/2?/1999	Texas Public Utility Commission	21528	Central Power and Light Company (Direct Testimony)
1/2?/2000	Texas Railroad Commission	897[illegible]	Texas Utilities Company/Lone Star Pipeline (Direct Testimony)
3/3?/2000	Texas Public Utility Commission	[illegible]	Sharyland Utilities, L.P. (Direct Testimony)
[illegible]/2000	Texas Public Utility Commission	[illegible]	Reliant Energy HL&P (Direct Testimony)
[illegible]/2000	Texas Public Utility Commission	[illegible]	[illegible] Cost of Service rate (Direct Testimony)
[illegible]	Texas Public Utility Commission	21956	[illegible] (Direct Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	TXU Electric Company (Direct Testimony)

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LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
[illegible]	Texas Public Utility Commission	[illegible]	Central Power and Light Company (Direct Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	Reliant Energy HL&P (Direct Fuel Case) (Direct Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	Reliant Energy HL&P (Direct Testimony - Fuel Case Expense Phase)
12/29/2000	Texas Public Utility Commission	23358	Reliant Energy HL&P (Supplemental & Rebuttal Testimony)
7/5/2001	Texas Public Utility Commission	24060	Reliant Energy (Direct Testimony)
9/6/2001	Texas Public Utility Commission	24239	Mutual Energy CPL, LP (Direct Testimony)
4/22/2002	State Corporation Commission of Kansas	02-WSRE-701 RTS	Western Resources, Inc. and Kansas Gas and Electric Company (Direct Testimony)
6/19/2002	Federal Energy Regulatory Commission	EX96-2-000	City of College Station, Texas (Direct Testimony)
3/5/2003	Oklahoma Corporation Commission	200300425	Oklahoma Gas and Electric Company (Responsive Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	Central Power & Energy [illegible] (Direct Testimony)
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
8/15/2003	State Corporation Commission of Kansas	03-KGSG-602-RTS	Kansas Gas Service, a Division of ONEOK, Inc. (Supplemental Testimony)
[illegible]	Federal Energy Regulatory Commission	ER04-55-000	Entergy Services, Inc. (Affidavit)
11/5/2003	Texas Public Utility Commission	26[illegible]	CenterPoint Energy Houston Electric, LLC (Supplemental Direct Testimony)
2/9/2004	Texas Public Utility Commission	28840	AEP Texas Central Company (Direct Testimony)
6/1/2004	Texas Public Utility Commission	29526	CenterPoint Energy Houston Electric, LLC, Reliant Energy Retail Services, LLC, and Texas Genco, LP (Direct Testimony)
8/19/2004	Texas Public Utility Commission	28813	Cap Rock Energy Corporation (Affidavit)
8/30/2004	Texas Public Utility Commission	28813	Cap Rock Energy Corporation (Direct Testimony)
1/7/2005	Texas Public Utility Commission	30485	CenterPoint Energy Houston Electric, LLC (Direct Testimony)
3/16/2005	Texas Public Utility Commission	30706	CenterPoint Energy Houston Electric, LLC (Direct Testimony)
[illegible]	Texas Public Utility Commission	2980[illegible]	Southwestern Public Service Company (Direct Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	AEP Texas Central Company, CPL Retail Energy, LP (Direct Testimony)
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

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LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
8/1?/2006	Texas Public Utility Commission	32093	CenterPoint Energy Houston Electric LLC (Direct Testimony)
8/23/2006	Texas Public Utility Commission	32795	Reallocation of Stranded Costs Pursuant to PURA § 39.25? (Direct Testimony)
8/2?/2006	Texas Public Utility Commission	32758	AEP Texas Central Company (Direct Testimony)
12/22/2006	Texas Public Utility Commission	32766	Southwestern Public Service Company (Direct Testimony)
2/1?/2007	Texas Public Utility Commission	33309	AEP Texas Central Company (Direct Testimony)
3/19/2007	State Corporation Commission of Kansas	07-AQLG-431-RTS	Aquila Networks-KCO (Direct Testimony)
4/27/2007	Texas Public Utility Commission	33687	Entergy Gulf States, Inc. (Direct Testimony)
[illegible] 2007	Texas Public Utility Commission	33823	CenterPoint Energy Houston Electric LLC (Direct Testimony)
[illegible] 2007	Texas Public Utility Commission	[illegible]687	East Texas Cooperatives (Supplemental Testimony)
[illegible] 2008	Texas Public Utility Commission	[illegible]	Guadalupe Valley Electric Cooperative, Inc. (Direct Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	Sharyland Utilities L.P. (Direct Testimony)
[illegible]	[illegible] Commission	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible] the State of Kansas	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

