COMMISSION
WASHINGTON, D.C. 20555

DEC 6 1977

Those on Attached List

MONTHLY LICENSEE EVENT REPORT (LER) PWR LISTINGS

The enclosed LER computer listings provide information on certain licensee event reports entered into the file during the month of November. The two listings provided are as follows:

1. LER output on PWR events sorted by cause, facility, and event date.

2. LER output on events involving personnel error sorted by facility and event date.

If you desire additional information or special searches, please do not hesitate to contact us.

T. A. Kirk, Acting Director
Regulatory Info. Systems Division
Office of Management Information
and Program Control

Enclosures:
As stated

OTHER CAUSE SUBCODE NOT PROVIDED CRYSTAL RIVER-3 ENGINES, INTERNAL COMBUSTION SUBCOMPONENT NOT APPLICABLE EMERG GENERATOR SYS + CONTROLS ROUTINE TEST/INSPECTION FAIRBANKS MORSE	05000302 77 03L 019302	092877 101277 30 DAY	STEADY STATE OPERATION (77-120) IN MODE 1 RUNNING MONTHLY EMERGENCY DIESEL TES., SP-354, 3A EM ER. DIESEL GEN. FAILED TO START CONTRARY TO TECH SPEC. REDUNDANT DIESEL 3A AVAILABLE & OPERABLE. FIRST TIME OCCURRENCE. CABLE [illegible] SP-321 [illegible] BREAKER VERIFICATION SP-321 PERFORMED. 3B EMER. DIESEL GEN. RESTORED [illegible] PERABLE IN 7 HOURS.. 032 LOSS OF DIESEL START PERMISSIVE DUE TO LOW LUBE OIL PRESSURE. EVENT COU LD NOT BE MADE TO REPEAT & HAS NOT REPEATED TO THIS DATE.
OTHER CAUSE SUBCODE NOT PROVIDED CRYSTAL RIVER-3 BATTERIES + CHARGERS SUBCOMPONENT NOT APPLICABLE DC ONSITE POWER SYS + CONTROLS ROUTINE TEST/INSPECTION EXIDE INDUSTRIAL DIV	05000302 77 03L 019300	101177 110177 30-DAY	STEADY STATE OPERATION (77-132) 11 & 26 OCTOBER 1977, UNITS 1 & 2 BATTERIES DIDN'T MEET ACCEPT ANCE CRITERIA OF QUARTERLY & WEEKLY SURVEILLANCE PROCEDURES, RESULTING I N A CONDITION CONTRARY TO T.S. 3.8.1.1.A. REDUNDANCY WAS MAINTAINED WIT H EMER. GEN. THIRD & FOURTH OCCURRENCES OF EVENT. BATTERIES RESTORED O PERABLE WITHIN 24 HOURS EACH TIME. 106 STRATIFICATION OF ELECTROLYTE DUE TO BATTERIES BEING IN NO LOAD CONDITIO N. RECOMMENDATION TO INCREASE FLOAT VOLTAGE .05 VOLTS WILL BE SUBMITTED TO PRECLUDE RECURRENCE.
OTHER NOT APPLICABLE DAVIS-BESSE-1 INSTRUMENTATION + CONTROLS OTHER NON INST SYS REQD FOR SAFETY OPERATIONAL EVENT CONSOLIDATED CONTROLS CORP.	05000346 77-014/01T-0 019300	092577 100777 2-WEEK	ROUTINE SHUTDOWN OPERATIONS HALF TRIP OF STEAM & FEEDWATER RUPTURE CONTROL SYSTEM CAUSED RISE IN REA CTOR COOLANT SYSTEM TEMP & PRESSURE. CAUSED PRESSURIZER POWER RELIEF VA LVE TO OPEN & VALVE FAILED TO CLOSE, CAUSING REDUCTION IN RCS PRESSURE. LCOS WERE EXCEEDED FOR 5 T.S., 3.4.1, 3.4.5, 3.4.6.2, 3.6.1.4 & 3.7.1.2 60 HALF TRIP CONDITION FROM SFRCS CHANNEL 2, WHICH CAUSED VALVE FUSE [illegible] LOSE. CAUSE OF THIS HALF TRIP HAS NOT BEEN POSITIVELY DETERMINED ALTHO GH EXTENSIVE INVESTIGATION HAS REVEALED LOOSE CONNECTIONS AT TERMINAL BL ANKS (POSSIBLE CAUSE).

