

ORIGINAL

FORMAL COMPLAINT



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Arizona Corporation Commission

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BEFORE THE ARIZONA CORPORATION COMMISSION

ALVIN S. RATLIFF; JOHN HART; DAN
TINGLE; DAN WHITE; DARREN
DUNLAP; ED CURRY; EFRAIN
ALVAREZ; FRED ZAMORA; JOE TULLY;
JUSTIN HAAS; LANCE OWEN; MONTE
ALLEN; NATHAN ZUCK; PAUL WHITE;
RANDY HAAS; TALBOTT STARLINGS

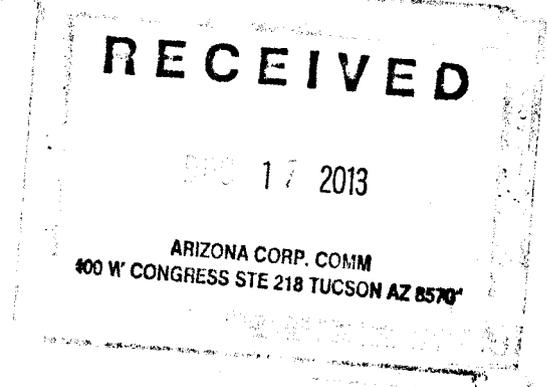
Docket No. E-01575A-13-0456

COMPLAINT

Complainants,

SULPHUR SPRINGS VALLEY ELECTRIC
COOPERATIVE, INC.,

Respondent.



Complainants Alvin S. Ratliff ("Buddy Ratliff"), John Hart, Dan Tingle, Dan White, Darren Dunlap, Ed Curry, Efrain Alvarez, Fred Zamora, Joe Tully, Justin Haas, Lance Owen, Monte Allen, Nathan Zuck, Paul White, Randy Haas, and Talbott Starlings (hereinafter referred to collectively as the "Irrigators"), pay substantial sums of money to Sulphur Springs Valley Electric Cooperative ("SSVEC") for critical power services. SSVEC is an Arizona public service corporation that has threatened to cut off the Irrigators' electric service unless "corrective action" is taken with regards to the performance of certain Variable Frequency Drives ("VFDs") that SSVEC directed the Irrigators install. Complainants, through undersigned

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1 counsel, hereby file this Complaint to the Arizona Corporation Commission to prevent SSVEC
2 from cutting off their power and for other meaningful relief.

3 **PARTIES**

4 1. Complainants, the Irrigators, are farmers doing business within SSVEC's
5 service boundaries, SSVEC customers, and irrigators who installed VFDs with DC Link Choke
6 harmonic mitigation devices in reliance on SSVEC. For purposes of this Complaint, the
7 Complainants can be reached and served at Good Law P.C., 3430 E. Sunrise Dr., Suite 270,
8 Tucson, Arizona 85718.

9
10 2. Respondent SSVEC is an Arizona public service corporation with its principal
11 place of business located at 350 N. Haskell Avenue, Willcox, Arizona 85643.

12 **JURISDICTION**

13 3. The Arizona Corporation Commission has jurisdiction over this action pursuant
14 to Article XV, Section 2, of the Arizona Constitution and A.R.S. § 40-246.

15 **ALLEGATIONS**

16 4. SSVEC provides electrical service to the Irrigators.
17
18 5. For over a decade, Variable Frequency Drives ("VFDs") have been the product
19 of choice for utilities who service customers that use variable-speed motors including irrigators,
20 municipal water suppliers, mining operations, and anyone who owns or maintains a domestic
21 water well. VFDs have the ability to save energy, but also have the potential to create harmonic
22 currents. As the use of VFDs has exponentially proliferated throughout industries, so too have
23 the problems associated with harmonic currents. To this day, the use of VFDs is expanding
24 with the encouragement of electric utilities including SSVEC. Adequately controlling and
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1 mitigating the harmonic currents, on the other hand, has been a source of vexation for many
2 utilities.

3 6. SSVEC's service area includes irrigators (both the Irrigators named in this
4 Complaint and irrigators not specifically named in this complaint), municipal water suppliers,
5 mining operations, various types of consumers, and numerous individuals who own and
6 maintain domestic water wells. On information and belief, the irrigators within SSVEC's
7 service area have installed roughly eighty (80) VFDs, and the municipal water suppliers have
8 installed roughly thirty five (35) VFDs. The mining operations within SSVEC's service area
9 have installed numerous VFDs, and customers who maintain domestic water wells have
10 installed VFDs and "single to three phase converters" that, on information and belief, could
11 number between fifteen-hundred to two thousand (1500 – 2000), or possibly higher. Further,
12 the number of SSVEC customers installing VFDs has continuously increased and continues to
13 increase.

