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SHRIVER,T.D. Arizona Public Service Co. (formerly Arizona Nuclear Power
LEVINE,J.M. Arizona Public Service Co. (formerly Arizona Nuclear Power
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SUBJECT: LER 89-004-03:on 890104,emergency diesel generator rocker arm failure/ESF actuation.

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PALO VERDE NUCLEAR GENERATING STATION
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192-00559-JML/TDS/DAJ
November 30, 1989

JAMES M. LEVINE
VICE PRESIDENT
NUCLEAR PRODUCTION

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

Dear Sirs:

Subject: Palo Verde Nuclear Generating Station (PVNGS)
Unit 3
Docket No. STN 50-530 (License No. NPF-74)
Licensee Event Report 89-004-03
File: 89-020-404

Attached please find Supplement No. 3 to Licensee Event Report (LER) No. 89-004-00 prepared and submitted pursuant to 10CFR 50.73. In accordance with 10CFR 50.73(d), we are herewith forwarding a copy of the LER to the Regional Administrator of the Region V office.

This report has also been submitted pursuant to Technical Specifications 4.8.1.13 and 6.9.2 for a Special Report concerning a Diesel Generator failure and 10CFR21. This report includes the information requested in 10CFR21.21(b)(3). In accordance with 10CFR21.21(b)(2), three copies of this report are being provided to the Director, Office of Nuclear Reactor Regulation.

If you have any questions, please contact T. D. Shriver, Compliance Manager at (602) 393-2521.

Very truly yours,

James M. Levine

JML/TDS/DAJ/kj

Attachment

cc: W. F. Conway
M. J. Davis
E. E. Van Brunt
T. E. Murley (3 copies)
J. B. Martin
T. J. Polich
A. C. Gehr
INPO Records Center
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U.S. NUCLEAR REGULATORY COMMISSION
APPROVED OMB NO. 3150-0104
EXPIRES: 8/31/88

LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	PAGE (3)
Palo Verde Unit 3	0 5 0 0 0 5 3 0	1 OF 1 3

TITLE (4)
Emergency Diesel Generator Rocker Arm Failure/ESF Actuation

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)
									N/A	0 5 0 0 0
0 1	0 4	8 9	8 9	0 0 4	0 3	1 1	3 0	8 9	N/A	0 5 0 0 0

OPERATING MODE (9)	1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more of the following) (11)					
POWER LEVEL (10)	1 0 0	20.402(b)	20.406(c)	X	50.73(a)(2)(iv)		73.71(b)
		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)	X 50.73(a)(2)(i)		50.73(a)(2)(viii)(A)		10CFR21 & Special 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
Timothy D. Shriver, Compliance Manager	6 0 2 3 9 3 - 2 5 2 1

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
B	E B	E N G	C 6 3 4	Y					

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)

On January 11, 1989 Palo Verde Unit 3 was in Mode 5 (COLD SHUTDOWN) when information was obtained while performing a root cause of failure evaluation on a failed Emergency Diesel Generator (EDG) rocker arm which indicated that the failure was a result of a manufacturing error. Consequently, the rocker arm failure was determined to be reportable pursuant to 10CFR21.

During routine testing of the "A" EDG on January 4, 1989, the exhaust rocker arm for the 8L cylinder failed resulting in an EDG trip. Subsequent investigation revealed that a crack, which had existed in the rocker arm prior to delivery to Palo Verde, resulted in the rocker arm failure. The remaining rocker arms on the "A" EDG were inspected, and another crack was identified on the exhaust rocker arm for the 9R cylinder.

Pursuant to Technical Specification ACTION requirements, Unit 3 was shut down and Mode 5 (COLD SHUTDOWN) was entered on January 7, 1989 at approximately 1032 MST. During the cooldown a spurious Main Steam Isolation Engineered Safety Feature actuation occurred.

The rocker arms for the remaining Palo Verde Units 1, 2, and 3 EDG's have been inspected and no other deficiencies were noted. The original equipment manufacturer (Cooper-Bessemer) has re-designed the rocker arm.

This report is also being provided pursuant to the provisions of (1) Technical Specification 4.8.1.1.3 for a Special Report concerning a Diesel Generator failure and (2) 10CFR21. The narrative below includes the information requested by 10CFR21.21(b)(3); however, it is being formatted to report this event in accordance with the requirements of 10CFR50.73.

