

Pt 21 85-029
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GENERAL  ELECTRIC

NUCLEAR ENERGY BUSINESS OPERATIONS
GENERAL ELECTRIC COMPANY • 175 CURTNER AVENUE • SAN JOSE, CALIFORNIA 95125
MC 682, (408) 925-1913

U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Washington, D.C. 20555

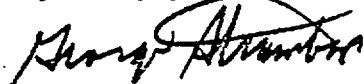
Attention: Mr. C. E. Rossi

Gentlemen:

SUBJECT: TELECON - GERMANE TO SAFETY - SCRAM DISCHARGE VOLUME DRAIN VALVE
COUPLING FAILURE

Please find the attached memo of my telecon to you of February 8, 1985. The telecon provided information about a stem coupling failure of the Hammel-Dahl 2500#, 2" valve which is utilized as a drain valve on the BWR scram discharge volume.

Very truly yours,



G. B. Stramback, Manager
Safety Evaluations Program


GBS:rf/G02043

Attachment

cc: L. S. Gifford, GE-Bethesda

IE19

MEMO OF TELECON

DATE: February 8, 1985
TIME: 9:15 a.m.
PERSON CALLING: G. B. Stramback 
PERSON CALLED: C. E. Rossi (NRC-I&E, 301-492-4193)

SUBJECT: SCRAM DISCHARGE VOLUME DRAIN VALVE COUPLING FAILURE

Ernie Rossi was called in order to inform the NRC of a condition determined to be not reportable but considered to be germane to safety. This conclusion is based upon GE completing its evaluation as to reportability under 10CFR Part 21.

The concern involves a procedural error which resulted in a coupling failure of the Hammel-Dahl 2500#, 2" valve. This valve is utilized as a control rod drive (CRD) drain valve on the scram discharge volume (SDV). The failed coupling, which connects the actuator and valve stems, prevented the valve from opening or fully closing. Other Hammel-Dahl valves with the same coupling design are: 600#-2", 2500#-1" and 600#-1". The 1" valves are utilized as SDV vent valves.

The coupling failure occurred during a five-second delay test at Wyle Laboratory. The cause of failure was determined to be inadvertent engagement of the valve hand wheel during valve setup for test purposes. On valve actuation during the test, coupling loads exceeded design loads. The stem connector deformed allowing disengagement between the stem connector and valve stem.

The valve had successfully passed the dynamic testing requirements of NUREG-0588 prior to the five-second delay test. In fact, the valve passed dynamic testing at loadings equivalent to two safe shutdown earthquakes and ten operating basis earthquakes, which are twice the current qualification test requirements. The five-second delay test was an additional test requested by GE to confirm the absence of valve chattering.

Neither the 1" nor 2" Hammel-Dahl valves are applied on any other safety grade system within GE scope of supply. However, the extent of balance of plant (BOP) or PWR applications is not known. GE has not purchased or supplied any other Hammel-Dahl valve designs which are susceptible to the above failure mode.

The domestic plants which, according to GE records, have installed these 1" and 2" Hammel-Dahl valves on the SDV are listed in Attachment 1. In addition 5 foreign plants have been identified.

The NRC Order for Modification of License Concerning BWR Scram System, dated January 9, 1981, requires two isolation valves in series in all SDV vent and drain lines. Failure of both redundant drain or both redundant vent valves to

completely close due to a coupling failure would result in a reactor coolant discharge path to the plant drain system. This discharge path can be isolated by manually closing isolation valves 102 or 112 on each hydraulic control unit associated with the SDV of concern or by resetting the scram signal from the control room when the trip signals have cleared.

The Staff's assessment of safety concerns associated with pipe breaks in the BWR scram system (NUREG-0803) presents the results of an off-site dose calculation assuming SDV rupture and release of radionuclides directly to the secondary containment. The results of this calculation, which bound the case of redundant vent or drain valve failure to close, indicate that the off-site doses remain within 10CFR Part 100 limits.