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LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
[illegible]/2008	Texas Public Utility Commission	35717	Oncor Electric Delivery Company (Direct Testimony)
6/26/2009	State Corporation Commission of the State of Kansas	09-WSEE-641-GIE	Westar Energy, Inc. and Kansas Gas and Electric Company (Direct Testimony)
6/29/2009	Texas Public Utility Commission	36918	CenterPoint Energy Houston Electric, LLC (Direct Testimony)
9/30/2009	State Corporation Commission of the State of Kansas	09-WSEE-925-RTS	Westar Energy, Inc. and Kansas Gas and Electric Company (Direct Testimony)
[illegible]/2010	Pennsylvania Public Utility Commission	R-2010-2161575, et al.	PECO Energy Company (Direct Testimony)
9/[illegible]/2010	Texas Public Utility Commission	38324	Oncor Electric Delivery Company, LLC (Direct Testimony)
9/10/2010	Texas Public Utility Commission	38339	CenterPoint Energy Houston Electric, LLC (Direct Testimony)
9/24/2010	Texas Public Utility Commission	38339	CenterPoint Energy Houston Electric, LLC (Cross-Rebuttal Testimony)
[illegible]/2010	Texas Public Utility Commission	38324	Oncor Electric Delivery Company, LLC (Cross-Rebuttal Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	[illegible] (Direct Testimony)
[illegible]	Texas Railroad Commission	GUD [illegible]	[illegible] Texas Gas (Direct Testimony)
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
[illegible]/2012	Delaware Public Service Commission	11-528	Delmarva Power & Light Company (Direct Testimony)
[illegible]/2012	Florida Public Service Commission	120015-EI	Florida Power & Light Company (Direct Testimony)
2/20/2013	Texas Public Utility Commission	40627	Westlake United Methodist Church (Cross Rebuttal Testimony)
[illegible]/2013	Texas Public Utility Commission	4[illegible]458	Sharyland Utilities, LP (Direct Testimony)
5/3[illegible]/2013	Texas Public Utility Commission	41474	Sharyland Utilities, LP (Direct Testimony)
8/23/2013	Texas Public Utility Commission	41794	Sharyland Utilities, LP (Direct Testimony)
11-7 2013	Texas Public Utility Commission	41474	Sharyland Utilities, LP (Rebuttal Testimony)
[illegible]/2/2014	Texas Public Utility Commission	421[illegible]	Sharyland Utilities, LP (Direct Testimony)
[illegible]/2014	Michigan Public Service Commission	U-[illegible]437	DTE Electric Company (Direct Testimony)
[illegible]/2014	Public Service Commission of West Virginia	[illegible]	SWVA, Inc. (Direct Testimony)
[illegible]/2014	Texas Public Utility Commission	[illegible]	[illegible]
[illegible]	Texas Public Utility Commission	[illegible]2699	Sharyland Utilities, LP (Direct Testimony)
[illegible]	Virginia State Corporation Commission	[illegible]	[illegible]
[illegible]	Texas Public Utility Commission	[illegible]	[illegible]
[illegible]	[illegible]	[illegible]	[illegible]

LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
3/23/2015	Texas Public Utility Commission	44281	Sharyland Utilities, LP (Direct Testimony)
2/19/2015	Texas Public Utility Commission	43438	Sharyland Utilities, LP (Direct Testimony)
4/8/2015	Texas Public Utility Commission	44020	Sharyland Utilities, LP (Direct Testimony)
5/13/2015	Regulatory Commission of Alaska	[illegible]	Municipal Light & Power, Municipality of Anchorage (Direct Testimony)
5/19/2015	West Virginia Public Service Commission	15-0303-E-GI	SWVA, Inc (Direct Testimony)
6/5/2015	Oregon Public Utility Commission	UE 294	Industrial Customers of Northwest Utilities (Direct Testimony)
9/8/2015	Texas Public Utility Commission	44020	Sharyland Utilities, LP (Rebuttal Testimony)
10/23/2015	Oklahoma Corporation Commission	201500208	Public Service Company of Oklahoma (Responsive Testimony)
12/11/2015	Texas Public Utility Commission	4494[illegible]	The Rate 41 Group (Direct Testimony)
[illegible]/2016	Texas Public Utility Commission	[illegible]191	The Rate 41 Group (Supplemental Testimony)
[illegible]/2016	Oklahoma Corporation Commission	2015[illegible]	Oklahoma Attorney General (Responsive Testimony)
[illegible]/2016	Oklahoma Corporation Commission	201500[illegible]	Oklahoma Attorney General (Responsive Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	Sharyland Utilities, LP (Direct Testimony)
[illegible]	Texas Public Utility Commission	[illegible]	Sharyland Utilities, LP (Direct Testimony)
[illegible]	[illegible]	[illegible]	SWVA, Inc [illegible]
[illegible]	[illegible]	[illegible]	Sharyland Utilities [illegible]
[illegible]	[illegible]	[illegible]	[illegible]

LIST OF TESTIMONY, AFFIDAVITS, AND EXPERT REPORTS PRESENTED IN REGULATORY AND COURT PROCEEDINGS BY JAMES W. DANIEL

DATE	REGULATORY AGENCY/COURT	DOCKET	UTILITY INVOLVED
12/28/2016	Texas Public Utility Commission	46710	Guadalupe Valley Electric Cooperative, Inc (Direct Testimony)
2/10/2016	Texas Public Utility Commission	45414	Sharyland Utilities, L.P. & SDTS, LLC (Direct Testimony)
2/7/2017	Regulatory Commission of Alaska	U-16-066	ENSTAR Natural Gas Company (Responsive Testimony)
3/7/2017	Texas Public Utility Commission	45414	Sharyland Utilities, L.P. & SDTS, LLC (Rebuttal Testimony)
4/6/2017	Public Service Commission of Utah	16035-036	Office of Consumer Services (Direct Testimony)
4/27/2017	Public Service Commission of Utah	16035-036	Office of Consumer Services (Rebuttal Testimony)

Wind Farm Life Expectancy Evaluation

Client: Empire District Electric Co.

Completion Date: 2007

Location: Cloud County, Kan.

Summary

Burns & McDonnell provided a wind farm life expectancy evaluation on the Meridian Way Wind Farm in Cloud County, Kan. Horizon Wind Energy, the developer and operator of the project, will use Vestas V90 3-MW turbines to generate about 100 MW of energy on this farm. Empire District Electric Co. will take delivery of power from the wind farm and needed an estimate of its useful project life for purposes of financial due diligence and proper accounting. The evaluation included due diligence on the turbines and an evaluation of the life expectancy of other wind farm components.

Services

- Wind turbine due diligence
- Wind farm life expectancy evaluation

Background

Empire District Electric Co. is based in Joplin, Mo., and was looking to expand its portfolio of energy sources in the renewable market. It is working with Horizon Wind Energy to develop a wind farm in Cloud County, Kan. Empire District Electric has signed a purchase power agreement for all the energy produced at the Meridian Way Wind Farm, and Horizon Wind Energy will be responsible for project development and on going operations.

Empire District Electric retained Burns & McDonnell to evaluate the life expectancy of the project because its purchase power agreement is for 20 years and the estimated life expectancy of the project will determine the accounting treatment of the agreement.

The Burns & McDonnell scope of work included a life expectancy assessment of wind farm assets:

- Access roads
- Electrical gathering system
- Wind turbine foundations
- Wind turbines (Vestas V90 3 MW)

The Burns & McDonnell project scope did not include evaluating the wind resource of the project site, nor did it include an evaluation of the array design of the wind project. Specific design/engineering aspects pertinent to the wind resource and production capabilities of the wind farm were not included. The focus of the project was solely on assessing the life expectancy of the assets being deployed in the wind farm.

With the turbine types deployed by Horizon Wind Energy and Burns & McDonnell's understanding of the other wind farm assets, Burns & McDonnell estimated that the wind farm project would have a service life of 30 years or more.

