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SUBJECT: LER 97-006-01:on 970327,equipment in containment rendered inoperable due to cracked floodup tubes was identified. Caused by work practices that resulted in two separate types of failures.Critical areas inspected.W/970530 ltr.

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INDIANA MICHIGAN POWER

May 30, 1997

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Operating Licenses DPR-58
Docket No. 50-315

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In accordance with the criteria established by 10 CFR 50.73 entitled Licensee Event Report System, the following report is being submitted:

97-006-01

Sincerely,

John R. Sampson for

A. A. Blind
Site Vice President

/mbd

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NRC FORM 366 (5-92)

U.S. NUCLEAR REGULATORY COMMISSION

APPROVED BY OMB NO. 3150-0104
EXPIRES 5/31/95

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LICENSEE EVENT REPORT (LER)

FACILITY NAME (1)	DOCKET NUMBER (2)	
Donald C. Cook Nuclear Plant - Unit 1	50-315	Page 1 of 10

TITLE (4)

Equipment in Containment Rendered Inoperable Due to Cracked Floodup Tubes

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: Cook - Unit 2	DOCKET NUMBER: 50-316
03	27	97	97	-- 006 --	01	05	30	97	FACILITY NAME	DOCKET NUMBER

OPERATING MODE (9)	6
POWER LEVEL (10)	0

THIS REPORT IS SUBMITTED PURSUANT TO THE REQUIREMENTS OF 10 CFR §: (Check one or more) (11)

	20.2201(b)		20.2203(a)(3)(i)		50.73(a)(2)(iii)		73.71(b)
	20.2203(a)(1)		20.2203(a)(3)(ii)		50.73(a)(2)(iv)		73.71c
	20.2203(a)(2)(i)		20.2203(a)(4)		50.73(a)(2)(v)		OTHER
	20.2203(a)(2)(ii)		50.36(c)(1)		50.73(a)(2)(vii)		(Specify in Abstract below and in Text, NRC Form 366A)
	20.2203(a)(2)(iii)		50.36(c)(2)		50.73(a)(2)(viii)(A)		
	20.2203(a)(2)(iv)		50.73(a)(2)(i)		50.73(a)(2)(viii)(B)		
	20.2203(a)(2)(v)	X	50.73(a)(2)(ii)		50.73(a)(2)(x)		

LICENSEE CONTACT FOR THIS LER (12)

NAME	TELEPHONE NUMBER (Include Area Code)
Mr. Mike Finissi, System Engineering - Electrical Supervisor	616/465-5901, x2830

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 15 single-spaced typewritten lines) (16)

This LER revision is being submitted to provide additional information regarding the safety significance and the root cause determination for cracked floodup tubes (FUTS) found in Cook Units 1 and 2.

During an inspection of floodup tubes for moisture intrusion, 3 FUTS with thru wall defects were identified. As a result, pro-active measures were taken to inspect the remaining Unit 1 FUTS. This resulted in the identification of six additional thru wall defects in Unit 1. As a result, Unit 2 FUTs were inspected, and 2 cracked tubes were found. Of the 11 total damaged tubes, Unit 1 contained 7 FUTS and Unit 2 contained 1 FUT with an associated circuit that is needed for accident mitigation or post accident monitoring. On March 23 the Unit 2 condition was reported under 10CFR50.72(b)(1)(ii). On March 27 Unit 1 condition was reported under 10CFR50.72(b)(2)(i). ENS notifications were made for both.

The damage has been attributed to work practices that resulted in two different types of failures--material stress cracks and random arc strikes, most probably early in plant life. All damaged Unit 1 EQ FUTS have been replaced and both Unit 2 tubes have been replaced. To prevent the cracks due to installation practices from reoccurring, the Cook Plant FUT Installation Work Instructions will be modified to contain additional guidance. Welding practices have been sufficiently enhanced since the early portion of the plant life to preclude arc strikes on FUTS. Inspections of the FUTS for damage will also be performed at the beginning and the end of the refueling outages until assurance is reached that no further problems were found.

Postulated failures that could result from the cracked floodup tubes were evaluated and found not to present a significant risk with regard to the protection of the public health and safety.

