

Exhibit No.:

Issues: Site Determination &  
Certificate of  
Convenience and  
Necessity (CCN)

Witness: Warren T. Wood

Sponsoring Party: MO PSC Staff

Type of Exhibit: Surrebuttal Testimony

Case No.: EA-2006-0309

Date Testimony Prepared: April 18, 2006

**MISSOURI PUBLIC SERVICE COMMISSION**

**UTILITY OPERATIONS DIVISION**

**SURREBUTTAL TESTIMONY**

**OF**

**WARREN T. WOOD**

**AQUILA, INC.**

**CASE NO. EA-2006-0309**

**Jefferson City, Missouri  
April 2006**

**BEFORE THE PUBLIC SERVICE COMMISSION  
OF THE STATE OF MISSOURI**

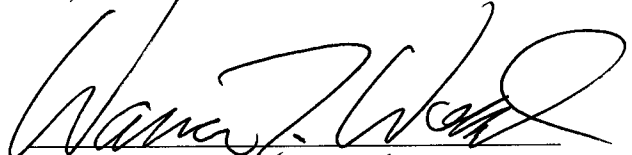
In the Matter of the Application of Aquila, )  
Inc. for Permission and Approval and a )  
Certificate of Public Convenience and )  
Necessity Authorizing it to Acquire, )  
Construct, Install, Own, Operate, Maintain )  
and otherwise Control and Manage )  
Electrical Production and Related )  
Facilities in Unincorporated Areas of Cass )  
County, Missouri Near the Town of )  
Peculiar )

Case No. EA-2006-0309

**AFFIDAVIT OF WARREN T. WOOD**

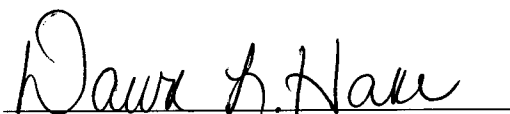
**STATE OF MISSOURI** )  
 ) ss  
**COUNTY OF COLE** )

Warren T. Wood, of lawful age, on his oath states: that he has participated in the preparation of the following Surrebuttal Testimony in question and answer form, consisting of 22 pages of Surrebuttal Testimony to be presented in the above case, that the answers in the following Surrebuttal Testimony were given by him; that he has knowledge of the matters set forth in such answers; and that such matters are true to the best of his knowledge and belief.

  
Warren T. Wood

Subscribed and sworn to before me this 14th day of April, 2006.



  
DAWN L. HAKE Notary Public  
My Commission Expires  
March 16, 2009  
Cole County  
Commission #05407643

My commission expires \_\_\_\_\_

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1 to lessen Aquila's need for these plants. Leon Bender is responding to the rebuttal  
2 testimony of Harold R. Stanley regarding sound impacts at the South Harper plant site.

3  
4 **Executive Summary**

5 Q. What is the purpose of your surrebuttal testimony?

6 A. Initially, I correct one statement and clarify another statement I made in  
7 my rebuttal testimony. Then I provide the Staff's responses to certain statements Cass  
8 County witnesses Gary Mallory and Bruce G. Peshoff make in their rebuttal testimony  
9 and that StopAquila.org witness Harold R. Stanley makes in his rebuttal testimony on the  
10 following general topics:

- 11 1) How power plants differ from other types of proposed developments and the  
12 factors to be considered in siting a power plant;
- 13 2) Commission ability to appropriately site power plants;
- 14 3) Cass County consideration of need for generation facilities;
- 15 4) Impacts of South Harper plant on local community;
- 16 5) 1991 Comprehensive Plan and 1997 updated Plan versus 2005  
17 Comprehensive Plan;
- 18 6) Past responsibility of utilities to reasonably site power plants and support  
19 infrastructure;
- 20 7) Power plant and support infrastructure siting in other states; and
- 21 8) Cass County transmission infrastructure siting.

Surrebuttal Testimony  
Of Warren T. Wood

1 I have organized my surrebuttal testimony to provide Staff's responses witness-  
2 by-witness. In my responses to each witness, before I address an issue, I identify the  
3 issue listed above that I am addressing.

4  
5 **Correction and Clarification to Rebuttal Testimony**

6 Q. What corrections and clarifications do you have to your rebuttal  
7 testimony?

8 A. Beginning on page 23 at line 19 of my rebuttal testimony, I discuss a  
9 memorandum Bucher, Willis & Ratliff Corporation provided the Cass County Planning  
10 Board as a planning advisory consultant as if the memorandum is about the South Harper  
11 site. After filing that testimony I realized the memorandum is actually about the Camp  
12 Branch site near Harrisonville where Aquila initially pursued locating the plant it has  
13 built at the South Harper site. Because the memorandum does not address the South  
14 Harper site, page 23, line 19 through page 24, line 9 of my rebuttal testimony should be  
15 disregarded.

16 Additionally, on page 23 at lines 9 to 14 of my rebuttal testimony, I state that the  
17 South Harper plant and Peculiar Substation are on sites zoned agricultural. I relied on  
18 statements, pleadings and positions of Cass County and StopAquila.org in this  
19 proceeding, prior proceedings before this Commission and state court proceedings in  
20 making that statement when I drafted my rebuttal testimony. Only when Aquila filed its  
21 March 30, 2006 pleading opposing Cass County's motion to dismiss did I realize my  
22 statement that the sites are zoned "agricultural" might be wrong.

Surrebuttal Testimony  
Of Warren T. Wood

1           On March 30, 2006, the Staff obtained a bound copy of Cass County's current  
2 land use plan, zoning ordinance and subdivision restrictions from Cass County. Darrell  
3 Wilson, Zoning Director of the Cass County Codes and Zoning Department, provided the  
4 copy. According to the copy, Cass County adopted the land use plan, zoning ordinance  
5 and subdivision restrictions on February 1, 2005. Included in the land use plan is a map  
6 that sets out planned land uses. A copy of that map is attached as **Schedule WW-10**. In  
7 the zoning ordinance is a provision that incorporates by reference a zoning map. A copy  
8 of that provision is attached as **Schedule WW-11**.

9           On April 5, 2006, I called Darrell Wilson to inquire if I could get a larger land use  
10 plan map and a copy of the Cass County zoning map on April 6, 2006, when I would be  
11 near Harrisonville. Mr. Wilson told me I could get a larger land use plan map, but that  
12 there was no other map. When I was in Harrisonville on April 6, 2006, I personally  
13 obtained from Darrell Wilson a larger copy of Cass County's land use plan map and  
14 when I asked for a copy of the zoning map was again told there was no map other than  
15 the use plan map. In further follow-up, I called Mr. Wilson again on April 7, 2006, to  
16 inquire if Cass County had a zoning map and was again informed the only map is the  
17 land use plan map.

18           Inspection of the land use plan map, **Schedule WW-10**, reveals that a strip of land  
19 on the west side of South Harper Road is designated "Multi-Use Tier." Based on the  
20 scale of the map, this strip of land includes most of the improvements to the South Harper  
21 plant site, *i.e.*, most of the combustion turbines and ancillary equipment, and all of the  
22 adjacent Southern Star interstate natural gas pipeline compressor station.

Surrebuttal Testimony  
Of Warren T. Wood

Multi-use tiers and zoning are defined on pages 25 and 26 of Cass County's current land use plan as follows:

**Multi-Use Tiers**

These are areas near towns and cities and along paved highways and thoroughfare roads where non-agricultural development, such as commercial and industrial uses, and residential development that is denser than 20-acre lots, is encouraged. Large-scale development is allowed, including commercial and industrial zoning, provided there are provisions for direct access to paved roads.