2

OPERATING UNITS STATUS REPORT

DATA AS OF 10-31-77

NUREG 002C
VOL. 1 NO.
NOVEMBER

LICENSED OPERATING REAC
DATA FOR DECISIONS

- Department Of Energy
- Nuclear Regulatory Commission

DAVIS-BESSE 1

NRC POWER RESTRICTIONS: NONE

FACILITY DATA

Facility Description

1. Location (State/County) Distance and direction from nearest city	Ohio/Ottawa Northwest, 21 miles
2. Electric Reliability Council	CAPCO
3. Type of Reactor	PWR (B&W)
4. Licensed Power Level (MWt)	2772
5. Design Electrical Rating (MWe-Net)	906
6. Date of Initial Criticality	N/A
7. Date of Commercial Operation	N/A
8. Condenser Cooling Method	Cooling Tower
9. Condenser Cooling Water Source	Lake Erie

Utility & Contractor Information

10. Licensee	Toledo Edison Co.
11. Corporate Address	Edison Plaza, 300 Madison Ave., Toledo, Ohio 43652
12. Corporate Contact	Lowell Roe, V.P., Power (419) 259-5000
13. Architect/Engineer	Bechtel Corp.
14. Nuclear Steam Supply System	Babcock & Wilcox Co.
15. Constructor	Bechtel Corp. (Mngr.)

Regulatory Information

16. IE Region Responsible	III
17. IE Branch Chief	G. Fiorelli
18. IE Senior Inspector	[illegible]
19. IE Resident Inspector	L. N. Tambling
20. Licensing Project Manager	L. Engle
21. Docket Number	50-346
22. License Number/Date of Issuance	NPF-3 [illegible]

INSPECTION STATUS

ENFORCEMENT STATUS

NONE

INSPECTION STATUS

1. OTHER SIGNIFICANT ITEMS

a. [illegible]

None.

b. [illegible]

None.

c. [illegible]

None.

DATES OF LAST INSPECTION: September [illegible], 1977

INSPECTION REPORT NO: [illegible]

2. SUMMARY

INSPECTION SUMMARY

• Inspection on September [illegible] [illegible]

PLANT STATUS

• Plant outage from the September [illegible], 1977 [illegible] continued until October [illegible], 1977. On October [illegible], 1977, the reactor tripped [illegible] September [illegible], 1977 [illegible] Outage continued to December [illegible], 1977.

REPORTS RECEIVED FROM LICENSEE

NUMBER	DATE OF EVENT	DATE OF REPORT	TYPE OF REPORT	SUBJECT
[illegible]	[illegible]	[illegible]	[illegible] Day Report	Loss of RCS pressure due to failure of [illegible] power operated relief valve.
[illegible]	[illegible]	[illegible]	30 Day Report	Diesel Generator No. 1 inoperable.
[illegible]	[illegible]	[illegible]	30 Day Report	[illegible] pump 1-2 inoperable due to injection valve closed.
[illegible]	[illegible]	[illegible]	30 Day Report	[illegible] inoperable for connection to the Pressurizer.
[illegible]	[illegible]	[illegible]	30 Day Report	[illegible] pump 1-2 inoperable due to a planned adjustment.
[illegible]	[illegible]	[illegible]	30 Day Report	[illegible] pump 1-1 inoperable due to replace the relief valve in cooling water line.
[illegible]	[illegible]	[illegible]	30 Day Report	[illegible] pump motor 1-1-2 declared inoperable due to [illegible]
[illegible]	[illegible]	[illegible]	30 Day Report	[illegible] pump 1-2 inoperable to install valve in cooling water line.
[illegible]	[illegible]	[illegible]	30 Day Report	Hydraulic snubber [illegible] inoperable.
[illegible]	[illegible]	[illegible]	30 Day Report	[illegible] level exceed [illegible] inches level.
[illegible]	[illegible]	[illegible]	30 Day Report	RCS flow less than [illegible] gallons per minute.
[illegible]	[illegible]	[illegible]	30 Day Report	RCS Temp less than [illegible] degrees F.
[illegible]	[illegible]	[illegible]	30 Day Report	Single RCS pump operating in a single loop.