Conditions Prior to Occurrence

Unit 1 was in Mode 6, Refueling
Unit 2 was in Mode 1, Power Operation, at 100 percent Rated Thermal Power

Description of Event

Electrical penetrations at the D. C. Cook Nuclear plant are located below the predicted flooding level inside containment following a loss of coolant accident. As a result, safety related cables are routed through stainless steel tubes, known as floodup tubes, which prevent the water in the containment from contacting the cables. This precaution is necessary because the electrical cables have not been environmentally qualified for submergence in water. All Katpon wires below floodup levels needed for EQ are contained in a floodup tube. There is no other EQ equipment below floodup level which needs floodup tubes to maintain its qualification.

As a result of LER 316/96-006-00, which was written to document the discovery of moisture intrusion into FUTs during Unit 2's 1996 refueling outage, one third of Unit 1's FUTs were inspected for moisture intrusion during its 1997 refueling outage. During the floodup tube inspection, nine tubes in Unit 1 were found to have cracks which would allow water intrusion following a loss of coolant accident. As a result of the Unit 1 findings, the floodup tubes in Unit 2 were inspected, and two cracked tubes were discovered.

The cables that are contained inside the floodup tubes are Kapton insulated, and a review of partial test data for Kapton insulated wires in high pH solutions has led to the conclusion that cable failures may occur after two hours of submergence in the high pH solution (9 to 10) that would flood the lower containment following a loss of coolant accident.

The Unit 1 tubes were inspected during the period March 16, 1997 through March 23, 1997. Following the inspection, the following equipment which is required for accident mitigation or post accident monitoring was identified as adversely impacted by the existence of a cracked floodup tube:

1-BLP-132	Steam Generator three narrow range (EIIS/IP-LT) level transmitter
1-BLP-142	Steam Generator four narrow range (EIIS/IP-LT) level transmitter
1-NTR-140	Reactor coolant loop 4 hot leg wide (EIIS/TR) range temperature recorder thermal sensor
1-NTR-240	Reactor coolant loop 4 cold leg wide (EIIS/TR) range temperature recorder thermal sensor
1-HR-1	Hydrogen Recombiner (EIIS/BB-RCB)
1-VMO-102	Containment Hydrogen Skimmer (EIIS/BB-IV) ventilation fan HV-CEQ-2 suction shutoff valve

Description of Event (cont'd)

1-NSO-021	Reactor Coolant System post-accident (EIIS/AB-VTV) vent train A solenoid valve
1-IMO-315	East RHR and North Safety Injection to (EIIS/BO-INV) reactor coolant loops 1 and 4 hot legs shutoff valve
1-IMO-316	East RHR and North Safety Injection to (EIIS/BO-INV) reactor coolant loops 1 and 4 cold legs shutoff valve
1-IMO-325	West RHR and south safety injection to (EIIS/BO-INV) reactor coolant loops 2 and 3 hot legs shutoff valve
1-NMO-151	Pressurizer relief valve NRV-151 (EIIS/AB-ISV) upstream shutoff valve
1-33-NRV-153	Pressurizer train A pressure relief valve NRV-153 close limit switch

The Unit 2 floodup tubes were inspected on March 23, 1997. At that time, a crack was found in the floodup tube 2-IP3-3. This floodup tube contains a cable which supplies power to one of two containment recirculation (CEQ) fans (EIIS/BB-FAN). The CEQ fans operate long term following a loss of coolant accident, and absent qualification data for water submergence, continued operation of the impacted CEQ fan could not be guaranteed.

Cause of the Event

The tube damage has been attributed to work practices that resulted in two separate types of failures--material stress cracks and random arc strikes, most probably early in the plant life.

In three isolated instances, unrelated to the material stress cracks, the tube exhibited holes in the tube approximately 1/8"-1/4" wide. These holes had a burned appearance such that they may have been caused by welding activities in the vicinity of the floodup tubes.

The other cause is due to localized stresses to the material at the point where the tube transitions from flexible to a rigid configuration. The causal analysis evaluated the basic tube construction, inspected damaged tubes, and performed an inspection on the installation in the annulus.

