

|                          |                                                 |
|--------------------------|-------------------------------------------------|
| <b>Exhibit No.:</b>      |                                                 |
| <b>Issues:</b>           | <b>Lake Road T-G#4 Accident</b>                 |
| <b>Witness:</b>          | <b>Dwight V. Svuba</b>                          |
| <b>Type of Exhibit:</b>  | <b>Surrebuttal Testimony</b>                    |
| <b>Sponsoring Party:</b> | <b>St. Joseph Light<br/>&amp; Power Company</b> |
| <b>Case No.:</b>         | <b>EO-2000-845</b>                              |
| <b>Date Prepared:</b>    | <b>October 17, 2000</b>                         |

**ST. JOSEPH LIGHT & POWER COMPANY**

**CASE NO. EO-2000-845**

**FILED**

**OCT 17 2000**

**Missouri Public  
Service Commission**

**SURREBUTTAL TESTIMONY**

**OF**

**DWIGHT V. SVUBA**

**ST. JOSEPH, MISSOURI**

**October 2000**

**NP**



**Review of Rebuttal Testimony**

Q. What is the position presented in Staff and OPC rebuttal testimony on the issue of management responsibility for the June 7, 2000 accident?

A. The opposing witnesses claim that the Company failed to employ "good utility practices" that could have prevented the accident.

Q. How is this claim supported?

A. The witnesses' primary argument is that the plant operators were inadequately trained at the time of the accident. Other arguments address the original design of the unit, poor engineering efforts, the schedule to bring the unit back in service and other issues.

Q. Do you believe there is evidence to support the position that SJLP failed to employ good utility practices?

A. No. The opposing witnesses are looking at the accident with perfect 20-20 hindsight and are trying to hold SJLP to impossible standards. We all know now what could have been done differently to prevent the accident. The Company's position is that any question of alleged imprudence is irrelevant to its request for an Accounting Authority Order in this case. Notwithstanding that position, we are willing to discuss, in general terms, the cause of the accident, since we are sure the Commission has some interest in that. The evidence shows that the Company did take reasonable steps to ensure the safe and reliable operation of the unit after the May 2000 scheduled outage.

**Engineering Design**

Q. Please discuss the Company's selection of consultants and suppliers.

A. The Company relies on outside consultants for engineering expertise. It is not cost

1 effective, nor is it possible, to employ the in-house engineering staff necessary to  
2 maintain expertise in all areas of power plant design. SJLP hires consultants that have  
3 demonstrated competence in their field. Similarly, suppliers are selected in part by their  
4 experience and the demonstrated quality of their products.

5 Q. How does the selection of consultants and suppliers relate to this accident?

6 A. The opposing witnesses repeatedly fault Company management for detailed engineering  
7 decisions or oversights that were clearly the responsibility of engineering consultants and  
8 suppliers retained by the Company.

9 Q. Please explain.

10 A. Addressing this in chronological order, OPC witness Kumar repeatedly points to a design  
11 decision made in the mid-1960's by Black & Veatch, a firm that is known internationally  
12 for designing high-quality electric generating plants.

13 Q. Where does Mr. Kumar address this design decision?

14 A. In his rebuttal testimony on page 7, lines 5-8, Mr. Kumar describes how the unit had only  
15 two instead of three lines of defense. On page 12, in the dialog beginning in line 1, he  
16 quotes Factory Mutual consultant Joe Byrd to imply that the Company was aware of the  
17 risk associated with this original design arrangement prior to the accident. He reiterates  
18 this point by quoting the GE report on page 22 and line 14. Finally, on page 24, line 15,  
19 he concludes, "To start with, the configuration of the lube oil pumps was not  
20 appropriate." Mr. Kumar repeatedly uses this design issue to imply fault by the Company  
21 management, when in fact it was an engineering decision made in the 1960's by a  
22 reputable engineering firm hired for that purpose. Company management had no reason  
23 to question the original design of the unit, especially since it had operated satisfactorily

1 since the unit was first placed in service, some thirty-three years ago.

2 Q. Did the opposing witnesses imply blame for other engineering decisions or oversights  
3 beyond Company management's control?

