February 10, 1994 NG-94-0595

INDUSTRIES INC.

Mr. John B. Martin Regional Administrator Region III U. S. Nuclear Regulatory Commission 801 Warrenville Road Lisle, IL 60532

> Subject: Duane Arnold Energy Center Docket No: 50-331 Op. License DPR-49 Licensee Event Report #94-002

Gentlemen:

In accordance with 10 CFR 50.73 please find attached a copy of the subject Licensee Event Report.

Very truly yours, mitwilson

David L. Wilson Plant Superintendent - Nuclear

DLW/JK/eah

cc: Director of Nuclear Reactor Regulation Document Control Desk U.S. Nuclear Regulatory Commission Mail Station P1-137 Washington, D. C. 20555

PDR

NRC Resident Inspector - DAEC

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February 10, 1994

L. Liu L. Root J. Franz Safety Committee K. Peveler Rich Anderson S. Swails C. Bleau P. Bessette C. Crew K. Shea (N&H) INPO GDS Associates, Inc. Central Iowa Power Cooperative Corn Belt Power Cooperative DAEC Commitment Control

FROM:

D. Wilson DWilson

Plant Superintendent - Nuclear

FILE: A-118a

Please find attached one copy of a Licensee Event Report that has been transmitted to the NRC.

LICENSEE EVENT REPORT NO. 94-002

Notification Letter No. NG-94-0595

DR NUMBERS: 94-013, 94-014, 94-015

JK/eah

(6/91)

Copied via PROFS Note: R. Baldyga

- D. Church
- J. Edom
- R. Hannen
- T. Allen (STA Coordinator)
- W. Miller
- A. Roderick
- D. Sjulin
- J. Thorsteinson
- G. Van Middlesworth
- T. Wilkerson
- A. Binder

To:

NRC F (5-92)	NRC FORM 366 U.S. NUCLEAR REGULATORY COMMISSI								APPROVED BY OMB NO. 3150-0104 EXPIRES 5/31/95									
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I. DESCRIPTION OF EVENT

On January 12, 1994, during quarterly surveillance test procedure STP42A021-Q, three of the four Reactor Core Isolation Cooling (RCIC) steam supply low pressure switches (PS2443A, PS2443C, PS2443D) were found low (non-conservative) outside of their as-found limits within the STP. These four switches comprise a two-out-of-two-once logic that generates isolation signals to the RCIC inboard and outboard steam supply isolation valves MO2400 and MO2401 which are designated as Primary Containment Isolation System (PCIS) Group 6A valves.

Upon discovery of the first out of tolerance condition on PS2443A, the Instrument and Controls (I&C) Engineering Department was contacted to provide the calculated allowed values for these instruments that had been included in a recent DAEC setpoint control project to replace existing Technical Specification nominal trip settings with plant specific calculated allowed values. Pressure switches PS2443A, PS2443C, and PS2443D were all outside of the calculated allowed values provided by the (I&C) Engineering Department.

All three switches were recalibrated and returned to service within the confines of the STP and allowed out of service time.

II. CAUSE OF EVENT

The cause of this event was instrument drift of the Barksdale model B2T-M12SS pressure switches. The most probable factors causing the drift were changes in ambient temperatures at the installed switch locations and performing the calibration at normal reactor pressure versus outage conditions with the system depressurized. Additional factors such as the effect of calibrating only one switch in a dual switch instrument, the existing STP as-left tolerances being very close to the as found limits, whether or not the existing ranges of the instruments support the desired setpoints, the effects the internal snubbers within the Barksdale switches have on the as-found setpoint, and the service life of the Barksdale switches, are being evaluated and have not been excluded as contributors to the drift.

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III. ANALYSIS OF EVENT

Pressure switches PS2443A through D are arranged in a two-out-of-two- once logic. PS2443A and PS2443C are in the 'A' logic channel which provides a close signal to the RCIC outboard steam supply isolation valve, MO2401. PS2443B and PS2443D are in the 'B' logic channel which provides a close signal to the RCIC inboard steam supply isolation valve, MO2400. Both logic channels also provide a RCIC turbine trip signal. With switches A, C and D out of tolerance, neither of the RCIC Steam supply isolation valves would have isolated at calculated pressures and is therefore considered a loss of function. However, both isolation valves were operable and would have isolated on low pressure a short time later than intended.

The setpoint for this isolation function is based on preventing RCIC turbine operation at stall conditions and preventing steam leakage past the turbine gland seals into the RCIC room. Such leakage isolation would have been completed by the RCIC room high ambient temperature isolation within design limits if such a condition had occurred. There was no effect on safe operation of the plant or threat to personnel safety as a result of this event.

This out of tolerance condition is considered non-conservative because of the potential to operate the RCIC System at turbine stall speeds and not provide the turbine trip and isolation signal in a low reactor pressure condition.

RCIC system operability was not a concern in this event. The reactor pressure at which the isolation signal actuates (nominal trip setting of 50<P<100 psig) is well below the pressure which defines RCIC operability requirements (>150 psig). Variations in plant operating mode would not have magnified the significance of this event.

IV. CORRECTIVE ACTIONS

As discussed previously, the three switches were re-calibrated and returned to service within the confines of the STP.

The DAEC has an existing Instrument Trending Program (ITP) that tracks drift data for various plant instruments including all of those contained in the DAEC Technical Specifications' tables. This event was the third in a series of recent Barksdale pressure switch drift occurrences that are being evaluated on a broader basis to make the necessary ITP and procedure enhancements to preclude recurrence of similar events. The following are actions being taken which offer both short term and long term solutions for this problem:

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A. Short Term Corrective Actions:

- STPs are being revised to include measurement and recording of instrument rack temperatures to obtain correlation data for instrument drift and local instrument temperature. These revisions will be performed prior to the performance of the next scheduled STP that calibrates Barksdale pressure switches.
- 2. For dual switch instruments, Equipment Specific Maintenance Procedures (ESMPs) are being revised to ensure that calibration of the first switch is reverified after adjusting the second switch. Barksdale model B2T pressure switches contain two switches that are actuated by the same boundon tube. Calibration of one switch can effect the setpoint of the other switch. This reverification will assure that both switches are left within allowable setpoint tolerances. This action will be completed by March 28, 1994.
- 3. Engineering evaluations of all currently installed Barksdale B2T switches were performed to determine which instruments should have increased calibration frequencies. Based on these evaluations, frequencies for the STPs that calibrate Barksdale B2T switches have been increased from quarterly to monthly. This will decrease the amount of drift and assure that the switch is calibrated more often to minimize the drift expected during the larger than normal temperature swings as it warms up from this year's record cold winter. As other corrective actions warrant, these frequencies may be returned to a quarterly basis. This action is complete.
- 8. Long Term Corrective Actions:
- 1. As a result of past ITP recommendations, (11) Barksdale pressure switches were previously replaced with the "TC" model Barksdales that are manufactured with temperature stabilized bourdon tubes. Current data shows that the performance of the "TC" model switches is, in some applications, no better than that of the existing switches. Therefore, an evaluation as to the effectiveness of these previous switch replacements is being done to ensure that this is a prudent form of corrective action. Due to the brevity of installed time for the temperature stabilized switches, this evaluation will be on-going and decisions for replacements will be made on a case by case basis. In conjunction with this effort, an investigation of trends of different brands of bistable switches is being performed using the Nuclear Plant Reliability Data System (NPRDS) and the DAEC ITP.

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