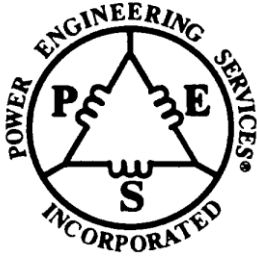


# **APPENDIX E**

**Electrical Hazard Assessment  
proposal for TVRWRF  
(Proposals for SJRWRF and  
MVRWRF included in original  
bid documents)**

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February 21, 2019  
PES No. 5198-19, R1  
EMWD/TVRWRF  
Blower Electrification  
Power System Study

Mark Thewes  
RWRF Electrical Services Supervisor  
**Eastern Municipal Water District**  
2270 Trumble Road  
Perris, CA 92570

Subject: Proposal for Electrical Hazard Assessment & Engineering Services  
Blower Electrification Project  
Temecula Valley Regional Water Reclamation Facility (TVRWRF)  
Temecula, CA

Dear Mr. Thewes,

Power Engineering Services, Inc. (PES) is pleased to submit a proposal to perform Electrical Hazard Assessment and Engineering Services for the EMWD TVRWRF. The report for this project includes a Short Circuit Analysis, Coordination & Protective Device Evaluation Study, and Arc-Flash Analysis unless otherwise specified. This proposal is valid for 60 days.

The Scope of Work is outlined in Enclosure 1 and PES will perform the Power System Studies for a not-to-exceed fee as detailed below:

<b>Base Fee:</b>	<b>Work Outlined in Enclosure 1</b>	<b>\$23,500.00</b>
<b>Optional Costs:</b>	<b>PES Installation of Labels</b>	<b>\$ 2,500.00</b>
<b>Total Fee Including Options:</b>		<b>\$26,000.00</b>

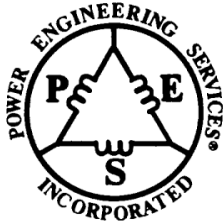
Please contact our office with any questions you may have. Thank you for the opportunity to be of service.

Sincerely,

Barbara Effenberger, P.E.  
*President*

Enclosures 1: Scope of Work  
2: Professional Services Rate Schedule

BE:sw



## ENCLOSURE 1

### POWER SYSTEM STUDIES

#### Temecula Valley Regional Water Reclamation Facility (TVRWRF) Blower Electrification Project Power System Study

### 1.0 GENERAL INFORMATION

#### 1.1 End Customer's Facility Information

End Customer	EMWD TVRWRF
Address	42565 Avenida Alvarado
City, ST, Zip	Temecula, CA 92590

#### 1.2 Quotation Based On: ("X" all the apply)

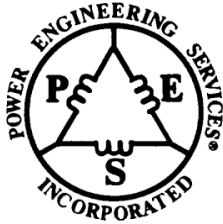
Facility Walk-Thru	
One-Line Drawings	X
Customer Supplied Device Count	
Other (Previous Study performed by _____)	

#### 1.3 Equipment Included in the Scope

Equipment Type	Quantity
Switchgear	2
Motor Control Centers	24
Switchboards	8
Panelboards	20
Variable Frequency Drives (VFD's)	5
Fused Disconnect Switches	1
Padmount Transformer Primary	1
Padmount Transformer Secondary	1
Standalone Starters	6
Control Panels	37
Generators	4
Transfer Switches	6
<b>TOTAL LABELS</b>	<b>115</b>

#### 1.4 Estimated Warning Labels

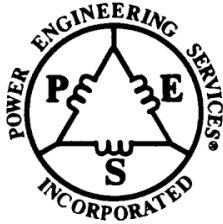
1.4.1 This proposal includes provision for one hundred fifteen (115) Warning Labels (Utility to 240V or 208V) and zero (0) Generic/Low Voltage Warning Labels (down to 50V) labels.



- 1.5 Arc-Flash Calculation Methodology
  - 1.5.1 Arc-Flash calculations shall be performed in accordance with the latest edition of NFPA 70E. The following calculation model(s) will be utilized:
    - i. IEEE 1584 Calculation Model   X
    - ii. NFPA 70E “Traditional” Calculation Model
- 1.6 Software
  - 1.6.1 SKM engineering software will be used for this project.
- 1.7 Estimated (ARO) Availability for Proposal
  - 1.7.1 Data Gathering by PES Personnel: Four (4) man-days of on-site data collection is included.
  - 1.7.2 Engineering: Eight (8) weeks after receipt of data or completion of site data collection.
  - 1.7.3 Label Installation (Optional Service): Two (2) days in addition to data collection and engineering.