The floodup tube construction is a standard single-ply helical corrugated bellows that is constructed from a Type 321 stainless steel. Both ends of the floodup tube are welded to a Type 304 stainless steel fitting with male threads. The fittings constitute a rigid point while the bellows themselves are a flexible member. This type of construction allows the tube to flex uniformly throughout its entire length except at the point where it connects to the fittings.

Cause of the Event (cont'd)

An examination of two cracked tubes which had this second type of failure was performed by DCCNP metallurgical engineers . A portion of their investigation follows:

> "An examination of two typically cracked tubes revealed a 3/4" long linear indication oriented parallel to the corrugation at the root of a convolution. The crack was located a distance of two convolutions from the weld attaching the bellows to the threaded fitting. One end of the crack, had a Y-pattern crack that is indicative of a crack initiation point due to excessive bending stress in the thin material. Due to the crack's location, the defect is not welding related.
>
> Although not used in this application, the corrugated bellows is capable of withstanding motion, lateral offset, angular rotation, as well as axial extension and compression over the entire length of the floodup tube. However, within a localized region, such as where the bellows are attached to the threaded fitting, the bellows transitions from flexible to rigid. At this location, the thin bellows material will not withstand any bending or torsional rotation loading."

The floodup tube installation in the annulus was reviewed to determine which configuration was more prone to failure. It was found that all those floodup tubes that have this type of defect were in those installations where there is a minimum of seven tubes per penetration. This is attributed to the fact that those penetration installations with more floodup tubes also have more stringent bending restrictions due to space restrictions.

The fact that all these cracks were near the fitting end of the floodup tube and in those installations which require smaller bending radii confirm that the cracks were due to localized stress. Due to the type, location, orientation of the defect and lack of loading during service, these defects were most probably initiated in the bellows during installation or subsequent rework.

Analysis of the Event

These events are reportable under the provisions of 10CFR50.73(a)(2)(i)(B), operation prohibited by the plant's technical specifications, 10CFR50.73(a)(2)(ii), any event or condition that resulted in the condition of the nuclear power plant, including its principal safety barriers, being seriously degraded, and 10CFR50.73(a)(2)(ii)(B), a condition which is outside of the design basis of the plant.

The cables are required to be environmentally qualified per 10CFR50.49. However, the environmental qualification testing did not include submerging the cable in water. Partial test data for Kapton insulated cable shows that one test sample failed after two hours, and a second test sample failed after forty eight hours. On this basis, it was determined that Kapton insulated cable was not suitable for long term use submerged in a sump solution having a pH of 9-10.

Analysis of the Event (cont'd)

Because the cracks in floodup tubes are located below the containment floodup level, water could enter the tube and the cable would be submerged in a sodium hydroxide solution having a pH of 9 to 10. Submergence in this solution would degrade the Kapton insulation, and it would eventually fail. As the time to failure cannot be accurately predicted, any equipment required for long term accident mitigation was considered to be inoperable. Equipment which could complete its safety function within two hours following the accident was considered operable for the purpose of the analysis presented in this LER.

It is not possible to tell when the tubes became cracked. However, the apparent cause of the cracks, welding arc strikes and stress cracking, indicates that they existed prior to discovery. Therefore, it is assumed that the unit was in T/S 3.0.3, which is reportable as a condition which is outside the design basis of the plant and as operation prohibited by the plant's technical specifications.

The result of the evaluation is that, although the potential for equipment failure placed the plant outside of its licensing basis in many instances, there was no postulated failure that is considered to have a major impact with regard to protecting the public health and safety. Also, in many cases the equipment was backed up by unaffected redundant equipment and/or equipment which could perform a similar safety function.

Unit 1
Narrow Range Steam Generator Level Transmitters

The narrow range steam generator level transmitters (1-BLP-132, -142) provide a signal to the reactor protection system, and they are used for post accident monitoring of the steam generator level (Technical specification 3.3.3.8 requires one operable channel per steam generator). The protection system function would be accomplished prior to the cable's becoming submerged. There are three narrow range steam generator level transmitters per steam generator, and the post accident monitoring function could be accomplished by either the remaining two narrow range transmitters.