I. DESCRIPTION OF WHAT OCCURRED:

A. Initial Conditions:

Diesel Generator Failure/Shutdown Required by Technical Specifications

At approximately 0602 MST on January 4, 1989, Palo Verde Unit 3 was in Mode 1 (POWER OPERATION) at approximately 100 percent power when the rocker arm failed on the "A" Emergency Diesel Generator (EDG)(EK). Following the rocker arm failure, Palo Verde Unit 3 was shutdown pursuant to Technical Specification 3.8.1.1 ACTION "B" and entered Mode 5 (COLD SHUTDOWN) at approximately 1032 MST on January 7, 1989.

ENGINEERED SAFETY FEATURE ACTUATION

At the time of the Main Steam Isolation Engineered Safety Feature actuation (JE)(SB) at approximately 0640 MST on January 7, 1989, Palo Verde Unit 3 was in Mode 4 (HOT SHUTDOWN). Reactor Coolant System (AB) temperature and pressure were approximately 237 degrees Fahrenheit and approximately 390 pounds per square inch-absolute (psia). Steam generator pressure was approximately 23 psia.

B. Reportable Event Description (Including Dates and Approximate Times of Major Occurrences):

Event Classification: Plant shutdown required by the Technical Specifications. Condition which could have prevented the fulfillment of a safety function. Engineered Safety Feature Actuation. 10CFR21 Report.

Diesel Generator Failure

Note: This section includes information requested by 10CFR21 concerning the nature of the defect and dates for which information was obtained/developed.

At approximately 0200 MST on January 3, 1989, the "A" Emergency Diesel Generator was declared inoperable for the performance of routine inspections and maintenance. Following the maintenance and

inspection, on January 4, 1989 at approximately 0250 MST the "A" Emergency Diesel Generator was started for a 4-hour engine performance analysis. At approximately 0602 MST on January 4, 1989, the "A" Emergency Diesel Generator tripped due to an indicated overspeed condition.

Subsequent investigation determined that the diesel trip resulted from excessive vibration which was caused by a failed exhaust rocker arm. The vibration caused the overspeed trip devices to actuate. It was determined that no actual overspeed condition existed. An engineering evaluation of the failed rocker arm was initiated.

A physical and visual examination of the 8L cylinder valve train assembly was completed on January 4, 1989. Following this examination, the failed rocker arm was replaced and on January 6, 1989 the "A" Emergency Diesel Generator was started for post repair testing. During the testing, excessive vibrations were observed and the diesel tripped on a high vibration condition at approximately 2132 MST. Per discussion and agreement with Cooper-Bessemer, the diesel generator was again started for further troubleshooting and another trip occurred due to high vibration at approximately 0111 MST on January 7, 1989. These trips were determined to be a result of turbocharger (EK)(BLO) damage which occurred as a result of the 8L exhaust valve rocker arm failure.

Shutdown Required by Technical Specifications

Due to the inoperable "A" Emergency Diesel Generator trip, Palo Verde Unit 3 was shutdown pursuant to Technical Specification 3.8.1.1 ACTION "b". Technical Specification 3.8.1.1 ACTION "b" states, "With one emergency diesel generator...inoperable,... restore the diesel generator to OPERABLE status within 72 hours or be in at least HOT STANDBY within the next 6 hours and in COLD SHUTDOWN within the following 30 hours." As discussed above, the "A" Emergency Diesel Generator was declared inoperable at approximately 0200 MST on January 3, 1989. The Unit 3 shutdown was commenced at approximately 0140 MST on January 6, 1989. At approximately 0637 MST on January 6, 1989 Mode 3 (HOT STANDBY) was entered. At approximately 1032 MST on January 7, 1989 Mode 5 (COLD SHUTDOWN) was entered.

Engineered Safety Feature Actuation

During the Unit 3 cooldown, a spurious Main Steam Isolation Engineered Safety Features (SB)(JE) actuation occurred at approximately 0640 MST on January 7, 1989 as the result of a Steam Generator (AB)(SG) Number 2 low pressure trip signal. All

components responding to the Main Steam Isolation actuation functioned properly.