4 A. Yes. On pages 10-13 of his rebuttal testimony, Mr. Kumar describes the removal of the  
5 manual pistol grip switch and how its removal contributed to the accident. Once again,  
6 the Company made a prudent decision to hire a reputable firm to perform the detailed  
7 engineering required to install the Mark V control system. General Electric (GE) was the  
8 manufacturer of Turbine-Generator #4 and the existing control system. GE's Mark V  
9 system is a widely-used, industry-recognized control system. SJLP hired GE to perform  
10 the detailed engineering design necessary to install the GE Mark V system on a GE  
11 turbine. At the time this decision was made, this choice was clearly the Company's  
12 lowest-risk option for the purchase and design of a new turbine-generator control system.

13 Q. Should the Company have been concerned that GE's design included the removal of  
14 several manual control switches, including the DC oil pump switch?

15 A. No. The replacement of manual switches with computer-driven "soft controls" is  
16 commonplace in industry. Literally hundreds of manual switches have been replaced in  
17 this manner at the Lake Road Plant. Mr. Modlin addresses this question on page 75, lines  
18 2-6 of his deposition.

19 Q. On page 11, line 9 of his rebuttal testimony, Mr. Kumar states that the manual control  
20 switch provided a "redundant control system." Is that true?

21 A. No. The DC oil pump has only one control system (and had only one prior to the Mark V  
22 project). The control switch simply provided a second location from which the operator  
23 could initiate a control action or enable the pump's automatic mode. From that

1 perspective it could be considered a redundant operator control interface.

2 Q. Should Company management have been concerned about removing this redundant  
3 control interface during the design and installation of the Mark V system?

4 A. No. Prior to the accident it was not an issue. I have already stated that such changes are  
5 commonplace in industry. In addition, it needs to be made clear that a redundant  
6 interface does not necessarily mean a better system. On page 103, in lines 5-8 of his  
7 deposition, Company employee John Modlin explains that there are situations in which  
8 the existence of a parallel control path can reduce reliability.

9 Q. Mr. Kumar discusses "delays and GE's performance" as an issue. Did Company  
10 management address these issues during the Mark V design process?

11 A. Yes. The Company made GE aware of the project schedule prior to issuing the purchase  
12 order. The Company conducted a project kickoff meeting with GE, during which a  
13 project schedule with target dates was established. Company personnel worked with GE  
14 engineers and provided all the information that they needed to do the design work. When  
15 it became apparent that GE was falling behind schedule, the Company notified GE and  
16 insisted on steps to correct the deficiencies.

17 Q. Did SJLP use good utility practice in the replacement of the Turbine-Generator #4 control  
18 system?

19 A. Yes. SJLP contracted with General Electric, a knowledgeable, recognized expert in  
20 turbine-generator control, to design and replace the existing Turbine-Generator #4 control  
21 system. The Company justifiably relied upon GE's engineering expertise. The control  
22 system was installed according to GE's design and its performance was checked for  
23 operation as designed.

**Operator Training**

Q. All three opposing witnesses claim that lack of training was the primary cause of the accident. Did SJLP management act appropriately in regard to the training issue?

A. Yes. Company management recognized the need for appropriate training even before the system was purchased, which is demonstrated by the fact that training was included in the initial purchase order for the system. Prior to the training, the Company worked with GE to schedule and plan the training. The Company accommodated the GE trainer's needs. The Company project manager solicited immediate feedback from plant operators as to the quality of the training. Concerns with the training were immediately communicated to the GE trainer, as well as to the Company's commercial contact with GE. Finally, the Company followed up with appropriate actions to obtain proper training from GE.

Q. Have the plant operators received additional training from GE?

A. Yes, that training was conducted in September.

Q. Prior to GE's additional training, how did the Company address the fact that the plant operators received poor training on the Mark V system?

