DATE 12/10/90 14:39 NRMS DOCUMENT CONTROL FORM SEQUENCE # 3900044430

PROCEDURES - APPROVED ORIGINALS
TRCODE ON-U1

*MGR LGS TRAIN CTR	GENERAL PHYS	03	C**	NUNEZ, R	LGS-PPC	01	I*
*MGR LGS SIMULATOR	TRAIN CTR	01	C**	OPERATIONS SUP CTR	LGS	01	I*
*MAINT/TSC LIBRARY	LGS/A3-4	01	I**	PLANT OP SUP FAC	LGS	01	I*
*TRAINING COORDIN	LGS-PPC	01	I**	SHIFT SUPT OFFICE	LGS/A5-2	01	I*
*CONST BLDG LIB	LGS/C4-4	01	I**	SUPPT BLDG LIB #1	LGS/SB-2-1	01	I*
*CONTROL RM CART LGS	LGS/A5-2	01	I**	SUPPT BLDG LIB #2	LGS/SB-4-3	01	I*
*EMERG OP FAC LGS	LGS-EOF	01	C**	TECH SUPP CTR LGS	LGS-340	01	I*
*INPO	OUTGOING	01	I**	TERM RM (SSVN OFF)	LGS/A5-2	01	I*
*LGS LIBRARY	LGS/A2-1	01	I**				*
*LGS OFFICE	LGS/A5-1	01	I**				*
*NRC OFFSITE	OUTGOING	01	C**				*

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ATTACHED IS A COPY OF:
PROCEDNO ON-120 BASES
REVISION 002
DATE 12/06/90

UNCONTROLLED: LIBRARY, INPO, NUNEZ

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W. J. McCormick 12/6/90

PHILADELPHIA ELECTRIC COMPAN
LIMERICK GENERATING STATION

3900044430

ON-120 BASES FUEL HANDLING PROBLEMS

1.0 SYMPTOMS

1.1 Unanticipated rise in SRM count rate during Fuel Handling (Criticality). (Step 2.1)

SRM count rate will increase incrementally as fuel bundles are added to the core; however, a sustained, continuing increase in count rate is an unanticipated increased which indicates criticality.

1.2 Fuel Floor Area Radiation Monitor alarms. (Step 2.2)

Self explanatory.

1.3 Fuel bundle dropped or damaged. (Step 2.3)

Self explanatory.

1.4 Unanticipated reduction of Reactor Cavity OR Spent Fuel Pool Water Level. (Step 2.4)

Self explanatory.

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2.0 OPERATOR ACTIONS

2.1 IF criticality occurs while inserting fuel into the core, THEN:

According to SIL No. 372, the most credible identified criticality concern during refueling operations is the possibility of inserting fuel bundles into an area of the core with two adjacent control blades withdrawn for maintenance. This would require bypassing the one-rod-out refueling interlock per Tech. Spec. 3.9.10.2, followed by inadvertently reloading fuel bundles around the withdrawn control blades. Criticality would be expected when the last bundle is loaded around the withdrawn blades.

According to UFSAR 9.1.2.3.1, the fuel storage racks are designed to prevent criticality even if a bundle is dropped on top of, through or next to the storage racks. Thus, criticality is not a concern when moving a bundle into the storage racks.

2.1.1 Raise fuel assembly from core so it clears upper grid.

Since the control rods would be withdrawn for maintenance, they would be blocked out of service. Thus, they would not insert when high flux causes a scram signal. If the control room operator observes SRM count rate increasing due to subcritical multiplication, stopping insertion of the fuel assembly may prevent criticality. Raising the fuel assembly will return the core to a subcritical configuration.

2.1.2 Evacuate Fuel Floor.

Self explanatory.

2.1.3 Inform Shift Supervision. Shift Supervision shall determine disposition of fuel bundle.

Shift Supervision should be aware of any problems associated with reactivity control. Shift Supervision shall be responsible for placing the fuel bundle in a "safe conservative position" when core alterations are suspended dependent on fuel floor accessibility.

2.1.4 Ensure all insertable control rods are inserted.

The most probable reason for criticality was that fuel assemblies were inadvertently inserted into the core in an area where at least two adjacent control rods were withdrawn. Thus, major errors in tracking fuel and control rod locations were made. This step ensures that the core is made as subcritical as possible in the short term.

2.1.5 Notify Health Physics.

Self explanatory.

2.1.6 Notify Reactor Engineering.

Self explanatory.

