

## LICENSEE EVENT REPORT (LER)

(See reverse for required number of digits/characters for each block)

ESTIMATED BURDEN PER RESPONSE TO COMPLY WITH  
THIS INFORMATION COLLECTION REQUEST: 50.0 HRS.  
FORWARD COMMENTS REGARDING BURDEN ESTIMATE TO  
THE INFORMATION AND RECORDS MANAGEMENT BRANCH  
(MNBB 7714), U.S. NUCLEAR REGULATORY COMMISSION,  
WASHINGTON, DC 20555-0001, AND TO THE PAPERWORK  
REDUCTION PROJECT (3150-0104), OFFICE OF  
MANAGEMENT AND BUDGET, WASHINGTON, DC 20503.

FACILITY NAME (1) Limerick Generating Station, Unit 2						DOCKET NUMBER (2) 05000 353			PAGE (3) 1 OF 6		
TITLE (4) Actuations of the Unit 1 and Unit 2 PCRVICS Resulting from the Inadvertent Grounding of a Keyswitch during its Replacement, due to Unclear Management Expectations.											
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 NAME	DOCKET NUMBER	
07	20	95	95	-- 007 --	0	08	18	95	Limerick, Unit 1	05000 352	
									FACILITY NAME	DOCKET NUMBER	
										05000	
OPERATING MODE (9)		1	THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)								
			20.402(b)			20.405(c)			X	50.73(a)(2)(iv) 73.71(b)	
POWER LEVEL (10)		97%	20.405(a)(1)(i)			50.36(c)(1)				50.73(a)(2)(v) 73.71(c)	
			20.405(a)(1)(ii)			50.36(c)(2)				50.73(a)(2)(vii) OTHER	
			20.405(a)(1)(iii)			50.73(a)(2)(i)				50.73(a)(2)(viii)(A) (Specify in	
			20.405(a)(1)(iv)			50.73(a)(2)(ii)				Abstract below	
			20.405(a)(1)(v)			50.73(a)(2)(iii)				and in Text.	
						50.73(a)(2)(ix)				NRC Form 366A)	
LICENSEE CONTACT FOR THIS LER (12)											
NAME J. L. Kantner, Manager - Experience Assessment, LGS								TELEPHONE NUMBER (Include Area Code) (610) 718-3400			

## 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)

YES  
(If yes, complete EXPECTED SUBMISSION DATE).

X NO

EXPECTED  
SUBMISSION  
DATE (15)

MONTH DAY YEAR

## ABSTRACT (Limit to 1400 spaces, i.e., approximately 15 single-spaced typewritten lines) (16)

On 07/20/95, a Technician was replacing a keyswitch associated with the refueling floor HVAC system control logic. At 0920 hours, the Technician inadvertently grounded the replacement keyswitch with an adjacent energized keyswitch, resulting in a blown fuse. This loss of power caused actuations of the Units 1 and 2 Primary Containment and Reactor Vessel Isolation Control Systems (PCRVICS), Engineered Safety Features. Installation of the keyswitch was then satisfactorily completed, the fuse was replaced, and the PCRVICS isolations were reset within 67 minutes. The consequences were minimal, and the PCRVICS isolations functioned as designed. The inadvertent grounding was the result of the Technician trying to complete the task in a confined space having the high probability of causing a short circuit. The Technician proceeded due to unclear management expectations regarding activities in confined spaces having a high potential to create a ground condition. The corrective actions include Maintenance/I&C supervisory and "All Hands" meetings, an Event Bulletin, and procedure revisions that disseminate and document management's expectations on this subject. Also, a For Your Information Bulletin will be issued to address the potential generic implications of this event.

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

Unit Conditions Prior to the Event:

Unit 1 was in Operational Condition (OPCON) 1 (Power Operation) at 97% power level. The unit was operating at 97% power for the investigation of a reactor recirculation pump transient. There were no Unit 1 structures, systems, or components out of service that contributed to this event.

