DSB

Consumers Power Company

General Offices: 212 West Michigan Avenue, Jackson, Michigan 49201 • (517) 788-0550

January 16, 1981

Mr James G Keppler
Office of Inspection & Enforcement
Region III
U S Nuclear Regulatory Commission
799 Roosevelt Road
Glen Ellyn, IL 60137

DOCKET 50-255 - LICENSE DPR-20 -
PALISADES PLANT - LICENSEE EVENT
REPORT 81-01 - STATION BATTERIES

Attached is Licensee Event Report 81-01 - Station Batteries - which is reportable under Technical Specification 6.9.2.A(2).

David P Hoffman
Nuclear Licensing Administrator

CC Director, Office of Nuclear Reactor Regulation
Director, Office of Inspection & Enforcement
NRC Resident Inspector - Palisades Plant

Attachment - 9 pages

JAN 20 1981

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PALISADES PLANT

NRC FORM 366 (7-77)

U. S. NUCLEAR REGULATORY COMMISSION

LICENSEE EVENT REPORT

CONTROL BLOCK: (1) (PLEASE PRINT OR TYPE ALL REQUIRED INFORMATION)

0 1 | M I P A L 1 (2) | 0 0 - 0 0 0 0 0 - 0 0 (3) | 4 1 1 1 1 (4) | (5)

LICENSEE CODE | LICENSE NUMBER | LICENSE TYPE | CAT

CON'T 0 1 | REPORT SOURCE L (6) | 0 5 0 0 0 2 5 5 (7) | 0 1 0 6 8 1 (8) | 0 1 1 6 8 1 (9)

DOCKET NUMBER | EVENT DATE | REPORT DATE

EVENT DESCRIPTION AND PROBABLE CONSEQUENCES (10)

0 2 During charging of station batteries, the output breakers of both batteries

0 3 were inadvertently opened for approximately one hour. Because of recent mod-

0 4 ifications to the DC distribution system, diesel generator starting capabili-

0 5 ty was maintained. In addition, all four battery chargers were in operation

0 6 and were capable of supplying remaining essential DC loads. Upon discovery,

0 7 proper breaker alignment was restored. Probable consequences under antici-

0 8 pated transients would have posed no threat to the public.

	SYSTEM CODE	CAUSE CODE	CAUSE SUBCODE	COMPONENT CODE	COMP. SUBCODE	VALVE SUBCODE
0 9	E C (11)	A (12)	C (13)	C K T B R K (14)	A (15)	Z (16)

(17) LER/RO REPORT NUMBER	EVENT YEAR		SEQUENTIAL REPORT NO.		OCCURRENCE CODE	REPORT TYPE		REVISION NO.
	8 1	—	0 0 1	/	0 1	T	—	0

ACTION TAKEN	FUTURE ACTION	EFFECT ON PLANT	SHUTDOWN METHOD	HOURS (22)	ATTACHMENT SUBMITTED	NPRD-4 FORM SUB.	PRIME COMP. SUPPLIER	COMPONENT MANUFACTURER
X (18)	X (19)	Z (20)	Z (21)	0 0 0 0 0	Y (23)	N (24)	A (25)	W 1 2 0 (26)

CAUSE DESCRIPTION AND CORRECTIVE ACTIONS (27)

1 0 Personnel error (failure to follow procedure) resulted in the misalignment.

1 1 Corrective actions include: appropriate reviews of all safety-related

1 2 surveillance and maintenance procedures prior to use; instruction to

1 3 personnel regarding adherence to procedures; and independent verification

1 4 of activities involving manipulation of safety related systems.

	FACILITY STATUS	% POWER	OTHER STATUS (30)	METHOD OF DISCOVERY	DISCOVERY DESCRIPTION (32)
1 5	E (28)	0 9 9 (29)	NA	A (31)	Observation

	ACTIVITY RELEASED	CONTENT OF RELEASE	AMOUNT OF ACTIVITY (35)	LOCATION OF RELEASE (36)
1 6	Z (33)	Z (34)	RA	NA

PERSONNEL EXPOSURES

	NUMBER	TYPE	DESCRIPTION (39)
1 7	0 0 0 (37)	Z (38)	NA

PERSONNEL INJURIES

	NUMBER	DESCRIPTION (41)
1 8	0 0 0 (40)	NA

LOSS OF OR DAMAGE TO FACILITY (43)

	TYPE	DESCRIPTION
1 9	Z (42)	NA

PUBLICITY

	ISSUED	DESCRIPTION (45)	NRC USE ONLY
2 0	Y (44)	News release on 1/16/81.	