Reviewed by MIPC OED: D.R. Beebe DATE: 11/29/77

Reviewed by NRR DOR: L.Engle DATE: 12/1/77

NUREG 0020
VOL. 1 NO. /
DECEMB

OPERATING UNITS STATUS REPORT

DATA AS OF 11-30-77

LICENSED OPERATING REAC

DATA FOR DECISIONS

- Department Of Energy
- Nuclear Regulatory Commission

FACILITY DATA

NRC POWER RESTRICTIONS: None

INSPECTION STATUS

Facility Description

1. Location (State/County) (nearest population center)	Ohio/Ottawa; Northeast, 21 miles
2. Electric Reliability Council	ECAR
3. Type of Reactor	PWR-B&W
4. Licensed Power Level (MWt)	2772
5. Design Electrical Rating (MWE-Net)	906
6. Date of Initial Criticality	[illegible]
7. Date of Commercial Operation	11/20/77
8. Condenser Cooling Method	Cooling Tower
9. Condenser Cooling Water Source	Lake Erie

Utility & Contractor Information

10. Licensee	Toledo Edison Co.
11. Corporate Address	Edison Plaza, 300 Madison Ave., Toledo, Ohio 43652
12. Corporate Contact	Lowell Roe, V.P., Power (419) 259-5000
13. Architect/Engineer	Bechtel Corp.
14. Nuclear Steam Supply System	Babcock & Wilcox Co.
15. Constructor	Bechtel Corp. (Mngr.)

Regulatory Information

16. IE Region responsible	III
17. IE Branch Chief	G. Fiorelli
18. IE Senior Inspector	[illegible]
19. IE Principal Inspector	T. N. Tambling
20. Licensing Project Manager	L. Engle
21. Docket Number	50-346
22. License Number/Date of Issue	NPF-3, 04-22-77

ENFORCEMENT STATUS

Contrary to the approved quality assurance manual and Criterion V of 10 CFR 50, Appendix B, administrative procedure 1071.00 was not completely [illegible] in the checking and review of jumper-lift sheets.

2. OTHER SIGNIFICANT ITEMS

a. SYSTEMS AND COMPONENT PROBLEMS

As a result of a spurious trip on September 24, 1977, in the Steam Feedwater Rupture Control System, feedwater was lost to No. 2 steam generator. This resulted in a sudden depressurization transient in both the secondary and primary water systems. These operational transients were aggravated by the failure of the No. 1 auxiliary feedwater pump to come up to operating speed and the pressurizer power operated relief valve failing open. Design modifications were made to the governor on the auxiliary feedwater pump turbine and the power operated relief valve to [illegible] concurrence. (77-32)

b. FACILITY ITEMS (PLANS AND PROCEDURES):

Power ascension testing is to be continued at the 40% power level. (77-33)

c. MANAGERIAL ITEMS:

None.

LAST IE SITE INSPECTION DATE: September 26-30; October 3-7, 11-14, 18-21 and 25-28, 1977

