OMAHA PUBLIC POWER DISTRICT
P.O. Box 399 Hwy. 75 - North of Fort Calhoun
Fort Calhoun, NE 68023-0399
(402) 636-2000

NUCLEAR LICENSING AND INDUSTRY AFFAIRS
FC-2-4 FCS Administration Building
Facsimile Telephone: (402) 533-7291

FACSIMILE TRANSMITTAL COVER SHEET

DATE: 7/26/94

TO: NRC - OPERATIONS CENTER	FROM: JOHN B. HERMAN
	SUPV- NUCLEAR LICENSING
LOCATION:	TELEPHONE NO: (402) 533-6905
	NUMBER OF PAGES (Including this Page): 4

COMMENTS:

1.) PART 21 NOTIFICATION SUBMITTED BY OMAHA PUBLIC POWER DISTRICT - FORT CALHOUN STATION

IE19

Report on Nonconforming Ohmite Components

This report is submitted pursuant to 10 CFR 21.21(c)(3)(i). The items identified address the specific information requested by 10 CFR 21.21(c)(4) as follows:

(i) Identification of individual providing this notification:

T. L. Patterson
Division Manager - Nuclear Operations
Omaha Public Power District, Fort Calhoun Station, P.O. Box 399, Fort Calhoun, NE 68023-0399.

(ii) Basic components containing defect:

Ohmite model CU1021 and CU1031 potentiometers and model CS-1 switches, supplied as attachable to the potentiometers, were found to be in nonconformance with the required function for which they were supplied for the Fort Calhoun Station.

(iii) Identification of supplier:

The subject Ohmite parts were supplied by ABB Combustion Engineering.

(iv) Nature of Defect:

Source of Discrepancy

The potentiometer and switches are modular such that the CS-1 switch is attachable to an entire series of potentiometers which includes the above listed models. The pot/switch assembly functions such that when the potentiometer shaft is rotated fully counter-clockwise (CCW) the switch is operated and "captures" the adjustment knob in the fully CCW position. The potentiometer adjustment will thus be captured at the one extreme of its adjustable range.

OPPD attempted to install a pot/switch assembly, and the assembly would not pass its post-maintenance test. OPPD discussed this discrepancy with ABB Combustion Engineering, who informed OPPD that Ohmite changed the manufacturing facility for these items from Mexico to Canada. The model numbers for the affected items were not changed. The components of different origin, i.e., manufactured at different facilities, appear to have the same external physical characteristics and can be assembled together but will not function correctly.

The assembly of a Canadian potentiometer and a Mexican switch will not allow for the potentiometer wiper arm to make contact with the switch. The potentiometer will seemingly function but will not operate the switch and will thus not be captured in the "off" position.

These pots/switches are used on the Power Range Nuclear Instrumentation (PRNI), Wide Range Nuclear Instrumentation (WRNI) drawers, and on the Reactor Protective System Calibration and Indication Panel (RPSCIP).

Potential Safety Significance

The Delta-T Trip Test potentiometer serves as a test input signal for the Delta-T power signal. Delta-T power is auctioneered with NI power in the Thermal Margin/Low Pressure (TMLP) calculator to develop a "Q" power signal which is used as the process input to RPS high power trip unit and is an input to the Axial Power Distribution (APD) and TMLP trip function calculations. The presence of a nonconforming potentiometer where the switch is reset or "off" and is not operated by the potentiometer wiper could result in a nonconservative error in Delta-T Power signal.

There are two potentiometers per PRNI channel used to provide a simulated test input for the respective subchannel (upper or lower). The PRNI trip test potentiometers supply an additive test input signal to the respective subchannel. The integral switch serves to provide an alarm and power trip test interlock function and to capture the potentiometer in the "off" or "zero input" fully CCW position. For this application, the integral switch does not enable the potentiometer, it is always in the circuit and must be captured in the "zero" input position by the switch.

A nonconforming potentiometer may not be captured in the "off" or "zero input" position and the alarm condition would be reset regardless of the position of the potentiometer knob. Thus a simulated subchannel signal could inadvertently be provided without intended precautionary alarms/trips. The impact of an inadvertent simulated subchannel input would be an elevated value for NI power which would reduce the margin to trip and would be an error in the conservative direction for nuclear safety. The subchannel input to the Axial Shape Index (ASI) calculation would also be affected by the erroneous input. This impact would be to calculate an ASI value that is inappropriately skewed either positive or negative depending upon the subchannel affected. The impact on ASI could be nonconservative. There could be an adverse safety impact to an axial power transient in the opposite direction of the simulated power. Note: There is an APD input to the TMLP calculator; however any error introduced is negligible when compared to the conservative error introduced by the increase in NI Power.