Attachment to Licensee Event Report 81-01
Consumers Power Company
Palisades Plant

Description of Event

On January 6, 1981, two plant electricians were in the process of terminating a battery charge which had been started the previous day. The procedure required shifting the battery chargers on each bus by opening the breakers associated with the chargers in service and closing the breakers of the idle chargers. Instead, both battery breakers were opened and the breakers for the idle chargers were closed. As a result, the station batteries were not connected to their respective buses; however, all four battery chargers were in service, and no interruption of DC power occurred. Coincident with the shifting of battery chargers, the procedure required adjusting the battery bus voltage; because of the improper alignment, the voltage could not be adjusted to the specified value. Investigation by a supervisor led to discovery of the improper lineup, and proper breaker alignment was immediately restored. The breaker misalignment existed for approximately one hour.

Probable Consequences

During the one hour period that the breakers were mispositioned, the plant suffered no detrimental consequences. DC and preferred AC power for instruments and controls were supplied via the chargers. In addition, 2400 volt buses 1C and 1D control power, and diesel generator 1-1 and 1-2 field flashing and control power (for starting) are supplied by a panel powered directly from the station batteries (eg, power available whether battery breakers open or close).

Three transients which could result in a challenge to the station batteries have been analyzed to determine if plant safety would be maintained throughout. While the scenarios chosen do not represent all those which could result in a challenge to the station batteries, they represent those considered to have a reasonable probability of occurring during the one hour time period in question. The sequence presented in the following discussion was constructed based on manufacturer's data regarding relay timing, plant electrical prints, and selected outputs from the plant data logger.

Main Generator Trip

The first plant transient considered is one in which the main generator trips. The sequence of events following such an occurrence is presented on Attachment 1. At time zero, one of the main turbine generator protection relays 386B, P or C is energized. The fast transfer relay 383-11 is energized 65 milliseconds (msec) later and following this the 2400 V bus 1C startup power breaker 152-106 closes and station power breaker 152-105 opens. Bus 1C breakers and associated relays have been referred to in this scenario but it should be noted that the events are mirrored on bus 1D. With the fast transfer having been executed, power to the DC buses is maintained and the sequence of events continues as normal with the diesel start relays being energized at 310 msec and the control rod drive clutch relays de-energized shortly thereafter.

Reactor Trip

Attachment 2 presents the sequence of events for a reactor trip. It can be seen that as with the previous transient analyzed, the fast transfer maintains power to the DC buses and the sequence of events progresses as normal.

As in any reactor trip, voltage is maintained on the 2400 volt bus 1C through the station power breaker 152-105 until the fast transfer relay 383-11 is energized. Since DC power to the station power breaker and startup power breaker 152-106 is supplied from panel D-11A which is connected directly to the battery, the fast transfer is executed. Similar breakers and relays are associated with bus 1D. The diesels are started during this transient as can be seen at the 310 msec time on Attachment 2.

R Bus Trip

R bus trip represents a loss of offsite power event in which the plant is simultaneously tripped. It has occurred only three times during the history of Palisades; therefore, it is not considered high probability event. Attachment 3 presents the initial sequence of events during such a transient. Following the trip of the R bus, startup transformer 1-2 low voltage relay 127-5 is energized and the cooling tower fans and pumps are tripped since they receive power from startup transformers 1-1 and 1-3 which, in turn, receive power from the R bus. At 575 msec into the transient, the auxiliary undervoltage relay 127X-5 is energized and 30 msec later the diesel start relays are energized. The lack of cooling water to the condenser would produce a mechanical vacuum trip at about 30 seconds. However, normal operating procedure is to trip the reactor as presented in the Emergency Operating Procedure EOP2. This time has been arbitrarily chosen on Attachment 3. The sequence of events after the reactor trip is similar to that presented on Attachment 2 with the following exceptions:

1. The load shed relays are energized at time 695 msec. For these relays to be energized, both the preload shed relay 144D-1 and the startup transformer low voltage auxiliary relay must be energized.