INSPECTION REPORT NO: 77-28, 77-30, 77-31 and 77-32

3. SUMMARY

INSPECTION SUMMARY

Inspection on October 11-14, (77-28): Unannounced inspection regarding implementation of approved security plan which was submitted in accordance with 10 CFR 50.34(c); applicable parts of 10 CFR 73.55 requirements effective as of May 25, 1977; and 10 CFR 73.55 requirements. Specifically, the inspection covered areas relative to the security organization, physical barriers, access controls, detection aids, communication controls, testing and maintenance of security equipment, response controls and records requirements. The inspection involved [illegible] inspector hours onsite by two NRC inspectors. Additionally, an enforcement meeting was held with corporate and site management on November 4, 1977, to discuss the inspection findings. This meeting involved 8 hours onsite by the Safeguards Branch Chief, the Chief of Security and Investigations Section, and the principal physical security specialist for this inspection. Of the eight areas inspected, no apparent items of noncompliance were identified in four areas; six items of noncompliance were identified in four areas (Physical Barriers, Access Controls, Detection Aids and Records). The Enforcement Conference held on November 4, 1977, with representatives of the licensee's management developed that corrective action has been initiated with respect to all of the items noted above. The adequacy of the action will be reviewed on receipt of the licensee's response to the notice of violation.

Inspection on October 25-28, (77-30): Nuclear material control and accountability including facility organization and operational measurements

SEE CONTINUATION PAGE 8-26A

REPORTS RECEIVED FROM LICENSEE

NUMBER	DATE OF EVENT	DATE OF REPORT	TYPE OF REPORT	SUBJECT	PUBLIC ATTENTION
50-346/77-[illegible]	10/21/77	11/[illegible]/77	14 Day Report	Cooling water to SFP heating improperly aligned.	
50-346/77-[illegible]	10/31/77	11/14/77	14 Day Report	Inoperable AFP 1-2 due to turbine governor valve drifting closed.	*
50-346/77-[illegible]	11/17/77	11/29/77	14 Day Report	Isolation of AFP 1-2's steam generator to feedwater differential pressure switches.	*
50-346/77-[illegible]	[illegible]/06/77	11/03/77	30 Day Report	Decay heat valve did not open to perform mode change.	**
50-346/77-[illegible]	10/10/77	11/03/77	30 Day Report	RPS channel inadvertently de-energized.	**
50-346/77-[illegible]	10/11/77	11/09/77	30 Day Report	Source range neutron detector NI-1 failed.	**
50-346/77-[illegible]	10/18/77	11/17/77	30 Day Report	Governor valve stuck on AFP 1-2.	**
50-346/77-[illegible]	10/16/77	11/16/77	30 Day Report	Exceeded allowed containment to annulus delta P on startup.	**
50-346/77-[illegible]	10/19/77	11/18/77	30 Day Report	EVS Train 2 damper failed to modulate correctly.	**
50-346/77-[illegible]	10/25/77	11/22/77	30 Day Report	Failure of valve SP 101, AFP 1-2 to steam generator.	**
50-346/77-[illegible]	10/25/77	11/23/77	30 Day Report	Surveillance test 5000.01, independent [illegible] of source [illegible], performed late.	**
50-346/77-[illegible]	10/28/77	11/23/77	30 Day Report	Failure of RIS 2007 in SFAS channel 4 to respond to check source.	**
50-346/77-[illegible]	10/26/77	11/23/77	30 Day Report	SFAS channel 3 containment radiation erratic.	**
50-346/77-[illegible]	10/27/77	11/23/77	30 Day Report	Source range neutron detector NI-1 failed.	**
50-346/77-[illegible]	11/01/77	11/28/77	30 Day Report	Failure to perform surveillance requirement of [illegible] valve [illegible] 72.	**

Reviewed by MIPC OED: P.E. [illegible] DATE: [illegible]

Reviewed by NRR DOR: [illegible] DATE: 1/1/78

CURRENT EVENTS

POWER REACTORS

UNITED
NUCL
REGUL
COMMI

THIS COMPILATION OF SELECTED EVENTS IS PREPARED TO DISSEMINATE INFORMATION ON OPERATING EXPERIENCE AT NUCLEAR POWER PLANTS IN A TIMELY MANNER AND AS OF A FIXED DATE. THESE EVENTS ARE SELECTED FROM PUBLIC INFORMATION SOURCES. NRC HAS, OR IS TAKING CONTINUOUS ACTION ON THESE ISSUES AS APPLICABLE, FROM AN INSPECTION AND ENFORCEMENT, LICENSING AND GENERIC REVIEW STANDPOINT.