**Zoning:** The County encourages commercial and industrial zoning classifications where major thoroughfare roads serve sites.

In light of all the foregoing, I cannot state what zoning classification or classifications, if any, apply to Aquila's South Harper site; however, based on the land use plan, zoning ordinance and subdivision restrictions Cass County adopted February 1, 2005, I am comfortable stating that a large portion of the South Harper plant site and most of the improvements Aquila has made to it are in an area in which Cass County has planned to encourage commercial and industrial uses, and residential development that is denser than 20-acre lots and where large-scale development is allowed, including commercial and industrial zoning, as provisions for direct access to paved roads have been made.

**Rebuttal Testimony of Gary Mallory on Behalf of Cass County**

Q. What issues does Cass County witness Gary Mallory raise in his rebuttal testimony that you are responding to on behalf of the Staff?



Surrebuttal Testimony  
Of Warren T. Wood

1           A.     While Mr. Mallory's background and experience as a civil servant is  
2 considerable and I agree with much of what he says in his rebuttal testimony, I disagree  
3 with four positions he presents regarding power plant and transmission facility siting.  
4 First, Mr. Mallory asserts power plants are no different than any other proposed  
5 development. Second, he asserts Cass County is in a superior position to the Commission  
6 to decide where power plants should be located. Third, by stating that Cass County can  
7 condition uses he implies the Commission cannot. And, fourth, he states Cass County  
8 should review the location of transmission facilities.

9  
10 **How Power Plants Differ from Other Types of Proposed Developments and the**  
11 **Factors to be Considered in Siting a Power Plant**

12           Q.     Where does Mr. Mallory assert in his rebuttal testimony that power plants  
13 are no different than any other proposed development?

14           A.     On page 13, at line 4 of his rebuttal testimony, Mr. Mallory states, "Power  
15 plants are no different than any other proposed development... ."

16           Q.     What is the Staff's response to this assertion?

17           A.     Power plants have characteristics that make them different than other  
18 types of development. Because they are converting energy from one form into electricity  
19 which must be created as it is used, i.e., it cannot be stored, power plants have unique  
20 siting requirements both due to access to the energy source(s) being converted to  
21 electricity and to transmission to allow the electricity generated to flow to those using it  
22 as it is created. For example, simple-cycle natural gas-fired units such as those located at  
23 the South Harper site, have the following requirements:

Surrebuttal Testimony  
Of Warren T. Wood

1           1)     The need for large quantities of natural gas delivered at high pressure,  
2                 typically from an interstate natural gas pipeline. Because of the need to limit  
3                 development over these pipelines and the risk of explosions, such large, high-  
4                 pressure, natural gas pipelines are located in utility easements that include  
5                 restrictions on how the land subject to the easement can be used.

6           2)     The need for on-site access to high-voltage transmission lines  
7                 interconnected to the grid that is used to transmit electricity to consumers.  
8                 Because of the need to limit development under these transmission lines, the need  
9                 to keep vegetation clear of these lines and the risk of electrocution, high-voltage  
10                transmission lines for power plants (generally 161,000 to 345,000 volts) are  
11                placed in utility easements that have restrictions on how the land subject to the  
12                easement can be used.

13          3)     The need to serve customers over a large area, not just the immediate area  
14                 in which the plant is located. If an electric utility is unable to provide electricity  
15                 to its customers, all businesses without power suffer and the quality of life of  
16                 those without power is adversely affected until electric service is restored.

17          4)     The need to comply with extensive emissions permitting regulations that  
18                 require sophisticated modeling to analyze.

19          5)     The need to be part of a portfolio of capacity resources that assures  
20                 reliable electric service to all customers.

21          6)     The need for major transmission systems to be constructed with alternate  
22                 flow paths to help ensure reliable electric service if a transmission line is severed.  
23

Surrebuttal Testimony  
Of Warren T. Wood

1           In summary, power plants are not like other developments. No one should  
2 assume you can take a map, look at the layout of major roads, traffic volumes on those  
3 roads, growth trends, a county land use plan, and county zoning and decide where to  
4 locate an electric power plant.

5  
6 **Commission Ability to Appropriately Site Power Plants**

7           Q.     Where does Mr. Mallory assert Cass County is in a superior position to  
8 determine where power plants should be located in the county?

9           A.     On page 13 at lines 10 through 13 of his rebuttal testimony, Mr. Mallory  
10 states, “The County possesses unique knowledge and experience with respect to its  
11 Zoning Ordinance and Development Plan, and is in a superior position to evaluate the  
12 propriety of a proposed use for property within the County, including proposed power  
13 plants.” Further, Mr. Mallory states, beginning on page 13 at line 20 and continuing to  
14 page 14, line 1, that if Cass County addresses the location of power plants such as the  
15 South Harper plant “...all affected have an opportunity to work in partnership toward a  
16 solution that balances the desire of the County to promote growth with the desire of  
17 residents to minimize the impact of growth on their property.” Moreover, Mr. Mallory  
18 asserts on page 14 at lines 1 and 2, “No other entity or agency is positioned to serve in  
19 this role but the County.”

20           While I generally agree with Mr. Mallory that Cass County has unique knowledge  
21 and experience with respect to its Zoning Ordinance and Development Plan and would be  
22 in a superior position to evaluate many types of development, I do not agree that Cass  
23 County is in a “unique” or “superior” position to evaluate and site power plants. The

Surrebuttal Testimony  
Of Warren T. Wood

1 Commission is uniquely suited to evaluate the need of a regulated utility to add  
2 generation resources to serve its customers. Further, while the concern of a county is  
3 within its borders, the siting of a power plant may affect more than just the county where  
4 the plant is sited. Only the borders of the State of Missouri limit the Commission's  
5 geographic jurisdiction. The Commission is in a superior position to Cass County for  
6 considering more than the local interests of Cass County in the siting of power plants of  
7 the utilities it regulates.

8 Q. Where does Mr. Mallory imply Cass County has authority to condition  
9 power plant siting and that the Commission does not?

10 A. On page 13 at lines 16 through 19 of his rebuttal testimony, Mr. Mallory  
11 says, "The County also has the ability to require the utility, as a condition of approval of  
12 an application for rezoning or special use permit for a power plant site, to make certain  
13 adjustments or improvements to its planned development to address citizens' concerns."

14 Q. What is the Staff's response?

15 A. The ability Mr. Mallory states Cass County has to condition approval of a  
16 site is very similar, if not identical, to the Commission's ability to impose conditions,  
17 which the legislature conferred in Section 393.170.3, RSMo. In my rebuttal testimony in  
18 this case, I listed six conditions the Staff recommends the Commission impose on  
19 issuance of a certificate of convenience and necessity (CCN) to Aquila for the South  
20 Harper site.

21

**Cass County Transmission Infrastructure Siting**

Q. Where does Mr. Mallory indicate Cass County should be reviewing the location of transmission facilities?

A. Mr. Mallory states on page 13 at lines 7 and 8 of his rebuttal testimony, “It is even more important that the location of a power plant or transmission facility be reviewed...” Until this statement, the Staff is unaware that any party in this case has suggested Cass County has any say as to where transmission lines may be located in Cass County. It may be that Mr. Mallory is asserting Cass County oversight over where substations are located. Based on the advice of counsel, it is the Staff’s understanding the Missouri Supreme Court’s decision in Harline, *State ex rel. Harline v. Public Service Commission of Missouri*, 343 S.W.2d 177 (Mo. App. 1960), is still the law, and with a valid franchise and certificate of convenience and necessity to serve a territory comes the authority to locate transmission lines to provide safe and adequate service in the service territory. If Mr. Mallory’s statement is regarding substations, Cass County’s record of reviewing substation siting has not been consistent. Of the other substations operated by Aquila in Cass County it appears that very few of them have received Cass County approvals and yet they were constructed and are operating and providing electric service to customers today without any apparent objections of the County.