2. The 2400 V loads on bus 1C and load control center 11 are shed.

3. Startup breaker 152-106 is not closed.

Following the above events and with the opening of station power breaker 152-105, the plant is without power except for the DC loads connected to the batteries for a short period of time. This time is less than 10 seconds since this is the maximum time required for the diesels to start and acquire proper voltage. At this time, the operator would manually close the diesel generator breaker 152-107 since the load shed relay 194-108 de-energizes during the short period of time without power and, as displayed on the logic diagram of Attachment 4, automatic closure is not possible. As can be seen from the same attachment, manual closure

of the breaker is possible after positioning the control switch to the "on" position. It should be noted that DC power for breaker 152-107 is supplied from panel D-11A which is connected directly to the battery. With the diesel connected to the 2400V bus 1C, manual start of the normal shutdown sequencer is necessary to return the sequence of events to normal. Similar breakers and relays to those described in this scenario for bus 1C are associated with 2400V bus 1D.

Eighty-five (85) amperes are required during normal power operation to meet the demand of a DC bus and the two preferred AC buses connected to it via the inverters. A reasonable expected maximum load on the two chargers connected to the DC bus when the diesel generator breaker is closed in the above transient would be 85 amps plus the locked rotor current of two DC oil lift pumps. The locked rotor current would be twice the full load current which is 70 amps per motor. The total maximum current thus equals 365 amps. Each charger is rated at 200 amps. Therefore, the two chargers combined would have sufficient capacity to handle the load.

One further point to be mentioned about the above transient is that during the period of time the diesel is starting and the plant is without power, all valves and controls will be in their safe mode.

Based on the above analysis, it is concluded that no significant threat to public health or safety existed during the period of time the battery breakers were mispositioned.

Cause of Occurrence

As evidenced by the sequence of events described in the "description of event", personnel error (eg, failure to follow a written procedure) resulted in the breaker misalignment. Investigation has revealed the following:

- The procedure addressed the minimum skill levels required of personnel performing the activity.
- Both individuals conducting the evolution met the minimum skill level requirement.
- Both individuals had been briefed regarding the evolution prior to its commencement.
- Both had previously participated in this evolution.
- The procedure was present at the scene of the activity.

Corrective Actions

The following short term corrective actions are being implemented.

1. Daily audits of plant operations are being conducted by a corporate management representative.

2. A committee consisting of a member of corporate manangement (in addition to the corporate representative referenced in item 1 above), a Senior Reactor Operator, and another qualified engineer will review all safety-related surveillance and maintenance procedures and other maintenance procedures which cover work to be conducted in vital areas before they are used again, to assure that:

   a. Each procedure is specifically identified as being safety related, or as having the potential to affect safety-related equipment;

   b. Authorization to perform work is required from plant management;

   c. Special notification of work performed is made to the Shift Supervisor;

   d. System conditions to perform work are defined;

   e. Minimum personnel skill-level is defined; and

   f. Return-to-normal verification requirements are specified.

3. All personnel who perform safety-related work or other work in vital areas will be reinstructed on the importance of strict adherence to procedures, and the necessity for performance of all assigned duties in a disciplined and professional manner.