Failure of the drain and vent valves in the closed position would result in the accumulation of water in the SDV due to CRD seal leakage. The NRC has required all BWRs to modify the SDV scram level instrumentation to provide additional assurance of reliable operation under all conditions. This instrumentation will detect water build-up and initiate reactor scram while sufficient SDV free volume exists to contain all reactor water exhausted by a full scram.

Based on the above, it is General Electric's conclusion that the valve/actuator stem coupling failure as a consequence of a procedural error does not constitute a substantial safety hazard. However, since GE is not aware of the extent of application of the Hammel-Dahl 1" and 2" valves in BOP or PWRs, it is considered germane to safety

GBS:rf/G02044*

ATTACHMENT 1

LIST OF PLANTS WITH GE SUPPLIED 1" AND 2"
HAMMEL-DAHL VALVES INSTALLED ON THE SDV

Domestic

Clinton
Fermi-2
Grand Gulf 1
Hanford 2
Hatch 1 & 2
Hope Creek 1
LaSalle 1 & 2
Limerick 1 & 2
Nine Mile Point 2
Perry 1 & 2
River Bend 1
Shoreham
Susquehanna 1 & 2

Foreign

Five plants

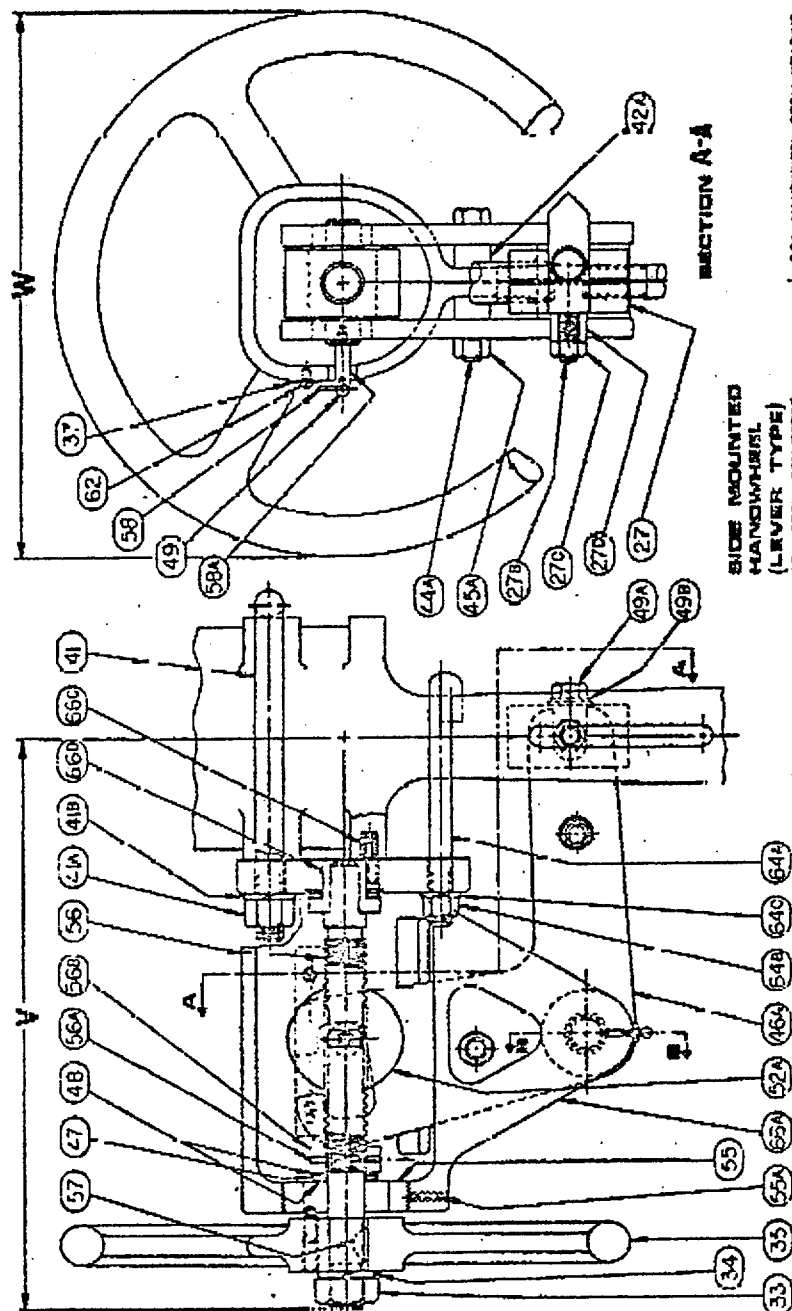
ITT HAMMEL DAHL CONO-FLOW

A Unit of ITT Grinnell Valve Division

175 Post Road, Warwick, Rhode Island 02886 (401) 781-6200

SM-1 SM-2 SIDE-MOUNTED HANDWHEEL

CUSTOMER