Unit 2 was in OPCON 1 operating at 100% power level. There were no Unit 2 structures, systems, or components out of service that contributed to this event.

Description of the Event:

On July 20, 1995, a Maintenance Technician was replacing a keyswitch (i.e., HS-XX-399A-3) (EIIS:HS) associated with the refueling floor heating, ventilation, and air conditioning system control logic. At 0920 hours, the Maintenance Technician inadvertently grounded an electrical lead from the replacement keyswitch with an adjacent energized keyswitch, resulting in a blown fuse (EIIS:BU), B21-F101A. This fuse is located in the Auxiliary Equipment Room panel 20C622, "Inboard Valve Relays NSSSS Div 1."

The loss of power caused by the blown fuse resulted in automatic actuations of the Unit 1 and Unit 2 Primary Containment and Reactor Vessel Isolation Control Systems (PCRVICS) (EIIS:JM), Engineered Safety Features (ESF), closing their outboard primary containment isolation valves:

- Unit 2 Primary Containment Instrument Gas (PCIG) Process Lines (EIIS:LK), and
- Unit 1 and Unit 2 Primary Containment Nitrogen Inerting Block valves.

The outboard isolation valves in the following Unit 1 and Unit 2 PCRVICS subsystems received a signal to close, however, no valve movement occurred since the associated valves were already closed due to plant conditions prior to the event:

- Primary Containment Purge Supply and Exhaust, and
- Primary Containment Exhaust to Reactor Enclosure Equipment Compartment Exhaust (REECE).

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At 0920 hours on July 20, 1995, licensed Main Control Room (MCR) operators observed annunciator indication in the MCR for isolations of the above listed PCRVICS valves. Additionally, the Maintenance Technician immediately notified the MCR operators that the replacement keyswitch was inadvertently grounded.

MCR operators restored the Unit 2 PCIG system by 0924 hours using PCRVICS isolation bypass keyswitches in accordance with General Plant (GP) procedure GP-8, "Primary and Secondary Containment Isolation Verification and Reset." Installation and testing of the replacement keyswitch was then satisfactorily completed by the Maintenance Technician, and the blown fuse was then replaced. MCR operators then reset and restored the remaining PCRVICS isolations by 1027 hours (i.e., within 67 minutes) on July 20, 1995, using Procedure GP-8.

A four (4) hour notification was made to the NRC on July 20, 1995, at 1254 hours in accordance with the requirements of 10CFR50.72(b)(2)(ii), since this event resulted in automatic actuations of ESFs. Accordingly, this report is being submitted in accordance with the requirements of 10CFR50.73(a)(2)(iv).

Analysis of the Event:

The consequences of this event were minimal. There was no release of radioactive material to the environment as a result of this event. The Unit 1 and Unit 2 PCRVICS isolation valves and system actuations functioned as designed under the loss of the system control logic power condition created by the blown power supply fuse. The Unit 1 and Unit 2 isolations were bypassed or reset. The PCRVICS isolations were restored to their pre-transient conditions by operators in accordance with plant procedures within 67 minutes, thereby preventing any adverse impact on plant systems.

Immediate and follow-up actions to this type of event (i.e., loss of logic power) are provided in procedure GP-8. Licensed operators receive requalification training to review and perform operator responses to transients of this type. This training provides practice on immediate operator actions and minimizes the length of time certain systems are isolated reducing the adverse impact on the plant. Therefore, as a result of adequate procedural guidance, training, and prompt operator actions, the event duration was limited and no adverse plant conditions developed.



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Additionally, if the fault introduced during the replacement of the subject keyswitch had resulted in this logic system being inoperable, the redundant PCRVICS isolation logic channel would have been available to isolate the PCRVICS system if required.

