

# Rosemount Nuclear Instruments

Rosemount Nuclear Instruments, Inc.  
12001 Technology Drive  
Eden Prairie, MN 55344 USA  
Tel 1 (952) 828-8252  
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12 December 2000

Re: Notification under 10 CFR Part 21 for Rosemount Model 710 Trip Unit

Pursuant to 10CFR Part 21 Paragraph 21.21(b), Rosemount Nuclear Instruments, Inc. (RNII) is writing to inform you of a deviation related to a single model 710DUOCL calibration unit with serial number 0515346. As a result of an isolated human error, this single calibration unit was originally shipped in July 1998 with the stable calibration current ramp rate out of specification. This deviation was identified when the calibration unit was returned to Rosemount Nuclear Instruments, Inc for an unrelated issue. The calibration unit has been reworked and now performs within specification.

- References (attached):
- (1) Rosemount Specification Drawing for Nuclear Qualified 710DU Trip/Calibration System 00710-0109 section 5.3.2
  - (2) Acceptance Test Specification for Nuclear Qualified 710DU Trip/Calibration System 00710-3322 section 4.71
  - (3) Model 710DU Trip/Calibration System Operations Manual MAN 4471-1, April 1983 p. 11 Stable Current Calibration

1.0 Name and address of the individual providing the information:

Mr. Jeffrey W. Schmitt  
Vice President & General Manager  
Rosemount Nuclear Instruments, Inc.  
12001 Technology Drive  
Eden Prairie, MN 55344

2.0 Identification of items supplied:

710DUOCL, Serial number 0515346

FISHER-ROSEMOUNT

Post-It <sup>®</sup> Fax Note	7671	Date	12/12/00	# of pages	6
To	NRC	From	J EDWARDS		
Co./Dept.		Co.	RNII		
Phone #		Phone #	(952) 828-3951		
Fax #	(301) 816-5151	Fax #	(952) 828-8280		

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**3.0 Identification of firm supplying the item:**

Rosemount Nuclear Instruments, Inc.  
12001 Technology Drive  
Eden Prairie, MN 55344

**4.0 Nature of the failure and potential safety hazard:**

The decreasing current ramp rate on model 710DU0CL calibration unit, serial number 0515346, was slow out of specification. The specified rate is  $1.0 \pm 0.1$  mA per second and the rate for this unit was 0.7 mA per second.

Slow ramp rate means that calibration current used to calibrate Master or Slave Trip Unit trip points would take more time than specified to ramp from one current value to another. During calibration operations, this calibration current is displayed on the readout assembly.

RNII does not have sufficient information to determine what the safety impact would have been as it related to the Licensee's plant operations. The customer for this unit has been advised.

**5.0 The corrective action which is taken, the name of the individual or organization responsible for that action, and the length of time taken to complete that action:**

The model 710DU0CL calibration unit serial number 0515346 has been reworked by replacing resistor R42 so that the decreasing stable calibration current ramp rate is within specification.

As a precautionary measure, we reviewed travel cards which document acceptance test procedure (ATP) results during manufacturing for all model 710DU0CL calibration units manufactured over the past four years to ensure that there were no other deviations of this type.

Additionally, the model 710DU0CL travel card was proactively revised in June 1999 to more clearly state the specification limits for this portion of the acceptance test procedure (ATP). An independent inspection is performed to verify that the value for the decreasing stable calibration current ramp rate recorded on every travel card is within specification.

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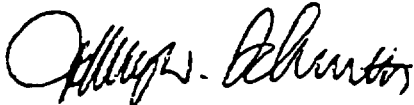
6.0 Any advice related to the potential failure of the item:

The end user must determine the full scope of this deviation as it relates to plant operations and plant safety and take action as deemed necessary.

Rosemount Nuclear Instruments, Inc. has a strong commitment to the nuclear industry and assures you that we are dedicated to the supply of high quality products and services to our customers. We are sorry for any inconvenience. If there are any questions, or you require additional information related to this issue, please contact Jerry Edwards (952) 828-3951, Mike Dougherty at (952) 828-5626 or Bob Cleveland at (952) 828-8255.