2.1.7 Fuel handling operations shall not be resumed until permission is obtained from Superintendent of Operations.

Self explanatory.

2.2 IF Fuel Floor Area Radiation Monitor alarms unplanned AND is not due to object handled near water surface which is immediately re-submerged,
THEN:

2.2.1 Evacuate Fuel Floor.

Self explanatory.

2.2.2 Notify Shift Supervision.

Shift Supervision should be aware of potential serious exposure hazards associated with fuel handling.

2.2.3 Notify Health Physics.

Self explanatory.

2.2.4 Notify Reactor Engineering.

Self explanatory.

2.2.5 Fuel handling operations shall not be resumed until permission is obtained from Superintendent of Operations.

Self explanatory.

2.3 IF fuel bundle is dropped or damaged, THEN:

A spent fuel bundle and the fuel grapple assembly falling as two separate, independent units from their respective fully raised heights into the reactor core is a limiting fault accident analyzed in UFSAR section 15.7.4. Operator actions are specified in UFSAR 15.7.4.2.2. The actions listed in this procedure cover the specified actions; however, the steps of directing personnel to the decontamination area, assessing potential radiation doses, and implementing additional radiological controls are considered to be implicit in the Health Physics Notification step.

If a spent fuel bundle is damaged by fuel handling such that it jeopardizes the structural integrity of the bundle, there is potential for consequences similar to the dropped fuel bundle.

If a new fuel bundle (or any heavy object) is dropped into the fuel pool or refueling cavity, it may cause damage to spent fuel by striking it directly or indirectly. It is prudent to follow this procedure whenever structural damage to spent fuel may have occurred, whether by dropping spent fuel, new fuel or other heavy objects or by other handling of spent fuel.

2.3.1 Evacuate Fuel Floor.

Self explanatory.

2.3.2 Inform Shift Supervision. Shift Supervision shall determine disposition of damaged bundle.

Shift Supervision should be aware of potential serious exposure hazards associated with fuel handling. Shift Supervision is responsible for placing a damaged fuel bundle in a "safe conservative position" when core alterations are suspended.

2.3.3 Ensure Normal Ventilation is isolated AND SGTS is initiated.
IF a single fuel rod is dropped
THEN a Refuel Floor isolation need not be initiated unless requested by Health Physics.

Initiating SGTS is a preemptive action anticipating a fission gas release potentially associated with a dropped fuel bundle.

Industry experience has shown that if a non-failed rod is dropped, there are no adverse affects on the fuel rod and no release of fission gases. Also, should a failed rod break-up, there is no release of fission gas since all of the fission gas has already been released in the reactor vessel.

2.3.4 IF spent fuel damage results in refueling area ventilation isolation (Alert)
OR major damage to spent fuel is observed (Site Emergency),
THEN implement "The Emergency Plan" (EP-101).

Self explanatory.

2.3.5 Notify Health Physics.

Self explanatory.

2.3.6 Notify Reactor Engineering.

Self explanatory.

2.3.7 Before allowing entrance to Fuel Floor area, a careful study of conditions, radiation levels, etc., shall be performed.

Self explanatory.

2.3.8 Fuel handling operations shall not be resumed until permission is obtained from Superintendent of Operations.

Self explanatory.

2.4 IF unanticipated decrease of Reactor Cavity OR Spent Fuel Pool water level occurs, THEN:

2.4.1 Notify Shift Supervision.

Shift Supervision should be aware of potential serious exposure hazards associated with fuel handling.

2.4.2 Perform S53.0.A, Response to Low Level.

This system procedure gives detailed actions to initiate makeup, determine and correct the cause of the low level condition in the reactor well or fuel storage pool, and it addresses the potential health physics hazard due to items stored above the fuel storage racks as level drops.

2.4.3 Notify Health Physics of possible radiation hazard on Refuel Floor OR Elevation 313'.

Self explanatory.

2.4.4 Suspend all core component transfer operations:

a. Return any core component being transferred to its nearest storage location in Fuel Storage Pool OR Core.

b. IF any Fuel Preparation Machine is loaded, THEN reposition it to its full down position.

Self explanatory.

2.4.5 IF water is lost to below fuel level in Spent Fuel Pool (Site Emergency), THEN implement "The Emergency Plan" (EP-101).

Self explanatory.

2.4.6 Fuel handling operations shall not be resumed until permission is obtained from Superintendent of Operations.

Self explanatory.