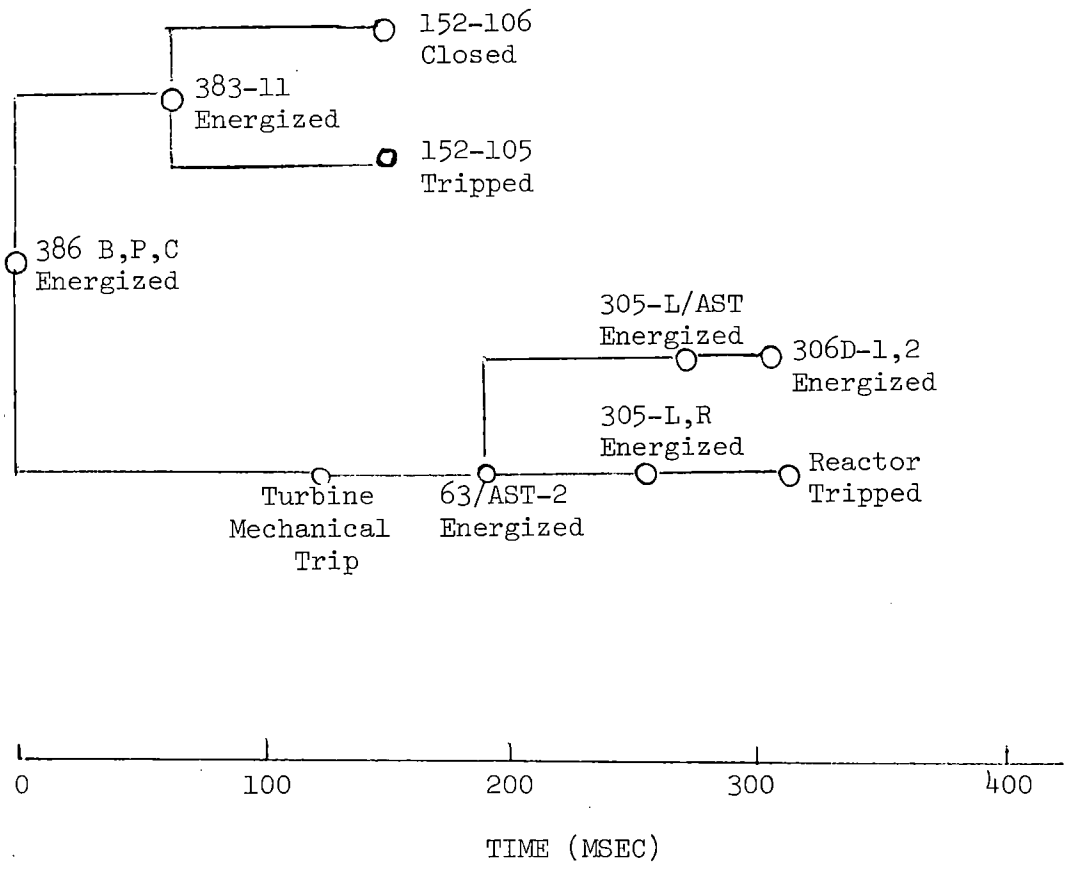
4. Immediately upon their completion, all activities involving the manipulation of safety-related circuits or systems will be verified by a second qualified individual. Qualified individuals will be designated by the Plant Manager for the specific tasks.

5. The specific circuitry involved in the January 6, 1981, event will be reviewed to determine if control room indications are required to show when an abnormal lineup exists.

Long term corrective actions are being developed.