**Rebuttal Testimony of Bruce G. Peshoff on Behalf of Cass County**

Q. What issues does Cass County witness Bruce G. Peshoff raise in his rebuttal testimony that you are responding to on behalf of the Staff?

Surrebuttal Testimony  
Of Warren T. Wood

1           A.     I agree with some of what Mr. Peshoff says in his rebuttal testimony;  
2 however, I disagree with a number of assertions he makes regarding the siting of power  
3 plants, the siting of the South Harper plant and Peculiar substation, and community  
4 impacts. These assertions are in the following general areas:

- 5           1) Minimum requirements for adequate power plant siting review;
- 6           2) The South Harper plant should be sited in or near an urban area;
- 7           3) Statement on historical Commission treatment of siting issues;
- 8           4) Cass County should review need for a generating plant as part of its analysis of  
9 whether to approve the construction of such a plant;
- 10          5) Cass County's land use plan in place before February 1, 2005 should be relied  
11 on in evaluating the South Harper Plant and Peculiar Substation sites, not the plan  
12 it adopted on February 1, 2005;
- 13          6) Aquila's development review for siting the South Harper Plant and Peculiar  
14 Substation was inadequate;
- 15          7) Aquila erected the South Harper Plant and Peculiar Substation without advance  
16 public participation;
- 17          8) Steps taken with the Aries plant show Aquila has submitted to and complied  
18 with Cass County land use planning and zoning requirements; and
- 19          9) Power plant and support infrastructure siting in other states.

20

**How Power Plants Differ from Other Types of Proposed Developments and the  
Factors to be Considered in Siting a Power Plant**

Q. Where does Mr. Peshoff state minimum requirements for adequate power plant siting review?

A. On page 9 at lines 4 through 12 of his rebuttal testimony, Mr. Peshoff states generally what he considers to be the minimum requirements for an adequate review of a development proposal and beginning on page 20 at line 33 and ending on page 23 at line 7 he lists what he considers to be major criteria for issuance of a Special Use Permit (SUP).

Q. What is the Staff's response to Mr. Peshoff's requirements and criteria?

A. They do not include a number of essential factors that must be considered when siting a power plant. These factors include, but are not limited to:

- 1) Is the site reasonably near the area where additional electric capacity and/or energy is needed to serve customers?
- 2) Is the site reasonably near fuel and transmission infrastructure needed to generate and transmit electricity such that the cost of interconnections, the visual impact of transmission facilities and the land use impacts associated with easements is minimized?
- 3) Can a site be reasonably acquired without resorting to taking it by condemnation?
- 4) Do any aspects of the site reduce reliability?
- 5) Is the overall cost of the site being considered reasonable in comparison to other potential sites?

Surrebuttal Testimony  
Of Warren T. Wood

1           Q.     Where does Mr. Peshoff make statements indicating he believes the South  
2 Harper Plant and Peculiar Substation should be sited in or near an urban area?

3           A.     Beginning on page 25 at line 33 and continuing through page 27 at line 35  
4 of his rebuttal testimony, Mr. Peshoff makes a number of statements in an effort to  
5 support his view that the plant Aquila built on the South Harper site should not be located  
6 there. My understanding of his statements is that he believes the South Harper Plant:

- 7           1) Is not an appropriate land use for its rural location;
- 8           2) Should have been located nearer to or within an Urban Area Reserve or  
9           incorporated area;
- 10          3) Is inappropriately located in an Agricultural district due to its industrial  
11          character, noise and height;
- 12          4) Is an inefficient “leap-frog” development that should be located closer to a  
13          city;
- 14          5) Creates inappropriate urban demands on the County;
- 15          6) Is a major industrial use, in conflict with the surrounding rural residential and  
16          agricultural uses;
- 17          7) Should be located in a setting with more intensive development, closer to or  
18          within an incorporated area;
- 19          8) Should be separated or buffered from existing or projected residential growth  
20          areas;
- 21          9) Was not built in accordance with policies which would require its impact on  
22          the surrounding roads be evaluated;



Surrebuttal Testimony  
Of Warren T. Wood

1           10) Is located in an Agricultural District and requires a SUP, which it does not  
2           have; and

3           11) Should be located in an appropriately zoned Industrial District.

4           Q.     What is the Staff's response to these statements?

5           A.     The Staff disagrees with many of them. Many suggest that this natural  
6 gas-fired power plant should be located in or close to areas that are likely to be more  
7 densely populated. If accepted, this would also mean that both high-voltage transmission  
8 lines and high-pressure, high-flow rate natural gas pipelines would be routed in or near  
9 areas that are likely to be more densely populated.

10

11       **Commission Ability to Appropriately Site Power Plants**

12           Q.     Where does Mr. Peshoff address how the Commission has historically  
13 treated the siting of plants?

14           A.     On page 35 at lines 21 through 23 of his rebuttal testimony, Mr. Peshoff  
15 says, "...siting considerations appear to be limited to the location of a facility in relation  
16 to its service area and the cost of the facility relative to consumer rates and shareholder  
17 return."

18           Q.     What is the Staff's response to this observation?

19           A.     To the extent it impugns the abilities of this Commission and its Staff to  
20 adequately address and consider planning and zoning related issues in the context of this  
21 case the Staff disagrees. I believe the Commission and its Staff is well suited to consider  
22 power plant siting issues and do so in an open public format as is normal, to the greatest  
23 degree possible, for all Commission proceedings. Also, I believe that the Commission

1 and its Staff is uniquely situated to assure that siting is done in a manner that serves the  
2 public interest of all Missourians.

3  
4 **Cass County Consideration of Need for Generation Facilities**

5 Q. Where does Mr. Peshoff state that Cass County would review need for a  
6 generating plant as part of its analysis of whether to approve the construction of such a  
7 plant?

8 A. On page 23 beginning at line 21 and ending on page 25 at line 2 of his  
9 rebuttal testimony, Mr. Peshoff urges that Cass County should consider Aquila's need for  
10 generation even specifically suggesting Cass County might consider in its review "...key  
11 "nagging" questions that arise from Aquila's proposal for the South Harper peaking  
12 facility relates (*sic*) to need...is the facility actually needed to supply regional electrical  
13 needs or is it merely an alternative business choice to improve the return for Aquila  
14 shareholders?"

15 Q. What is the Staff's response?

16 A. The Staff disagrees that need is a factor the County should consider.  
17 Aquila customers' need for generation is a matter for this Commission. Mr. Peshoff's  
18 suggestion that the County should evaluate need is inappropriate. Further, it is  
19 inconsistent with Cass County witness Mallory's statement made in his rebuttal  
20 testimony on page 14 beginning at line 13. There he states, "The Public Service  
21 Commission should be responsible for determining the need for power...."

**1991 Comprehensive Plan and 1997 Updated Plan versus 2005 Comprehensive Plan**

Q. Where does Mr. Peshoff assert the land use plan Cass County had in place when Aquila began constructing the South Harper Plant and Peculiar Substation should guide evaluation of the siting of the South Harper Plant and Peculiar Substation, not the plan it adopted on February 1, 2005?