Features

- 100 MW wind farm
- Vestas V90 3-MW wind turbines
- Evaluation of life expectancy

Source: https://www.burnsmcd.com/projects/wind-farm-life-expectancy-evaluation

10.02.2015 4 Bewertung(en) Schriftgröße

Technology

Wind turbines for 40 years?

Wind turbines need not give up the ghost after 20 years. If properly serviced, they can remain in operation twice as long. A guest post by Markus Claudius Romberg.

Ask people from the wind sector how long a turbine can run, and you will get a clear answer: 20 years. Why? The only reason is that the service life is the same as the term of the permit. Yet, turbines are not broken after 20 years, and that term does not represent the limit of what is technically possible. Hydropower plants built in 1922 are still running. We keep them running because we know them well, take care of them, and revamp them occasionally. Wind farms can also be run like conventional power plants. They can stay in operation for at least 25 years and even reach the ripe old age of 40 with retrofits and replacement components.

Markus Claudius Romberg handles wind farms in Germany for Swiss energy provider Repower. He came to the wind sector from conventional power plant technology.

private

If you want to keep a wind turbine running smoothly, you just have to answer one question: what is the greatest cause of damage to the machine? The answer is the turbine's direction towards the wind. Proper orientation can be optimized with on-site measurements.

Unfortunately, a lot of wind farm operators forgo this option by signing full-service maintenance contracts. These contracts essentially take away the operator's options to do a better job. In return, operators receive a service that is always worse than what they could do themselves. In full-maintenance contracts, manufacturers essentially optimize themselves. If a technician is nearby, servicing work is performed – regardless of whether the wind is blowing or not.

Manufacturers don't make good on their word

Of course, manufacturers always promise to service their turbines optimally. We know from our own wind farms that this is not the case. Three-dimensional ultrasound measurements have detected deviations of up to several degrees between a turbine's orientation and the direction of the wind. The damage caused to turbines in their "youth" from improper orientation reduces their overall service life. The same holds true for improper

Wind turbines need not give up the ghost after 20 years. If properly serviced

they can remain in operation twice as long. A guest post by Markus Claudius Romberg

Neue Märkte für Meereswindparks (01.12.2017)
Mini-Windparks um griechische Inseln (30.11.2017)
Anleger gründen Schutzverein (28.11.2017)
Muss Kiel neue Windkraftflächen schneller ausweisen? (27.11.2017)
Neue Vorgaben zur Digitalisierung in der Energiebranche (25.11.2017)

» Alle Artikel des Ressorts

pitch. Our inspections have revealed that the pitch of blades on a single turbine can differ by two degrees. The result is an imbalance that can damage the machine

All optimization requires additional expenses and should therefore be done when the turbines are not generating a lot of electricity. In addition, retrofits are a good idea at the latest when the wind turbines have been written down. Turbine owners should calculate the returns from modern control technology and a new generator if the retrofit can increase efficiency by a few percentage points.

Additional cost savings can come from long-term operation of the wind farms when the payments to property owners are changed. If an agreement can be reached, I can extend the lease immediately and pay upfront. Instead of stretching the lease across 20 years and losing money from interest and inflation, I can pay upfront and ask for a discount of a few percentage points

Of course, the upfront payment increases the upfront investment. But our experience with banks shows that long-term partnerships are also desired in project financing. By paying the lease upfront, we reduce the number of question marks for the bank down to one: future wind conditions.
Banks like it when the future cash flow to the wind farm does not have to be shared but is instead available in full to repay the principal. Often though, banks express their thanks with better conditions despite the longer loan terms.

Ist dieser Artikel für Sie hilfreich?