SECTION A-A

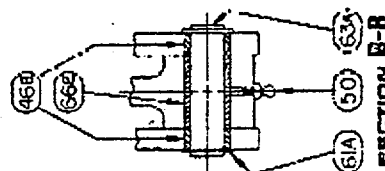
SIDE MOUNTED
HANDWHEEL
(LEVER TYPE)

56A HANDWHEEL STEM BEARING
STOP
56B PIN
57 HANDWHEEL STEM KEY
58 HANDWHEEL TRAVEL INDICATOR
59A INDICATOR ARM
61A PIVOT PIN SLIP RING
62 TRAVEL INDICATOR SCALE
SCREW
63A PIVOT PIN
64A LOWER U-BOLT NUT
64B LOWER U-BOLT WASHER
64C LOWER U-BOLT WASHER
65A HANDWHEEL HOUSING
66B HANDWHEEL HOUSING
BUSHING
66C LOCATING PIN
66D HANDWHEEL STEM BUSHING

27 STEM CONNECTOR
27B STEM CONNECTOR SCREW NUT
27C STEM CONNECTOR SCREW NUT
27D SPACER
33 HANDWHEEL NUT
34 HANDWHEEL LOCK WASHER
35 HANDWHEEL LOCK WASHER
37 HANDWHEEL TRAVEL INDICATOR
SCALE
41 UPPER U-BOLT
41A UPPER U-BOLT NUT
42 LOWER U-BOLT NUT
42A HANDWHEEL ARM SPACER
44A ARM SPACER CAP SCREW NUT
45A ARM SPACER CAP SCREW NUT
46A HANDWHEEL ARM BUSHING
47 BEARING
48 THRUST RACE
49 HANDWHEEL TRAVEL INDICATOR
SCREW
49A TRAVEL INDICATOR SCREW
49B TRAVEL INDICATOR SCREW
L WASHER
50 GREASE FITTING
52A JACKING NUT
55 HANDWHEEL STEM NUT
55A SET SCREW
56 HANDWHEEL STEM

CERTIFIED CORRECT
BY _____
DATE _____

CONT'D.



SECTION B-B

DIAPH. EFFECT. AREA (SQ. IN.)	BOUNNET MOUNT. REF. Z	MAX. ASBL. STROKE (INCH)	V	W
50	2 1/8	1 1/8	12	10
75	2 1/8	1 1/8	12	10
100	2 1/8	1 1/8	12	10
75	2 1/8	1 1/8	12	10
100	2 1/8	1 1/8	12	10
100	3 1/8	2 1/8	12	10
200	2 1/8	1 1/8	15	15
200	3 1/8	2 1/8	15	15