A. On page 11 at lines 34 through 36 of his rebuttal testimony, Mr. Peshoff states, "The 1991 Comprehensive Plan was adopted by the Cass County Planning Board on November 27, 1990 and adopted by the County Commission in February 1991. This Plan is the basis for other planning documents I describe in my testimony." Then on page 25 at lines 11 through 15 of his rebuttal testimony, Mr. Peshoff says, "I reviewed and applied the 2003 Cass County Comprehensive Plan to determine Aquila plant and substation Plan consistency and the 1997 Cass County Zoning Ordinance to determine Aquila plant and substation compliance with the County's zoning and development requirements."

Q. Does the Staff agree that in this case the Commission should rely on the land use plan Cass County had adopted before Aquila began constructing the South Harper Plant and Peculiar Substation?

A. The Staff does not believe the land use plan and zoning ordinance, or ordinances, Cass County had in place when Aquila began constructing the South Harper Plant and Peculiar Substation are irrelevant; however, the Staff believes the Commission should consider the land use plan and zoning ordinance that Cass County now has in place as well. As discussed in the clarification I made to rebuttal testimony near the beginning of this surrebuttal testimony, Cass County adopted a new land use plan on

Surrebuttal Testimony  
Of Warren T. Wood

1 February 1, 2005 that includes planned use of a strip of land on the west side of South  
2 Harper that includes much of the South Harper site as Multi-Use, a designation which  
3 includes industrial uses and thus far the Staff has been unable to obtain a current zoning  
4 map from Cass County. As indicated above, a copy of Cass County's planned land use  
5 map adopted February 1, 2005, is attached as **Schedule WW-10** and a copy of the zoning  
6 ordinance provision adopted February 1, 2005, that incorporates by reference a zoning  
7 map the Staff has been unable to obtain is attached as **Schedule WW-11**.

8  
9 **Past Responsibility of Utilities to Reasonably Site Power Plants and Support**  
10 **Infrastructure**

11 Q. Where in his testimony does Mr. Peshoff assert Aquila's development  
12 review for siting the South Harper Plant and Peculiar Substation was inadequate?

13 A. On page 7 at lines 22 through 26 of his rebuttal testimony, Mr. Peshoff  
14 states that "...the locations for the South Harper generating plant and the Peculiar  
15 substation..." were not given adequate development review.

16 Q. What is the Staff's response to this assertion?

17 A. I disagree with Mr. Peshoff that the process Aquila used for siting the  
18 South Harper plant and Peculiar substation was inadequate. I provide my review of the  
19 process Aquila employed beginning on page 9 of my rebuttal testimony and will not  
20 repeat it again here. My conclusion is that Aquila's process was adequate.

21 Q. Where does Mr. Peshoff state the public was not allowed to participate in  
22 Aquila's selection of the South Harper plant and Peculiar Substation sites before Aquila  
23 began building the plant and substation?

Surrebuttal Testimony  
Of Warren T. Wood

1           A.     On page 8 at lines 1 through 3 of his rebuttal testimony, Mr. Peshoff states  
2 that "...the plant and substation were erected without any participation by the public."

3           Q.     Do you agree?

4           A.     No.     In part Aquila arrived at the South Harper plant site due to input  
5 from the public and encouragement from City of Peculiar officials. Aquila first selected  
6 the Camp Branch near Harrisonville as its preferred site. When faced with public  
7 participation in opposition to locating the plant and substation at the Camp Branch site  
8 and with encouragement from City of Peculiar officials, Aquila chose to move forward  
9 with the South Harper site. Aquila held a public meeting regarding the plant and  
10 substation in Peculiar before it began construction although the meeting was held soon  
11 before Aquila began construction at the South Harper site.

12          Q.     Where does Mr. Peshoff argue Aquila has recently submitted to and  
13 complied with Cass County land use planning and zoning requirements in connection  
14 with a power plant?

15          A.     Beginning on page 15 at line 3 of his rebuttal testimony and ending on  
16 page 16 at line 33 and again on page 16 beginning at line 35 and ending on page 17 at  
17 line 27, Mr. Peshoff cites to the process employed with regard to the Aries plant as  
18 showing Aquila is familiar with Cass County's land use approval process, Aquila has not  
19 always taken the position it is exempt from complying with Cass County development  
20 application requirements and it is inconsistent for Aquila to now assert it is exempt from  
21 Cass County's planning and zoning requirements.

22          Q.     What is the Staff's response to Mr. Peshoff's analysis?

Surrebuttal Testimony  
Of Warren T. Wood

1           A.     Staff witness Lena Mantle provides some history regarding the Aries plant  
2 and Cass County's involvement with that plant in her surrebuttal testimony. The  
3 significant point here is that the Aries plant is, and always has been, an unregulated  
4 merchant generation plant, which means it has never been subject to the Commission's  
5 jurisdiction. Aquila did not participate in building the Aries plant. An Aquila subsidiary  
6 not subject to the Commission's authority participated in the construction and ownership  
7 of the Aries plant. To the Staff's knowledge County Commission oversight of the siting  
8 of that plant was never disputed.

9  
10 **Power Plant and Support Infrastructure Siting in Other States**

11           Q.     Where does Mr. Peshoff provide information regarding power plant and  
12 support infrastructure siting in other states?

13           A.     On page 31, at line 21 continuing through page 35 at line 8 of his rebuttal  
14 testimony, Mr. Peshoff provides a summary of practices regarding approval or  
15 certification of power plants and support infrastructure in some other states. I regularly  
16 read articles regarding these ongoing activities in other states. I have attached two  
17 articles regarding natural gas-fired power plant siting efforts in California and Arizona as  
18 **Schedule WW-12, Sheet Nos. 1 through 5**. I am not suggesting that the outcomes in  
19 these articles were inappropriate, but thought the Commission might benefit from this  
20 information as these projects demonstrate some of the types of site remediation measures  
21 other utilities are incorporating and the timeline that these processes can impose on a  
22 project.

**Rebuttal Testimony of Harold R. Stanley on Behalf of StopAquila.org**

Q. What does StopAquila.org witness Harold R. Stanley raise in his rebuttal testimony that you are responding to on behalf of the Staff?

A. Mr. Stanley misstates how close his residence is to the South Harper plant, he states the South Harper Plant and Peculiar Substation are inconsistent with the character and use of nearby land and he asserts Aquila's siting analysis is flawed.

**Impacts of South Harper Plant on Local Community**

Q. Where does Mr. Stanley misstate how close he is to the South Harper site?

A. On page 2 at lines 4 through 6 and on page 3 at line 4, Mr. Stanley states he lives one-half mile from the South Harper plant property. Based on scaled aerial maps from the University of Missouri - Columbia Center for Agricultural, Resource and Environmental Systems (CARES), Mr. Stanley lives about three-quarters of a mile from the plant. In an effort to personally assess the distance and visual impact of the South Harper plant from the area where Mr. Stanley lives, I visited Mr. Stanley's neighborhood and took pictures at different locations. There is a row of trees and a low ridge that runs north-south through the neighborhood which provide significant visual shielding of the South Harper plant for many of the homes.