1 SEPTEMBER - 31 OCTOBER 1977

(PUBLISHED DECEMBER 1977)

Porter EXHIBIT 9
FOR IDENTIFICATION
7/12/79
S. McGR

OPERATOR ERROR

On January 11, 1977 while the Fort Calhoun Station Unit 1 was operating, water from the Refueling Water Storage Tank was pumped into the containment through the containment spray header due to an operator error.

During the performance of a quarterly test of the safety injection and containment spray pumps, the operator noticed an increase in the containment sump level approximately ten minutes after the low pressure safety injection pump had been started. Approximately 3300 gallons of water had been pumped to the containment. About one minute later the ventilation isolation actuation signal was received. At this time the operator realized he had failed to follow the surveillance procedures and had left the discharge valve of the low head safety injection pump open. He immediately secured the pump.

The Reactor Coolant System was checked for leakage and containment entry was made approximately one hour later. Inspection revealed that a discharge from the containment spray nozzles had occurred. A few minutes later power reduction was started. A second containment entry was made about an hour later, after containment air samples confirmed that a full face mask would provide adequate respiratory protection for the levels of radioactivity in the building. A detailed inspection revealed no serious deficiencies and no electrical grounds; the power reduction was terminated at a power level of 83%.

Although the operator had not followed the procedure and the discharge valve was open, the containment spray header isolation valve (HCV-345) and the low pressure safety injection to containment spray header cross-connect valve (HCV-335) should have prevented the event. The electric/pneumatic converter on HCV-345 had failed and both red and green position indication lights were on, indicating the valve was partially open. Prior to the event the auxiliary Building Equipment Operator had taken local control of the valve in an attempt to completely close the valve. After about 1/2 inch of stem travel, the operator removed the valve pin and the valve went back to its previou position as demanded by the valve positioner. The third valve (HCV-3: in the incident had a leakage problem that had been previously identi: but no corrective action had been taken.

The pneumatic relay on valve HCV-345 was replaced and valve HCV-335 repaired. Valve HCV-344 and HCV-345 are now required to be placed in the test mode prior to operating the low pressure safety injection pump or contain spray pump for testing. This mode along with verification of an annunciator will ensure that both of these valves are in the fully closed position prior to pump operation.

VALVE MALFUNCTIONS

1. Primary System Depressurization

On September 24, 1977, Davis Besse Nuclear Power Station Unit No. 1 experienced a depressurization when a pressurizer power relief valve failed in the open position. The Reactor Coolant System (RCS) pressure was reduced from 2255 psig to 875 psig in approximately twenty-one (21) minutes. At the beginning of this event, steam was being bypassed to the condenser and the reactor thermal power was at 263 MW, or 9.5%. Electricity was not being generated. The following systems malfunctioned during the transient:

a. Steam and Feedwater Rupture Control System (SFRCS).

b. Pressurizer Pilot Actuated Relief Valve.

c. No. 2 Steam Generator Auxiliary Feed Pump Turbine Governor.

The event was initiated at 2134 hours, when a spurious "half-trip" occurred in the SFRCS, resulting in closure of the No. 2 Feedwater Startup Valve and loss of flow to No. 2 Steam Generator. Approximately one minute later, low level in the No. 2 Steam Generator caused a full SFRCS trip, closing the Main Steam Isolation Valves

(MSIV). The loss of heat sink for the reactor caused the RCS temperature, pressure, and pressurizer level to rise.

The RCS pressure increased to the pilot actuated relief valve setpoint (2255 psig) and the valve cycled open and closed nine times in rapid succession, failing to close on the tenth opening. Meanwhile, the reactor operator observed the pressurizer level increase and manually tripped the reactor about one minute after MSIV closure (two minutes into the transient). At this point the RCS pressure was approximately 2000 psig and decreasing while the pressurizer level had reached its maximum initial rise of about 310 inches. The RCS pressure continued to decrease due to the open relief valve and upon reaching 1620 psig approximately three minutes into the transient, actuated Safety Features including high pressure (water) injection and containment isolation.