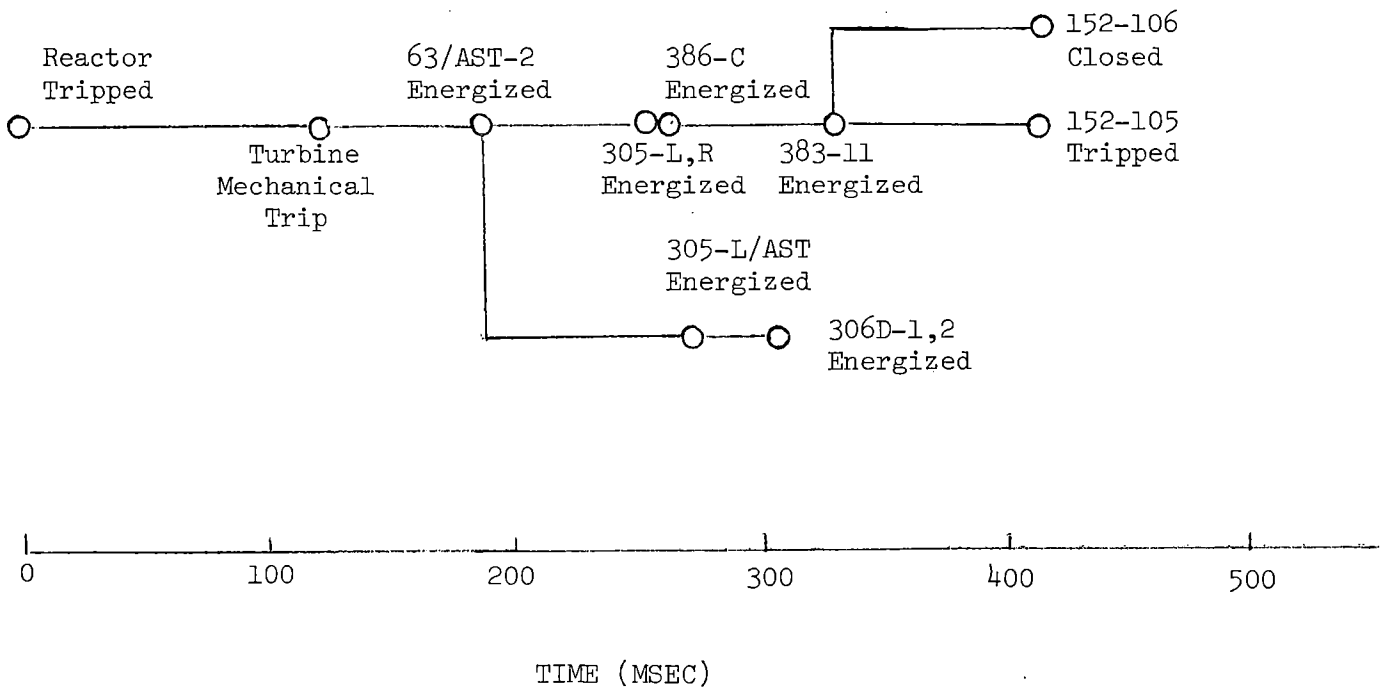
ATTACHMENT 1

GENERATOR TRIP



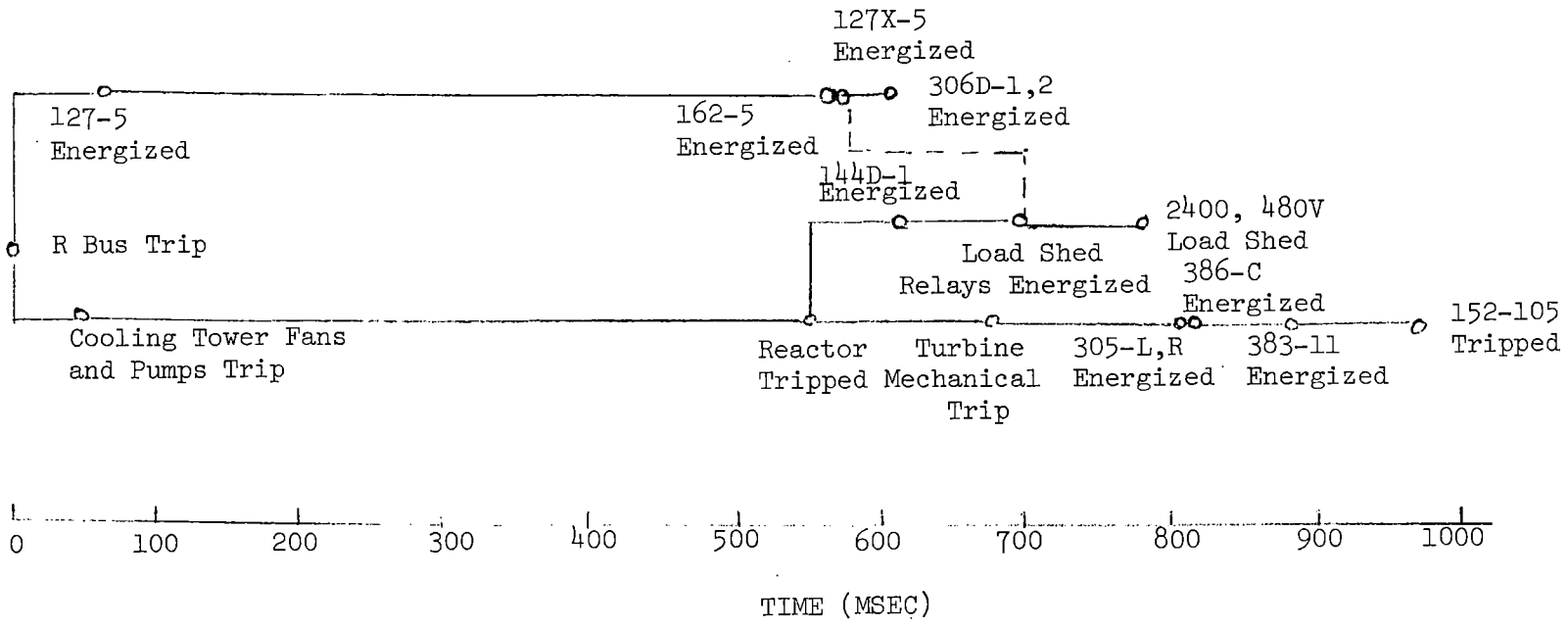
ATTACHMENT 2

REACTOR TRIP



