Public Service Company of Colorado

16805 Road 19 1/2, Platteville, Colorado 80651-9298

August 11, 1982
Fort St. Vrain
Unit No. 1
P-82311

Mr. John T. Collins, Regional Administrator
Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive
Suite 1000
Arlington, Texas 76011

Reference: Facility Operating License
No. DPR-34

Docket No. 50-267

Dear Mr. Collins:

Enclosed please find a copy of Reportable Occurrence Report No. 50-267/82-024, Corrected Revised Final, submitted per the requirements of Technical Specification AC 7.5.2(b)3.

Also, please find enclosed one copy of the Licensee Event Report for Reportable Occurrence Report No. 50-267/82-024.

Very truly yours,

Don Warembourg
Manager, Nuclear Production

DW/cls

Enclosure

cc: Director, MIPC

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FORT ST. VRAIN NUCLEAR GENERATING STATION
PUBLIC SERVICE COMPANY OF COLORADO
16805 WELD COUNTY ROAD 19 1/2
PLATTEVILLE, COLORADO 80651-9298

REPORT NO. 50-267/82-024/03-X-2

Corrected Revised Final

IDENTIFICATION OF OCCURRENCE:

At 1550 hours on June 5, 1982, with the reactor at approximately 13% power, and the main turbine generator not synchronized to the distribution system, the 480 volt essential busses #1, #2, and #3 automatically shed electrical loads, which eventually led to the reactor being manually scrammed. Upon investigation, it was determined that an undervoltage relay was improperly adjusted due to the inadequacy of a calibration procedure. The improper adjustment resulted in a premature trip of the relay and eventual loss of the 480 volt essential busses. Since the cause was inadequacy of a procedure, this event is being reported per Fort St. Vrain Technical Specification AC 7.5.2(b)3.

EVENT DESCRIPTION:

On June 5, 1982, at 1550 hours, while recoving from a single loop shutdown (loop shutdown had occurred on June 4, 1982, from a spurious ultrasonic steam rupture trip signal), and reactor power at approximately 13%, one of two undervoltage relays which monitor the 4,000 volt side of the reserve auxiliary transformer (RAT) tripped. The tripping of this relay (Westinghouse type CV-2 undervoltage relay) caused automatic shedding of all three 480 volt essential busses. All three essential busses were lost due to the turbine being off-line and the RAT supplying the busses.

Upon losing the essential busses, certain essential plant equipment was lost until restarted on the diesel generator automatic sequencer. This included the instrument air compressors, service water pumps, bearing water pumps, helium recirculating compressors, hydraulic oil pumps, and other less essential equipment. The bearing water upset tripped 1B, 1C, and 1D helium circulators causing a Loop 2 shutdown. 1A circulator did not trip apparently due to sufficient backup bearing water accumulator flow until normal bearing water was restored in approximately 30 seconds. The reactor was manually scrammed as a precautionary measure.

Since both undervoltage relays on the 4,000 volt side of the RAT must trip in order to open the 4,000 volt feed breaker, power to the

essential 4,000 volt equipment (1B boiler feedwater pump, 1A and 1B condensate pumps, 1A and 1B circulating water pumps) was not lost and that equipment remained operating/operable (see Figure 2).

Immediately upon loss of the 480V essential busses, both emergency diesel generator sets automatically started and closed into their respective 480V busses. The programmed automatic sequencer then began starting the essential loads as designed and without mishap. The diesel generators were allowed to remain in service while the problem was ascertained and resolved by plant electricians. The essential 480V busses and diesel generators were paralleled to the RAT at 1810 hours and by 2030 hours the electrical system was returned to its normal configuration. Normal reactor recovery continued, and the reactor was brought back to critical at 0415 hours on June 8.

CAUSE
DESCRIPTION:

Upon investigation of this event, it was found that the undervoltage relay which tripped contains two parallel contacts. However, the relay calibration procedure stated calibration of only one contact. It was noted that Fort St. Vrain is one of few locations within the Public Service Company of Colorado's distribution system which contains the dual parallel contacts. The normal Westinghouse type CV-2 voltage relay used by Public Service Company contains only one contact with the capability of adding a second contact (see Figure 1).

According to the records, upon the last calibration check of this relay, it was found to trip at 44 volts (63.8% of rated voltage). The relay was then calibrated to 55 volts (79.7% of rated voltage) by the procedure. The procedure, however, did not include calibration of the second set of contacts which are affected by the setting of the primary contacts. After the trip on June 5, 1982, the relay was checked, and the second set of contacts were found to trip at 63 volts (69 volts is 100%). Plant conditions at the time of this occurrence were sufficient to lower the operating voltage of the electrical system to the premature undervoltage trip setting on the second set of contacts.