A. Mr. Modlin discusses this question in some detail in his deposition beginning with the question asked at page 144, line 4 through page 145, line 17. I will summarize the three components of his response. First, the operators gained additional familiarity with the system through day-to-day use of the system and during the start-up process by working with Mr. Modlin and the GE start-up engineer. Second, since the start-up process is the most complicated part of the turbine control operation, either a GE start-up engineer or Mr. Modlin was and would be present for any start-ups that occurred prior to the

1 operators receiving additional training from GE. Third, after the unit was on-line, the  
2 operators only needed to perform basic functions to control load and vars on the unit. If a  
3 dangerous or uncertain condition arose, the operators knew how to take the unit off-line.  
4 Company management was not aware of any risk in proceeding in this way.

5 Q. \*\*

6  
7  
8 A.

9 \*\*

10 Q. Did GE's poor training of SJLP's power plant operators contribute to the accident?

11 A. I don't believe so, based on what I know now.

12 Q. Please explain.

13 A. Mr. Modlin points out in his deposition that nobody was aware of the fact that the DC oil  
14 pump control in the DCS did not return to automatic mode after a stop command. "[The  
15 operators] didn't know. I didn't know. GE didn't know." (Modlin deposition, page 165,  
16 lines 17-19). Both OPC and Staff witnesses acknowledge the fact that this trap in the DC  
17 oil pump logic was an unknown problem (Kumar rebuttal, page 13, line 2; Harris rebuttal,  
18 page 20, lines 4-8). Obviously, if the GE engineer who created the trap was unaware of  
19 it, so was the GE trainer. Since the trainer couldn't teach something he didn't know, it's  
20 highly unlikely that better training from GE would have made a difference in preventing  
21 the accident.

22 Q. Can you provide an analogy to clarify this point?

23 A. Yes. Consider the case in which a typical office program such as WordPerfect or Excel

1 has a "bug" in it. Assume that the software user could easily work around this bug, if he  
2 or she knew about it. The user attends extensive training on how to use the software.  
3 Regardless of how well the training material is presented, if the trainer is unaware of the  
4 bug, then the user will be unaware of it and won't know how to work around it.

5 Q. If the Company does not believe that training contributed to the incident, why is it listed  
6 on the Company's list of "possible contributing factors"?

7 A. The list is a draft version of a list of possible factors. As Mr. Modlin explained at page  
8 138, lines 19-23 and page 150, lines 18-20 of his deposition, he was listing what he saw  
9 as all possible factors that could have contributed to the accident, without regard to their  
10 relative importance. It appears likely that this item will not be on the final list.

11 Q. Did the Company knowingly risk the safety and reliability of Unit 4/6 when it was started  
12 on June 2 with the operators only partially trained on the Mark V system?

13 A. No. The unit was tested and started under GE supervision over a period of days up to and  
14 including June 2, 2000 when the unit came on-line. After the afternoon of June 2, the  
15 unit was operating in a stable mode. At that time, the operators had adequate knowledge  
16 to perform necessary operations using the Mark V system and, if necessary, to safely  
17 perform a normal shut down.

18 Q. Does the fact that the unit came down "un-safely" on June 7 contradict your last  
19 statement?

20 A. No. First, in a controlled shutdown, the operators transfer auxiliary AC power to an  
21 outside source prior to tripping the turbine, so the DC oil pump would not have been  
22 needed. Second, in an "un-controlled" trip, such as that on June 7, all evidence now  
23 indicates that the DC pump would have failed to work regardless of the quality of training

1 received from GE by the operators.

2  
3 **Outage Scheduling and Duration**

4 Q. OPC witnesses Kumar and Trippensee both indicate that the Company may have  
5 “rushed” to place the unit back in service by the scheduled date of June 3, that it started  
6 the unit up “prematurely” and that the decision to do so was driven by inappropriate  
7 economic factors. Was the start-up of Unit 4/6 on June 2 premature?

8 A. No. As Mr. Modlin explained repeatedly in his deposition, the Company was working  
9 under GE’s direction to start the unit up and was not going to put the unit on line until the  
10 GE start-up engineer was satisfied that it was safe to do so. (Modlin deposition page 119,  
11 line 2-18; page 180, line 14 through page 181, line 2). The Company did not override the  
12 GE start-up engineer’s recommendations.

