Commonwealth Edison
Byron Nuclear Station
4450 North German Church Road
Byron, Illinois 61010

DD IE22

May 22, 1991

Ltr: BYRON 91-0381

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

Dear Sir:

The enclosed supplemental Licensee Event Report from Byron Generating Station is being transmitted to you in accordance with the requirements of 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(ii)(B).

This report is number 90-005; Docket No. 50-455.

Sincerely,

R. Pleniewicz
Station Manager
Byron Nuclear Power Station

RP/DK/mw

Enclosure: Licensee Event Report No. 90-005

cc: A. Bert Davis, NRC Region III Administrator
W. Kropp, NRC Senior Resident Inspector
INPO Record Center
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MAY 28 1991

(0753R/0088R)

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LICENSEE EVENT REPORT (LER)

Form Rev 2.0

Facility Name (1)	Docket Number (2)	Page (3)
Byron, Unit 2	0 5 0 0 0 4 5 5	1 of 0 6

Title (4) Pre-Outage Modification Work Initiated Without Proper Operability Review Due to Programmatic Deficiencies

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)
										NONE	0 5 0 0 0
0 8	1 7	9 0	9 0	---	0 0 5	0 1	0 5	2 0	9 1		0 5 0 0 0

OPERATING MODE (9)		THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10CFR (Check one or more of the following) (11)					
	1	___ 20.402(b)	___ 20.405(c)	___ 50.73(a)(2)(iv)	___ 73.71(b)		
POWER LEVEL (10)	4 9	___ 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 (Specify in Abstract below and in Text)		
		___ 20.405(a)(1)(iii)	X 50.73(a)(2)(i)	___ 50.73(a)(2)(viii)(A)			
		___ 20.405(a)(1)(iv)	X 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	Ext.	TELEPHONE NUMBER (AREA CODE)
D. Bowers, Maintenance Staff	Ext. 2913	
T. Gierich, Work Planning Supervisor	Ext. 2888	8 1 5 2 3 4 - 5 4 4 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	

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 August 17, 1990 at approximately 1500, with Unit 2 in Mode 1 at 49% power, it was discovered that supports on the 2A Auxiliary Feedwater pump (AF)[BA] piping had been worked on without Operating Department concurrence. Limiting Condition for Operation Action Requirement 2BOS 4.10-1a was immediately entered and an Engineering Evaluation was initiated. The current condition of the system was found acceptable and the LCOAR was exited.

On 8-23-90, during a walkdown to verify assumptions made in determining operability during the support work, scaffolding was discovered supported by the AF line in question. The scaffolding was immediately removed. The load bearing nuts on one of the affected supports were also found loose at this time. They were promptly tightened and tested.

The cause of the supports being affected was that a contracted modification foreman did not request an out-of-service prior to performing work on existing operational equipment. The scaffolding was improperly attached to the system due to a lack of contractor awareness of the impact on the system. The loose fasteners are suspected to be a result of the work sequence. The root cause of these events was programmatic deficiencies in parts of the modification program.

As preventive action, the Daily Construction Work Authorization Sheet has been formalized and will specify the scope of the work step by step during non-outage periods. The contractor scaffolding procedure has been revised to include Shift Engineer review. In addition, all erected scaffolding was inspected. The contractor has also instituted a new policy to walkdown all work performed for impact on other components.

The event is reportable per 10CFR50.73(a)(2)(i)(B) and 10CFR50.73(a)(2)(ii)(B) for exceeding the LCOAR for the 2A AF pump and exceeding design basis criteria during the work process.

A. PLANT CONDITIONS PRIOR TO EVENT:

Event Date/Time 8-17-90 / 1500

Unit 1 MODE 1 - Power Operation Rx Power 100% RCS [AB] Temperature/Pressure Normal Operating

Unit 2 MODE 1 - Power Operation Rx Power 49% RCS [AB] Temperature/Pressure Normal Operating

B. DESCRIPTION OF EVENT:

On August 17, 1990, at approximately 1500, the Nuclear Regulatory Commission Resident Inspector made an inquiry to the Station concerning a removed strut from the Essential Service (SX)[BI] suction pipe to the 2A Auxiliary Feedwater (AF)[BA] pump. The Technical Staff System Engineer (non-licensed) determined during a walkdown that a support appeared to have been replaced and notified the Shift Control Room Engineer (SCRE, Senior Reactor Operator). The SCRE determined that control room personnel were not aware of work in progress on the AF system and had therefore not entered a Technical Specification Limiting Condition for Operation Action Requirement (LCOAR). The ensuing investigation discovered other concerns as detailed below.