(v) Date information of defect was obtained:

OPPD discovered the discrepancy on April 22, 1994 and provided an interim report pursuant to 10 CFR 21.21(a)(2) on June 21, 1994 (LIC-94-0141). The evaluation which determined that the discrepancy was a defect was completed on July 20, 1994. The Senior Vice President, who is the responsible officer in OPPD with executive authority over Part 21 issues, was informed on July 25, 1994.

(vi) Number and Location of components containing defect:

The applications discussed above that could have adverse safety implications have been verified at Fort Calhoun Station to not be subject to the failure symptom discussed. The time frame that Ohmite changed manufacturing facilities is not known by OPPD.

(vii) Corrective action which has, or is being taken:

It has been verified that the potentiometers/switch combinations are not installed at Fort Calhoun Station in a location which could have an adverse safety implication. ABB Combustion Engineering is recommending that these potentiometers/switches be procured and supplied as a completed assembly.

(viii) Advice related to defect to be given to licensees:

The scope of this nonconformance is believed to be limited to the time period since the availability of the subject parts from a second origin of manufacture. The symptoms of nonconforming pairs are believed to be observable from the function of the parts (i.e., removal and disassembly should not be required).

NUCLEAR REGULATORY COMMISSION

Office For Analysis and Evaluation Of Operational Data
Division Of Operational Assessment
Incident Response Branch

Two White Flint North Operations Center

FACSIMILE TRANSMITTAL

DATE: _____

PAGES (INCLUDING COVER SHEET) 9

FROM: _____

SEND TO:

NAME: W. HAASS

ORGANIZATION: _____

FAX#: _____

VERIFICATION: _____

MESSAGE: _____

OPERATIONS CENTER FAX #: (301) 816-5151
VERIFICATION # (301) 816-5100, Ext. 3008

POWER REACTOR	EVENT NUMBER: 27583

FACILITY: FT CALHOUN REGION: 4 UNIT: [1] [ ] [ ] STATE: NE RX TYPE: [1] CE	NOTIFICATION DATE: 07/26/94 NOTIFICATION TIME: 19:00 [ET] EVENT DATE: 07/26/94 EVENT TIME: 00:00[CDT] LAST UPDATE DATE: 07/26/94
NRC NOTIFIED BY: FASCIMILE (J. B. HERMAN) HQ OPS OFFICER: THOMAS ANDREWS	NOTIFICATIONS
EMERGENCY CLASS: NOT APPLICABLE 10 CFR SECTION: CCCC 21.21 UNSPECIFIED PARAGRAPH	

UNIT	SCRAM CODE	RX CRIT	INIT PWR	INIT RX MODE	CURR PWR	CURR RX MODE
1	N	N	0		0	

EVENT TEXT

REPORT ON NONCONFORMING OHMITE COMPONENTS

THIS REPORT IS SUBMITTED PURSUANT TO 10 CFR 21.12(C)(3)(I). THE ITEMS IDENTIFIED ADDRESS THE SPECIFIC INFORMATION REQUESTED BY 10 CFR 21.21(C)(4) AS FOLLOWS:

(1) IDENTIFICATION OF INDIVIDUAL PROVIDING THIS NOTIFICATION

T. L. PATTERSON
DIVISION MANAGER - NUCLEAR OPERATIONS
OMAHA PUBLIC POWER DISTRICT
FORT CALHOUN STATION
P.O. BOX 399
FORT CALHOUN, NE 68023-0399

(2) BASIC COMPONENTS CONTAINING DEFECT

OHMITE MODEL CU1021 AND CU1031 POTENTIOMETERS AND MODEL CS-1 SWITCHES, SUPPLIED AS ATTACHABLE TO THE POTENTIOMETERS, WERE FOUND TO BE IN NONCONFORMANCE WITH THE REQUIRED FUNCTION FOR WHICH THEY WERE SUPPLIED FOR THE FORT CALHOUN STATION.

(3) IDENTIFICATION OF SUPPLIER:

THE SUBJECT OHMITE PARTS WERE SUPPLIED BY ABB COMBUSTION ENGINEERING.