14 7. This massive expansion in the use of VFDs in SSVEC's service area is partially
15 in response to SSVEC's own directives. On information and belief, as early as 2002, SSVEC
16 began pushing its customers to use VFDs. In 2007, SSVEC began directing the Irrigators to
17 install VFDs on their irrigation pumps to increase energy efficiency and to reduce SSVEC's
18 costs. To urge the Irrigators to install VFDs, SSVEC offered to lend the Irrigators the purchase
19 price of a VFD at 0% interest.

20 8. The Irrigators acquiesced to SSVEC and installed VFDs on their irrigation
21 pumps. The specific Irrigators acting as Complainants in this case installed a total of forty nine
22 (49) VFDs. Authorized personnel from SSVEC approved of the expense and installation of the
23 VFDs. The Irrigators received special authorization over the phone from an SSVEC
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1 representative prior to installing many of the VFDs, including authorization for the particular
2 DC Link Choke harmonic mitigation device the Irrigators' VFDs included.

3 9. SSVEC also specifically directed particular brands of VFDs. On information
4 and belief, SSVEC directed the Irrigators install either Danfoss or Square D brand VFDs. On
5 information and belief, the Irrigators followed SSVEC's brand directions and installed either a
6 Danfoss or Square D VFD.
7

8 10. The Irrigators, being relatively inexperienced in the field of harmonic mitigation
9 techniques, relied on representations from SSVEC, including the representations in SSVEC's
10 Service Conditions that SSVEC's Standard Offer Tariff incorporates, to mitigate their VFDs'
11 harmonic output.
12

13 11. SSVEC's Service Conditions provide a party installing a VFD two options
14 regarding harmonic currents, either: 1) the party can verify themselves that the installation
15 satisfies the Institute of Electrical and Electronics Engineers' "Recommended Practices and
16 Requirements for Harmonic Control in Electrical Power Systems," more commonly known and
17 hereinafter referred to as "IEEE-519"; or 2) if the party is unable to verify that their VFD
18 installation satisfies IEEE-519, the party can install one of four specifically-listed types of
19 VFDs that each include a particular type of harmonic mitigation device.
20

21 12. According to SSVEC's Service Conditions, a party unable to verify IEEE-519
22 compliance themselves may install: 1) A 6-Pulse Drive w/5% Line Reactor; 2) A 6-Pulse Drive
23 w/3% DC Link Choke; 3) A 6-Pulse Drive w/ drive-applied harmonic filter; or 4) A 12-Pulse
24 Drive w/ Delta-Delta drive isolation transformer. The Service Conditions do not express a
25 preference toward any one of the four options. The clear implication from the Service
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Conditions is that installing one of the four listed options satisfies the Irrigators' obligations under the Standard Offer Tariff relating to harmonic currents.

13. Performing the calculations and tasks necessary to verify compliance with IEEE-519 is complicated. Thus, the Irrigators chose the Service Conditions' second option and installed 6-pulse VFDs that included a DC Link Choke harmonic mitigation device. The Service Conditions specifically list a 6-pulse drive with a DC Link Choke harmonic mitigation device as an adequate alternative to the Irrigators personally verifying IEEE-519 compliance themselves. Further, on information and belief, both the Danfoss and Square D brand VFDs contain a DC Link Choke harmonic mitigation device.

14. SSVEC, through authorized personnel, oversaw and approved many of the Irrigators' VFD installations. On information and belief, an SSVEC employee was on site and oversaw roughly half of the Irrigators' VFD installations.

15. SSVEC began installing Automated Meter Reading (AMR) equipment in 2002 to lower the cost of its operations and improve efficiency. On information and belief, SSVEC recently upgraded its meter-reading equipment again.

16. On August 15, 2013, SSVEC sent a letter to the Irrigators. In that letter, SSVEC complained that the use of VFDs (that SSVEC promoted) created communication problems with SSVEC's new meter reading equipment, necessitating SSVEC read the meters manually rather than with their AMRs, causing SSVEC expense. *See* Exhibit 1, August 15, 2013 Letter from SSVEC.

17. The "Standard Offer Tariff" that controls the Irrigators' relationship with SSVEC was approved in late 2009. That Standard Offer Tariff locks in a rate for meter reading services. SSVEC cannot force the Irrigators to take responsibility for problems the Irrigators'

1 equipment causes with SSVEC's upgraded equipment. Such a requirement constitutes a back-
2 door unauthorized rate increase upon the Irrigators as SSVEC is seeking the Irrigators expend
3 additional funds for the same electric power services. However, the harmonic impacts to the
4 AMR system is much broader than any impacts created by the Irrigators.
5