As the Unit is being cooled down and steam generator pressure is decreasing, steam generator low pressure trip setpoints are periodically reduced to prevent inadvertent Engineered Safety Feature actuations. The variable trip setpoints are manually reduced by control room personnel (utility, licensed) at prescribed intervals during the cooldown. At approximately 2309 MST on January 6, 1989, the Steam Generator Number 2 Channel "C" low pressure trip setpoint reduction circuitry operated improperly.

The low pressure trip setpoint was observed to increase rather than decrease when it was adjusted by control room personnel. This caused a spurious Steam Generator Number 2 low pressure channel trip; however, a Main Steam Isolation did not occur as the required two (2) of four (4) coincidence was not completed. Steam Generator Channel "C" was placed in "bypass", thus changing the Main Steam Isolation actuation coincidence to two (2) of three (3). The cooldown continued and at approximately 0606 MST on January 7, 1989, the Main Steam Isolation Valves (ISV)(SB) were closed pursuant to procedural controls during the unit cooldown. At approximately 0640 MST on January 7, 1989, a Steam Generator Number 2 low pressure Channel "A" trip was received which resulted in the Main Steam Isolation Engineered Safety Feature actuation. All components operated per design during the actuation.

C. Status of structures, systems, or components that were inoperable at the start of the event that contributed to the event:

Other than the "A" Emergency Diesel Generator and Steam Generator Number 2 Low Pressure Channel "C" as discussed above in Section I.B, there were no structures, systems, or components inoperable at the start of the event that contributed to the event.

D. Cause of each component or system failure, if known:

Note: This section includes information requested by 10CFR21 concerning the nature of the defect and dates for which information was developed.

1. Rocker Arm Failure

ANPP removed the fractured rocker arm and visually inspected the part. ANPP discussed the failure with Cooper-Bessemer on January 4, 1989, and an evaluation of the rocker arm failure was started. The 8L cylinder exhaust rocker arm failed when

the end of the push rod arm fractured and separated from the main exhaust valve rocker arm (Figure 1). The push rod arm casting is machined to accept a round insert which comprises the push rod seat. The fracture occurred at the rocker arm wall on both sides of this insert and down through the base of the push rod arm. Subsequent inspection of the fractured piece revealed evidence of paint on the fracture face. This indicates a crack had occurred prior to painting the rocker arm and the paint seeped into the crack. ANPP received the rocker arm painted from the factory. ANPP sent the failed rocker arm to Cooper-Bessemer for inspection and analysis. On January 11, 1989, discussions with Cooper-Bessemer confirmed that the rocker arm failure resulted from an original defect prior to delivery to ANPP. The cause of the rocker arm failure has been determined to be an inadequate original design coupled with insufficient inspection of the rocker arm for cracks in the material around the push rod seat insert. As designed the rocker arm casting was not sufficiently strong to withstand the stress incurred when the push rod seat insert was press-fit into place. This excessive stress resulted in the cracks which then went undetected during post-manufacturing inspections.

On January 11, 1989, ANPP removed the inspection covers and visually inspected the remaining intake and exhaust rocker arms on the "A" Emergency Diesel Generator. This inspection revealed a cracked exhaust rocker arm for the 9R cylinder. An inspection of the fracture revealed evidence of paint on the fracture face. This rocker arm remained functional. The rocker arm had been cracked prior to receipt from the factory.

2. Turbocharger Failure

On January 9, 1989, ANPP and Cooper-Bessemer conducted an investigation concerning the turbocharger (intake blower) damage. An inspection was made of the combustion air intake piping and turbocharger intake blower. The inspection of the combustion air intake piping included the piping both upstream and downstream from the turbocharger. During the inspection, various turbocharger pieces were found. This included pieces of the aluminum intake blower and a single vane from the turbocharger diffuser. A visual and microscopic examination of the turbocharger diffuser vane was conducted. This examination indicated that the vane attachment bolts failed under sudden loading conditions.

A preliminary examination of the damaged turbocharger blower fracture surface was made. It was observed that the fracture

surface did not indicate the presence of beach marks or crack arrest lines typical of high cycle fatigue failures.