Cause of the Event:

The cause of the isolations was the blowing of the PCRVICS fuse B21-F101A. The cause of the blown fuse was the inadvertent grounding of an electrical lead from a replacement keyswitch with the energized contacts of an adjacent keyswitch. The inadvertent grounding was the result of the Maintenance Technician trying to complete the assigned task in a very tight confined space that had a high probability of causing a short or ground. The Maintenance Technician proceeded to attempt to complete this task because of unclear management expectations and inadequate directions with regards to work activities in confined spaces having a high potential to create a ground or short circuit condition in an electrical component. A brief description of the inadvertent grounding incident is as follows:

The Maintenance Technicians's pre-job walkdown identified that electrical clearances adjacent to the replacement keyswitch were in close proximity, and that insulating barriers were needed between the replacement keyswitch and an adjacent energized keyswitch. Further inspection revealed that an insulating barrier could only be installed on the left-hand side of the replacement keyswitch. The congestion of the wiring and the close proximity of the adjacent energized keyswitch prevented the Maintenance Technician from installing insulating material on the right-hand side of the replacement keyswitch. Also, the Maintenance Technician concluded that the insulating material could be removed from the left-hand side, but not from the right-hand side following installation of the new keyswitch.

The Maintenance Technician satisfactorily removed the original keyswitch and de-terminated all electrical leads per the requirements of the common Maintenance Procedure M-C-700-200, "Lifting and Landing of Electrical Leads." Prior to installing the replacement keyswitch, the Maintenance Technician installed insulating material on the left-hand side electrical contact points. While installing the replacement keyswitch, the Maintenance Technician unintentionally contacted the adjacent energized keyswitch thereby creating the ground condition and the resultant PCRVICS isolations.

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Corrective Actions:

1. On July 25, 1995, the Director-Maintenance/I&C conducted a Management Meeting with Maintenance Division first-line supervisors to discuss this event and to ensure that supervision is adequately disseminating the expectations with regards to work activities having a high potential for causing a ground condition in an electrical component.
2. Maintenance and I&C "All Hands" meetings were conducted by the Director-Maintenance I&C on August 1 and August 2, 1995, with clear discussion on the expectation that a worker in any circumstance shall not proceed beyond their abilities. This discussion also conveyed the need for preventing unexpected shorts and grounds when working in confined spaces and the types of corrective and preventative actions the technicians are expected to take.
3. To capture and document for future reference the information presented in Corrective Actions 1 and 2 stated above, an Event Bulletin will be disseminated to all electrical technicians by the Director-Maintenance/I&C that clearly defines management's expectations, provides direction, and heightens the technician's awareness of activities having a high potential to cause a ground or short circuit condition. This action is expected to be completed by September 1, 1995.
4. The procedure M-C-700-200 and the common I&C Procedure IC-11-00100, "Documentation of Temporary Lifted Leads and Jumpers," will be revised to incorporate cautions and specific directions concerning the actions to take in situations where shorts and grounds have a high probability of occurrence. This action is expected to be completed by September 15, 1995.
5. Although an event of this type has not occurred in other groups at the Limerick Generating Station (LGS), a "For Your Information (FYI)" bulletin will be issued to all station supervision to address the 'potential' generic implications of this event. This FYI will further communicate the lessons learned from this event, and ensure these group's policies/practices are consistent with the expectations described in the Event Bulletin. This action is expected to be completed by September 1, 1995.

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## Previous Similar Occurrences:

There have been previous events at LGS where a fuse blew due to personnel error. These previous events were due to causes such as the inadvertent grounding of test equipment leads, improper continuity checks, the dislodging of a screw from a "starter" (i.e., self-holding) screwdriver... etc. These events did not occur in confined spaces having a high potential to create a ground or short circuit condition. This incident being reported concerned the inadvertent shorting of an electrical keyswitch terminal during the replacement of a keyswitch for corrective maintenance, and was due to less than adequate management expectations and directions with regards to activities in confined spaces having a high potential for creating a ground or short circuit condition. Therefore, the corrective actions from these previous events would not have prevented this event from occurring.