NRC Form 366
(9-83)

U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/85

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Davis-Besse Unit 1	0 5 0 0 0 3 4 6	1 OF 0 3

TITLE (4)
Consolidated Controls Corporation Field Installed Wire Wrap Practice

EVENT DATE (5)			LER NUMBER (6)			REPORT DATE (7)			OTHER FACILITIES INVOLVED (8)	
MONTH	DAY	YEAR	YEAR	SEQUENTIAL NUMBER	REVISION NUMBER	MONTH	DAY	YEAR	FACILITY NAMES	DOCKET NUMBER(S)
										0 5 0 0 0
0 1	2 3	8 6	8 6	0 0 9	0 0	0 2	2 1	8 6		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)			
	5	20.402(b)	20.405(c)	50.73(a)(2)(iv)	73.71(b)
POWER LEVEL (10)	0 0 0	20.405(a)(1)(i)	50.36(c)(1)	X 50.73(a)(2)(v)	73.71(c)
		20.405(a)(1)(ii)	50.36(c)(2)	50.73(a)(2)(vii)	X OTHER (Specify in Abstract below and in Text, NRC Form 366A)
		20.405(a)(1)(iii)	50.73(a)(2)(i)	50.73(a)(2)(viii)(A)	Follow up potential Part 21 report
		20.405(a)(1)(iv)	50.73(a)(2)(ii)	50.73(a)(2)(viii)(B)	
		20.405(a)(1)(v)	50.73(a)(2)(iii)	50.73(a)(2)(x)	

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER
	AREA CODE
Charles E. Rupp, Senior Assistant Engineer	4 1 9 2 4 9 - 5 0 0 0

COMPLETE ONE LINE FOR EACH COMPONENT FAILURE DESCRIBED IN THIS REPORT (13)

CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS		CAUSE	SYSTEM	COMPONENT	MANUFACTURER	REPORTABLE TO NPRDS	

SUPPLEMENTAL REPORT EXPECTED (14)

		EXPECTED SUBMISSION DATE (15)	MONTH	DAY	YEAR
YES (If yes, complete EXPECTED SUBMISSION DATE)	X NO				

ABSTRACT (Limit to 1400 spaces, i.e., approximately fifteen single-space typewritten lines) (16)

Toledo Edison (TED) observed a Consolidated Controls Corporation (CCC) field engineer performing modifications in the Steam and Feedwater Rupture Control System (SFRCS) cabinets. TED noted that the field engineer had the practice of sliding existing wire wrap connections down the terminal posts to make room for additional wires. This practice was questioned, but TED was assured by the CCC field engineer that this was an acceptable practice.

Subsequently, TED performed pull testing of some wire wraps and determined that once a wrap has been moved its strip force was sharply reduced. Of the four wraps that were moved two would not have met the Military Standard MIL-STD-1130B, and none of the four would have met the ANSI Standard C83.72-1976 for minimum strip force for wire wrap connections.

This condition was reported under 10CFR Part 21 by telephone to the NRC Region III on January 24, 1986 with the follow up five day written report submitted January 28, 1986.

This written report is being submitted as additional follow up to the Part 21 report and under 10CFR50.73(a)(2)(v) as a condition that could have prevented the fulfillment of the safety function of SFRCS.

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☆ U.S.GPO:1984-0-454-481/18759

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TEXT (If more space is required, use additional NRC Form 366A's) (17)

Description of Occurrence: Toledo Edison was observing a Consolidated Controls Corporation (CCC) field engineer performing modifications in the Steam and Feedwater Rupture Control System, SFRCS, (JB), cabinets. SFRCS was in a deenergized mode with the logic modules (a small card that has integrated circuits to control system functions) removed from the cabinets. These logic modules have .025 inch square posts that are used for terminations of wiring. The connections are made by a process called wire wrapping. The wire wrap is accomplished by wrapping an uninsulated portion of wire around the square posts using a special gun (similar to a drill). The CCC field representative was observed sliding and existing wire wrap connection down the square post to make room for a second termination. This practice was questioned, but TED was assured that this was acceptable.

Subsequent investigation by TED revealed two standards (Military Standard MIL-STD-1130B, Connections, Electrical, Solderless Wrapped, and ANSI Standard C83.72-1976, Solderless Wrapped Electrical Connections) that stipulated specific criteria for acceptable wire wraps. The requirement for a minimum strip force (the force required to displace the wire wrap connection a minimum of one wire diameter) for the 30 AWG wire being used is 3 pounds in the ANSI Standard and 2 pounds in the Military Standard.

Subsequently, TED performed pull testing on some wire wraps and determined that wraps that had not been moved would not fail until 8 to 12 pounds of strip force was applied, which is well above the acceptance criteria. However, when the test was conducted on four wire wraps that had been applied to terminal posts and then pushed down further, the strip force required was sharply reduced. One wrap pulled with 2½ pounds, one with 2 pounds and two with 1 pound of strip force applied. Two of the four would not have met the minimum Military Standard requirements and none would have met the ANSI requirements.

TED, therefore, identified that moving a wire wrapped connection will require retermination to ensure the minimum strip force criteria is satisfied.

This is being submitted as a follow up the the Part 21 report submitted January 28, 1986 and under 10CFR50.73(a)(2)(v) as a condition that could have prevented the fulfillment of the safety function of SFRCS.

Designation of Apparent Cause of Occurrence: The cause of this condition in the SFRCS cabinets was the failure of the CCC field representative to follow his own procedure and the lack of a station procedure to be used to check the work. CCC procedure QS-WR-104, Inspection of Solderless Wire Wrap Connections, specifically prohibits the probing, by any means, of wire wraps. Disturbing an existing connection to make room for an additional wire would be contrary to this procedure.

Analysis of Occurrence: None of the wire wrap deficiencies had been shown to be directly related to an actual failure in the SFRCS cabinets. However, had a failure in the connection occurred, the SFRCS actuated equipment may not have been able to perform its safety function.

Corrective Action: Maintenance Procedure IC 2701.20, Instructions for Installation and Removal of Wire Wrap Connections has been written to provide the station with detailed instructions for proper wire wraps.

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TEXT *(If more space is required, use additional NRC Form 366A's)* (17)

Under Maintenance Work Orders (MWO) 1-86-0328-00 and 1-86-0328-01 the SFRCS logic racks will be stripped and rewired onsite.

The logic modules were stripped and rewired offsite by a vendor using an automatic wire wrapping machine. This offsite work was done in compliance with Military Standard MIL-STD-1130B.

Toledo Edison has begun a review of other major instrument systems to determine if other wire wrap problems exist. Any deficiency which affect operability will be reported in a revision to this report.

Failure Data: There have been no previous reports of wire wrap connection problems.

REPORT NO: NP-33-86-05

DVR NO(s): 86-015

TOLEDO EDISON

February 19, 1986

Log No. KA86-65
File: RR 2 (NP-33-86-05)

Docket No. 50-346
License No. NPF-3

U. S. Nuclear Regulatory Commission
Document Control Desk
Washington, D. C. 20555

Gentlemen:

LER No. 86-009
Davis-Besse Nuclear Power Station Unit 1
Date of Occurrence: January 23, 1986

Enclosed is Licensee Event Report 86-009 which is being submitted in accordance with 10CFR50.73, to provide 30 day written notification of the subject occurrence.

Yours truly,

Louis F. Storz

Louis F. Storz
Plant Manager
Davis-Besse Nuclear Power Station

LFS/syc

Enclosure

cc: Mr. James G. Keppler
Regional Administrator
USNRC Region III

Mr. Walt Rogers
DB-1 NRC Resident Inspector

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