A visual inspection of the turbocharger main journal bearing assemblies was conducted. This included both the turbine exhaust and the blower intake ends of the turbocharger. The babbitt lining on the bearing pad inserts indicated abnormal signs of wear. Micrometer readings of the pad thickness indicated that approximately 4 mils of the babbitt had been worn away. No indication of discoloration or heat damage typical of a loss of lubrication failure was apparent. The abnormal wear was determined to be a result of rotor imbalance following the turbocharger damage.

The oil seals on both ends of the turbocharger had indications of damage from contact with the rotor labyrinth oil seal. The main thrust bearing exhibited indications of scoring from normal wear.

A review was conducted of the historical operating data for the turbocharger lube oil pressures and vibration monitoring. No unusual trends indicating an impending bearing failure were found.

A visual inspection of the damaged turbocharger intake blower was made. Per discussions with Cooper-Bessemer, a blower overspeed condition is indicated by cracking initiated at the blower hub section bore. This cracking propagates outward from the hub bore toward the blower wheel outer diameter. No indications of this type of cracking were found in the blower hub bore during the visual inspections. Additionally, Cooper-Bessemer indicated that an overspeed failure would have resulted in a total failure of the intake blower. The type of failure experienced at ANPP, the loss of a blade from the front section of the blower, is not typical of an overspeed failure.

It was determined that the damage to the turbocharger was not a result of high cycle fatigue failure, loss of bearing function, or an overspeed of the turbocharger rotating element.

During the failure of the 8L exhaust valve rocker arm, strong pulsations occurred in the combustion air intake piping. These pulsations occurred because the exhaust valves would not open and combustion gasses flowed into the intake piping instead of the exhaust piping. These pulsations were observed by engineering and operations personnel at the DG

building during the performance of surveillance testing. These pulsations caused the turbocharger intake blower to surge. Surge is a phenomenon which can occur in radial flow compressors such as the diesel generator turbocharger intake blower. It can be described as a periodic reversal of flow through individual stages of the compressor blower. Pulsating back pressure on the blower causes a reduction in the fluid mass flow rate at the compressor inducer inlet. This causes a flow separation of the fluid from the blade resulting in a localized stall condition. Stall encourages a reversal of flow through the affected stages causing a system instability described as surge. During surging, violent flow processes can occur causing periods of back flow through the compressor. Operation in surge condition not only drastically reduces compressor performance but can also result in compressor damage.

The blower surge combined with the pulsations caused severe bending stresses to occur in the blower vane. These bending stresses caused the blower vane to fail at the hub fillet near the front of the blower. The root cause of the turbocharger intake damage failure was determined to be pulsation disturbances of the combustion air intake piping. These disturbances resulted directly from the 8L exhaust rocker arm failure.

E. Failure mode, mechanism, and effect of each failed component, if known:

The failed rocker arm resulted in the "A" Emergency Diesel Generator trip as described in Section I.B. The failed rocker arm also resulted in turbocharger damage which resulted in the subsequent diesel generator trip as described in Section I.B.

F. For failures of components with multiple functions, list of systems or secondary functions that were also affected:

Not applicable - the failed rocker arm and damaged turbocharger do not have multiple functions.

G. For failure that rendered a train of a safety system inoperable, estimated time elapsed from the discovery of the failure until the train was returned to service:

The failed rocker arm resulted in the "A" Emergency Diesel Generator (EDG) trip at approximately 0602 MST on January 4, 1989. The "A" EDG was returned to service at approximately 0350 MST on January 14, 1989.

H. Method of discovery of each component or system failure or procedural error:

The rocker arm failure was detected as a result of a post trip visual inspection performed on the Emergency Diesel Generator. The actual method of detection was as a result of observing signs of heat blistering near the 8L cylinder intake manifold. Upon removal of the cylinder head inspection cover, a visual inspection determined that the exhaust rocker arm assembly on the 8L cylinders had failed.

The turbocharger failure was detected as a result of a second post trip visual inspection performed on the "A" EDG. This visual inspection identified the turbocharger damage.

There were no procedural errors.

I. Cause of Event:

See Section I.D. for the discussion concerning the Emergency Diesel Generator exhaust rocker arm failure and turbocharger damage.