I have prepared a map showing where I took several pictures while I was in this area in early April, and the pictures I took. I have identified on the map the location from which I took each picture by placing the same number on the bottom of the picture at the place on the map that corresponds with the location from which I took the picture. This map and the associated pictures are attached to my surrebuttal testimony as **Schedule**

1 **WW-13** and **Schedule WW-14**. **Schedule WW-13** is the map that shows where all the  
2 pictures were taken from. I took Pictures 1 through 8 on **Schedule WW-14 Sheet Nos. 1**  
3 **through 8** from the locations identified on **Schedule WW-13**. **Schedule WW-14, Sheet**  
4 **No. 7** is a picture I took looking toward the South Harper plant from Mr. Stanley's road.  
5 **Schedule WW-15, Sheet Nos. 1 and 2** show the visual screening and sound attenuation  
6 berms built on the north side of the South Harper plant site (Sheet No. 1) and the  
7 transmission lines running north-south from the South Harper plant site (Sheet No. 2).

8 Q. Where does Mr. Stanley assert the South Harper Plant and Peculiar  
9 Substation are inconsistent with the character and use of nearby land?

10 A. On page 3 at lines 9 and 10, Mr. Stanley states the South Harper plant, "is  
11 inconsistent with the character and use of the surrounding area..." and on page 6 at lines  
12 3 and 4, he states the South Harper plant is a, "heavy industrial facility in this residential  
13 neighborhood." The Staff disagrees with Mr. Stanley's assessment and notes that Cass  
14 County's land use designation for this area is "multi-tier" and "where non-agricultural  
15 development, such as commercial and industrial uses, and residential development that is  
16 denser than 20-acre lots, is encouraged." Further, to the degree that these facilities may  
17 impact the local community, I do believe that measures can and have been taken to  
18 ameliorate these impacts.

19  
20 **Past Responsibility of Utilities to Reasonably Site Power Plants and Support**  
21 **Infrastructure**

22 Q. Where does Mr. Stanley assert the Aquila's siting analysis is flawed?



Surrebuttal Testimony  
Of Warren T. Wood

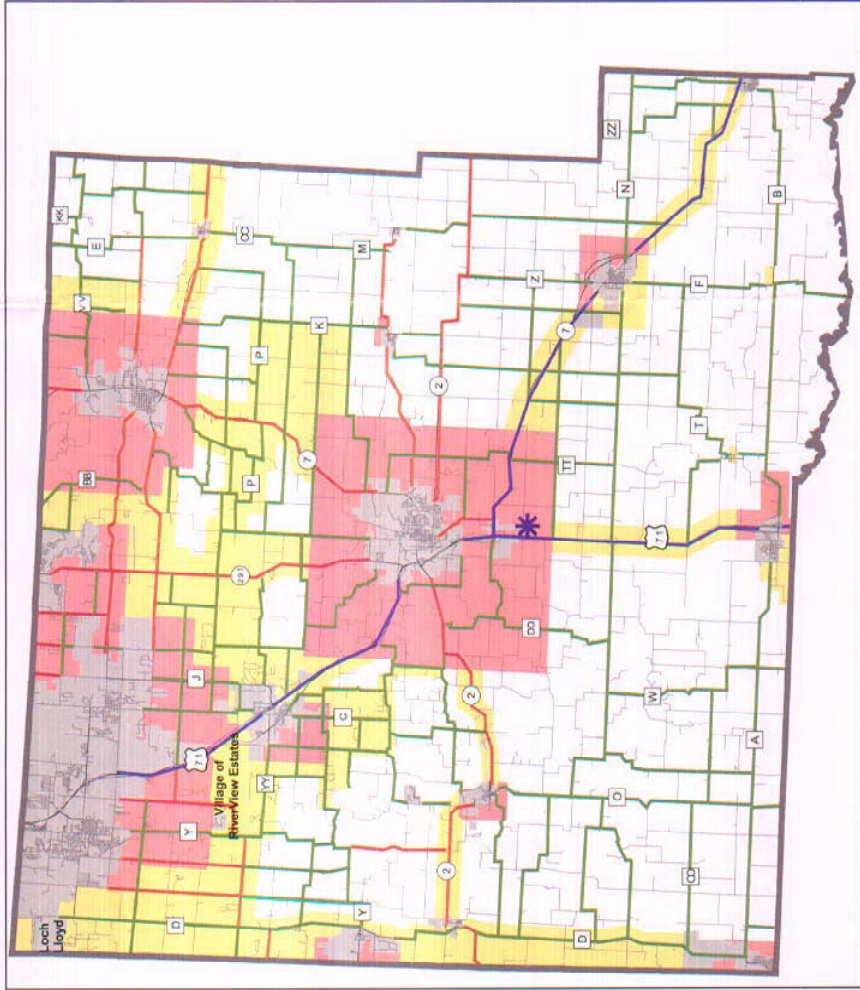
1           A.     On page 16 at lines 12 and 13, Mr. Stanley states that the fatal flaw in  
2     Aquila's analysis of possible sites for this plant for "all but one of the lower-ranked  
3     alternates" is "schedule impact." On page 17 at lines 1 to 15, Mr. Stanley also states that  
4     the South Harper site was not the lower cost site when selected. Staff disagrees with  
5     these assessments. A review of the factors considered by Aquila shows that electric  
6     transmission line construction or upgrade distances and cost, natural gas line construction  
7     or upgrade distances and cost, air permitting and scheduling were all factors considered  
8     in assessing the suitability of a site for further study. What contributed to the confusion  
9     on this matter is the fact that the schedules developed by Aquila for this analysis do not  
10    reflect the benefits of Chapter 100 financing, which significantly improved the cost-  
11    effectiveness of the South Harper site when it was being considered.

12           Q.     Does this conclude your surrebuttal testimony?

13           A.     Yes, it does.

# COMPREHENSIVE PLAN UPDATE - 2005

## Cass County, Missouri



### Land Use Tiers

#### LEGEND

- US Highway
- Arterials
- Collectors
- Other Roads
- Incorporated Cities
- Urban Service Tier
- Multi-Use Tier
- Rural Density Tier
- County Boundary
- Airport Overlay District



0.8 0 0.8 1.6 2.4 3.2 4 Miles

**BUR** BUCHER, WILLIS & RATLIFF  
CORPORATION

7920 WARD PARKWAY  
BWR 96262  
KANSAS CITY, MISSOURI 64114-2021  
816 / 361-2696  
APRIL 1997  
2002145/cass county apr  
LAYOUT - Development Patterns

## ARTICLE 4 - ZONING DISTRICTS

- A. Classification of Zones: In order to carry out the purpose and intent of these regulations, the unincorporated area within Cass County, Missouri, is hereby divided into the following zoning districts:

<u>Symbol</u>	<u>Name</u>
A	Agricultural District
RR	Residential—Rural District
R-S	Residential—Suburban District
R-1	Single-Family Residential District
R-2	Two-Family Residential District
M-U	Mixed Use Residential
MP	Manufactured Home Park District
C-1	Local Business District
C-2	General Business District
I-1	Light Industrial District
I-2	Heavy Industrial District
PD	Planned Development District

- \* B. Official Zoning Map: The location and boundaries of zoning districts are hereby established and shown on the official zoning maps entitled "Official Zoning Map of Cass County, Missouri" that together with all explanatory matter thereon, is hereby adopted by reference and declared to be a part of this order.

- C. Boundaries of Zones: Where uncertainty exists to the boundaries of any zoning district shown on the official zoning map, the following rules shall apply:

1. Boundaries indicated as approximately following the centerlines of streets, highways, alleys, or other public rights-of-way shall be construed to follow the centerlines.
2. Boundaries indicated as approximately following platted lot lines shall be construed as following the lot lines.
3. Boundaries indicated as approximately following city limits shall be construed as following city limits.
4. Boundaries indicated as following railroad lines shall be construed to be midway between the main tracks.
5. Boundaries indicated as approximately following the centerlines of streams, rivers or other bodies of water shall be construed to follow these centerlines.

