



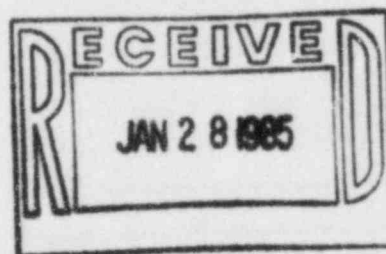
Public Service Company of Colorado

P.O. BOX 840 · DENVER, COLORADO 80201
2420 W. 26th Avenue, Suite 100D, Denver, CO 80211

January 22, 1985
Fort St. Vrain
Unit No. 1
P-85021

Regional Administrator
Region IV
Nuclear Regulatory Commission
611 Ryan Plaza Drive, Suite 1000
Arlington, Texas 76011

Attn: Mr. E. H. Johnson



Docket No. 50-267

SUBJECT: Surveillance of Fort St. Vrain
Seismic Accelerometer Trigger

REFERENCE: PSC Letter Brey to Johnson
dated November 7, 1984
(P-84478)

Dear Mr. Johnson:

In response to the commitment made in our November 7, 1984 letter to send an accelerometer from Fort St. Vrain to be completely tested by the manufacturer, the attached test report and associated certificates of calibration are submitted for your information.

Please note that the Fort St. Vrain seismic accelerometer trigger was within the specified tolerance. If the southeastern Wyoming earthquake on October 18, 1984 had produced ground accelerations at Fort St. Vrain of 0.01g or greater, the seismic event would have been recorded as designed.

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PDR ADDCK 05000267
P PDR

H005
RETURN ORIGINAL
TO RIV 1/1

If you have any questions regarding this matter, please contact Mr. M. H. Holmes at (303) 571-8409.

Very truly yours,

H. L. Brey by S. Milton McBride

H. L. Brey
Executive Staff Assistant
Electric Production

HLB/MHH:pa

Attachment



SURVEILLANCE PROCEDURE / DATA SHEET

CHANNEL CALIBRATION of
STRONG MOTION VERTICAL SEISMIC TRIGGER
KINEMATRICS INC., MODEL VS-1
INSTALLED IN MODEL SMA-1 ACCELEROGRAPH

Customer Public Service Co of Colorado
Location 16805^{1/2} Wells County Road Platteville Colorado (Cal at mfg facility)
Customer Representative Doran Meade 303-785-2223 ext (291)
Kinometrics' Sales Order No. C-K4351
VS-1 S/N n/a SMA-1 S/N 323
Customer order No. PO. N15706

REVISION	ORIG.
DATE	02JAN85
APPROVED	<i>JSD</i>

Date of Test January 3 1985
Performed by David St John
Title SMA-1 Coordination engineer
☒ Outlay Viengkhou
Services Engineer



1.0 GENERAL DESCRIPTION AND OPERATIONAL SEQUENCE OF SYSTEM

The VS-1 Seismic Trigger is an acceleration switch sensitive to vertical motion. It can be purchased alone, enclosed in a machined aluminum housing and requiring an external power supply, or it can be built into any one of several Kinematics products including the SMA-1 Strong Motion Accelerograph. When the applied acceleration reaches a preset level, a SPST switch is closed, and stays closed for a preset time.

2.0 PURPOSE OF PROCEDURE

The purpose of this procedure is the determination and adjustment, if required, of the trigger such that it responds to an input traceable to the National Bureau of Standards. This test will also meet the requirements for Channel Functional Test and Channel Check. Calibration may require removal of the device from its normal location.

3.0 FREQUENCY

It is recommended that this test be performed every 18 months or at refueling.

4.0 REFERENCES

American National Standards Institute: ANSI ANS-2.2-1978

American National Standards Institute: ANSI N18.5-1974

Kinematics Inc: Operating Instructions for Model VS-1
Vertical Seismic Trigger (Switch)

5.0 TEST EQUIPMENT NEEDED

<u>ITEM:</u>	<u>MANUFACTURER:</u>	<u>MODEL:</u>	<u>SUBSTITUTE?</u>
Digital Voltmeter	Fluke	8050A	YES
Field Calibrator	Kinematics	FC-1	NO
Calibration Labels	Kinematics	no model	YES
Calculator	Texas Inst.	TI-55	YES
Desiccant	Kinematics	P/N 700049	YES

Stopwatch or wristwatch with sweep-second hand
(NBS traceable calibration not necessary)



6.0 PERFORMANCE PRACTICES AND LIMITATIONS

This procedure will also serve as the data sheet.