The cause of the improper operation of the Steam Generator Number 2 channel "C" low pressure trip setpoint reduction circuitry could not be determined. The improper operation discussed in Section I.B could not be recreated during troubleshooting. This type of circuit behavior has been experienced before at Palo Verde. There is a periodic problem with an asynchronous clock circuit card in the trip setpoint reduction circuitry. This is an infrequent phenomenon and is considered low risk since the clock circuitry is enabled only when the setpoint reduction reset button is pushed or when steam generator pressure is increasing. This problem does not adversely affect the ability of the Main Steam Isolation System to be actuated when necessary.

The cause of the spurious Main Steam Isolation System Engineered Safety Feature actuation was determined to be a malfunctioning matrix relay (94) in the Steam Generator Number 2 Channel "B" low pressure circuitry. The resistance value between the relay contacts was discovered to be abnormally high. The high resistance in Channel "B" resulted in more current flow through the Channel "A" portion of the "A-B" matrix logic vice equally between channels "A" and "B". When Channel "A" tripped as steam generator pressure was decreasing (See section I.B), there was a momentary interruption in current flow since a short period of time was required for current flow to re-establish through the "B" portion of the matrix logic. This momentary interruption in current flow caused the Main Steam Isolation Actuation. The high resistance

problem is considered to have no adverse safety consequences since the Main Steam Isolation System would be conservatively actuated on a one (1) of four (4) coincidence vice the normal two (2) of four (4) coincidence.

The relay is manufactured by Electro Mechanics, Inc. The model number is 33335/ELME.

J. Safety System Response:

Other than the Main Steam Isolation system response described in Section I.B, no safety system responses occurred and none were necessary.

K. Failed Component Information:

Note: This section includes information requested by 10CFR21 concerning the identification of the firm supplying the basic component and the number and location of the rocker arms at Palo Verde.

The rocker arms and turbochargers installed on the Palo Verde Diesel Generators were manufactured by Cooper-Bessemer. The rocker arm is a cast iron cylinder with three integral arms, two for actuation of the exhaust valves and one for the push rod to act on. The cylinder has a longitudinal hole, with oil lubricated bearings for the mounting shaft, about which the rocker arm pivots. The two valve actuation arms are fitted with hydraulic lifters and clearance adjusters. The push rod arm is fitted with a steel insert for the push rod to pivot in. (See Figure 1)

The damaged turbocharger model number is ET-24 and the failed rocker arm part number is KSV-25-1A#1. Both of these parts are installed on the "A" Emergency Diesel Generator Engine Serial Number 7187, Model No. KSV-20-T.

The emergency diesel generators utilized at Palo Verde Units 1, 2, and 3 are manufactured by Cooper-Bessemer division of Cooper Energy Services. The model number is KSV-20-T. Each unit utilizes two (2) emergency diesel generators (six total). Each emergency diesel generator has twenty cylinders. Each cylinder has one intake rocker arm and one exhaust rocker arm. There are 120 exhaust rocker arms and 120 intake rocker arms installed at Palo Verde.

II. ASSESSMENT OF THE SAFETY CONSEQUENCES AND IMPLICATIONS OF THIS EVENT:

Emergency Diesel Generator Failure

Note: This section contains the information requested by 10CFR21 concerning the nature of the safety hazard which is created or could be created.

There were no safety consequences as a result of the failed rocker arm on the "A" Emergency Diesel Generator as the "B" Emergency Diesel Generator remained operable and off-site power sources remained available. However, the emergency diesel generators serve as a back-up power supply in the event off-site power becomes unavailable. In the event of a loss of off-site power, the emergency diesel generators would be required to supply the safety related equipment necessary for (1) the safe shutdown of the facility and (2) the mitigation and control of accident conditions within the facility. As discussed in Section I.B., rocker arm failure results in emergency diesel generator unavailability.

Engineered Safety Feature Actuation

There were no safety consequences or implications resulting from the Main Steam Isolation Engineered Safety Feature actuation. The Main Steam Isolation System (MSIS) rapidly terminates steam blowdown and feedwater flows by isolating each generator, should a significant loss of steam generator mass inventory or pressure occur. The MSIS is actuated by receipt of a 2-out-of-4 high containment pressure, low steam generator pressure, or high steam generator water level signal. The steam generator pressure setpoints are variable. At steam generator pressures below normal operating conditions, control room personnel have the ability to manually decrease the setpoint to a fixed increment below existing system pressure. This is used during plant cooldown.

