

E-141/C-93-106 ORDER REQUIRING COMPREHENSIVE TESTING,  
INSTALLATION OF A SPARK GAP ISOLATOR, HERD DATA AND STRAY VOLTAGE  
RESPONSE MATERIALS

BEFORE THE MINNESOTA PUBLIC UTILITIES COMMISSION

Don Storm  
Tom Burton  
Marshall Johnson  
Cynthia A. Kitlinski  
Dee Knaak

Chair  
Commissioner  
Commissioner  
Commissioner  
Commissioner

In the Matter of a Formal  
Complaint by Harold Johnson  
Regarding Stray Voltage Against  
Stearns Cooperative Electric  
Association

ISSUE DATE: March 1, 1994

DOCKET NO. E-141/C-93-106

ORDER REQUIRING COMPREHENSIVE  
TESTING, INSTALLATION OF A SPARK  
GAP ISOLATOR, HERD DATA AND  
STRAY VOLTAGE RESPONSE MATERIALS

**PROCEDURAL HISTORY**

On February 1, 1993, Harold Johnson and Joe Kenning (the Complainants) filed a petition alleging problems with the stray voltage policies and procedures of Stearns Cooperative Electric Association (Stearns or the Cooperative).

On June 11, 1993, the Commission issued its ORDER REQUIRING REVISION OF THE COMPLAINT AND ANSWER. The Commission directed the Department of Public Service to meet with the Complainants to revise the Complaint so that it fully complied with the Commission's rules for Complaints. The Order directed Stearns to file an answer to the revised Complaint within 20 days after the revised filing was served and address in the answer, among other things, the sufficiency of the number of consumers signing the complaint.

On October 26, 1993, Harold Johnson filed a revised Complaint with the Commission.

On November 8, 1993, Mr. Johnson filed a letter with the Commission stating that the October 26, 1993 filing did not meet all the filing requirements of Minn. Rules, Parts 7830.1300 through 7830.1700. Mr. Johnson stated that he would refile the entire complaint with all necessary information and serve copies on all parties.

On November 17, 1993, the Commission received the latest version of the Complaint from Harold Johnson.

On December 2, 1993, Stearns filed an answer to the formal complaint of Harold Johnson. In its Answer, Stearns did not contest the Commission's jurisdiction over the Complaint and did not challenge the sufficiency of the signatures that accompanied the Complaint.

On February 2, 1994, Stearns filed a letter with the Commission citing potential deficiencies in some of the signatures. The Cooperative added, however, that it did not claim prejudice by these potential deficiencies and did not claim that the Commission lacked jurisdiction to hear this matter.

On February 2, 1994, the Minnesota Department of Public Service (the Department) filed a petition to intervene in this matter as a matter of right pursuant to Minn. Stat. § 216A.07.

On February 10, 1994, the Commission met to consider this matter.

## FINDINGS AND CONCLUSIONS

### Revised Complaint and Answer

In his revised Complaint filed November 17, 1993 (hereinafter referred to as the Complaint), Harold Johnson asserted that Stearns has violated Minn. Stat. § 216B.04 by failing to provide safe, adequate, and reasonable service. Specifically, the Complaint alleged that Stearns' service to the Complainant's farm causes dairy herd production and animal and human health problems as well as financial problems.

For relief, the Complainant requested that the Commission order Stearns to

- investigate the entire electrical parameter of the animal environment including neutral-to-earth measurements, amperage measurements, ground currents, DC currents, high frequency and 60 hertz spikes coming in on distribution wires, power quality, electric and magnetic fields (AC and DC), and grid measurements
- install a spark gap arrestor at the Company's expense without requiring the Complainant to sign a liability waiver
- change the distribution system so that the earth is not used as a current carrying conductor.

In its Answer to the Complaint, Stearns denied that its distribution system is responsible for the Complainant's alleged herd problems and human health problems.