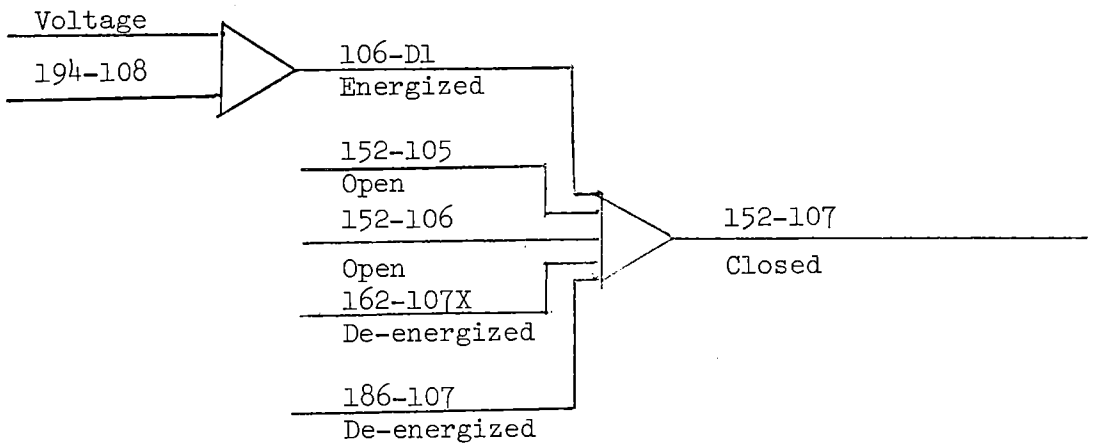
ATTACHMENT 3

R BUS TRIP

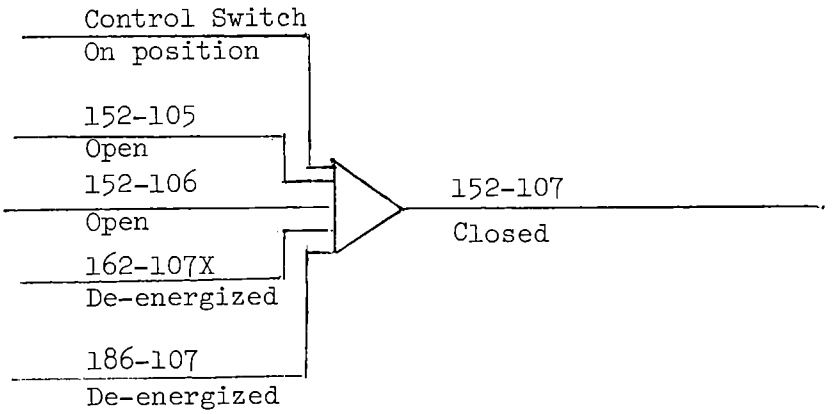


ATTACHMENT 4

DIESEL BREAKER 152-107



AUTOMATIC



MANUAL