Sincerely,

ROSEMOUNT NUCLEAR INSTRUMENTS, INC.



Jeffrey W. Schmitt  
Vice President & General Manager

Attachments:

- (1) Rosemount Specification Drawing for Nuclear Qualified 710DU Trip/Calibration System 00710-0109 section 5.3.2
- (2) Acceptance Test Specification for Nuclear Qualified 710DU Trip/Calibration System 00710-3322 section 4.71
- (3) Model 710DU Trip/Calibration System Operations Manual MAN 4471-1, April 1983 p. 11 Stable Current Calibration

5.2.6 Test Jacks (Continued)

WHITE (J3): Selected trip status output.

5.3 Performance Specifications5.3.1 Reference Operating Conditions

All performance specifications are under these conditions unless otherwise noted.

TEMPERATURE: 40 to 90 degrees F  
 RELATIVE HUMIDITY: 40 to 80%  
 RADIATION: Less than 0.5 mRad/hr  
 PRESSURE: 1 atmosphere (nominal)

5.3.2 Stable Current

ADJUSTMENT RANGE: 4 to 20 mA  
 RATE OF CHANGE:  $1.0 \pm 0.1$  mA/Sec.  
 STABILITY:  $\pm 0.005$  mA

5.3.3 Transient Current

ADJUSTMENT RANGE: 0.5 to 20.5 mA  
 RANGE OF CHANGE: Follows the adjustment potentiometer.  
 STABILITY:  $\pm 0.050$  mA  
 RISE AND FALL TIME: Less than 0.1 mS from 10% to 90% or 90% to 10%.

5.4 Nuclear Qualification

The 7100U Trip/Calibration System was qualified per Rosemount Test Procedure 98213A and documented in reports D8200037 and D8300112. The calibration unit is only qualified seismically per the above reports. The calibration unit has no environmental qualification and is not required to function during or after the DBE.

6.0 CARD FILE

The card file is constructed to mount in a standard nineteen inch rack. Room is provided for twelve trip units in any combination and one calibration unit.

**MASTER DRAWING**  
**CLASS IIE USAGE**

SIZE	CODE IDENT NO.	DOC NO.
A	04274	00710-0109
SCALE		SHEET 20 OF 25

4.7 Calibration Unit (Internal Document is Reference 2.7).

4.7.1

OUTPUT OR INDICATION	SPECIFIED TOLERANCE OR CONDITION
Maximum Stable Current	20.50 mA Min.
Minimum Stable Current	3.50 mA Max.
Common Mode Rejection	± 0.020 mA
Stable Current Ramp Rate	1 mA/sec ± 0.1 mA/sec.
Stable Current Change: Between Power Supply =24 Vdc & 23.5 Vdc	± 0.01 mA
Between Power Supply =24 Vdc & 26.5 Vdc	± 0.01 mA
Minimum Transient Current	0.50 mA
Maximum Transient Current	20.50 mA Min.
Common Mode Rejection	± 0.020 mA
Transient Current Change: Between Power Supply =24 Vdc & 23.5 Vdc	± 0.05 mA
Between Power Supply =24 Vdc & 26.5 Vdc	± 0.05 mA
Proper Functioning of Transient Polarity Switch	
Proper Function of Calibrate Location Select Switch	
Proper Function of Calibration Command & Calibration Current Function Switch	

4.8 S.C.R. Test for 4-20 mA Input Master Trip Units, RTD Input Trip Units, and Slave Trip Units (Internal Document is Reference 2.22).

4.8.1 The S.C.R. Testing determines that the silicon controlled rectifier (S.C.R.) on the gross fail output, will not reset under a trip output transient condition. The test is performed after a trip unit has passed the applicable acceptance test.

4.9 Tagging Procedure (Internal Documents are Reference 2.15, 2.16, 2.17, 2.18, and 2.19).

4.9.1 For each unit, select appropriate nameplate. Type applicable information from unit travel card onto the nameplate. (Tag typing done by Production Control). Remove backing from the nameplate and install per print.