Prior to the MSIS actuation described in Section I.B, the steam generator low pressure trip setpoint had been reduced to zero (o) psia. Due to normal instrument error associated with the steam generator low pressure trip circuitry, it is not unusual for steam generator trip signals to be actuated as steam generator pressure approaches atmospheric pressure during the cooldown. These low steam generator pressure trip signals are expected and are not indicative of an abnormal steam generator pressure. Control room personnel (utility, licensed) verified that no actual condition requiring an MSIS actuation occurred (i.e., significant loss of steam generator mass inventory or pressure).

III. CORRECTIVE ACTIONS:

This section contains the information requested by 10CFR21 concerning the corrective action which has been, is being, and will be taken; the

organizations responsible for the corrective action; and the length of time for accomplishing the corrective action.

A. Immediate:

Emergency Diesel Generator Failure

The failed rocker arm and damaged turbocharger components were replaced. The remaining rocker arms on the "A" Emergency Diesel Generator (EDG) have been inspected and one was replaced. These corrective actions were completed by January 12, 1989. Following the return of the "A" EDG to service, the "B" EDG rocker arms were inspected. No other failed rocker arms were identified. This action was completed by January 14, 1989.

The Unit 1 and 2 EDG intake and exhaust rocker arms were visually inspected on January 16, 1989. No additional defective rocker arms were identified.

Engineered Safety Feature Actuation

The malfunctioning matrix relay in the Steam Generator Number 2 Channel "B" low pressure circuitry was replaced.

B. Action to Prevent Recurrence:

Emergency Diesel Generator Failure

Replacement rocker arms received from Cooper-Bessemer are being inspected by APS utilizing non-destructive examination techniques prior to installation. The non-destructive examination provides assurance that the replacement rocker arms utilized at Palo Verde are free from cracks in the press fitted area. Cooper-Bessemer has re-designed the rocker arm used in nuclear applications. The new design utilizes an adhesive to affix the push rod insert in place vice the press-fit previously used. Also, Cooper-Bessemer has instituted additional quality controls to ensure that the rocker arms are properly inspected.

Engineered Safety Feature Actuation

As corrective action to prevent recurrence for the periodic improper operation of the steam generator low pressure trip setpoint reduction circuitry, a design modification has been prepared to replace the appropriate variable setpoint card with an improved model. The design modification has been installed in Unit 3 and will be installed in Units 1 and 2 in accordance with pre-established schedules. As an interim measure, additional

procedural instructions were provided to advise operations personnel about the problem which may occur and to delineate the appropriate measures for minimizing the probability of occurrence.

Concerning the malfunctioning matrix relay in the Steam Generator Number 2 Channel "B" low pressure circuitry, no further corrective actions are considered necessary at this time. However, it should be noted that similar relay malfunctions have previously occurred and an engineering evaluation of this problem is being conducted. If substantial changes to the corrective actions described in this LER are implemented as a result of this event, a supplement to this report will be issued.

IV. PREVIOUS SIMILAR EVENTS:

Emergency Diesel Generator Failure

ANPP experienced one other broken rocker arm in September 1985. The failure occurred on the Unit 2, Train "B" Diesel Generator. The intake rocker arm failed at the junction of the push rod arm and rocker arm body. The September, 1985 root cause of failure was due to improper adjustment of the push rod clearances. This caused the push rod to hammer against the push rod seat eventually breaking the rocker arm. The material and casting were not found to be deficient and proper tappet adjustments have precluded recurrence. This was determined to be reportable under 10CFR50.55(e) (Reference: Deficiency Evaluation Report 85-20). There have been no previous similar events reported pursuant to 10CFR50.73.

Engineered Safety Feature Actuation

There have been no previous similar events reported pursuant to 10CFR50.73 for the Main Steam Isolation System actuation described above.

V. SPECIAL REPORT ADDITIONAL INFORMATION:

Pursuant to Technical Specification 4.8.1.1.3, the following is provided to include information concerning a valid Emergency Diesel Generator failure not described above and which is required in Regulatory Position C.3.b of Regulatory Position 1.108.