With Unit 2's second refueling outage approaching (to begin August 31, 1990), Engineering and Construction (ENC) and the Station's modification contractor (William A. Pope Company Joint Venture) completed a pre-modification installers walkdown for modification M6-2-88-060. The scope of the modification was to install a flushing line with associated isolation valves and supports from the 2AF01PA SX suction line (2SX25AA-6") to the B train SX return header line. In addition, existing supports were to be modified to support the additional weight of the new pipe. On 8-6-90 the Pope Foreman received permission under Nuclear Work Request B73629 to install "SX piping and supports, build scaffolds, and remove insulation" as described on a hand written, informal Daily Work Authorization Sheet. The "Description of Work to be Done" field clearly stated "no tie-in to existing piping until B2R02 out-of-service". The Shift Foreman (SF, Senior Reactor Operator) questioned the Pope Foreman on the scope of the work, concerned that it was on a safety-related system. The Pope Foreman stated that there would be no system interaction, only work on new piping and component supports. Believing that the scope of the work was to begin installation of equipment to the point of interaction with the system, the SF granted permission to begin the work. The scaffolding was erected on the same day.

On 8-7-90, the workers added stiffener plates to U-bolt support M-2AF03032G. U-bolt removal was not required to perform this change. On 8-8-90, the rod on the east end of trapeze support M-2AF03021R was increased in size from 5/8" diameter to 3/4" diameter. The support was temporarily removed to perform this change. On 8-9-90, support M-2AF03019R was increased in size from Grinnell B to C, and temporarily removed to support the activity. On each day, the Pope Foreman signed in with the Shift Foreman using the same Daily Work Authorization Sheet since it still applied to the work in progress. The Shift Foreman still believed the work was not involving the operational systems. Each activity was started and completed on the aforementioned dates prior to commencing the next activity.

B. DESCRIPTION OF EVENT: (continued):

When the SCRE was notified that work had been performed on the system, the pump was immediately declared inoperable pending a review of the work completed to date. LCOAR 2BOS 4.10-1a was entered at 1500 on 8-17-90. 2BVS 4.10-6.2, "Post Maintenance Visual Examination (VT3/4) of Safety Related Component Supports," was satisfactorily completed for all three supports and reviewed at 1837 on 8-17-90. Construction Quality Control verified installation and performed dimensional inspections on the supports after the work was completed. An Engineering Evaluation and 10CFR50.59 Safety Evaluation determined that the current condition of the revised supports did not adversely affect operability since the changes increased the load capacity of the supports and did not impose any loads not previously considered. An On-Site Review concluded that both the AF and SX systems were operable and the LCOAR was exited at 2010 on 8-17-90.

The Architect/Engineer (Sargent & Lundy) began calculations to determine the operability of the system during the modification process. To verify assumptions made in the calculations which were yielding suspect results, the Engineers performed a walkdown of the equipment. On 8-23-90 at 1420, it was discovered that the scaffolding that had been erected on 8-6-90 was being supported from safety related line 2AF03AA-6" and two pipe supports (2PSL-AF051-H89E-3 and 2PSL-AF051-H89E-4). The scaffolding was immediately removed. At 1500, the load bearing nuts on component support M-2AF03021R were found loose. LCOAR 2BOS 4.10-1a was entered. The support was promptly tightened and tested via NWR B78922. The LCOAR was exited at 2138 on 8-23-90.

On August 30, 1990, ENC received the results of Sargent & Lundy's evaluation of the pipe support installation sequence and scaffolding loads. The results indicated that the normal operating loads were within code allowable values. However, code allowable values were exceeded for design basis load combinations (seismic) during the time supports M-2AF03021R and M-2AF03019R were individually removed. Therefore, this event is reportable pursuant to 10CFR50.73(a)(2)(i)(B) as a result of operation prohibited by Technical Specifications since the AF pump should have been declared inoperable on 8-8-90 and returned to an operable status within 72 hours. In addition, per 10CFR50.73(a)(2)(ii)(B) this event is reportable due to operation in a condition outside the design basis of the plant.

C. CAUSE OF EVENT:

The cause of the supports being removed was that the Pope Foreman did not request an Out-of-Service prior to performing work on existing component supports of an operational system. Per BAP 330-1, "Station Equipment Out-of-Service Procedure," an operability review would have recognized the proper time restraints for rendering the AF system inoperable. The contractor foreman incorrectly assumed that the existing supports had no effect on the operating system pressure boundary and therefore did not require an Out-of-Service.

The cause of the scaffolding being attached to a safety related line and to pipe supports was due to a lack of contractor compliance with the Pope scaffold procedure which prohibited attachment of scaffold to piping without prior authorization.

The cause of the loose load bearing nuts on support M-2AF03021R is postulated to be due to the subsequent replacement of support M-2AF03019R. The rod on M-2AF03021R was replaced and inspected on 8-8-90. M-2AF03019R was replaced and inspected on 8-9-90. However, the effect of support M-2AF03019R replacement on the rest of the equipment on that line was not considered and therefore not inspected. It is postulated that during the expansion of M-2AF03019R's support pins during installation, the fasteners on M-2AF03021R were de-tensioned.

C. CAUSE OF EVENT: (continued)

The root cause of these events was programmatic deficiencies in parts of the modification program related to coordination of work.