## PORTFOLIO OF PACESETTING PLANTS

Another way the company reduced the first cost of the Fox project, said Jerry Murray, PE, director of engineering project management for Calpine Construction Management Inc (CCM), Folsom, was to eliminate the bridge or gantry crane traditionally installed in turbine halls to lift the casing.

Murray talked some about how the engineering and construction groups were challenged to rethink the way Calpine was building its plants. Management wanted efficiency, reliability, and the shortest possible construction time, and none of the "gold plating" evident in some earlier designs. He said a turbine-room crane for Fox would have cost about \$4-million, "for what, to use it once every seven years or so."

The "new thinking" was to design the turbine hall with a removable roof and provide adequate access onsite for the mobile cranes that would be hired when the plant had to "lift the lid." Of course, the traditionalists balked initially—including plant personnel and the company's central turbine maintenance group. It was a difficult concept to build a consensus around, but all stakeholders contributed to a solution that benefited the company.

**The construction sequence** for Fox was influenced by Calpine's contract with Wisconsin Public Service, which required power beginning June 1. First one GT and HRSG and the ST were installed, then the second GT and HRSG. The company relies on its so-called Construct Plus Model to erect plants in the most efficient way possible. The basic building block of the model is that Calpine, through CCM, operates as its own general contractor. This allows for standardization of design and construction to the extent possible. Detail engineering was done by WorleyParsons, Reading, Pa.

**Freeze protection** was a top priority for designers given the tough Wisconsin winter. A specialty contractor was brought in to assure adequate heat tracing to -32F; Calpine engineering and operations personnel were actively involved in the decision-making. A 50,000-lb/hr natural-gas-fired packaged boiler from Rentech Boiler Systems Inc, Abilene, was installed to provide sparging steam to both the HRSGs and GTs when they are not in service.

**Water treatment system** is atypical for Wisconsin where adequate makeup water is generally is available from natural sources. Calpine opted to tap into a source of tertiary-treated municipal wastewater about three miles from the plant—something that's "standard" in California where the company owns and operates many plants.

A clarifier/thickener and multimedia filter process the grey water for both cooling tower makeup and as feed to a reverse osmosis unit upstream of mixed-bed demineralizers. The deionized product from the demin trailer is used as boiler makeup, GT fogging, and for NO<sub>x</sub> control when firing distillate.

Cooling tower blowdown goes directly into the Fox River via a submerged discharge pipe. It is of a higher quality than the water coming from the wastewater treatment plant which formerly was discharged to the river.

## PACESETTER, METCALF

# \* Calpine overcomes development obstacles once reserved for nuclear plants to build combined cycle in Silicon Valley

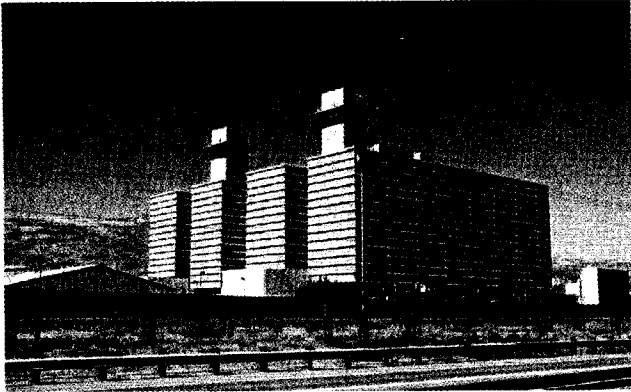
An industry rule of thumb says a 2 × 1 F-class combined-cycle plant should take no longer than two years to build—20 months probably is a better goal if you want to keep your job. Calpine Corp, San Jose, Calif, came in under the 24-month benchmark for its nominal 545-MW Metcalf Energy Center, starting construction in June 2003 and declaring the facility "commercial" May 29, 2005.

So what's the big deal? Only that the plant, located just 10 miles from company headquarters, is the first generating facility of significant size ever built in Silicon Valley. Public opposition was so fierce that it took more than four years before the first shovel-full of dirt could be moved. The project even was cited by Time Magazine (Jan 29, 2001) as "...the poster child for the frustrations that power companies face..."

Although the plant is a "standard" 7000-Btu/kWh combined-cycle—essentially two 501FD2 gas turbines (GTs) from Siemens Power Generation Inc, Orlando, and two heat-recovery steam generators (HRSGs) supplying steam to a 226-MW steam turbine/generator—it is cited as a "pacesetter" for the extraordinary development and construction challenges overcome, and innovative architectural treatment.

Metcalf, managed by Bob McCaffrey, GM for South Bay projects, is capable of 600 MW with steam injection into the gas turbines (GTs) and supplementary firing of the HRSGs. Calpine Energy Services LP sells all the power produced by the plant to large wholesale customers and into the daily energy market. CES also manages the purchase and delivery of natural gas.

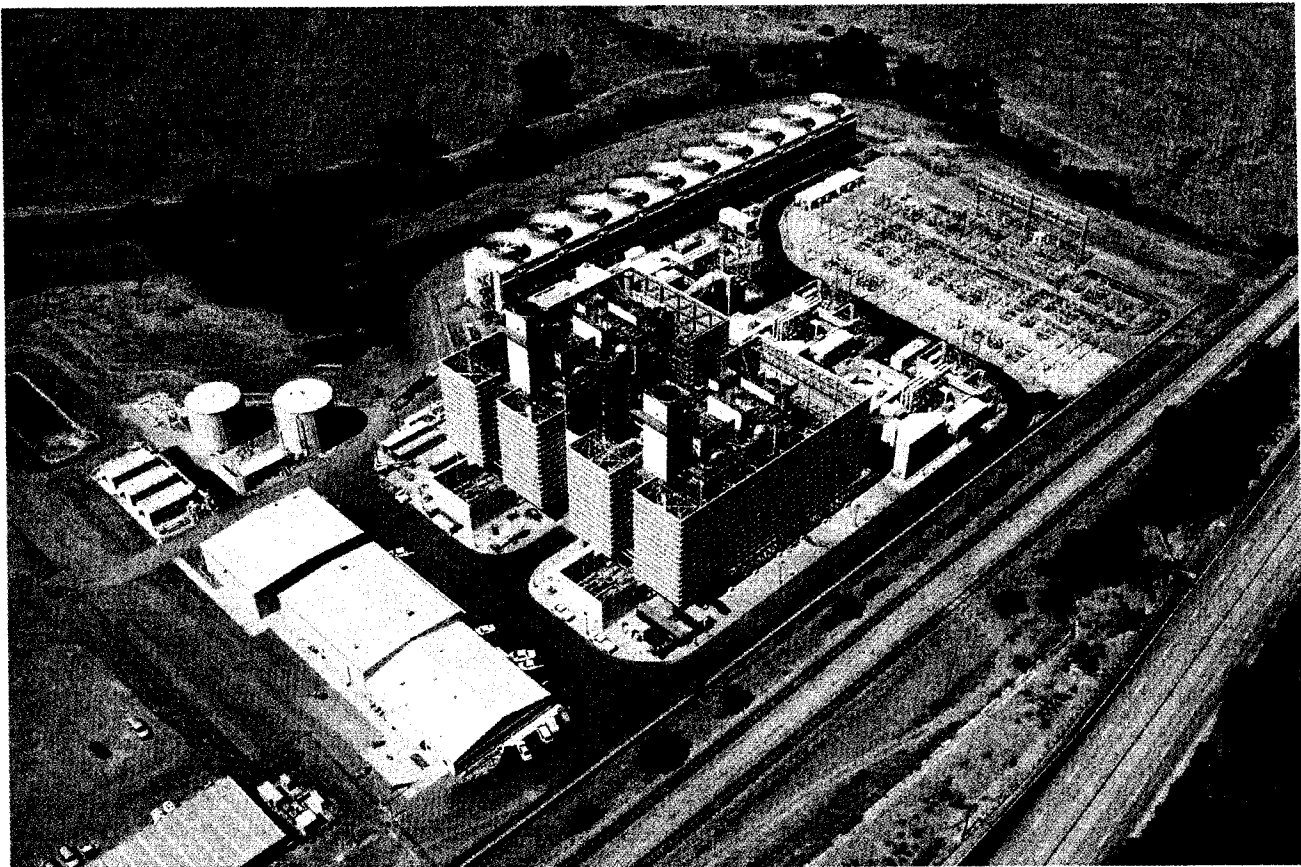
**Background.** Silicon Valley had always received its electricity from distant powerplants. But over the last 30 years, the region became an economic engine for the San Francisco Bay Area, experiencing tremendous population growth and occasional shortages of electricity. As the last decade drew to a close, the state regulatory