Artikel [illegible]

2 Kommentare zu "Wind turbines for 40 years? "

1. James Wimberley - 15.02.2015, 21:47 Uhr

   Village coops should probably reject the suggestion that they could do a better job of maintaining their few turbines than a manufacturer or specialist contractor. Instead they should try to address the principal-agent problem by designing service contracts with incentives for performance. I recall that GE offers profit-sharing contracts for upgrades to control systems on its own turbines

2. [illegible] - 11.02.2015, 22:2[illegible]

   That blade out pitch figure-2* seems-'stimulating'.You need ultrasound too detect it?A michrophone should suffice.I had a crossbar bolt pinch a small section on a hanglider sail once years ago -I did notice it on preflight but thought it minor and left it Once(only)-imagining that levered by hundreds,causes uncomfortable clenching One other item of setup and maintenence may be of intrest-In 2005,nuc useful idiots began to whine that the turbines installed at a demo wind farm at Gull Lake Saskatchewan,shut dowm at low temptures,and so were unreliable These turbines had ports in the gear box for block heaters for just this eventuality-but the block heaters were not installed If this is a reason other instalations in other areas are shutting down at a time of peak demand and often peak output,insuring that a pair of $50 bar heaters are installed in hopefully pre existing ports and plugged in may have -a compelling payback.

Bitte geben Sie einen Inhalt ein *

Dr. Magdalena Kurkowska

Wind turbines are typically designed for a 20 years services life. In fact, many of them remain operational beyond this age. Industry experts believe, if carefully planned, the life of a wind farm can be extended even up to 40 years. Such an extension can increase assets value, maximize the revenue and reduce the Levelized cost of energy. In practice, the lifetime of the wind power project is most often determined by the length of the subsidy scheme which usually lasts 15 years.

Beyond that point, the decision what to do with the end-of-life assets must be carefully weighted. Dismantling and disposing of functional turbines does not sound like a good business practice, but on the other hand turbine components, as their age, are becoming increasingly failure-prone, resulting in high O&M costs, greater risks of structural failures, and associated health & safety hazards. How to minimize these risks and keep the project going? Life-extension can be the answer. wind-farm-lifecycle.iqpc.de With the ageing fleet, an increasing number of wind farm operators face a dilemma which end-of-life strategy to pursuit. Can life-extension be the optimal option? What are the pros and cons? What is the market opportunity for life extension programs? What approaches can be taken to assess the suitability of wind farm for life extension?

Life extension may generate much less regulatory and permitting hurdles than repowering, which in many markets involves reapplying for a permit to operate.

In prequalification tests, commonly used standards are generally based on laboratory testing procedures, and it is important to know that these test procedures cannot often determine the true corrosion prevention potential of a coating system. No overall laboratory test exists which considers all the different stresses and includes the appropriate acceleration factor in order to relate an accurate number of hours in an accelerated test to lifetime in years in real life. Within a structure erected in a maritime environment (sheet pile walls, oil platforms or wind energy structures), there are generally different zones with different intensities of corrosive attack: bottom or sea floor, immersion and low water zone, tidal and splash zone and last but not least, the atmospheric zone. Therefore, it is necessary to consider different intensities of corrosion in any test procedure to be developed or applied.

Furthermore, a continuous mechanical stress from waves, floating matter and ice movement in winter that can attack coatings, and coatings also commonly suffer from mechanical impact during transport and erection, which can lead to localized damage and coating detachment.

Life extension exposes operators to lower risks than repowering, but there are also drawbacks. Replacing single components rather than full repowering seems to deliver less added value.

The study, conducted by National Renewable Energy Laboratory, Denver, Colorado, compared two scenarios: the full repowering versus replacement of the turbine drivetrain and rotor only using an existing tower and foundation.

Until recently, due to generous subsidies, market seemed to favor repowering over life extension. This trend, however, may change in the near future. As the governments gradually lessen or completely withdraws support for wind power projects, the life-extension option becomes increasingly attractive. A shift from repowering toward life extension was observed in Spain in 2013, when the government removed the feed-in-tariffs (FIT) support for wind energy developments.

Under a new scheme, the generators are offered 7.5% rate of return calculated over the plant lifetime. Many older wind farms have already received such amount through FIT and were not eligible for any further subsidies.

This change has left operators relying entirely on the sales of produced energy for their income, typically insufficient to allow investing in full repowering. Life extension can be achieved at a fraction of the cost the full repowering demands. Replacing a rotor hub or blades will obviously cost less than replacing the entire turbine structure. At present, the cost of extending the life of an operating turbine in Europe is about € 100,000/MW comparing to one million € for a new turbine required for repowering.

Moreover, life extension may generate much less regulatory and permitting hurdles than repowering, which in many markets involves reapplying for a permit to operate.

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