(4) NATURE OF THE DEFECT:

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SOURCE OF DISCREPANCY

THE POTENTIOMETER AND SWITCHES ARE MODULAR SUCH THAT THE CS-1 SWITCH IS ATTACHABLE TO AN ENTIRE SERIES OF POTENTIOMETERS WHICH INCLUDES THE ABOVE LISTED MODELS. THE POT/SWITCH ASSEMBLY FUNCTIONS SUCH THAT WHEN THE POTENTIOMETER SHAFT IS ROTATED FULLY COUNTER-CLOCKWISE (CCW) THE SWITCH IS OPERATED AND "CAPTURES" THE ADJUSTMENT KNOB IN THE FULLY CCW POSITION. THE POTENTIOMETER ADJUSTMENT WILL THUS BE CAPTURED AT THE ONE EXTREME OF ITS ADJUSTABLE RANGE.

OPPD ATTEMPTED TO INSTALL A POT/SWITCH ASSEMBLY, AND THE ASSEMBLY WOULD NOT PASS ITS POST-MAINTENANCE TEST. OPPD DISCUSSED THIS DISCREPANCY WITH ABB COMBUSTION ENGINEERING, WHO INFORMED OPPD THAT OHMITE CHANGED THE MANUFACTURING FACILITY FOR THESE ITEMS FROM MEXICO TO CANADA. THE MODEL NUMBERS FOR THE AFFECTED ITEMS WERE NOT CHANGED. THE COMPONENTS OF DIFFERENT ORIGIN, I.E., MANUFACTURED AT DIFFERENT FACILITIES, APPEAR TO HAVE THE SAME EXTERNAL PHYSICAL CHARACTERISTICS AND CAN BE ASSEMBLED TOGETHER BUT WILL NOT FUNCTION CORRECTLY.

THE ASSEMBLY OF A CANADIAN POTENTIOMETER AND A MEXICAN SWITCH WILL NOT ALLOW FOR THE POTENTIOMETER WIPER ARM TO MAKE CONTACT WITH THE SWITCH. THE POTENTIOMETER WILL SEEMINGLY FUNCTION BUT WILL NOT OPERATE THE SWITCH AND WILL THUS NOT BE CAPTURED IN THE "OFF" POSITION.

THESE POTS/SWITCHES ARE USED ON THE POWER RANGE NUCLEAR INSTRUMENTATION (PRNI), WIDE RANGE NUCLEAR INSTRUMENTATION (WRNI) DRAWERS, AND ON THE REACTOR PROTECTIVE SYSTEM CALIBRATION AND INDICATION PANEL (RPSCIP).

POTENTIAL SAFETY SIGNIFICANCE

THE DELTA-T TRIP TEST POTENTIOMETER SERVES AS A TEST INPUT SIGNAL FOR THE DELTA-T POWER SIGNAL. DELTA-T POWER IS AUCTIONEERED WITH NI POWER IN THE THERMAL MARGIN / LOW PRESSURE (TMLP) CALCULATOR TO DEVELOP A "Q" POWER SIGNAL WHICH IS USED AS THE PROCESS INPUT TO RPS HIGH POWER TRIP UNIT AND IS AN INPUT TO THE AXIAL POWER DISTRIBUTION (APD) AND TMLP TRIP FUNCTION CALCULATIONS. THE PRESENCE OF A NONCONFORMING POTENTIOMETER WHERE THE SWITCH IS RESET OR "OFF" AND IS NOT OPERATED BY THE POTENTIOMETER WIPER COULD RESULT IN A NONCONSERVATIVE ERROR IN DELTA-T POWER SIGNAL.

THERE ARE TWO POTENTIOMETERS PER PRNI CHANNEL USED TO PROVIDE A SIMULATED TEST INPUT FOR THE RESPECTIVE SUB CHANNEL (UPPER OR LOWER). THE PRNI TRIP TEST POTENTIOMETERS SUPPLY AN ADDITIVE TEST INPUT SIGNAL TO THE RESPECTIVE SUB CHANNEL. THE INTEGRAL SWITCH SERVES TO CAPTURE THE POTENTIOMETER IN THE "OFF" OR "ZERO INPUT" FULLY CCW POSITION. FOR THIS APPLICATION, THE INTEGRAL SWITCH DOES NOT ENABLE THE

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POTENTIOMETER, IT IS ALWAYS IN THE CIRCUIT AND MUST BE CAPTURED IN THE "ZERO" INPUT POSITION BY THE SWITCH.