Approximately five minutes into the transient the rupture disc on the pressurizer quench tank, which was receiving the RCS blowdown, burst. Bursting of the rupture disc was aggravated by the actuation of containment isolation, which had isolated the quench tank cooling system, resulting in expedited pressurization of the quench tank.

The RCS continued to blow down through the open pressurizer power relief valve and the quench tank rupture disc opening until primary coolant saturation pressure was reached, about six minutes into the transient. The formation of steam in the RCS caused an insurge of water into the pressurizer. This insurge and the high pressure water injection then restored pressurizer level to about 310 inches after nine minutes into the transient.

Approximately thirteen minutes into the transient, the secondary side of the No. 2 Steam Generator went dry. About fourteen minutes into the transient, the operators noticed the low level condition and found that the auxiliary feed pump was operating at reduced speed. Manual control of the auxiliary feed pump was started and water level restored to the No. 2 Steam Generator.

At approximately 21 minutes into the transient, the operators discovered that the pressurizer power relief valve was stuck open. Blowdown via this valve was stopped by closing the block valve, thus terminating the reactor vessel depressurization. The RCS pressure recovered to normal and cooldown of the system followed.

The reason for the spurious "half-trip" of the SFRCS has not yet been determined. An extensive investigation revealed several loose connections at terminal boards, but nothing conclusive.

Investigation into the failure of the pressurizer pilot actuated relief valve revealed that a "close" relay was missing from the control circuit. This missing relay would normally provide a "seal-in" circuit which would hold the valve open until the pressure dropped to 2205 psig. Without the relay the power relief valve cycled open and closed each time the pressure of the RCS went above or below 2255 psig. The rapid cycling of the valve caused a failure of the pilot valve stem, and this failure caused the power relief valve to remain open.

It was determined that the auxiliary feed pump did not go to full speed because of "binding" in the turbine governor.

The transient was analyzed by the NSSS vendor and determined to be within the design parameters analyzed for a rapid depressurization.

With exception of the above noted malfunctions, the plant functioned as designed and there was no threat to the health and safety of the general public.[2-3]

2. Feedwater Isolation Valves

On two occasions in July, at the Trojan nuclear plant, a hydraulic feedwater isolation valve failed to close upon receipt of a close signal. All other equipment required to operate, functioned normally.

The first failure, July 6, 1977, had been attributed to an improperly assembled solenoid in the hydraulic actuator. Investigation of the second failure indicated that both events were due to a lack of sufficient hydraulic pressure.

Failure of the valve to close was caused by the pressure regulator leaking and failing to close down to regulate the pressure. This caused the hydraulic system on the valve to be drained down to a point that the valve would not operate. Inspection of the regulator revealed that a locking screw on the regulator adjusting knob was loose and would allow the knob to vibrate to any position. With the regulator improperly set it would not close down to regulate pressure and would allow the hydraulic fluid to drain before the hydraulic operator could function. A similar problem was discovered on two other valves, although the maladjustment was not sufficient to prevent these valves from operating.

ATOMIC ENERGY CLEARING HOUSE
(REG. U. S. PAT. OFF.)
PUBLISHED BY
CONGRESSIONAL INFORMATION BUREAU, INC.
DAILY NEWS SERVICE SINCE 1897
COLORADO BUILDING
FOURTEENTH AND G STREETS, NORTHWEST
WASHINGTON, D. C. 20005

ROBERT P. CAZALAS
PRESIDENT

GROVER C. BOYDSTON
EDITOR

Vol. 24

January 9, 1978

13

IN THIS WEEK'S ISSUE

NRC WILL HOLD PUBLIC HEARING ON PROPOSED CLEARANCE PROGRAM FOR SOME EMPLOYEES IN COMMERCIAL NUCLEAR INDUSTRY. Proposed changes to NRC regulations upgrading its safeguards program would apply to personnel who have access to or control over certain quantities of special nuclear material (high enriched uranium, plutonium and uranium-233), or access to protected areas of facilities such as nuclear power plants and fuel reprocessing plants.