## **2.0 SHORT CIRCUIT STUDY**

- 2.1 The following information is needed for PES to begin the Study. PES will perform onsite data gathering to obtain the following information:
  - 2.1.1 All building motor loads 50hp and above.
  - 2.1.2 Status of all circuit breakers (in service, not in service, normally closed, normally open).
  - 2.1.3 Generator data, including electrical ratings and prime mover type, if applicable.
  - 2.1.4 Transformer data including kVA, voltages, taps, impedance, type.
  - 2.1.5 Feeder data (length, conductor size, number per conduit, conduit type, conductor type).
- 2.2 The following information shall be provided by others:
  - 2.2.1 Available short circuit duty in three-phase, phase-ground and X/R ratio at utility services. Base must be provided if per unit values are given. PES will provide a letter for use by the client to obtain data from the utility.
  - 2.2.2 Utility name, contact and phone number.
- 2.3 PES Scope of Work for Short Circuit Study
  - 2.3.1 Create computer model of system single-line diagram impedances with printout of impedances. A separate impedance diagram as output from the computer analysis program will be provided.
  - 2.3.2 Calculate short circuit duties for all busses included in the study.
  - 2.3.3 Model system for normal conditions.
  - 2.3.4 Model system for worst-case duties with all switch positions closed.



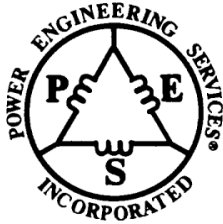
2.3.5 Establish minimum required short circuit rating of devices.

### **3.0 COORDINATION STUDY**

- 3.1 The following information is needed for PES to begin the Coordination Study. PES will provide onsite data gathering to obtain the following information:
  - 3.1.1 A list of protective devices with complete catalog numbers, manufacturer, supply voltages, current transformer ratios, where applicable, control voltages, trip units, trip plugs, time current characteristics, etc. and their “as-left” settings.
  - 3.1.2 Three-line diagrams and control diagrams (if available).
  - 3.1.3 Bill of Materials and device configuration for switchboard and panelboard.
- 3.2 The following information shall be provided by others:
  - 3.2.1 Utility protective device settings. PES will assist client with obtaining necessary information from serving utility.
- 3.3 PES Scope of Work for Coordination Study
  - 3.3.1 Provide setting data sheets for all adjustable protective devices included in the scope of work.
  - 3.3.2 Provide discussion of protective device application and coordination.
  - 3.3.3 Provide time-current curves, as required to show device coordination.

### **4.0 ARC FLASH STUDY**

- 4.1 The following information is needed for PES to begin the Arc Flash Study. This information is required to be supplied by others.
  - 4.1.1 Provide the utility and any generation short circuit contribution values. The study will include both utility and generation source values.
  - 4.1.2 Provide the normal system operating configuration. This study will include the normal system configuration and up to 3 other configurations will be modeled to determine the maximum Arc Flash Hazard at each equipment location.
  - 4.1.3 Provide all information required in Parts 2.0 and 3.0 of this proposal and any other information requested to complete the Arc Flash Hazard analysis.
  - 4.1.4 Provide a copy of any previously completed Arc Flash studies including the electronic data files.
- 4.2 PES Scope of Work for Arc Flash Study
  - 4.2.1 Incorporate the computer model of the system single-line diagram impedances created in Part 2.0 above, Short Circuit Study, into the Arc Flash Study.
  - 4.2.2 Incorporate the protective device Coordination Study created in Part 2.0 above into the Arc Flash Study.



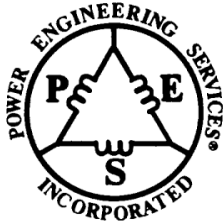
- 4.2.3 Perform an Arc Flash Hazard analysis in accordance with NFPA 70E and/or IEEE Standard 1584 to establish the “worst case” Arc Flash Hazards.
- 4.2.4 Evaluate the Arc Flash Hazards for each bus or location and provide recommendations (where feasible and practical) for mitigation measures to reduce incident energies above 8,0 cal/cm<sup>2</sup> to a lower level.
- 4.2.5 After receipt of written confirmation from the client regarding which mitigation measures will be implemented, PES will provide the report with Arc Flash Warning Label data for customer use.
- 4.2.6 PES will print and provide labels in the quantity indicated for installation by the client, unless label installation by PES personnel is selected.

## **5.0 DELIVERABLES**

- 5.1 At the beginning of the project, PES will review the data required to be provided by the client with the client and PES will provide an Action Item checklist.
- 5.2 PES will provide a draft letter for the client to use to request short circuit and utility protective device information from the utility. The client is responsible to send the letter to the utility and pay all fees and charges required by the utility to provide the short circuit duty and utility protective device information
- 5.3 PES will provide a draft report for client review when the study is complete.
- 5.4 PES will review the report with the client, answer any questions, and make any necessary revisions.
- 5.5 PES will provide (1) hard copy final report and (1) CD containing a PDF of final report along with documentation and electronic files of each study completed.
- 5.6 PES will provide labels in the quantity indicated for installation by the Client, or PES personnel if optional service is selected.