Responding to each of the Complainant's requests for relief, Stearns took the following positions:

- Further testing: Stearns cited the numerous testings that have occurred at the Complainant's farm and suggested that this testing was adequate to show that the Complainant's claims are without merit.

- Spark gap isolator: The Cooperative also noted that three devices have been installed at the farm to mitigate any stray voltage levels, suggesting that the Complainant's request for installation of a fourth device, a spark gap isolator, was unnecessary.
- Distribution system: Regarding Complainant's request that the distribution system be changed, the Cooperative stated that its system, a grounded wye system, complied with the rules of the Department and the rules of the National Electric Safety Code, as required by Minn. Stat. § 326.43 (1992). The Cooperative stated that its construction and line design practices are standard among rural electric cooperatives in the United States.

Stearns concluded that the Complainant had failed to show need for any further proceedings. The Cooperative urged the Commission to dismiss the Complaint.

### **Commission Analysis and Action**

#### **1. Testing**

There have been several instances of testing at the Complainant's farm over the past twelve years. However, none of the actual data from those testings have been placed in the record of this matter. Moreover, it appears even if they had been placed in the record, they would be inadequate to resolve the points at issue in this matter.

**1992:** Testing done at the Johnson farm and four others in April 1992 was part of a demonstration test day conducted by the Department for members of the Environmental Quality Board (EQB). It was never intended to be part of a stray voltage investigation and was never analyzed as such.

**1989:** The data recorded in the Dataright testing (1989) has never been analyzed and, as such, is no more illuminating than undeveloped film. In addition, data taken prior to installation of the Dairyland isolator would not be representative of current conditions.

**1983, 1984, 1986:** Stearns conducted electrical testing at the Complainant's farm in 1983, 1984, and 1986. The Cooperative has filed summaries of these testings. However, the summaries provide little information about the dynamics of the electrical environment at the farm. In addition, the data collected by Stearns in the course of these testings is by now outdated due in part to the installation of the Dairyland isolator.

The Commission will proceed to prepare a record that will be adequate to responsibly evaluate the Complainant's claims. The

Commission will require Stearns to conduct testing at the Johnson farm pursuant to a testing protocol developed by Commission Staff. Data from that testing will be made available to all parties for their comment and analysis.

## **2. Isolator Devices**

It is Stearns' policy to install a Dairyland isolator when the Cooperative views its use is warranted, but only after the farmer has agreed to pay for it and has signed a document waiving any claim against the Cooperative for damages resulting from installation of the isolator.

The Complainant requested that Stearns be required to install a different isolation device, a Spark Gap isolator, at the Cooperative's expense without being required to sign the standard waiver of liability form. The Spark Gap isolator provides complete isolation until the voltage differential across the device exceeds 300 volts. At that point, the Spark Gap switch closes, restoring the bonded neutral system with its increased grounding features.

Stearns opposed being required to install a Spark Gap isolator as requested by the Complainant. The Cooperative asserted that its Dairyland isolator is in working order and provides adequate isolation for the voltage differential levels that the Johnson farm is likely to experience. The Cooperative argued that the Dairyland isolator is, in fact, superior to the Spark Gap isolator because it [the Dairyland isolator] will cease to isolate the farm and restore the bonded neutral system as soon as the voltage differential between the primary and secondary neutrals reaches 25 volts. According to the Cooperative, this lower switch-back level provides an extra margin of safety to the general public.

The Dairyland isolator's advantage identified by the Cooperative (the low level that it ceases to function as an isolator) is also its disadvantage from the farmer's point of view.

At this point in the Johnson case, the Commission finds that it is preferable to secure the higher level of isolation provided by the Spark Gap isolator. Accordingly, the Commission will direct the Cooperative to install this device as an investigative initiative.

In addition, the Commission finds that it would be inappropriate to require the Complainant to sign the Cooperative's waiver of liability form. The Commission will not allow the Cooperative to condition its installation of the Spark Gap isolator at the Complainants farm on the signing of such a waiver.