Because this procedure is intended for use by a trained Kinometrics Field Engineer, detailed step-by-step instructions will not necessarily be provided.

If a deficiency is observed, the Field Engineer may undertake additional testing and install factory-authorized and/or calibrated replacement parts as necessary to restore proper operation of the sensors and systems.

Any situation which is not covered in the body of this procedure will be explained under "COMMENTS".

All equipment deficiencies and corrective actions will be reported under "COMMENTS".

Any item which cannot be brought into compliance with the requirements of this test will have a red REJECT tag affixed in a clearly visible location. The tag will identify the item, show the nature of the deficiency, and recommend a course of action.

Unless otherwise noted, limits will be based upon Kinometrics Inc. in-house acceptance tests and on recommendations found in ANSI N18.5-1974. If an item is found to be outside those limits and cannot be adjusted sufficiently to satisfy this procedure, the Kinometrics Field Engineer will recommend an appropriate course of action but it will be the responsibility of the customer to act in accordance with plant policy and technical specifications.

It is assumed that the system under test is functioning properly. If neither a Channel Functional Test nor a Channel Check has been run within 45 days prior to this test, a preliminary Channel Check will be performed before beginning the Calibration.



7.0 PRETEST PREPARATION

7.1 If the VS-1 trigger is mounted in another Kinematics product, note the model and serial number of the product below.

Model SMA-1 S/N 323

8.0 CALIBRATION

8.1 Measure supply voltage. SPECIFIED AS FOUND AS LEFT

11.5-13VDC +/- 54V +/- 54V

8.2 Using a calibrated FC-1 Field Calibrator, check the acceleration set points, both + and -, of the sensor. Each should match the specified value $\pm 20\%$. Adjust if needed.

<u>Specified</u>	<u>As Found</u>	<u>As Left</u>
+ <u>.01</u> g	+ <u>.0086</u>	<u>.0086</u>
-	<u>.0086</u>	<u>.0084</u>

8.3 Gently blow on the mass of the vertical sensor. The output relay should close and remain closed for 11 ± 4 seconds. Adjust if necessary.

<u>Specified</u>	<u>As Found</u>	<u>As Left</u>
<u>11 sec. \pm 4 sec.</u>	<u>10 sec</u>	<u>10 sec</u>

8.4 Confirm visually that the mass of the vertical sensor is in the center third of its available travel.

(initials) 0.5

8.5 In the chart below, record the test equipment used in the performance of this calibration.

Equipment	Manufacturer	Model No.	Range	Owner & ID No.	Calibration Last / Due
Digital Multimeter	Fluke	8065A	0-20V	#0586	9/6/84 / 3/6/85
Field Calibrator	Kinematics	FC-1	.001-.1G	#0398	10/22/84 / 10/22/85
Stopwatch	Micronta		0-60 sec	#0024	11/1/84 / 11/1/85



8.6 Attach certifications for test equipment to the back of this procedure.

9.0 SUMMARY (Comments, parts replaced, deficiencies, etc)

vertical starter is functioning properly

9.1 CERTIFICATION

All items included in this procedure have been performed unless noted above and were found or have been adjusted to be within the range required by this procedure.

[Handwritten Signature]
signature

9.2 ACTION REQUIRED (if any)

None
This starter and inst are being recalibrated completely and refurbished to factory specifications prior to immediate ~~repair~~ return to customers Plant - Fort St. Vrain nuclear power plant

[Handwritten Signature]
OK



CERTIFICATE OF CALIBRATION

ITEM Field Calibrator
MFG. KINEMATICS SYSTEMS MODEL FC-1
SERIAL NUMBER 0398 PROP.# 0398
CALIBRATION DATE 22 Oct. 84 RECAL DUE 22 Oct. 85

Kinematics Systems certifies that the above listed instrument meets or exceeds all published manufacturer's specifications and has been calibrated using standards whose accuracies are traceable to the National Bureau of Standards or have been derived from accepted values of natural physical constants.

CONDITION RECEIVED _____ CONDITION RETURNED _____
[X] WITHIN TOLERANCE [X] WITHIN TOLERANCE
[] OUT OF TOLERANCE [] LIMITED _____
[] OPERATIONAL FAILURE _____
[] PHYSICAL DAMAGE _____

CALIBRATION EQUIPMENT

MANUFACTURER	MODEL	SERIAL	TEST DATE	RECALL DATE
Fluke	8050A	2504256	7 June 84	7 Dec. 84

QA REVIEWED
By GWS
Date 29 Oct 84

Certified by

John G. Diehl
Manager of Services

RD TECHNOLOGY, INC.