4.9.2 If a wire on tag is called out on the travel card, type the specified data on the tag.  
Attach wire-on tag to the unit per print.

4.10 FINAL INSPECTION (Internal Documents are Reference 2.8, 2.9, 2.10, 2.11, 2.12, and 2.24).

Each unit will be visually inspected to assure conformance to Drawing (Reference 2.1), workmanship in conformance with Rosemount Workmanship Manual (Reference 2.14), and correctness of identification and tagging.

<b>CLASS IE USAGE</b>	<b>SS IE USAGE</b>	SIZE	CODE IDENT. NO.	DRAWING NO.
		A	04274	00710-3322
<b>MASTER DRAWING</b>				SHEET 9 OF 13

## CALIBRATION UNIT SPECIFICATIONS

### General

The following specifications apply to the 710DU Calibration Unit.

### Electrical Specifications

#### TRIP UNIT INTERFACE:

1. **Stable Calibration Current:** The Calibration Unit produces a stable, independently adjustable current which is used to calibrate Master or Slave Trip Unit trip points, or verify analog outputs.

**STABLE CALIBRATION RANGE:** 3.5 to 20.5 mA.

**RAMP RATE:** Maximum rate of change of stable calibration current is  $1.0 \pm 0.1$  mA per second.

**STABILITY:** Once set, stable calibration current will not vary more than  $\pm 5$  microamps for normal operating conditions.

2. **Transient Calibration Current:** The Calibration Unit produces an independently adjustable step (transient) current which is added to, or subtracted from the stable current. Transient current may be used to check response time of Master and Slave Trip Units or external equipment driven by the 710DU System, and also to verify gross fail points.

**TRANSIENT CALIBRATION CURRENT RANGE:** 0.5 to 20.5 mA. Addition or subtraction is determined by a switch on the Calibration Unit's front panel labeled Polarity.

**RISE AND FALL TIME:** The rise and fall time of transient calibration current in response to the transient current amplitude adjustment or transient polarity switch is less than 100 microseconds between 10 and 90%, or 90 and 10% of final value.

**STABILITY:** Once set, transient calibration current will not vary more than  $\pm 50$  microamps for normal plant operating and environmental conditions.

3. **Calibration Current:** Calibration current is the total current (0 to 41 mA) routed to a Master Trip Unit. Calibration current can be (1) stable calibration current only, or (2) stable current added to transient calibration current, or (3) the difference between stable and transient currents. If the transient current is used as a negative value, it cannot force the sum of the transient and stable currents to a value less than 0.0 mA.

4. **Calibrate Command:** Calibrate command is a 24 Vdc signal to a Master Trip Unit which actuates a DPDT relay to substitute calibration current for the input signal.

5. **Trip Status Signal:** The Calibration Unit receives a trip status signal (12 Vdc for logic level 1 and 0 Vdc for logic level 0) from the Master or Slave Trip Unit being calibrated. The signal latches the trip current display on the Readout Assembly at the trip point of the Master or Slave Trip Unit.

6. **Calibration Status Signal:** When energized, the Calibration Unit produces a 24 Vdc signal capable of driving a resistive load of 75 ohms and up, and an inductive load of up to 0.8 Henries. The signal provides for remote status indication that a Trip Unit is being calibrated.

7. **Transient Blanking Signal:** When transient calibration current is activated, the transient blanking signal blanks the trip current display on the Readout Assembly.

#### READOUT ASSEMBLY CONNECTIONS:

Signals provided at the Readout Assembly connector are:

1. Chassis ground.
2. +24 Vdc power
3. Display engaged.
4. +24 Vdc power return.
5. Calibration current return.
6. Calibration current.
7. Trip status output.
8. Transient blanking.

#### TEST JACKS:

Three test jacks on the Calibration Unit's front panel access the:

1. Transient trigger signal (J1).
2. Signal return (J2).
3. Trip status signal (J3).