Finally, during this investigatory period at least, the Complainant will not be charged the cost of installing the Spark Gap isolator. The question of who will ultimately bear the cost of the installation will be considered by the Commission in

future proceedings in this matter.

### **3. Herd Health**

The Complainant has commented regarding the production levels and milk quality of his herd. For instance, Mr. Johnson stated in his Complaint that his herd production dropped from 18,000 pounds in 1984 to 15,000 pounds in 1985 and 1986. Mr. Johnson noted that 1985 and 1986 were wet years, a condition which makes the soil a better conductor of electricity. He further stated that in 1988, a very dry year, milk production rebounded to 18,000 pounds.

The Commission will not undertake to instruct the Complainant on exactly what evidence he should present to bear his ultimate burden of proof regarding his complaint: what is necessary to show a causal connection between electrical conditions on the farm attributable to Stearns and herd behavior/health/production.

For its own investigatory purposes, however, the Commission will direct the Complainant to provide certain monthly herd data:

- 12 months of past records of production and herd health data (water consumption, milk production, and somatic cell count if available) and
- data on herd health and production (water consumption, milk production, and somatic cell count) for a period of 90 days following this Order.

As with any party before the Commission, of course, the Complainant may present additional evidence in a manner he feels best guarantees its reliability and sufficiency to meet his burden of proof.

### **4. The Cooperative's Stray Voltage Materials**

The Commission's consideration of this matter will be assisted by a record which includes comprehensive information detailing Stearns' response to the stray voltage problem. Therefore, the Commission will direct the Cooperative to file all written materials it has prepared, uses or maintains regarding its response to the stray voltage problem. These materials would include at least

- its policies, procedures, and documents used in the course of responding to initial inquiries and complaints and unresolved concerns of customers such as Mr. Kenning, and
- its current and previous year's budget figures for research, for publications, for complaint response, for education, and for any other elements of its response to the stray voltage problem.

The Cooperative will be required to provide these materials within 30 days of the date of this Order.

## ORDER

1. The Stearns Cooperative Electric Association (Stearns or the Cooperative) shall conduct a comprehensive sampling of animal electrical environment on the Johnson farm including but not limited to cow contact voltage points pursuant to a Staff-developed protocol and under Staff supervision.
2. Within 30 days after completing the testing required in Ordering Paragraph 1, the Cooperative shall file the test data and its analysis of that data with the Commission and serve a copy of such data and analysis on the parties.
3. Within 30 days after receiving the Cooperative's testing data and analysis pursuant to Ordering Paragraph 2, the parties shall provide comments.
4. Within 15 days after receiving the comments filed pursuant to Ordering Paragraph 3, parties may file reply comments.
5. Within 10 days of this Order, the Cooperative shall install a Spark Gap isolator at the Complainant's farm. At this time, the cost shall be borne by the Cooperative and the Complainant's signing of a liability waiver shall not be required.
6. Within 100 days of this Order, the Complainant shall file records of production and herd health data for the period March 1, 1993 through May 1, 1994.

The production and herd health data required by this Ordering Paragraph shall consist of, at least, the following:

- water consumption
  - milk production
  - somatic cell count
7. Within 30 days of this Order, the Cooperative shall file with the Commission and serve copies on the parties the following: all materials it has prepared, uses or maintains regarding its response to the stray voltage problem. These materials would include, at a minimum, the following:
    - 1) its policies, procedures, and documents used in the course of responding to
      - initial inquiries and complaints and
      - unresolved concerns of such customers as Mr. Kenning, and

2) its current and previous year's budget figures for

- research,
- publications,
- complaint response,
- education, and
- any other element of its response to the stray voltage problem.

8. This Order shall become effective immediately.

BY ORDER OF THE COMMISSION

Burl W. Haar  
Executive Secretary

(S E A L)