13 Q. Did GE have any economic incentive to get the unit back in service as soon as possible?

14 A. No. There were no contractual penalties to GE for a late start-up, nor economic  
15 incentives for an early start-up. GE had a much greater financial risk if the Mark V  
16 system failed in some way, because they had responsibility to oversee the start up of the  
17 control system.

18 Q. OPC witness Kumar summarizes Mr. Modlin’s comments regarding project delays by GE  
19 on page 20 of his rebuttal testimony. Do you agree with Mr. Modlin’s comments, as  
20 summarized by Mr. Kumar?

21 A. Generally yes. The Company clearly has an issue with the quality and timeliness of GE’s  
22 engineering services as they relate to this project.

23 Q. Regardless of the amount of time a utility has to review drawings prior to the installation

1 of a new control system, is it considered "good utility practice" to test and verify the  
2 operation of the affected equipment before it goes back in service?

3 A. Yes, it is.

4 Q. Were control circuits affected by the Mark V installation tested prior to June 2, 2000?

5 A. Yes.

6 Q. As part of this testing, was automatic operation of the DC lube oil pump checked prior to  
7 placing the unit back in service?

8 A. Yes. It was tested for this purpose on the evening of May 20, 2000.

9 Q. On June 2, 2000, was Company management aware of any risks due to starting the unit  
10 up on that day, as opposed to some later date?

11 A. No.

12  
13 **Operator Actions**

14 Q. Both OPC witnesses Kumar (rebuttal page 21, line 13) and Trippensee (rebuttal page 10,  
15 line 12) claim that Mr. Modlin stated in his deposition that a weekly test of the DC oil  
16 pump was a required procedure for the operating department. Is this claim true?

17 A. No. Nowhere in his deposition does Mr. Modlin say that the operating department is  
18 required to perform this test. Rather, Mr. Modlin explained that the activity is scheduled  
19 for every Monday and that he did not know what the specific requirements were for the  
20 operating crews regarding the completion of such an activity. (Modlin Deposition pages  
21 83-88)

22 Q. What are the guidelines for the operating crews regarding this testing?

23 A. The Company explained in the following response to Staff Data Request No. 13 in this

1 case that the test is a routine test that is normally done, but not always, depending upon  
2 other demands on the operating crew.

3 Yes, [the Monday DC oil pump test] was a routine weekly test. Routines are  
4 normally done, but not always, depending upon other time requirements such as  
5 start ups and shutdowns of boilers and turbines, maintenance clearances required  
6 for the next morning, operating problems requiring additional operator time such  
7 as a clinker in the slag tank, problems with the fly ash collecting system, etc.  
8 Another example would be the equipment rounds that are routine for each shift.  
9 These are not always done every shift, and sometimes are partly done but not  
10 completed because of more urgent duties.  
11

12 Q. Did the operating department test the DC oil pump prior to start-up on June 2, 2000?

13 A. Yes. The pump was tested by the operating department on May 24, 2000.  
14

15 **Summary**

16 Q. Please summarize your testimony.

17 A. Staff and OPC witnesses have the benefit of perfect hindsight in this case. SJLP  
18 management decisions can be judged fairly considering only the information that was  
19 available when those decisions were made. When the facts of the case are considered in  
20 this light, it is clear that the Company used good utility practice. SJLP hired competent  
21 and reputable firms, it took appropriate steps to manage the project, test the new and  
22 modified equipment and arrange training for its employees. The accident resulted from a  
23 situation that no one had specific knowledge about. It was a hidden trap created by the  
24 oversight of an expert hired by the Company to perform the detailed engineering  
25 necessary to install the new control system. Turbine-Generator #4 was started up under  
26 the control and guidance of the GE start-up engineer. On June 2, 2000, there were no red  
27 flags waving. The Company started Unit 4/6 that day unaware of any risks associated

Surrebuttal Testimony of  
Dwight V. Svuba

1           with the new control system, its installation or the capability of its operators to use it.

2

3       Q.   Does this conclude your surrebuttal testimony at this time?

4       A.   Yes.