CORRECTIVE
ACTION:

After the proper procedure for calibrating both sets of contacts was written via a Procedure Deviation Report, the relay was recalibrated and adjusted to the proper setting of 55 volts.

All other undervoltage relays at the plant were rechecked and tested.

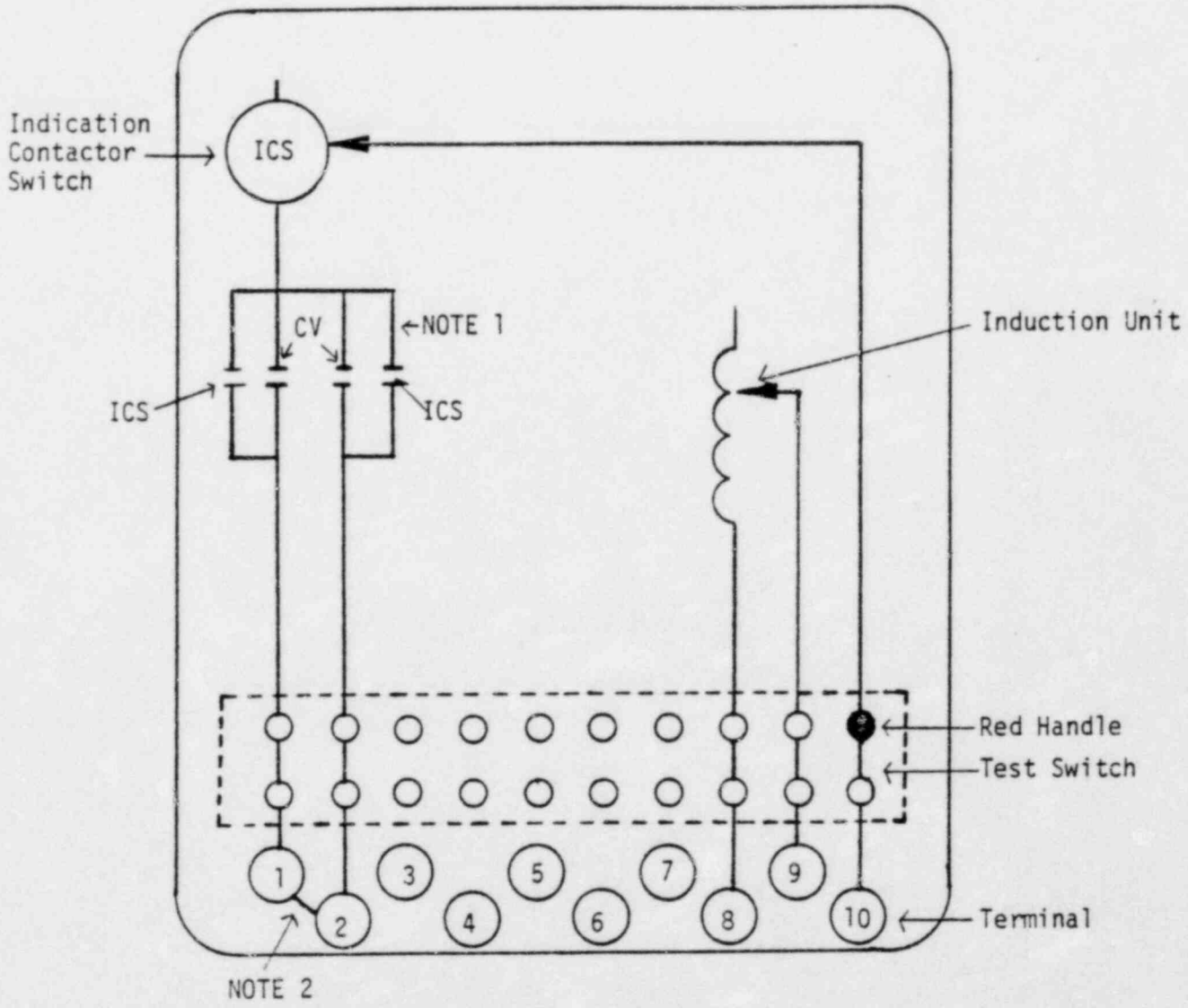
The calibration procedure which was found to be inadequate has been rewritten and verified against the equipment used at this plant.

All of the calibration procedures used by the Public Service Company Relay Shop Department at Fort St. Vrain are to be reviewed for accuracy and rewritten as necessary. This is expected to be completed by December 31, 1982.

No further corrective action is anticipated or required.