**1. Metcalf is wrapped in an office-type exterior** considered compatible with future business parks



**2. Architectural screen shields** generating equipment from public view, but allows the plant to "breathe"



**3. Metcalf packs 600 MW** into an area of about 11 acres

authorities said Silicon Valley was vulnerable to blackouts because of transmission-system constraints.

Calpine responded, investigating nearly two dozen possible powerplant sites in the San Jose area. The location selected for Metcalf was considered ideal: less than a mile from a high-pressure gas line, 300 ft from a 230-kV Pacific Gas & Electric Co substation that serves the region, and on the far side of a hill that shielded the facility from the nearest residential neighborhood more than a half-mile away.

Opposition to the plant was widespread and

tenacious, and reminiscent of the welcome nuclear-plant proposals received in the state 25 years earlier. The mayor of San Jose and the city council, a local neighborhood activist group, and a large corporation were among the Nimby crowd. Concerns centered on air and water quality, property values, and aesthetics. During the early stages of development, emotions ran high as hundreds of protesters attended public meetings.

A patient, committed Calpine participated in more than 50 meetings before the tide turned and it began gaining community trust. The Silicon Valley chapters of the Sierra Club and the American Lung

## PORTFOLIO OF PACESETTING PLANTS

Assn were among the first major organizations to support the project. Finally, in September 2001, after a comprehensive public participatory process that lasted for more than two years, the California Energy Commission licensed the plant.

**Architectural and design highlights** include the following:

- Elaborate architectural screens that shield the powerplant from public view (Figs 1, 2). Calpine worked closely with residents, businesses, and the city of San Jose to develop an office-type exterior that would be compatible with future business parks.

- Landscaping included the planting of more than 800 trees, many grown from seedlings collected from the plant site prior to construction.

- A plume abatement system was incorporated into the design of the cooling tower, minimizing the potential for visual impairment. The 10-cell mechanical-draft tower is of the wet/dry type.

- A 131-acre parcel of land in the vicinity of the plant was purchased and developed into an ecological preserve. An endowment fund was established to support ongoing costs.

- Like virtually all new powerplants in California, Metcalf uses recycled Title 22 water for cooling-tower makeup. Treated tower blowdown is returned to the water quality control district.

- Calpine voluntarily reduced emissions below levels required by the Bay Area Air Quality Management District.

Construction challenges and how Calpine handled them at Metcalf is instructive. Major points:

- Calpine Construction Management Co (CCM), Folsom, built the facility using its Construct Plus model and performed all general contractor functions—including management of design, engineering, and equipment procurement through completion. At the peak of construction, the company directed the activities of 16 cranes and more than 700 workers onsite.

- The extremely small footprint for the plant—only half of the 20-acre site was usable space—demanded expert coordination and required the full capabilities of state-of-the-art computer modeling and planning tools (Fig 3).

- Horizontal directional drilling was used to install a 1700-ft interconnection to the main gas pipeline—55 ft below ground and under a highway, freeway, creek, and railroad track.

Construct Plus was developed under the direction of Doug Kieta, senior VP for construction and engineering. Kieta said Calpine has morphed to a very hands-on organization—one that buys (1) major equipment direct from manufacturers, (2) construction services through specialty contractors, and (3) detail engineering from qualified firms. This enables the company to maintain tight control of project cost and schedule, simplifies changes when required, and eliminates markups.

He added that Calpine is “detuning” its standardized design by removing features considered necessary a few years ago but not today. In

essence, the company is reacting to market needs in real time and making its plants more competitive.

Sam McIntosh, senior project manager for CCM, was at the forefront of the Metcalf effort. McIntosh is proud of what he and his colleagues accomplished in building this state-of-the-art generating plant virtually without a hiccup. The following summarizes what he told the editors of the COMBINED CYCLE Journal via telephone:

**A key tenet of Construct Plus** is to maximize use of local specialty contractors. This permits local retention of earnings and helps build a sense of community. Having local specialists as partners also allows Calpine to confidently drive task-related problem-solving down to the people who are best qualified to make decisions—the crafts responsible for the work.

Compiling a team of qualified local contractors for Metcalf was particularly challenging because there's a limited amount of heavy industrial experience to be had in the Bay Area.

But that didn't stop McIntosh and his colleagues; it just meant they'd have to put more effort into the indoctrination process. That involved introducing Calpine's project control system, explaining how engineering modeling software is used, and communicating the roles and responsibilities of specialty contractors in controlling cost, ensuring safety, and in maintaining a high level of quality.

**The just-in-time engineering** and construction required for project success today demands input from all stakeholders. Here's how this was accomplished at Metcalf and is handled on other projects: All contractors required for a particular task are assembled in a conference room for a briefing on objectives. Applicable 3-D drawings developed by the modeling software are projected for group analysis. Participants comment and group discussion identifies possible problems—for example, interferences—and solutions. This information is communicated to designers and changes are made before drawings are finalized. Positive result is a dramatic reduction in field changes.

McIntosh and colleagues indoctrinated more than 50 contractors for Metcalf. There were about 30 prime-size contracts (greater than \$4 million each) and a like number of contracts under \$1 million. A few were between those amounts; a half-dozen contractors were awarded multiple contracts.

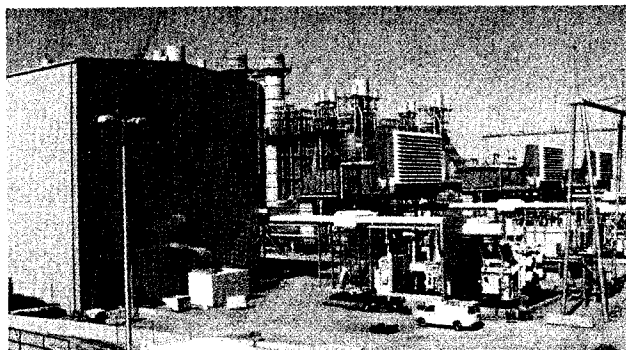
Construct Plus calls for meetings each morning and afternoon between the construction manager and his superintendents; contractors are included in the afternoon meetings. Reaction to a problem is immediate. Weekly, all participants gather for a “look-ahead” meeting.