A NONCONFORMING POTENTIOMETER MAY NOT BE CAPTURED IN THE "OFF" OR "ZERO INPUT" POSITION AND THE ALARM CONDITION WOULD BE RESET REGARDLESS OF THE POSITION OF THE POTENTIOMETER KNOB. THUS A SIMULATED SUB CHANNEL SIGNAL COULD INADVERTENTLY BE PROVIDED WITHOUT INTENDED PRECAUTIONARY ALARMS / TRIPS. THE IMPACT OF AN INADVERTENT WHICH WOULD REDUCE THE MARGIN TO TRIP AND WOULD BE AN ERROR IN THE CONSERVATIVE DIRECTION FOR NUCLEAR SAFETY. THE SUB CHANNEL INPUT TO THE AXIAL SHAPE INDEX (ASI) CALCULATION WOULD BE AFFECTED BY THE ERRONEOUS INPUT. THIS IMPACT WOULD BE TO CALCULATE AN ASI VALUE THAT IS INAPPROPRIATELY SKEWED EITHER POSITIVE OR NEGATIVE DEPENDING UPON THE SUB CHANNEL AFFECTED. THE IMPACT ON ASI COULD BE NONCONSERVATIVE. THERE COULD BE AN ADVERSE SAFETY IMPACT TO AN AXIAL POWER TRANSIENT IN THE OPPOSITE DIRECTION OF THE SIMULATED POWER. NOTE: THERE IS AN APD INPUT TO THE TMLP CALCULATOR; HOWEVER ANY ERROR INTRODUCED IS NEGLIGIBLE WHEN COMPARED TO THE CONSERVATIVE ERROR INTRODUCED BY THE INCREASE IN NI POWER.

(V) DATE INFORMATION OF DEFECT WAS OBTAINED:

OPPD DISCOVERED THE DISCREPANCY ON APRIL 22, 1994 AND PROVIDED AN INTERIM REPORT PURSUANT TO 10 CFR 21.21(A)(2) ON JUNE 21, 1994 (LIC-94-0141). THE EVALUATION WHICH DETERMINED THAT THE DISCREPANCY WAS A DEFECT WAS COMPLETED ON JULY 20, 1994. THE SENIOR VICE PRESIDENT, WHO IS THE RESPONSIBLE OFFICER IN OPPD WITH EXECUTIVE AUTHORITY OVER PART 21 ISSUES WAS INFORMED ON JULY 25, 1994.

(VI) NUMBER AND LOCATION OF COMPONENTS CONTAINING DEFECTS:

THE APPLICATIONS DISCUSSED ABOVE THAT COULD HAVE ADVERSE SAFETY IMPLICATIONS HAVE BEEN VERIFIED AT FORT CALHOUN STATION TO NOT BE SUBJECT TO THE FAILURE SYMPTOM DISCUSSED. THE TIME FRAME THAT OHMITE CHANGED MANUFACTURING FACILITIES IS NOT KNOWN BY OPPD.

(VII) CORRECTIVE ACTION WHICH HAS, OR IS BEING TAKEN:

IT HAS NOT BEEN VERIFIED THAT THE POTENTIOMETER / SWITCH COMBINATIONS ARE NOT INSTALLED AT FORT CALHOUN STATION IN A LOCATION WHICH COULD HAVE AN ADVERSE SAFETY IMPLICATION. ABB COMBUSTION ENGINEERING IS RECOMMENDING THAT THESE POTENTIOMETERS / SWITCHES BE PROCURED AND SUPPLIED AS A COMPLETED ASSEMBLY.

(VIII) ADVICE RELATED TO DEFECT TO BE GIVEN TO LICENSEE:

THE SCOPE OF THIS NONCONFORMANCE IS BELIEVED TO BE LIMITED TO THE TIME PERIOD SINCE THE AVAILABILITY OF THE SUBJECT PARTS FROM A SECOND ORIGIN OF MANUFACTURE. THE SYMPTOMS OF

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NONCONFORMING PAIRS ARE BELIEVED TO BE OBSERVABLE FROM THE FUNCTION OF THE PARTS (I.E., REMOVAL AND DISASSEMBLY SHOULD NOT BE REQUIRED.)