Hot Leg Wide Range Temperature Recorder

The hot leg wide range temperature recorder (1-NTR-140, -240) signal is required as input to the RCS subcooling monitor, and the subcooling monitoring system would be less effective since input temperatures from an entire RCS loop would be lost.

The operator also has available subcooling indication using the core exit thermocouples. This is actually the preferred method of determining subcooling since it provides conservative results. Thus the loss of 1-NTR-140 and 1-NTR-240 would not have significantly impacted plant operations and is judged to have had no adverse impact on public health and safety.

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LICENSEE EVENT CONTINUATION

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

Analysis of the Event (cont'd)

Hydrogen Recombiner

The Cook Nuclear Plant has two hydrogen recombiners of which only one is required for accident mitigation. Only one of the two recombiners (1-HR-1) was adversely impacted by a cracked floodup tube.

The hydrogen recombiner is used to maintain the long-term hydrogen concentration inside containment below 4 volume per cent. Although the principal means of hydrogen control that is included in the plant design basis are two electric hydrogen recombiners combined with two containment air recirculation fans, additional means of hydrogen control, hydrogen igniters, were added to address the possibility of excessive hydrogen concentrations that may exist following a severe accident. An analysis has been performed to show that the igniters are capable of preventing hydrogen ignition from endangering the public health and safety when hydrogen concentrations are excessively high. Therefore, in the event that both recombiners were to fail, and the hydrogen concentrations were to build up to excessive amounts, it is believed that the hydrogen igniters would prevent the ensuing problems with hydrogen ignition from adversely impacting public health and safety.

Although the igniters do not have the data to support longevity of operation, they are capable of supporting operation for at least one week. It is believed that the igniters would last for periods considerable beyond that time. During the time that there was total reliance on the hydrogen igniters, it may be possible to repair the unaffected electric hydrogen recombiner (if the repair could be performed outside the containment) or establish some other means of long term hydrogen control, if it were necessary.

Based on the combination of the unlikelihood of failure of the redundant hydrogen recombiner, combined with the availability of the hydrogen igniters, it is concluded that there would be an almost negligible chance that the cracks in the floodup tubes servicing electrical cables to 1-HR-1 would have resulted in significant problems associated with hydrogen ignition should a design basis LOCA have occurred at the plant. It is therefore concluded that the crack in the floodup tube associated with 1-HR-1 did not represent a significant hazard with regard to the protection of the public health and safety.

Containment Recirculation Fan Valve

The Cook Nuclear Plant has two recirculation fans, only one of which is required for accident mitigation. Only one of the recirculation fans was impacted by the cracked floodup tube containing the cable associated with valve 1-VMO-102.

The containment air recirculation system valve is activated 10 minutes after the accident occurs. Based on partial test data which demonstrate that a minimum of two hours is required before Kapton insulation is degraded to the point where it is no longer effective, it is concluded that this valve would have performed its function prior to the insulation's being significantly degraded.

Analysis of the Event (cont'd)

Reactor Vessel Head Vent Valve

The Cook Nuclear Plant has two head vent valves, only one of which is required by the technical specifications to be operable. Only one of the head vent valves was impacted by a cracked floodup tube.

The reactor vessel head vent system (1-NSO-021) is a series/parallel arrangement where four valves are supplied by two separate power trains. An identical arrangement exists for the pressurizer head vent.

No credit is taken for the reactor head vents in the FSAR design basis accident analysis. They are strictly a contingency to be used for severe accidents. The reactor head vents were installed in the Cook Nuclear Plant in response to 10CFR50.44 (c)(3)(iii) to vent a hydrogen bubble in the reactor head in the event of a degraded core accident with significant hydrogen generation. This head vent is also used in the Emergency Operating Procedures to aid in vessel depressurization after all other mechanisms have failed, including both the primary and secondary power operated relief valves.

Cold Leg to Hot Leg Injection Valves

Valves 1-IMO-315, 1-IMO-316 and 1-IMO-325 are required to function when switching from cold leg to hot leg injection following a loss of coolant accident. Valves 1-IMO-315 and 1-IMO-325 are required to open to provide a hot leg flowpath to loops 1,2,3, and 4. Valve 1-IMO-316 is required to close to block the cold leg flowpath to loops 1 and 4.