The failure described above is the third failure in the last 100 valid tests. The failure described above is the first failure in the last 20 valid tests. The current surveillance testing interval is once per 31 days.

EXHAUST ROCKER ARM ASSEMBLY

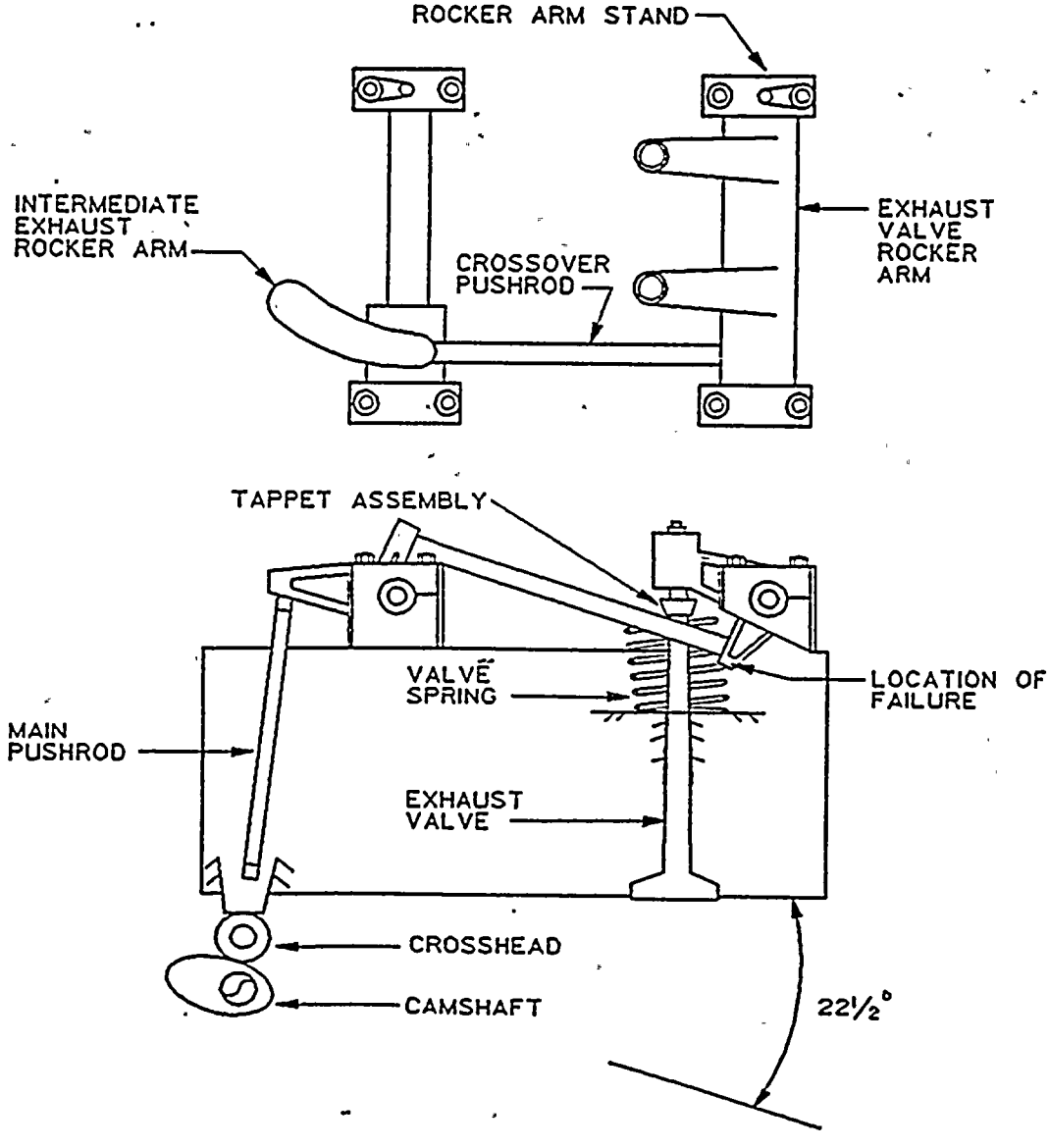

Figure 1