The date and location of the hearing will be announced later.

The Commission will specifically seek comments of individuals and groups on such matters as:

(1) The advantages and disadvantages of alternative programs, such as psychological testing administered by licensees under standards established by the Commission, and alternative safeguards measures not involving investigation or testing of licensee employees.

(2) The extent to which the clearance program meets the performance requirements for protecting nuclear power reactors, particularly toward meeting the postulated threat of internal conspiracy.

(3) The desirability of applying the rule to university research and training reactors subject to Part 73 (physical protection of plants and materials) of NRC regulations.

(4) Impact of the proposed clearance program on transportation of special nuclear material.

Persons who wish to present oral or written statements on the proposed clearance program, announced by the NRC last March, must submit their name and name of their organization, if any, to the Secretary of the Commission, Washington, D.C. 20555, by January 27.

- 6 - 6 - 6 - 6 - 6 - 6 -

to stocks, although restrictions on the enrichment of foreign uranium for domestic use were partially lifted. All restrictions were to be lifted by 1983.

During the same 9-month period, 123 tons of uranium compounds, including metals and alloys, valued at $2.9 million and 882 tons of uranium compounds, including $59.0 million were exported. The value of exported special nuclear materials, principally enriched uranium, for the first 10 months was $391 million.

\- 6 - 6 - 6 - 6 - 6 - 6 -

NRC'S REPORT OF CURRENT EVENTS FOR POWER REACTORS FOR THE PERIOD SEPTEMBER 1-OCTOBER 31, 1977, published December 1977, is presented below:

OPERATOR ERROR

On January 11, 1977 while the Fort Calhoun Station Unit 1 was operating, water from the Refueling Water Storage Tank was pumped into the containment through the containment spray header due to an operator error.

During the performance of a quarterly test of the safety injection and containment spray pumps, the operator noticed an increase in the containment sump level approximately ten minutes after the low pressure safety injection pump had been started. Approximately 3300 gallons of water had been pumped to the containment. About one minute later the ventilation isolation actuation signal was received. At this time the operator realized he had failed to follow the surveillance procedures and had left the discharge valve of the low head safety injection pump open. He immediately secured the pump.

The Reactor Coolant System was checked for leakage and containment entry was made approximately one hour later. Inspection revealed that a discharge from the containment spray nozzles had occurred . A few minutes later power reduction was started. A second containment entry was made about an hour later, after containment air samples confirmed that a full face mask would provide adequate respiratory protection for the levels of radioactivity in the building. A detailed inspection revealed no serious deficiencies and no electrical grounds; the power reduction was terminated at a power level of 83%.

Although the operator had not followed the procedure and the discharge valve was open, the containment spray header isolation valve (HCV-345) and the low pressure safety injection to containment spray header cross-connect valve (HCV-335) should have prevented the event. The electric/pneumatic converter on HCV-345 had failed and both red and green position indication lights were on, indicating the valve was partially open. Prior to the event the Auxiliary Building Equipment Operator had taken local control of the valve in an attempt to completely close the valve. After about 1/2 inch of stem travel, the operator removed the valve pin and the valve went back to its previous position as demanded by the valve positioner. The third valve (HCV-335) in the incident had a leakage problem that had been previously identified but no corrective action had been taken.

The pneumatic relay on valve HCV-345 was replaced and valve HCV-335 repaired. Valve HCV-344 and HCV-345 are now required to be placed in the test mode prior to operating the low pressure safety injection pump or contain spray pump for testing. This mode along with verification of an annunciator will ensure that both of these valves are in the fully closed position prior to pump operation.

VALVE MALFUNCTIONS

1. Primary System Depressurization

On September 24, 1977, Davis Besse Nuclear Power Station Unit No. 1 experienced a depressurization when a pressurizer power relief valve failed in the open position. The Reactor Coolant System (RCS) pressure was reduced from 2255 psig to 875 psig in approximately twenty-one (21) minutes. At the beginning of this event, steam was being bypassed to the condenser and the reactor thermal power was at 263 MW, or 9.5%. Electricity was not being generated. The following systems malfunctioned during the transient:

a. Steam and Feedwater Rupture Control System (SFRCS)
b. Pressurizer Pilot Actuated Relief Valve.
c. No. 2 Steam Generator Auxiliary Feed Pump Turbine Governor.