Using the current licensed methodology, the inability to switch to hot leg recirculation would result in boron precipitation in the core and possible heat transfer degradation, potentially leading to a cladding temperature heatup. However, Westinghouse has developed a new methodology which, if licensed and implemented, would eliminate the need to switch to hot leg recirculation. This methodology models the flow through the gap between the hot leg nozzle and the barrel as a mechanism for transporting borated vessel water to the sump. The Westinghouse WCAP presents the methodology and documents a generic analysis that is applicable to most Westinghouse 3 and 4 loop plant, including Cook. Among the conclusions drawn from the generic analysis is that the ECCS does not need to be aligned to the RCS hot legs post-LOCA in order to limit the buildup of boron. As such, the hot leg nozzle gap would have limited the buildup of boron after the LOCA, even if the ECCS could not have aligned to the hot legs. This would have prevented boron precipitation in the core, maintaining the heat transfer capability . Thus the inability to align the ECCS to the hot legs would not have resulted in a violation of any of the 10 CFR 50.46 criteria.

Power Operated Relief Valve Block

Valve 1-NMO-151 is a normally open block valve for a pressurizer power operated relief valve (PORV), and is the only one of the three PORV block valves that was impacted by a cracked floodup tube.

The Cook Nuclear Plant pressurizer has three PORVs which limit reactor coolant system pressure. The PORVs, which are spring closed and air-to-open upon actuation of their associated solenoid valve, operate automatically or by remote manual control. Remotely operated block valves are provided to isolate the PORVs.

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

Analysis of the Event (cont'd)

Power Operated Relief Valve Block (cont'd)

To evaluate the impact of the cracked floodup tubes, four conditions were considered: 1) FSAR accidents; 2) high energy line breaks inside containment where immediate isolation of the PORV is required; 3) conditions outside of the normal FSAR analysis where it may be necessary to isolate the PORV after the electric wire housed in the cracked PORV has been submerged for several hours, and 4) conditions outside the FSAR analysis where it may be necessary to open an isolated PORV after the electric wire housed in the cracked PORV has been submerged for several hours. Each of these conditions is discussed below.

The single Chapter 14 accident analysis which requires PORV operability is the steam generator tube rupture (SGTR) with a loss of offsite power. In this event, one PORV is required to reduce primary system pressure during the recovery phase of the accident to slightly above the secondary side pressure. A second PORV is required to be operable for single failure considerations. The UFSAR Chapter 14 SGTR is not considered to be a flooding event, and therefore the cracked floodup tubes would not have impacted the PORV block valve operability for this accident.

Credit is taken in the plant emergency operating procedures for the PORVs to recover from a variety of accidents. This would include the category of events and accidents that could cause the PORVs to open and fail to close, resulting in a small break LOCA (e.g. normal plant cooldown, activation of the safety injection system, or severe transients such as a feedwater line break or steam line break inside containment). The main function of the PORV block valves is to isolate a PORV if the PORV fails in the open position. For events of the type cited above, either they do not cause containment flooding, or if they do cause flooding, the need to close the PORVs occurs early enough in the transient that the block valves would still be considered operable in spite of the water intrusion that may have occurred due to cracks in the floodup tubes.

A third category of events include long term recovery actions such as response to inadequate core cooling or response to degraded core cooling where the containment could be flooded. Each of these events require that a stuck open PORV be isolated. These events are beyond those considered in the plant design basis, and it is considered highly unlikely that an adverse accident of this type could occur at the same time that a PORV sticks open, the cables are submerged, and the block valve fails to close when it is required.

The final category is events that require a PORV to be open to facilitate accident recovery. An example of this would be the feedwater line break recovery. However, not all of the three PORVs would have been affected by cracks in the floodup tubes, and at least one would be available for this purpose. This meets the minimum requirement.

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

Analysis of the Event (cont'd)

Unit 2
Containment Air Recirculation/Hydrogen Skimmer Fan

The Cook Nuclear Plant has two containment air recirculation/hydrogen skimmer (CEQ fans), only one of which is required for accident mitigation. Only one fan was adversely impacted by a cracked floodup tube.