SM-1

SM-2

EFFECTIVE: 7-31-75
SUPERSEDES: 0-0-00

HDC-11043
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NOTE: FOR DIAPHRAGM ACTUATOR DIMENSION
(X) SEE HDC-11041

ITT HAMMEL DAHL CONOFLOW

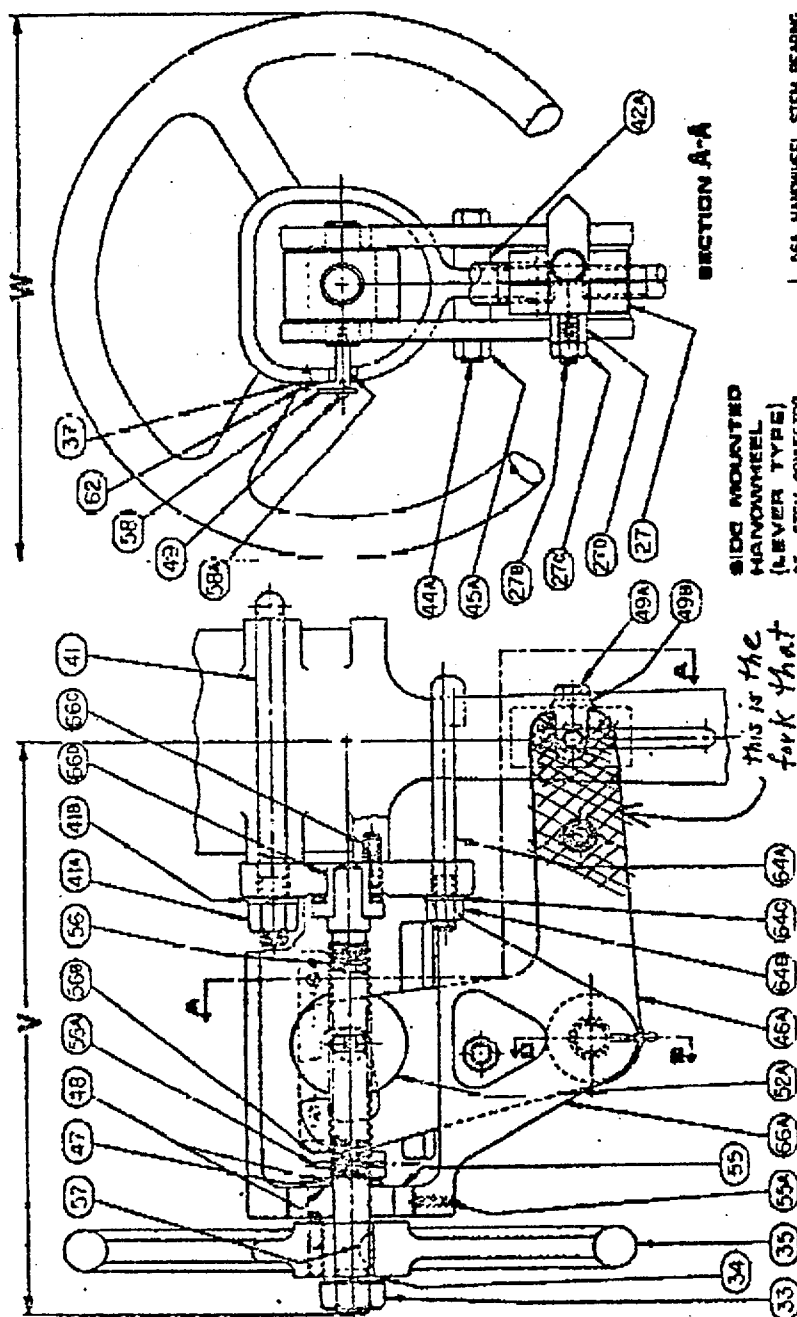
A Unit of ITT Grinnell Valve Division
175 Post Road, Warwick, Rhode Island 02008 (401) 781-8200

CUSTOMER

MA 11 EST 008

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1004.210

SM-1 SM-2 SIDE-MOUNTED HANDWHEEL



SECTION A-A

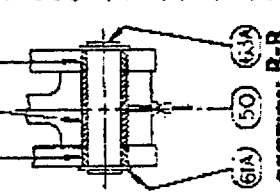
SIDE MOUNTED HANDWHEEL (LEVER TYPE)