D. SAFETY ANALYSIS:

There were no adverse safety consequences from this event. Based on Sargent & Lundy's evaluation, the calculated piping stresses and associated support, structural and equipment stresses resulting from the normal operating loads due to the installation sequence were within code allowable values. However, based on the results of the piping stress analysis, design basis load combinations exceeded code allowable values when the two supports were removed. Since the situation was temporary and no seismic event occurred during that time, no over stresses occurred.

The 2A AF pump would have been capable of performing its intended function during a normal operating event based on Sargent & Lundy's evaluation.

Had a seismic event occurred in which the 2A AF pump was rendered inoperable due to over stresses in the pipe, the 2B AF pump would have been available to supply the required AF flow to the steam generators. The 2B AF pump was available throughout this event.

E. CORRECTIVE ACTIONS:

The Daily Construction Work Authorization sheet was formalized by Operating and ENC. This sheet requires completing a Daily Work Description Sheet which provides detailed information to the Shift Engineer concerning the scope and requirements necessary to perform the work during non-outage periods. This sheet, in conjunction with a copy of the Nuclear Work Request and the Road Map traveler (specifies what work is to be done step by step), allows the Shift Engineer (or Designee) to address operability concerns. Additionally, ENC concurrence is now obtained prior to shift review.

On August 20, 1990, the Unit 2 Operating Engineer informed the Operating Department of the new pre-outage work authorization policy.

The Maintenance Modification Contractor's Scaffold Procedure (JVSCAF-1) has been revised to include a requirement that Operating perform a pre-job review and sign final authorization for scaffold use.

An Awareness Day meeting between the Maintenance Modification Contractor, ENC, and Station personnel was held on August 25, 1990. Among the items discussed were the Station's approach to maintenance activities, operability concerns, safety, engineering interaction, and the need for enhanced communications with the Operating Department. All work activities in progress were inspected by a team consisting of representatives from ENC, Pope and Station Management (such as Technical Staff, Operating and/or Maintenance). The teams had a current copy of the Pope Scaffold Log Book and used it to identify, inspect and retag all existing Pope scaffolds with the revised scaffold inspection tags, and a copy was given to the Shift Engineer's office. All discrepant items identified during the inspections have been corrected.

E. CORRECTIVE ACTIONS (continued):

To prevent undetected adverse effects on other system components after work performed, Pope has instituted a new Production Supervisor Walkdown policy that now includes walkdown requirement of all work performed. The Pope Quality Control Department is also required to participate in the walkdown of all safety related, code related, and regulatory related work in order to identify any loose, missing or damaged equipment associated with the project.

The following changes to the Modification Program are being tracked by AIR's 455-225-90-299, 455-225-90-300 and 455-225-90-301.

To facilitate initial modification work package review and approval, the work analyst, with input from both Tech Staff and a licensed Operations person, will write a Summary of Installation Steps worksheet, including any operational steps, i.e., Take equipment Out-of-Service, enter LCOAR, etc. The level of detail contained in the summary will be sufficient to address operational and reliability concerns. This summary worksheet will generally be done prior to detailed work package development.

The installation summary worksheet will be reviewed, commented on, and approved by an SRO and Tech Staff. This approved worksheet will be used by the Work Analyst as a tool to properly separate work packages and develop the initial work instructions.

Final work package approval and subsequent revisions will be controlled by the Station's Maintenance/Modification Procedure (MMP) process per BAP 400-11. This approval process will allow for Operations department verification that all operation concerns outlined in the worksheets have been properly addressed.

On simple modifications the worksheet requirement may be waived by the applicable Operating Engineer. Whether or not the worksheet is used, final operational review will be accomplished via the MMP approval process.

All modification work packages which have Pre Out-of-Service/LCOAR work will be broken down into sub-packages clearly delineating Pre Out-of-Service/LCOAR work from Post Out-of-Service/LCOAR work.

All modification work packages will be reviewed and approved by an Operating Engineer or designee. The Operating Engineer will assure that Pre Out-of-Service/LCOAR work is clearly defined and segregated. In addition the Operating Engineer may at his discretion insert "Operating Hold Points" or request that work steps be added to the Road Map Traveler (step by step work instructions) to require operating concurrence prior to work proceeding. This review and approval will be accomplished by the addition of an SRO signature on the Maintenance/Modification Procedure (MMP) form prior to the quality reviews. These requirements will be specified in BAP 400-11.

Modification Work Packages which have Pre Out-of-Service/LCOAR work will be scheduled and statused on the routine or outage work schedule (as applicable) on a sub-package level.

F. PREVIOUS OCCURRENCES:

There has been one previous similar occurrence of a contracted maintenance crew operating outside the scope of work authorization. The crew stroked a valve without clearly receiving permission from Operating. Corrective actions did not apply to this event.

Number	Title
87-012 (Docket 454)	Two trains of safety related component cooling inoperable due to loss of water inventory caused by personnel error.

G. COMPONENT FAILURE DATA:

Component failure did not initiate this event nor did component failure result from this event.