6 18. SSVEC, in its August 15, 2013 letter, also claimed that the Irrigators' VFDs
7 were not in compliance with IEEE-519, and demanded that the Irrigators take "corrective
8 action" to remedy the situation. SSVEC's demand is in direct contravention of the Service
9 Conditions that provide that a party installing a VFD can choose a VFD with a particular
10 harmonic mitigation device in lieu of verifying IEEE-519 compliance themselves. The demand
11 also constitutes a back-door unauthorized rate increase as SSVEC is seeking the Irrigators
12 expend additional funds for the same electrical power services.
13

14 19. In subsequent communication, SSVEC demanded that in order to bring the
15 VFDs within IEEE-519 compliance, the Irrigators would have to install a harmonic filter.
16 Installing a harmonic filter will cost the Irrigators roughly \$6,000 - \$9,000 per unit.
17

18 20. SSVEC's Service Conditions do not require a harmonic filter. The Service
19 Conditions provide a 6-pulse drive that includes a DC Link Choke as an equally-adequate
20 alternative to a 6-pulse drive that includes a harmonic filter. The Irrigators relied on SSVEC's
21 approval of the DC Link Choke option when installing their VFDs. The Irrigators, by installing
22 a 6-pulse drive with a DC Link Choke harmonic mitigation device fully satisfied their
23 obligations under the Service Conditions regarding VFD harmonics.
24

25 21. Neither SSVEC nor the Irrigators have assurance or confidence that installing
26 the harmonic filter that SSVEC is attempting to force will actually remedy the supposed
27 problem. SSVEC has been unable to verify that installing a harmonic filter will bring the
28

1 Irrigators' VFDs into compliance with IEEE-519. SSVEC's recommendations in its Service
2 Conditions and correspondence have apparently been wrong so far. Further, the Irrigators have
3 no assurance that SSVEC's measurements are correct. The Irrigators should not be forced to
4 subsidize SSVEC's trial-and-error approach to dealing with harmonic currents – a system-wide
5 condition that stems at least in part from the use of VFDs, which SSVEC encouraged and
6 directed in the first place. But VFDs are not the only source of harmonic currents.
7

8 22. SSVEC has not demanded that all of its customers who installed VFDs install a
9 harmonic filter, but has instead specifically targeted the Irrigators. SSVEC's specific targeting
10 of the Irrigators discriminates against the Irrigators.
11

12 23. SSVEC's service area includes municipal water suppliers, mining operations,
13 and residential customers with domestic water wells who have installed VFDs and other
14 devices potentially in far greater number than the Irrigators.
15

16 24. On information and belief, residential customers with domestic water wells have
17 installed 1500 – 2000 VFDs and “single to three phase converters.” Single to three phase
18 converters are subject to the same requirements under SSVEC's Service Conditions as VFDs
19 regarding harmonics.
20

21 25. A few of the Irrigators have recently conducted harmonic testing on VFDs and
22 single to three phase converters on motors similar to the motors residential customers with
23 domestic water wells use. The test results showed that the motors similar to those residential
24 customers with domestic water wells use emit more harmonic currents than do the motors the
25 Irrigators use.

26 26. When asked directly by one of the Irrigators whether SSVEC would hold the
27 residential customers with domestic water wells to the same standard as the Irrigators and order
28

1 that the residential customers take similar “corrective action,” authorized SSVEC personnel
2 responded that SSVEC was not concerned with VFDs or converters on motors at or below ten
3 horsepower. However, according to the tests the Irrigators conducted, these smaller motors
4 pose a greater harmonic threat (and are likely more numerous) than do the Irrigators’ motors.
5 SSVEC’s decision to exempt the residential customers with domestic water wells (who
6 potentially pose an immense harmonic threat) from the costs it is attempting to impose on the
7 Irrigators (who potentially pose much less of a harmonic threat) is nothing more than arbitrary,
8 unfair, and discriminatory. The impacts to the AMR system arise from the broad rate base and
9 should be solved across the rate base.
10

11
12 27. SSVEC, in its August 15, 2013 letter, threatened to disconnect the Irrigators’
13 power if the Irrigators do not take “corrective action” to bring the VFDs into compliance with
14 IEEE-519 by February 1, 2014. *See* Exhibit 1.

15
16 28. SSVEC’s demands against the Irrigators amount to an unauthorized rate increase
17 as SSVEC is attempting to force the Irrigators to expend additional funds for the same metering
18 and electric services.

19
20 29. SSVEC’s demands also violate the Service Conditions as the Irrigators, by
21 installing 6 pulse drives that contain a DC Link Choke harmonic mitigation device as
22 encouraged and approved by SSVEC, are in full compliance with the Service Conditions.

23 **PRAYER FOR RELIEF**

24 The Irrigators seek declaratory relief that all 6 pulse VFDs that include a DC Link
25 Choke harmonic mitigation device installed before August 15, 2013, as SSVEC’s Service
26 Conditions specify, satisfy the Service Conditions as specifically encouraged and approved by
27 SSVEC, and that no further “corrective action” from the Irrigators is necessary. The Irrigators
28



Sulphur Springs Valley Electric Cooperative, Inc.