FIGURE 1: Internal Schematic of the Double Trip Type CV Under or Over Voltage Relay

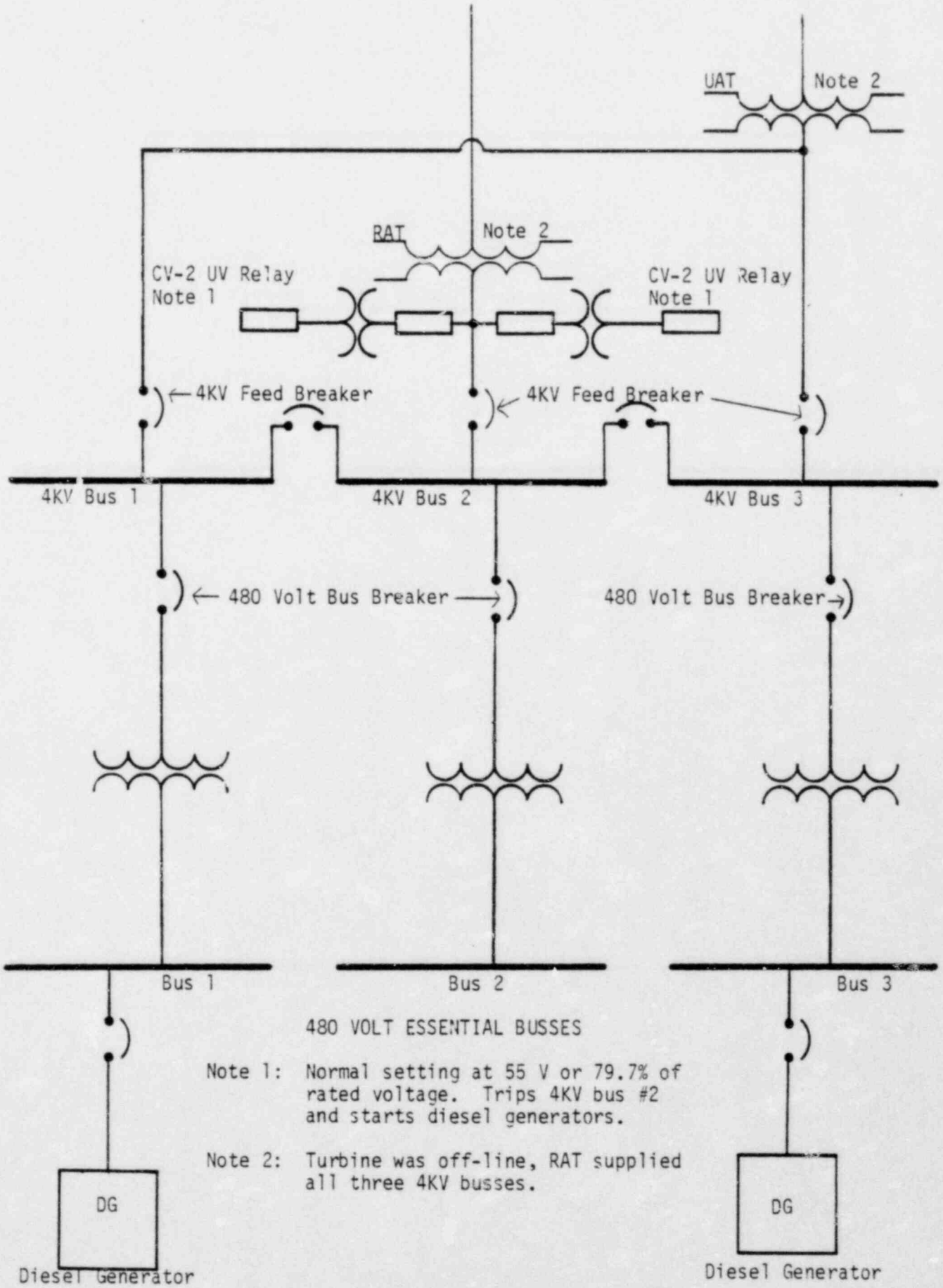
(Westinghouse Type CV Voltage Relay)



NOTE 1: Contact positions - relay deenergized
Over voltage - OPEN
Under voltage - CLOSED

NOTE 2: Most relays used by PSCo do not have the contacts associated with Terminal 2. Fort St. Vrain does have parallel contacts as shown.

FIGURE 2: Basic Schematic of 480 Volt Electrical Supply



480 VOLT ESSENTIAL BUSSES

Note 1: Normal setting at 55 V or 79.7% of rated voltage. Trips 4KV bus #2 and starts diesel generators.

Note 2: Turbine was off-line, RAT supplied all three 4KV busses.

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