Metcalf was constructed under a full union project labor agreement. Supervisors were part of contractors' staffs and in some circumstances there was one supervisor for every five union workers. Regarding craft performance, McIntosh concluded the interview saying that the union workforce at Metcalf was top-notch.



## PACESETTER, SANTAN

# \*Environmental upgrades focal point of plant expansion



1. New units at Santan are 2 × 1 and 1 × 1 combined cycles powered by Frame 7FA-e gas turbines

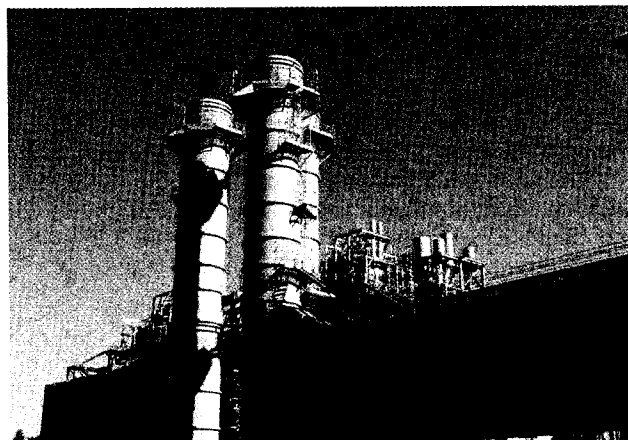


2. Plant is barely visible behind a 25-ft-high, tree-lined berm which is needed only on two sides of the site

It wasn't that the majority of people living near Salt River Project's Santan Generating Station just outside Phoenix in Gilbert, Ariz., didn't want the plant to expand, they just didn't want to see the facility, or hear it, or be subject to increased pollutant emissions.

The plant dates back to the early 1970s when SRP built four single-shaft (1 × 1) combined-cycle units on the 120-acre Santan site. These so-called STAG units, supplied by GE Energy, Atlanta, were powered by Frame 7B gas turbines (GTs). Originally, the units burned distillate and did not have emissions controls. In the early 1980s, the GTs were converted to dual-fuel firing because of the lower price of gas compared to oil.

Burgeoning power needs in the Southwest demanded that SRP plan to increase its generating capability as the 1990s came to a close. That plan called for adding two combined-cycle units at Santan with a total capacity of 825 MW. Unit 5, which began commercial operation last April, is a



3. Triangular arrangement of stacks was considered by neighbors to be more visually pleasing than individual stacks

## PORTFOLIO OF PACESETTING PLANTS

2 × 1 arrangement powered by Frame 7FA+e GTs. Unit 6, a 1 × 1, consisting of a 7FA+e and GE's new, high-efficiency A14 steam turbine, is scheduled for operation in 2006 (Fig 1).

Bill Rihs, SRP's manager of new generation projects said that the permits for the new units had several significant conditions related to environmental control, including the following:

- The original GTs were upgraded to Frame 7Es and dry low-NO<sub>x</sub> combustion systems were installed to reduce emissions. Controls were replaced with the Mark VI systems required for DLN combustion. Upgrades also were required for the cooling towers and heat-recovery steam generators (HRSGs). In addition to the environmental benefits, unit heat rate improved by about 10% and unit output increased by about 20 MW.
- Natural gas was specified as the only fuel acceptable for power production.
- Visible and noise pollution were high on the public's agenda. One reason: Residential development has expanded outward from Phoenix to

the plant location in the last 30 years. To help reduce noise and hide the plant from view, the new generating facilities are located behind a manmade 25-ft-tall berm (Fig 2). Plus, the foundations for the HRSGs are set about 15 ft below grade. To make the stacks less noticeable, they are arranged in an aesthetic triangular pattern (Fig 3). More than 1000 mature trees were planted on the berm to further mask visibility.

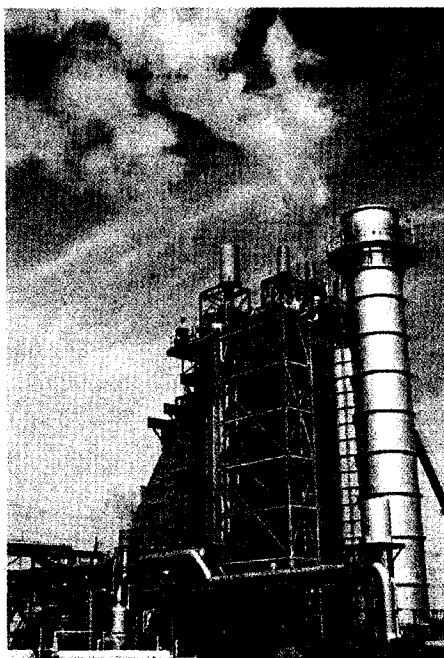
Water, a major concern of every power project in the West, comes from the Colorado River and other sources via the Central Arizona Project. Consumption is carefully monitored and controls are in place to assure optimum use. Makeup water for the reduced-plume cooling towers and other requirements is ordered a day ahead. Underground storage facilities are provided at the plant.

Santan wastewater is treated to exacting specifications and delivered under contract to the Roosevelt Water Conservation District for irrigation purposes. In effect, the plant is a zero liquid discharge (ZLD) facility because all wastewater is reused.

## Reconditioned GT powers OxyChem's new cogen plant

**R**elentless global competition and tighter environmental regulations are key factors in American industry's drive to upgrade its energy infrastructure. Achieving higher efficiency and reliability and lower emissions at minimum cost are primary goals in virtually every project.

At Occidental Chemical Corp's Battleground (Tex) plant, for example, this meant refurbishing and upgrading a 25-yr-old GE Frame 7 gas turbine (GT) to power a new 70-MW cogeneration plant. GE Energy, Atlanta, managed work on the 7E, which had been mothballed nearby at the company's Deer Park facility. The unit was upgraded with a dry, low-NO<sub>x</sub> (DLN) combustion system and Mark VI control system (was a Mark IV). Plus a new fuel skid was provided for the gas-only machine—one equipped to remove potentially damaging liquids that users are seeing more of today. Relocation, erection, and commissioning of the "like-new" GT at Battleground also were part of GE's scope of work.



Black & Veatch (Overland Park, Kans) construction subsidiary Overland Contracting Inc (OCI) was the EPC contractor for the entire project. It managed the GE contract and handled BOP (balance of plant) engineering, procurement, and construction. OCI Project Manager Steve Stark said this work included erection of a new heat-recovery steam generator and installation of a 3500-ft-long pipeline to deliver intermediate-pressure steam from the HRSG to OxyChem's LaPorte chemical plant. A return line for the condensate also was provided.

Stark spoke with the editors of the COMBINED CYCLE Journal about the construction challenges. He focused on the extremely small

footprint available for the powerplant in a busy environment, and on the underground infrastructure—primarily piping and electrical—that had to be worked around. The site was so small, he continued, a single-width, duct-fired HRSG was required (photo). The boiler was shipped to the site in modules, enabling OCI to go from foundation to hydro in only nine weeks. NO<sub>x</sub> emissions out the stack are 4 ppm.

The new facility started producing power in June 2005, one year and 300,000 craft hours after it began. Safety record was perfect: No OSHA (Occupational Safety and Health Administration) recordable incidents or lost-time accidents.









**Picture #1**



Picture #2





**Picture #3**





Picture #4



Picture #5





**Picture #6**



**Picture #7**





**Picture #8**