- 1

[illegible]

The [illegible] at full power, [illegible] a spurious "half-trip" occurred
in the [illegible] of the No. 2 Feedwater Startup Valve and loss of
flow to No. 2 Steam Generator. Approximately one minute later, low level in the No. 2
Steam Generator [illegible] full [illegible] trip, closing the Main Steam Isolation Valves
(MSIV). The loss of heat sink for the reactor caused the RCS temperature, pressure,
and pressurizer level to rise.

The RCS pressure increased to the pilot actuated relief valve setpoint (2255 psig)
and the valve cycled open and closed nine times in rapid succession, failing to close
on the [illegible] opening. Meanwhile, the reactor operator observed the pressurizer level
increase and manually tripped the reactor about one minute after MSIV closure (two
[illegible] into the transient). At this point the RCS pressure was approximately 2000
psig and decreasing while the pressurizer level had reached its maximum initial rise
of about 310 inches. The RCS pressure continued to decrease due to the open relief
valve and upon reaching 1600 psig approximately three minutes into the transient,
Engineered Safety Features including high pressure (water) injection and containment
isolation.

Approximately five minutes into the transient the rupture disc on the pressurizer
quench tank, which was receiving the RCS blowdown, burst. Bursting of the rupture
[illegible] by the [illegible] of containment isolation, which had isolated
the quench tank cooling system, resulting in expedited pressurization of the quench
tank.

The RCS continued to blow down through the open pressurizer power relief valve
and the quench tank rupture disc opening until primary coolant saturation pressure
was reached, about six minutes into the transient. The formation of steam in the
RCS caused an insurge of water into the pressurizer. This insurge and the high
pressure water injection then restored pressurizer level to about 310 inches after
[illegible] minutes into the transient.

Approximately thirteen minutes into the transient, the secondary side of the
No. 2 Steam Generator went dry. About fourteen minutes into the transient, the
operators noticed the low level condition and found that the auxiliary feed pump
was operating at reduced speed. Manual control of the auxiliary feed pump was
started and water level restored to the No. 2 Steam Generator.

At approximately 21 minutes into the transient, the operators discovered that
the pressurizer power relief valve was stuck open. Blowdown via this valve was
stopped by closing the block valve, thus terminating the reactor vessel depressuri-
zation. The RCS pressure [illegible] to normal and cooldown of the system followed.

The reason for the spurious "half-trip" of the SFACS has not yet been determined.
An extensive investigation revealed several loose connections at terminal boards, but
nothing conclusive.

Investigation into the failure of the pressurizer pilot actuated relief valve
revealed that a "close" relay was missing from the control circuit. This missing
relay would normally provide a "seal-in" circuit which would hold the valve open
until the pressure dropped to 2205 psig. Without the relay the power relief valve
cycled open and closed each time the pressure of the RCS went above or below 2255
psig. The rapid cycling of the valve caused a failure of the pilot valve stem,
and this failure caused the power relief valve to [illegible] open.

It was determined that the auxiliary feed pump did not go to full speed because
of "binding" in the turbine governor.

The transient was analyzed by the NSSS vendor and determined to be within the
design parameters [illegible] for a rapid depressurization.

With exception of the above noted malfunctions, the plant functioned as designed
and there was no threat to the health and safety of the general public.

2. Feedwater Isolation Valves

On two occasions in July [illegible] the [illegible] nuclear plant, a hydraulic feedwater
isolation valve [illegible] close upon receipt of a close signal. All other equipment
[illegible] operated normally.

The first failure, July 6, 1977, had been attributed to an improperly assembled
solenoid in the hydraulic actuator. Investigation of the second failure indicated
that both [illegible] to [illegible] hydraulic pressure.