KINEMATRICS
CUSTOMER

Certificate of Calibration

MFG. Fluke MODEL 8060A DESCRIPTION DMM/Counter
SERIAL NUMBER 3190456 ASSET # 0586 TEST # 15918
CALIBRATION DATE 6 SEP 84 TEMPERATURE _____ °F
RECALIBRATION DATE 6 MAR 85 HUMIDITY _____ %RH

RD TECHNOLOGY, INC. CERTIFIES THAT THE ABOVE LISTED INSTRUMENT MEETS OR EXCEEDS ALL PUBLISHED SPECIFICATIONS AND HAS BEEN CALIBRATED USING STANDARDS WHOSE ACCURACIES ARE TRACEABLE TO THE NATIONAL BUREAU OF STANDARDS WITHIN THE LIMITATIONS OF THE BUREAU'S CALIBRATION SERVICES, OR HAVE BEEN DERIVED FROM ACCEPTED VALUES OF NATURAL PHYSICAL CONSTANTS, OR HAVE BEEN DERIVED BY THE RATIO TYPE OF SELF-CALIBRATION TECHNIQUES. OUR "CALIBRATION SYSTEM REQUIREMENTS" IS IN COMPLIANCE WITH MIL STD 45662.

CONDITION RECEIVED

- WITHIN TOLERANCE
 OUT OF TOLERANCE
 REFER TO OUT OF TOLERANCE REPORT
 OPERATIONAL FAILURE

CONDITION RETURNED

- WITHIN TOLERANCE
 LIMITED CAL _____

INSTRUMENT ACCURACY MEG SPEC

APPLICABLE NBS TEST REPORT NUMBERS:

DC VOLTAGE 5046/231966

AC VOLTAGE 807676

RESISTANCE 5142/231966

INDUCTANCE 5117/231966

CAPACITANCE 5054/231966

TEMPERATURE F160013

FREQUENCY WWVL Boulder Col

PRESSURE MS5049

QA REVIEWED

By GWS
Date 27 SEP 84

William Taylor

CERTIFIED BY

Robert E. Mentz

CHIEF OF METROLOGY

mm

Attachment to
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RD TECHNOLOGY, INC.

Kinemetrics
CUSTOMER

Certificate of Calibration

MFG. Micronta MODEL _____ DESCRIPTION Stop Watch
SERIAL NUMBER _____ ASSET # 0024 TEST # 17303
CALIBRATION DATE 01 Nov 84 TEMPERATURE _____ °F
RECALIBRATION DATE 01 Nov 85 HUMIDITY _____ %RH

RD TECHNOLOGY, INC. CERTIFIES THAT THE ABOVE LISTED INSTRUMENT MEETS OR EXCEEDS ALL PUBLISHED SPECIFICATIONS AND HAS BEEN CALIBRATED USING STANDARD, WHOSE ACCURACIES ARE TRACEABLE TO THE NATIONAL BUREAU OF STANDARDS WITHIN THE LIMITATIONS OF THE BUREAU'S CALIBRATION SERVICES, OR HAVE BEEN DERIVED FROM ACCEPTED VALUES OF NATURAL PHYSICAL CONSTANTS, OR HAVE BEEN DERIVED BY THE RATIO TYPE OF SELF CALIBRATION TECHNIQUES. OUR "CALIBRATION SYSTEM REQUIREMENTS" IS IN COMPLIANCE WITH MIL STD 45662.

CONDITION RECEIVED

- WITHIN TOLERANCE
 OUT OF TOLERANCE
 REFER TO OUT OF TOLERANCE REPORT
 OPERATIONAL FAILURE

CONDITION RETURNED

- WITHIN TOLERANCE
 LIMITED CAL _____

INSTRUMENT ACCURACY MFG Spec

APPLICABLE NBS TEST REPORT NUMBERS:

DC VOLTAGE 5046/231966
AC VOLTAGE 807676
RESISTANCE 5142/231966
INDUCTANCE 5117/231966
CAPACITANCE 5054/231966
TEMPERATURE F160013
FREQUENCY WWVL Boulder Col
PRESSURE MS5049

QA REVIEWED

By GWS
Date 5 NOV 84

Bob Sneddon

CERTIFIED BY

Robert E. Ment

CHIEF OF METROLOGY