## **6.0 CLARIFICATIONS AND EXCLUSIONS**

- 6.1 Tasks, activities, services, systems, and equipment not specifically identified in Item 1.3 and Parts 1, 2, or 3 above are excluded from the scope of work.
- 6.2 Equipment not listed within the scope of work is excluded and will be included for an additional fee.
- 6.3 The client shall provide a site electrician or an electrical contractor electrician to provide access and assist with all data gathering and to remove and replace equipment covers, and provide switching of devices to de-energize equipment for inspection if necessary.
- 6.4 Installation of warning labels by PES is an optional service.
- 6.5 The fee for this project is based on providing one hundred fifteen (115) labels. Additional bus points and the associated analysis and labels will be added to the scope of work for an additional fee of \$200.00 per bus point.
- 6.6 Training services are excluded from the PES scope of work.

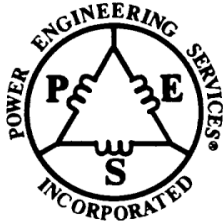


- 6.7 Testing of equipment and verification of applied settings for installed equipment is excluded. Costs for testing are excluded from this scope.
- 6.8 Development of an Electrical Safety or Maintenance Program is excluded. PES can assist in the development of an Electrical Safety or Maintenance Program as an additional service.
- 6.9 Installation or adjustment of new or existing electrical equipment and devices is excluded. Replacement of fuses is excluded.
- 6.10 Maintenance of the Power System Study, including but not limited to, updating one-line drawings, the coordination study, or Short Circuit and Arc-Flash Calculations and Labels is excluded. PES can update applicable studies and warning labels when changes are made to the facility for an additional fee.
- 6.11 PES will provide our standard insurance coverage.
- 6.12 PES will perform the studies in SKM software as selected by the client. Use of other third party analysis software is excluded by PES.
- 6.13 Utility system protective device settings are to be provided by the utility. Any fees charged by the utility for providing data will be paid by the client.
- 6.14 PES will provide electronic data files for the completed study and report. The client and end user will be responsible to purchase licensed copies of the software and pay all annual maintenance fees if the end user desires to use or modify the data files provided.
- 6.15 The client shall provide facility one-line diagrams, plan drawings and other electrical system documentation available at the time the project begins. Electronic files in AutoCAD 2012 format are preferred if available.
- 6.16 The client shall provide copies of all power system studies previously completed for the facility including all electronic files available.
- 6.17 All expenses for fees, taxes, licenses, and permits, including but not limited to City taxes, City business licenses, City fees, and City permits, for services rendered by PES for this project are not included in this fee proposal and will be billed as an extra expense to this project.

## **7.0 WARRANTY**

- 7.1 If labels provided by PES fail due to weather-related damage within five years of installation, PES will provide a one-time replacement of produced labels, based on the original study data base, free of charge for installation by the client. The labels will include the original date of issue and do not extend the NFPA 70E recommended five year due date for re-evaluation of Arc Flash Hazards. This warranty excludes damage due to chemical, solvent, fire, abrasion, or other deteriorating agents.





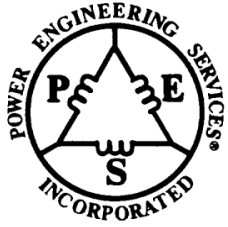
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## **8.0 ADDITIONAL SERVICES**

- 8.1 If authorized in advance and in writing by the Client, PES shall furnish or obtain from others Additional Services, which are not considered to be part of the scope of work included in Part 1.0 of this fee proposal.
- 8.2 Additional Services for the Project include, but are not limited to, changes in size, complexity, Client's schedule, character of construction, or project delivery; and revising previously accepted studies, reports, design documents, or Contract Documents, when such revisions are due to causes beyond PES control.

## **9.0 ABANDONMENT**

- 9.1 In the event the project is abandoned, the compensation will be based on the last progress billing plus a mutually agreed upon amount for the work completed since the last billing.



February 21, 2019  
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## ENCLOSURE 2

### PROFESSIONAL SERVICES RATE SCHEDULE

<u>CLASSIFICATION OF SERVICES</u>	<u>Hourly Rate</u>
Principal	\$180
Professional Engineer, Registered P.E.	\$165
Project Engineer	\$150
Engineer	\$125
Senior Designer	\$135
Designer	\$115
CAD Specialist	\$70
Technical Admin Assistant	\$70
Admin Assistant/Word Processing	\$60

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