A Touchstone Energy® Cooperative



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350 N. Haskell Ave, Willcox AZ 85643

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August 15, 2013

Dear Irrigator,

I hope this growing season is going well for you. There is an issue that I would like to bring to your attention. If you are currently using Variable Frequency Drive (VFD) or are considering the use of one in the future, some issues have recently surfaced considering VFD's. Your cooperation in this matter is required. Below you will find what has come to light concerning VFD's and the corrective action that must be taken.

As you know SSVEC began installing Automated Meter Reading (AMR) equipment in 2002 to lower our cost of operations. The AMR meters worked very well and by the end of 2011 SSVEC had replaced all the manually read meters.

Beginning in the summer of 2011 we noticed some minor loss of communications with meters in some rural areas. In 2012 the communication losses increased again and we found the problem became worse in the summer and seemed to be at the same time and on the same circuits that customers began using VFD's on their wells. In 2013 as more VFD's came on line the problems became worse yet. When we lose the communication link, the meters have to be read manually which is very costly to SSVEC and its members. The problem is not just isolated to the individual wells but cause communication problems with other meters on the circuit. SSVEC also found that there appeared to be a correlation between active VFD pumps and communication failures.

While investigating the communication problems SSVEC has discovered that many of the Variable Frequency Drives (VFD's) which have been installed on irrigation motors in the past have not been compliant with the Institute of Electrical and Electronics Engineers (IEEE) standard 519. Standard 519 sets requirements for harmonics control in electrical power systems.

Exhibit E is one of SSVEC's tariffs, adopted in SSVEC's last rate case. The standard has been part of SSVEC's Service Conditions for many years prior to that rate case. Paragraph 3.7 of SSVEC's Service Conditions, another tariff, provides that all customers must comply with all Customer Service Entrance requirements. Paragraph 2.20.3 (A)(1) of the Service Conditions and Arizona Administrative Code section R14-2-211 C (1) (a) provide that SSVEC may disconnect a customer's electric service for a violation of any of SSVEC's tariffs.

The applicable portions of Paragraph 5 of Exhibit E, Service Entrance Requirements; General Motor Load, 0 through 500 horsepower, 0 to 600 volts states:

5. VARIABLE FREQUENCY DRIVES & SINGLE PHASE TO THREE PHASE CONVERTER REQUIREMENTS:

• **Variable Frequency Drives.** The Customer's load shall not exceed the Power Quality Impact described in IEEE-519, Recommended Practices and Requirements for Harmonic Control in Electric Power Systems.

The Customer shall be responsible to make sure the installation complies with the guidelines set forth in IEEE-519 as measured at the point of common coupling (PCC). At the very least, if the Customer is unable to verify performance, the Customer shall install one of the following at the Customer's expense:

- 6-Pulse Drive w/5% Line Reactor
- 6-Pulse Drive w/3% DC Link Choke
- 6-Pulse Drive w/drive-applied harmonic filter
- 12-Pulse Drive w/Delta-Delta drive isolation transformer

• **Single to Three Phase Converters.**

If after installation, voltage dip limits are exceeded, the service will be disconnected until corrective action is taken by the Customer.

Because of the recent communications problems on our lines, SSVEC has purchased additional testing equipment that provides the ability to test the Total Harmonic Distortion (THD) on the voltage and current side at the PCC. Preliminary tests have found that several locations using VFD's are over the allowable limits of the IEEE-519 standards. To ensure our system is operating reliably and efficiently, SSVEC will require that all current and future installs of VFD's meet the IEEE-519 specifications as stated in our approved tariffs.

We understand that to require the changes immediately is not practical due to the current irrigation season being in full operation. However, this problem must be corrected before the irrigation season of 2014. Thus, SSVEC will require that all VFD's be compliant by February 1, 2014. Your cooperation will be greatly appreciated in this effort. In short, both future and existing VFD installations will be required to meet the current SSVEC service conditions as stated above that have been in effect since 2009. To assist you, SSVEC has a limited amount of funds available for loan at 0% for no more than a 5 year term that we will make available to bring your VFD into compliance. Approval of the loans will be on a case by case basis while funds are available*.

When you install or have brought your VFD into compliance, please provide us with documentation that the VFD is compliant. As time and workload allow, SSVEC service technicians will perform THD testing for customers at their request. Technicians will also be performing random tests for to ensure that standards are met. For services where the drives that are not compliant by February 1, 2014, SSVEC will be forced to disconnect power to the location until the drive is compliant and our normal service charges for reconnection will apply.

Respectfully,

Telly Stanger

Telly Stanger
520-384-5515

* Loan program availability and funding subject to change without notice.