- 56A HANDWHEEL STEM BEARING
- 56B PIN
- 57 HANDWHEEL STEM KEY
- 58 HANDWHEEL TRAVEL INDICATOR
- 58A INDICATOR ARM
- 61A PIVOT PIN SNAP RING
- 62 TRAVEL INDICATOR SCALE
- 63A PIVOT PIN
- 63A LOWER U BOLT
- 64B LOWER U BOLT NUT
- 64C LOWER U BOLT WASHER
- 65A HANDWHEEL HOUSING
- 65B BUSHING
- 66C LOCATING PIN
- 66D HANDWHEEL STEM BUSHING
- 27 STEM CONNECTOR SCREW
- 27B STEM CONNECTOR SCREW NUT
- 27C SPACER
- 33 HANDWHEEL NUT
- 34 HANDWHEEL LOCK WASHER
- 35 HANDWHEEL
- 37 HANDWHEEL TRAVEL INDICATOR
- 41 UPPER U BOLT
- 41A UPPER U BOLT NUT
- 42A HANDWHEEL ARM WASHER
- 44A ARM SPACER CAP SCREW
- 45A ARM SPACER CAP SCREW NUT
- 46A HANDWHEEL ARM
- 46B HANDWHEEL ARM BUSHING
- 47 RS-ARM
- 48 THRUST RACE
- 49 HANDWHEEL TRAVEL INDICATOR
- 49A TRAVEL INDICATOR SCREW
- 49B TRAVEL INDICATOR SCREW
- 50 GREASE FITTING
- 52A JACKING NUT
- 53 HANDWHEEL STEM NUT
- 55A SCREW
- 56 HANDWHEEL STEM

CERTIFIED CORRECT
BY _____
DATE _____

CONT'D.

this is the
fork that
can cause a
problem if
left unadjusted



SECTION B-B

CHAR. EFFECT. AREA (SQ. IN.)	BORE/MT. PER Z	MAX. STROKE (INCH)	V	W
5C	2 1/8	1 1/8	12	10
7E	2 1/8	1 1/8	12	10
100	2 1/8	1 1/8	12	10
7C	2 1/8	1 1/8	12	10
100	2 1/8	1 1/8	12	10
100	3 1/8	2 1/8	12	10
200	2 1/8	1 1/8	15	15
200	3 1/8	2 1/8	15	15

SM1

SM2

EFFECTIVE: 7-31-78
SUPERSEDES: 0-0-00

HDC-11043
PRINTED IN U.S.A.

NOTE: FOR DIAGRAM ACTUATOR DIMENSION
(X) SEE HDC-11041

GENERAL ELECTRIC

NUCLEAR SYSTEMS TECHNOLOGY OPERATION

GENERAL ELECTRIC COMPANY • 175 CURTNER AVENUE, M/C • SAN JOSE, CALIFORNIA 95125 • (408) 925-

MC 682, (408) 925-1913

MFN 017-85

February 14, 1985

U.S. Nuclear Regulatory Commission
Office of Inspection and Enforcement
Washington, D.C. 20555

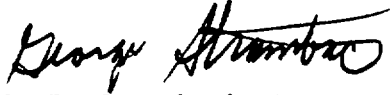
Attention: Mr. C. E. Rossi

Gentlemen:

SUBJECT: TELECON-GERMANE TO SAFETY - SCRAM DISCHARGE VOLUME DRAIN
VALVE COUPLING FAILURE-SUPPLEMENTAL INFORMATION

Please find the attached memo of my telecon to you of February 13, 1985. The telecon provided supplemental information about a stem coupling failure of the Hammel-Dahl 2500#, 2" valve which is utilized as a drain valve on the BWR scram discharge volume.

Very truly yours,



G. B. Stramback, Manager
Safety Evaluations Program

Attachment

cc: L. S. Gifford, GE-Bethesda

MEMO OF TELECON

DATE: February 13, 1985
TIME: 2:00 p.m.
PERSON CALLING G. B. Stramback *Gary Stramback*
PERSON CALLED: C. E. Rossi (NRC-I&E, 301-492-4193)
SUBJECT: SCRAM DISCHARGE VOLUME DRAIN VALVE COUPLING
FAILURE-SUPPLEMENTAL INFORMATION

Ernie Rossi was called to provide additional information requested in a telecon of the previous day (2/12/85 at 2 pm). All of the BWR's listed in the Attachment to the original communication have been informed of this concern.

The testing conditions during the supplemental five-second delay test were a normal environment without any seismic loading. The cause of failure was determined to be inadvertent engagement of the valve hand wheel during valve setup for test purposes. On valve actuation during the test, coupling loads exceeded design loads. The stem connector deformed allowing disengagement between the stem connector and valve stem.