The CEQ fans are required to provide a continuous mixing of the containment atmosphere for the long term post blowdown accident environment. They are also required to prevent the formation of hydrogen pockets within the various compartments and subcompartments of the ice condenser containment.

Two full capacity fans, each capable of blowing air from the upper volume into the lower volume are provided. For accident analysis conditions, only one fan is modeled based upon the limiting single failure of a train of containment safeguards equipment. The air recirculation fans have sufficient head to overcome the compartment pressure differentials that occur after the initial RCS blowdown. The fans will blow air from the upper compartment to the lower compartment thereby returning air to the lower compartment which was displaced by the blowdown. Although the fans are modeled during both the containment response transient following a LOCA and MSLB, the greatest impact resulting from their activation is seen during the LOCA transient response due to the long term transient scenario. The air return fans are modeled to operate upon reaching the high-high containment pressure setpoint following a ten minute delay. During the LOCA response transient the fans provide a flow path early in the transient, therefore their function plays an important role (before the time of peak pressure) in the containment response calculation. Similarly during the MSLB containment response calculation the fans function in a likewise manner. However, the time the fans activate follow the time when the containment peak pressure and temperature occurs, therefore their impact on the containment response transient is minimal. Their primary effect is on the rate of containment depressurization and cooldown after 10 minutes into the MSLB containment response transient.

Based upon sensitivities which have been performed for an ice condenser plant similar to the Cook Nuclear Plant when considering inoperable air return fans, the effect of the loss of the air return fan on containment peak pressure was 5 psi. Since the Cook design pressure is 12 psi, this means that the maximum pressure achieved by the containment should both fans be lost is 17 psi. Although above the plant design basis of 12 psi, this is well within the containment ultimate capability of approximately 36 psi.

The potential loss of CEQ fans also means the loss of ability to remove hydrogen from the compartments of the Cook Nuclear Plant. This will not occur until two hours into the accident. As part of the Cook Nuclear Plant's probabilistic risk assessment, studies have been performed to evaluate the loss of CEQ fans following a severe accident. These studies have concluded that no adverse impact on containment performance is expected due to containment recirculation fan failures.

On the basis of the above, it is concluded that the loss of one CEQ fan did not adversely impact the public health and safety. It is further pointed out, that only one of the two redundant fans was impacted, and therefore following a high energy line break inside containment the plant may have stayed with its design basis containment pressure of 12 psi.

NRC FORM 366A U.S. NUCLEAR REGULATORY COMMISSION

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Corrective Action

Critical areas for all floodup tubes in each unit have been inspected for cracks.

The damaged Unit 1 EQ floodup tubes and Unit 2 floodup tubes have been replaced.

Preventive Action

Adequate precautions for welding in the vicinity of electrical equipment have been identified in the AEP Welding Manual, General Welding Requirements, step 6.13 which in condensed version states: base materials and other metallic regions outside of the weld zone **shall** be protected to prevent inadvertent arc strikes. In addition, PMI-2270 (FIRE PROTECTION), contains the Welding, Burning, & Grinding Permit which is issued for all welding activities. The permit covers area requirements which provide direction to cover electrical equipment and cable trays with fire blanket. To supplement these plant requirements, an inspection as stated below will be performed to verify that the tubes have not been damaged prior to start-up after outage work has been performed.

Work Standards to the Nuclear Plant Maintenance (NPM) and Environmental Qualification Preservation Documents (EQPD) will be enhanced to identify that while working on the floodup tubes there is a need to avoid adding undue localized stress to the floodup tubes and then to verify that no cracks have developed . The Work Standards to the NPM for floodup tube installation have already been revised to include these precautions. As a long term action, new EQPD will be issued by June 1, 1998 for floodup tubes to identify the critical EQ parameters.

Inspections will be made at the beginning of each outage to check for any cracks. Inspections will also be made at the end of the outage to ensure that no outage activities damaged any tubes.

In addition, although not contained in a formal program, the knowledge that the tubes are subject to this type of damage will heighten awareness and improve work being done on and around the floodup tubes.

Failed Component Identification

Not Applicable

Previous Similar Events

None